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GARDENING IN ALL ITS BRANCHES.

THIS IS AN ART
WHICH DOES MEND NATURE: CHANGE IT RATHER: BUT
THE ART ITSELF IS NATURE.—Shakespeare.

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TO THE MEMORY OF

DR. JOHN TORREY,

A GOOD MAN AND A DISTINGUISHED BOTANIST,

THIS VOLUME OF "THE GARDEN" IS DEDICATED.

London, June 30th, 1874.

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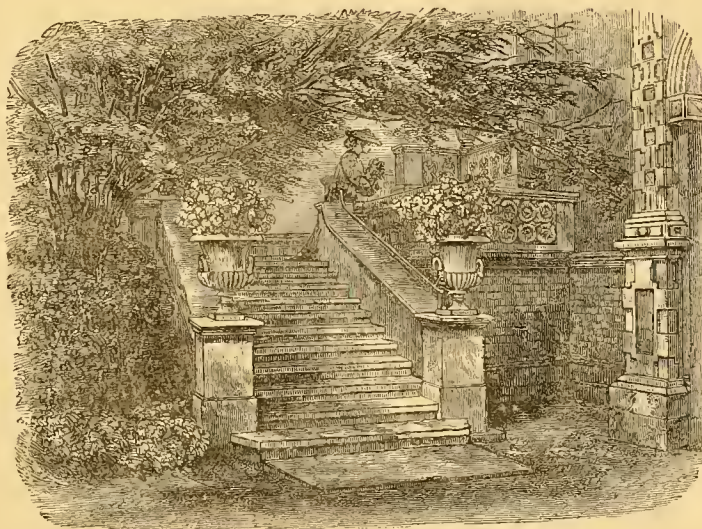
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THE LATE DR. TORREY.

JOHN TORREY, the chief of American botanists, was born in New York, on the 15th of August, 1796. He received such education only as the public schools of his native city then afforded, and was also sent for a year to a school in Boston. When only fifteen or sixteen years old he happened to attract the attention of AMOS EATON, a well-known pioneer of natural science, who taught him the structure of flowers and the rudiments of botany, and thus awakened in him for that science a taste which was extinguished only with his life. In 1815, TORREY began the study of medicine, and took his medical degree in 1818; and engaged in the practice of medicine with moderate success, turning the while his abundant leisure to scientific pursuits, especially to botany. In 1817, while yet a medical student, he reported to the Lyceum of Natural History—of which he was one of the founders—his Catalogue of the plants growing spontaneously within thirty miles of New York. ELLIOT'S "Sketch of the Botany of South Carolina and Georgia," was about this time in course of publication, and Dr. TORREY planned a counterpart systematic work upon the botany of the Northern States. The result of this was his "Flora of the Northern and Middle Sections of the United States, *i.e.* North of Virginia,"—which was issued in parts, and the first volume concluded in the summer of 1827. In this work he first developed his remarkable aptitude for descriptive botany, and for the kind of investigation and discrimination, the tact and acumen, which it calls for. Only those few,—now, alas, very few,—surviving botanists who used this book through the following years can at all appreciate its value. In 1824, the year in which the first volume (or nearly half) of his "Flora" was published, he was chosen Professor of Chemistry, Mineralogy, and Geology in the United States Military Academy. Three years later he exchanged this chair for that of Chemistry and Botany. The "Flora of the Northern States" was never carried further; although a "Compendium" (a pocket volume for the field, containing brief characters of the species which were to have been described in the second volume) along with an abridgement of the contents of the first, was issued in 1826. The opportunity for extending his investigations to the great plains and the Rocky Mountains on their western boundary, was furnished by the collections placed in Dr. TORREY'S hands by Dr. EDWIN JAMES, the botanist attached to Major Long's expedition in 1820. This expedition skirted the Rocky Mountains belonging to what is now called Colorado Territory, where Dr. JAMES, first and alone, reached the charming Alpine vegetation, scaling one of the very highest summits, which from that time and for many years afterwards was appropriately named James' Peak, although it is now called Pike's Peak, in honour of General PIKE, who long before had probably seen, but had not reached it. As early as the year 1823, Dr. TORREY communicated to the Lyceum of Natural History descriptions of some new species of JAMES'S collection, and in 1826 an extended account of all the plants collected, arranged under their natural orders. This was the earliest treatise of the sort in America arranged upon the natural system; and with it began the history of the botany of the Rocky Mountains, if we except a few plants collected early in the century by LEWIS and CLARK where they crossed them many degrees farther north, and which are recorded in PURSH'S "Flora." The next step, in the direction he was aiming, was made in the year 1831, when he superintended an American reprint of the first edition of LINDLEY'S "Introduction to the Natural System of Botany," and appended a catalogue of the North American genera arranged according to it.

Dr. TORREY took an early and prominent part in the investigation of the United States species of the vast genus *Carex*. His friend, Von SCHWEINITZ, of Bethlehem, Penn., placed in his hands and desired him to edit, during the author's absence in Europe, his "Monograph of North American Carices". It was published in the "Annals of the New York Lyceum," in 1825, much extended, indeed almost wholly re-written, and so much to SCHWEINITZ'S satisfaction that he insisted that this classical "Monograph" "should be considered and quoted in all respects as the joint production of Dr. TORREY and himself." Ten or eleven years later, in the succeeding volume of the "Annals of the New York Lyceum," appeared Dr. TORREY'S elaborate "Monograph of the other North American Cyperaceæ," with an appended revision of the Carices, which meanwhile had been immensely increased by the collections of RICHARDSON, DRUMMOND, &c., in British and Arctic America. A full set of these was consigned to his hands for study (along with other important collections), by his friend the late Sir WM. HOOKER, upon the occasion of a visit which he made to Europe in 1833. But Dr. TORREY generously turned over the Carices to the late Professor DEWEY, whose rival "Caricography" is scattered through forty or fifty volumes of the "American Journal of Science and Arts;" and so had only to sum up the results in this regard, and add a few southern species at the close of his own "Monograph" of the order. About this time, namely in the year 1836, upon the organisation of a geological survey of the State of New York upon an extensive plan, Dr. TORREY was appointed botanist, and was required to prepare a Flora

of the State. A laborious undertaking it proved to be, involving a heavy sacrifice of time, and postponing the realisation of long-cherished plans. But in 1843, after much discouragement, the "Flora of the State of New York," the largest, if by no means the most important, of Dr. TORREY's works, was completed, and published in two quarto volumes, with 161 plates. Early in his career Dr. TORREY had resolved to undertake a general Flora of North America, and, with the assistance of Dr. ASA GRAY, in July and in October, 1838, the first two parts, making half the first volume, were published. The remaining half of the first volume appeared in June 1840. The first part of the second volume followed in 1841; the second in the spring of 1842; and in February, 1843, came the third and the last. Passing by various detached and scattered articles upon curious new genera, we may remark that much more would have been published if Dr. TORREY had been as ready to complete as he was to investigate, annotate, and sketch. Through undue diffidence and a constant desire for a greater perfection than was at the time attainable, many interesting observations have from time to time been anticipated by other botanists.

In the estimate of Dr. TORREY's botanical work, it must not be forgotten that it was nearly all done in the intervals of a busy professional life; that he was for more than thirty years an active and distinguished teacher, mainly of chemistry, and in more than one institution at the same time; that he devoted much time and remarkable skill and judgment to the practical applications of chemistry, in which his counsels were constantly sought and too generously given; that when, in 1857, he exchanged a portion, and a few years later the whole, of his professional duties for the office of United States Assayer, these requisitions upon his time became more numerous and urgent. Some eight years ago he was sent by the Treasury Department to California by way of the Isthmus; and at a later date he went again across the Continent, and in both cases enjoyed the rare pleasure of viewing in their native soil, and plucking with his own hands, many a flower which he had himself named and described from dried specimens in the herbarium, and in which he felt a kind of paternal interest. Perhaps this interest culminated during this journey, when he stood on the flank of the lofty and beautiful snow-clad peak to which a grateful former pupil and ardent explorer, ten years before, gave his name, and gathered charming Alpine plants which he had himself named forty years before, when the botany of the Colorado Rocky Mountains was first opened. That age and fast-failing strength had not dimmed his enjoyment, may be inferred from his remark, when, on his return from Florida the previous spring, with a grievous cough allayed, he was rallied for having gone to seek PONCE DE LEON's Fountain of Youth. "No," said he, "give me the fountain of Old Age. The longer I live, the more I enjoy life." He evidently did so. If never robust, he was rarely ill, and his last sickness brought little suffering and no diminution of his characteristic cheerfulness. To him, indeed, never came the "evil days" of which he could say, "I have no pleasure in them." Evincing in age much of the ardour and all of the ingenuousness of youth, he enjoyed the society of young men and students, and was helpful to them long after he ceased to teach,—if, indeed, he ever did cease. To the conductor, who was introduced to him, in 1870, by the Editor of the *American Agriculturist*, and who now dedicates this fifth volume of THE GARDEN to his memory, he gave kindly help towards seeing some of the botanical and horticultural treasures of his country. As Emeritus Professor in Columbia College (with which his old medical school was united), he not only opened his herbarium, but gave some lectures almost every year, and, as a trustee of the college, for many years he rendered faithful and important service. His large and truly invaluable herbarium, along with a choice botanical library, was several years ago made over to Columbia College, which charges itself with its safe preservation and maintenance.

This sketch of Dr. TORREY's public life and works, which it is our main duty to exhibit, would fall short of its object if it did not convey, however briefly and incidentally, some just idea of what manner of man he was. That he was earnest, indefatigable, and able, it is needless to say. His gifts as a teacher were largely proved and are widely known through a long generation of pupils. As an investigator, he was characterised by a scrupulous accuracy, a remarkable fertility of mind, especially as shown in devising ways and means of research, and, perhaps, by some excess of caution. He was genial and conscientious, thoroughly unselfish, and won the affection of all who knew him. One thing no one could fail to notice, and that was his thorough love of truth for its own sake. As to the customary testimonial which the botanist receives from his fellows, it is fortunate that the first attempts were nugatory. Almost in his youth a genus was dedicated to him by his correspondent, SPRENGEL; this proved to be a *Clerodendron*, misunderstood. A second, proposed by RAFINESQUE, was founded on an artificial dismemberment of *Cyperus*. The ground was clear, therefore, when, thirty or forty years ago, a new and remarkable evergreen tree was discovered in the Southern States, which it was at once determined should bear Dr. TORREY's name. More recently, a congener was found in the noble forests of California. Another species had already been recognised in Japan, and lately a fourth in the mountains of Northern China. All four of them have been introduced and are greatly prized as ornamental trees in Europe. So that, all round the world, *Torreya taxifolia*, *Torreya californica*, *Torreya nucifera*, and *Torreya grandis*—as well as his own important contributions to botany, of which they are a memorial—should keep the memory of TORREY as green as their own perpetual verdure. We are indebted to Dr. THURBER for the portrait, and to Dr. ASA GRAY, TORREY's friend and co-worker, for the facts of the preceding account, which were contributed by him to the TORREY Botanical Society.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

CALIFORNIAN LILIES.

By DR. BOLANDER, of San Francisco.

THE genus *Lilium* is represented in the State of California by the following distinct species, of which there are several well-marked varieties:—1. *Lilium Washingtonianum* (Kellogg). 2. *Lilium Humboldtii* (Roezl), *L. Bloomerianum* (Kellogg). 3. *Lilium canadense* (Linn.); var. *L. parviflorum* (Hook.); var. *L. pardelinum* (Kellogg); var. *L. californicum* (Hort.). 4. *Lilium parvum* (Kellogg).

Bulbs ovoid, outer scales largest, fleshy, imbricated, lanceolate.

1. *LILIAM WASHINGTONIANUM* (Kellogg).—This occurs on the Cuyumaca Mountain in San Diego Co., its most southern limit known at present, northward along the western slope of the Sierra Nevada, between 3,500 and 6,000 feet altitude, in Pregon to the Columbia River, and on the coast ranges north of San Francisco, especially in the eastern parts of Mendocino and Humboldt Co. In all localities named it occurs either on ridges, or on lightly shaded slopes of ridges, having a porous loose soil, resting on a gravelly sub-soil. At no time have I met with a plant of this species in a soil the drainage of which was not perfect, and, when found on a slope, did not face towards some point between east and south. The pale loosely-scaled ovoid bulb is generally found at a depth of from 12 to 20 inches. The height of the stem, the number of whorls and of flowers on a single stem, vary very much according to soil, exposition, and age of the bulb. Much has been said about the difficulty of cultivating this beautiful species. I willingly confess that I have also met with many reverses, until I paid proper attention to its habits and habitats. If the bulb is planted at a depth of from 8 to 12 inches in a loose somewhat gravelly soil, having perfect drainage, there is no difficulty in obtaining satisfactory results. Although there is positively no specific difference between bulbs and plants collected either on the Sierras or on the coast ranges, yet I found that bulbs from the coast ranges would always bloom more readily in San Francisco (in cool houses) than those from the Sierras. The reason is obvious, but it would be interesting to know if the same holds good at other places than San Francisco. The flowers are very fragrant, and change gradually from a pure white to various shades of purple or lilac; the purplish-red spots are rather minute. The figure given in Mons. Louis Van Houtte's "Flore" (Vol. XIX.) is a very correct representation of this species.

2. *LILIAM HUMBOLDTII* (Roezl) *L. Bloomerianum* (Kellogg).—This large species has apparently a far less wider range than the preceding. It occurs mainly on the more elevated portions of the foot-hills of the Sierras, from 2,500 to nearly 3,500 feet altitude, evidently requiring a greater amount of heat to develop its full size and beauty than the first-named species. The soils in which its bulb is found are of a rather compact character, consisting of clay with an admixture of broken rocks, and a small portion of vegetable mould. Growing in open park-land, or land entirely cleared off, and therefore exposed to a hot and burning sun, and surrounded by a dry and exsiccating air, we find its bulb also at considerable depth. Its ovoid bulbs are very large and strongly built; its outer scales are largest, imbricated, lanceolate, tinged with purple, and very fleshy, well calculated to hold a large supply of moisture. A short time ago, this species was also found by Mr. Harford on the Island of Santa Rosa, opposite Santa Barbara. As far as I know, it has not yet been found on any part of the coast ranges belonging to the mainland. The plant found on Santa Rosa Island differs but slightly from that on the foot-hills of the Sierras. Its leaves are of a brighter green, acuminate, and its whorls are denser and more regular; while the leaves of plants from the Sierras are rather spatulate, and terminating with a blunt point; their green is also of a less vivid colour. The former is exposed to sea-breezes and fogs; the latter to a dry and

exsiccating air. It may be stated in connection with the above remarks, that bulbs from Santa Rosa Island do far better with us here than those from the Sierras; the reason is plain. The figure in the "Flore" of Mons. Louis Van Houtte (Vol. XIX.), represents the Santa Rosa Island form as truthfully as a representation can be made. In the "Notes on Lilies and their Culture," by Messrs. Teutschel & Co., I find this species wrongly enumerated as one of the caudaceous Lilies. Its root is ovoid, not rhizomatous; nor does it ascend as high as Devil's Gate. What Roezl found there was one of the caudaceous varieties, and not *L. Humboldtii*.

Bulbs rhizomatous with short fleshy scales.

3. *LILIAM CANADENSE* (Linn.).—a. Var. *L. parviflorum* (Hook.); b. var. *L. pardelinum* (Kellogg); (var. *L. puberulum* Torr.); c. var. *L. californicum* (Hort.); (var. *L. Walkeri* Wood), (var. *L. Hartwegii* Baker). The above enumerated varieties of this species demonstrate the influence of soil, location, and climate more forcibly than any other species of our Lilies, because it is more generally distributed, and has a wider range throughout the entire State. It is, therefore, not to be wondered at that so many excellent botanists described different forms of this variable species under so many different names.

a. The form of *L. canadense* var. *parviflorum* Hook. occurring largely in boggy soil, west of the great Redwood belt, and on the immediate coast, presents even there differences in size and form, well calculated to lead astray. Here, wherever exposed to the daily continuous westerly winds, it attains hardly 2 feet in height, bearing often but a single small flower of a deep red colour, with the sepals but slightly recurved towards the tip; but wherever sheltered, either by trees or shrubbery, it attains a height of from 3 to 5 feet, bearing numerous flowers of a less reddish tint, and arranging its leaves, at least a part of them, in whorls; while those of the exposed plant are all scattered, and few in number. This form extends along the immediate coast from Vancouver's Island to Oregon and California. This long linear extension and range is common to many plants of the immediate western coast.

b. Proceeding, however, eastward, along a stream into the interior, to a point where the coast climate changes gradually into that of the inland-coast valleys, and where an abundance of sunshine and shelter is added to that of moisture, we find the beautiful and charming form described by Dr. Kellogg under the name of *L. pardelinum*. Here in deep recesses on the banks of streams, in such favourable localities, the plant attains a height of from 6 to 9 feet; here its rhizomatous bulb ramifies and multiplies rapidly, forming clusters several feet in diameter. Stems shoot up, side by side, from every terminating point of the ramifying and radiating bulb, giving the plant a gregarious appearance. Perhaps nowhere, in this state, is this gregarious character so well and plainly exhibited as in the Bear Valley on the Sierras, at an altitude of 4,000 feet, where acres of a wet meadow are densely covered by this magnificent variety. The whorls are here usually broken up, and the large leaves are indefinitely scattered all over the huge stems, which are variously branched, bearing numerous flowers, with strongly recurved perianths of a bright yellowish-red colour, copiously spotted with purple spots on the face. But, if we proceed from the inland coast valleys farther eastward, and enter the large valleys of the interior, where the climate is hot and the air dry, we soon lose sight of this plant, even on the banks of streams. Crossing these valleys, and ascending the foot-hills of the Sierras to an altitude of from 2,500 to 4,000 feet, we meet it again in all its glory in wet localities. Growing in wet boggy soil, mostly subject to overflowing at some time during the year, its bulbs are imbedded but a few inches beneath the surface of the soil. At San Francisco it blooms readily in cool houses.

c. The next marked form, *L. californicum* Hort. (*L. Walkeri* Wood, *L. Hartwegii* Baker—*L. puberulum* Torr.), differs very strikingly from the preceding variety in the form and arrangement of its leaves, and in habitat. The leaves are usually arranged in dense and numerous whorls; only the uppermost are scattered, linear-lanceolate, acuminate, and of a dull green colour; while those of the preceding form are mostly spatulate, or oblanceolate, and of a bright green colour. This form we find on moist slopes of the lower foot-

hills of the Sierras, as well as of those of the coast ranges, where the climate approaches more or less in character that of the interior valleys. In these thus characterised localities the plant is neither copiously supplied with moisture by heavy dews or dense fogs, nor by an abundance from below.

4. *LILIUM PARVUM* (Kellogg).—The specific name of this species refers solely to the small size of the flower for, in every other respect, this plant attains as large a size as any other of our Lilies, if not larger. It begins at an elevation in the Sierras, where, to my knowledge, *Lilium pardelinum* ceases to grow, namely, at an altitude of 4,000 feet, and extends upwards to 8,000. It is found growing exclusively on the banks of mountain streams, or in shady swampy places, through which a constant stream of cold water runs. The leaves are mostly scattered over the entire stem, spatulate or oblanceolate, and somewhat glaucous. The ramifications of the branches and the number of flowers depend upon the size to which the plant develops. The perianth is of an orange-yellow, spotted with purple, and but slightly recurved at the tip. Its cultivation seems to offer more difficulties than any other of our species.

Botanists, either collecting or studying Californian plants, cannot bestow too much care upon their habitats; and can never possess, of one and the same species, too large a quantity of specimens, collected at different localities. In a country like this, where there are, in fact, but two seasons, the wet and the dry, passing abruptly from one into the other—the proximity to, or the distance from, the foggy coast, the general physical and mechanical properties of the different soils, the elevation, the exposition (whether west and north, or east and south), and the distance from the rainless belt bordering this State in the south, or from the rainy belt approaching it in the north, must be carefully taken into consideration. Omitting, for the present, any remarks on those parts of California situated south of latitude 35°, and those north of latitude 40°, there are, distinguishable in middle California, the following ten well-marked botanical regions, or belts, from west to east:—1. The immediate sea-coast belt; 2. the redwood belt; 3. the hilly or mountainous park and *chaparral* belt; 4. the Sacramento and San Joaquin valleys; 5. the lower foot-hills of the Sierra Nevada to 2,000 feet altitude; 6. the middle Sierra belt, between 2,000 to 4,000 feet; 7. the higher Sierra belt; 8. the Alpine region; 9. the eastern slope; and 10. the eastern basin. The characteristic plants of these various regions or belts, their climates, and their influences on plants, will be the subject discussed in a future article.

GARDEN INSECTS, AND MEANS FOR THEIR DESTRUCTION.

By THOMAS BAINES, Southgate.
Aphides.

THERE is no insect that preys upon such a number and diversity of plants as the numerous species of aphides. On the soft leaves of the Cucumber and Cineraria, the tender shoots of the Heath and hard-wooded New Holland plants, the young delicate foliage of the Peach, and the deciduous tree of a hundred years' growth, some species of the destructive family seem equally at home. In many cases, from their numbers and the wide field of their attacks, it is impossible to do anything for their destruction. But on all plants grown under glass, as also the better class of outdoor fruits, it is imperative to destroy them. The means for their destruction, in many cases, must be modified according to the different description of plants they infest, as the remedy that may be safely employed in the case of one plant would be death to another, similarly applied. Fumigation with tobacco, or the numerous preparations made from it, is the most general as well as the best method for their destruction under glass; but, even here, there are numbers of plants upon which they cannot be killed by this method without serious injury to the plants. This is the case with many Orchids, more especially the thin-leaved kinds, such as *Dendrobium Devonianum*, *D. Falconerii*, *D. chrysanthum*, *Calogyne cristata*, some *Odontoglossa*, &c.; consequently, where these and similar plants are grown in a house

that it becomes necessary to fumigate, they should be removed. And I may here remark that the more heat, shade, and moisture that is used in the cultivation of this class of plants, the more liable they are to suffer from the effects of fumigation. When such plants as those above indicated are attacked by aphides, they should be carefully but thoroughly washed with a fine syringe every three days, for a time, using clean water. Some Ferns, such as the young unmatured fronds of *Adiantums*, and *Tree-Ferns*, unless grown very cool, suffer from smoke; these are best dipped in tobacco-water, just sufficiently strong to kill the insects. For the generality of greenhouse plants, when affected, fumigation at intervals of ten days, until the plants are quite clean, is the best remedy; but such plants as herbaceous *Calceolarias*, *Cinerarias*, and *Pelargoniums* in flower, must have a mild application of the smoke or they will suffer. Amongst hard-wooded plants, *Aphelexis* frequently are attacked by aphides, but it requires an experienced eye to detect them, as these plants, like many others, have great influence on the size and colour of the insects. On the *Aphelexis*, they assume almost the exact colour of the plant, and appear so sickly and small as to be scarcely discernible; yet, if allowed to remain unmolested, they quickly destroy the flower-buds and turn the young leaves yellow. Their presence may be detected by their excrement on the leaves near the points of the shoots; it has the appearance of small white crystals. It is scarcely possible to kill them on these plants by fumigation. Syringe with strong tobacco-water, laying the plants on their sides over any vessel that will catch the liquid. In the plant-stove they much seldomer make their appearance on account of the atmospheric moisture and frequent application of the syringe. Yet, when necessary to fumigate, there are few plants here, except such tender-leaved things as *Torenia asiatica*, that will suffer. Cucumbers and Melons, especially in low pits and frames, are delicate subjects to fumigate, and, when affected with these insects, should have the smoke applied with great care, a little and often until the plants are clean. But, in smoking plants in small places, such as garden-frames, there is always danger, as in such small space the smoke gets out before it has time to effectually kill the insects, necessitating a stronger application than the plants frequently can bear. Covering the lights with mats assists the retention of the smoke. Damp mild evenings are the best for the operation in any structure. As an additional and important means for the destruction of these insects under glass, I always have in readiness a few gallons of tobacco-water, with which to wash any plant as soon as it is discovered to be affected. The "stitch in time" principle applied in this way, instead of allowing the insects to increase and spread, saves much labour and expense.

In fumigating plants, either in large or small houses, it should always be borne in mind that the nearer the plants are to the roof the more certain is the destruction of the insects, the smoke being the most dense near the top of the house; it will also be obvious that the closer the laps are in the glazing, the more effectually will the smoke do its work; where the laps are open it is good practice to cover them with mats, or any available material that will assist in confining the smoke. In the case of plants that will bear syringing overhead with clean water, it is well to give them a good washing the morning after; any of the insects that are nearly, but not quite, killed will receive the finishing stroke by this. Whatever material is used for fumigation, tobacco, tobacco-cloth, or paper, see that it is sufficiently moist to prevent its flaming, or it will do serious harm to the plants. The operator should always stand outside till the house is sufficiently full of smoke, to see that the material does not burst into a flame, but simply smoulders. A good plan is to sprinkle a little damp Sphagnum over the material as soon as it is ignited; it cools the smoke and prevents flame. Care must also be taken, that whatever is used to ignite the fumigating material is such as will contain no deleterious gases likely to be injurious to vegetable life. Coal in a half-burnt state is liable to do much harm in this way. Wood-embers, charcoal, or a little coke is the best. The material should always burn quickly, throwing up a dense volume of smoke, so as to fill the house in as little time as possible; there is then less danger of dryin

the atmosphere of the house so as to be injurious to plant life. In the density of the smoke required to kill the insects, the operator must be guided by his knowledge of the strength of the material he is using, the size of the house, and the description of the plants it contains. The larger the house the less danger I have found of injuring its occupants by fumigation; consequently, such houses may be filled more densely with the smoke than plants in small houses will bear. Pot Roses are very liable to suffer from fumigation, unless the application is very slight. With such plants as the above, frequent and weaker smokings are the safest. If Pelargoniums are fumigated when in bloom, the flowers generally drop, consequently attention should be given to see that the plants are quite clean before the flowers begin to open. The flowers of *Spiraea japonica*, in every stage of development, are generally spoiled if fumigated. The implements used for fumigating are various, from a garden-pot with a hole in the side to those mechanical contrivances that are frequently making their appearance, but which are more for sale than use. The fumigators which I have had in use for fourteen years, and which are the best I have seen, are made of strong sheet-iron riveted. They are 10 inches in diameter by 9 inches deep, on three legs $1\frac{1}{2}$ inches high; the bottom and sides, half-way up, are perforated with holes one-eighth of an inch in diameter, one inch between the holes; it has a stout handle at the side much like that of an ordinary saucepan. This is much better than a handle across the top, as, if the material does not burn freely, it can with more convenience be taken by the handle and swung repeatedly backward and forward, the draught quickly causing it to burn freely. I use one of these fumigators at each end of the house requiring smoking, by which means it is filled more rapidly.

Plants that have been fumigated over-night are better for being shaded the day following if the sun shines brightly. The fumigation of individual plants out of doors under improvised coverings, as is sometimes done, I look upon as a mistake; half the time and equal cost in material in the shape of a good syringing with tobacco-water will not only kill the living insects, but also destroy the eggs, which fumigation leaves unharmed, and ready to come into life in less than a fortnight from the time they are deposited. There is no plant that suffers more from the ravages of aphides than the Rose, and, where they are grown by the acre, as is the case with those in the trade, it is a difficult matter to do anything with them, but on open exposed grounds of large extent, such as those who cultivate for sale usually have, they do not so often make their appearance as in the often confined and over-sheltered plot of the amateur. Here they are to be met with almost as certainly as the return of spring, and, if they make their appearance whilst the leaves are not fully developed, and yet tender, the best means is a good syringing with tobacco-water. Further on in the season, when the foliage becomes harder, syringing two or three times a week with clean water, or, still better, the use of the garden-engine will keep them clean; the insects are not able to withstand the continuous application of water, and here it can be used with good effect to the plants in other ways besides the destruction of the insects. Dahlias, Asters, and Verbenas are all plants on which they thrive apace, and, as a general rule, the better the plant suits them, the more injury they do to it. These, and other plants of similar character, require the same treatment as Roses. Peaches and Nectarines are especially their favourites, and the trees are few that escape their attacks every spring, sometimes before, but often just as the trees go out of bloom. They may easily be detected by the leaves beginning to curl before they are half developed. A diligent look-out should be kept at this time, and not a day should be lost, as soon as they are discovered, in syringing well with tobacco-water the parts affected. But this is not always effectual unless the trees are syringed with the tobacco-water all over. This I always do as soon as any insects are discovered, and one dressing of this description is sufficient, for as soon as the leaves get further developed, they will stand the use of the garden-engine, used with care regularly twice or thrice a week, which keeps in check those and other pests. Cherries on walls are often attacked by the black aphid. This is one of

the worst of the family, as it is harder to kill than the common green aphid, and sometimes requires a second application of the tobacco-water. In washing all trees attached to a wall, the operator should stand sideways to the wall, so as to get the liquid as much as possible to the underside of the leaves; by this means there is less waste of the liquid employed. With the same object, a fine-rosed syringe should be used. The amateur who does not happen to have more than a few trees, will find the soapy water from the laundry not a bad substitute for the tobacco-water, used in the same way. Chrysanthemums, more especially such as are grown in pots, when out of doors in summer, are very liable to the attacks of aphides; dip the points of the shoots as soon as the insects are discovered, and afterwards syringe every evening with clean water. This will keep them free from the insects, and benefit the plants in other ways. There is one species of this insect that attacks the roots of Lettuce in summer, frequently destroying the crop in a few days. There is no warning until the damage is too far done to be repaired. The first evidence of their presence is given by a few plants suddenly flagging in the sun. If the roots are examined, they are generally found swarming with the insects. When such is the case, nothing can be done to save the crop. As a preventive, from the middle of June to September, as soon as the plants get a couple of inches high, we give them a good dressing round the collar with soot, washing it well down to the roots; this, generally, is effectual. With bush fruits, especially Currants, which often suffer severely from the ravages of these insects, where they are largely grown, the cost in labour would be too much; where the number of trees are small, if the insects are attacked as soon as ever they make their appearance, they may be destroyed with clean water from the garden-engine.

BIRDS AND BERRY-BEARING PLANTS.

THERE are few who would not endorse the remarks of "D. T. F." (see p. 521, Vol. IV.), regarding the wholesale disappearance of our Holly and other winter berries. I would, however, rather protect as many berries as would be required for Christmas decoration than destroy the feathered delinquents that feed upon them at this season. Here we have very fine Hollies, which literally bend down every season owing to the load of berries which they bear, and which attract swarms of birds. Hundreds of wood pigeons also eat enormous quantities of them in a single day. With the exception of the pigeons, the fatal barrel is never pointed at one of these depredators, which, at this season, are in their prettiest plumage, and much to be preferred even to the berries themselves, which are at best short-lived. I have always found a stuffed cat or two, placed in some of the most conspicuous trees, a complete protection from birds of all kinds. Not only do they frighten the small birds, but they also keep rooks from building in our large Holly trees in spring. Until we used the stuffed cats, no other means that we tried would frighten them. The high gales of wind which we have had during this month have strewn the ground under the trees with berries. I have always observed that here in very mild seasons the berries of Hollies are ready to drop off at a touch, a circumstance easily accounted for when we consider that evergreen trees in winter are susceptible of the smallest change in the atmospheric temperature. As a proof of this, I may state that here the catkins upon the common Bay are from an inch to two inches long; indeed, a few more mild days would have induced some of them to develop their flowers. It is something remarkable that during such a mild and open season, the small birds referred to by "D. T. F." should have been so destructive to his winter berries. Were it not for the fieldfares and wood-pigeons, all the berries that small birds eat here would be only a grain, as it were, from every bushel: it is, however, almost incredible what pigeons and fieldfares can devour in one day. Like "D. T. F.," I find little birds to be most destructive in spring to the fruit buds of bushes in particular; yet I spare them, not, I hope, from any absurd sentimental feeling, but because they have life and beauty, and suffer and rejoice under the various operations of nature like myself. J. T.

NOTES OF THE WEEK.

— THE house at Meecham Place, Newhaven, is now covered on all sides with *Pyracantha*, in full berry, to a height of two storeys and more. So striking a picture is not afforded by any other shrub or wall-plant at this season. We have, by the way, long observed the *Pyracantha* to be a good sea-side tree.

— REPORTS reach us from all quarters as to the damage done to the flowers of Orchid and other choice plants by the late dull foggy weather. In some establishments scarcely an expanded flower escaped, and even the unopened buds in many cases damped off, from causes wholly beyond the cultivator's control. *Calanthes* suffered severely, and the damage appears to have been greatest in the warmest houses.

— PASSING the pretty churchyard of the village of Bletchington, between Newhaven and Eastbourne, the other day, we were surprised to see a number of neat bushes of the well-known bright yellow Pea-flowered plant, *Coronilla glauca*, flowering as freely and well in the open air as they ever do in the greenhouse—a fact worth remembering by those having gardens by the sea and in mild districts.

— WE have to thank Dr. Bolander, of San Francisco, for the valuable contribution on the Lilies of California, which forms our leading article this week. As these superb hardy Lilies are now being freely distributed in our gardens, this contribution as to their history will prove useful. Dr. Bolander considers it desirable to call attention to the needless multiplication of species. He holds there are four species and no more, and that those are easily distinguishable by the roots. Various handsome forms, reputed to be species in this country, are considered by Dr. Bolander to be varieties of the Canadian Lily.

— ENGLISH-GROWN Pine Apples long maintained the reputation of being of finer quality than imported fruit of that kind. Now, however, they are surpassed in winter by those from St. Michael's, from which we get the same kinds as we grow at home, and like them, too, are grown under glass. They arrive in our markets in excellent condition, averaging from 3½ lbs. to 7 lbs. in weight. On Monday last a large consignment of these Pines was disposed of by auction at prices ranging from 15s. to 21s. a piece, and the salesmen greatly prefer them to home-grown produce, inasmuch as they are of decided soundness in the heart, whereas English Pines, though externally to all appearance sound, are sometimes discoloured at the core, and not infrequently quite black.

— ORCHID-GROWERS, who have long been accustomed to look upon the collection of these plants at Kew as most unsatisfactory, as far as good culture is concerned, will be pleased to learn that it now shows signs of vigorous improvement. A good collection of Orchids is always interesting; but it is in a botanic garden that we look for those minute or inconspicuous species not to be found elsewhere in cultivation. The Kew collection is rich as regards species, but not more so than one or two other collections that might be named, while the introduction of really new kinds is left almost wholly in the hands of our leading nurserymen. Considering the facilities which Kew possesses for the introduction of new plants, surely Orchid collecting should not be overlooked.

— WE have received from Mr. Batters, Chilworth Manor, Rensley, beautiful branches of Sweet Bay, loaded with fruit as large as wild Cherries, and with them the following letter:—"Bay-trees flower, set, and ripen fruit freely here. You will see that they are heavily laden with berries, which the birds have just commenced to clear off, and in two or three weeks they will, doubtless, have completed their task. We have a golden (or yellow) berried Holly, about 30 feet high, densely covered with berries, but it will soon share the fate of the Bay, and be stripped of its beauty. *Cotoneaster Simmondsii*, although the plant is young, bears its pretty red berries in abundance. We have it as a (small, at present) pyramid on the Grass. We are, I believe, something like 220 feet above sea-level. The soil is of a poor white gravelly character; *Rhododendrons* thrive luxuriantly in it, as do also Laurels, and many other shrubs, but, for kitchen gardening in dry summers, it is not so suitable."

— THE Rev. Mr. Ewbank, St. John's Vicarage, Ryde, writes to us as follows respecting vegetation in the Isle of Wight:—"I can add," he says, "to the list (see p. 536, Vol. IV.) two or three things which seem to do exceptionally well here. *Rhynchospermum jasmiioides* I planted in the open ground in my garden three or four years ago, and it has done remarkably well, last summer it was full of blossom; *Stantonia latifolia* is covering the porch of my church, and appears likely to prosper; *Ceanothus rigidus* is a delightful wall plant here, and, like *Ampelopsis Veitchii*, it seems to grow by magic. Last week I had more than thirty shrubs and flowers in blossom at one time. Among them were *Gentiana acaulis*, *Erica carnea*, *Berberis Darwinii*, *Souvenir de Malmaison*, and other Roses. *Narcissus* and *Anemones* are also in flower in the open ground, thus indicating what

a forward state of things we have here. Another plant that I should have named is *Lardizabala biternata*. It is covering the east end of St. John's Church, and its glossy foliage is worthy of great admiration.

— THE naked-flowered Jasmine (*Jasminum nudiflorum*) is now in full blossom in many gardens about London, and, when intermixed with Ivy, its beauty is enhanced. In the Victoria Nursery, at Holloway, it is grown in small pots for conservatory decoration. It has been very fine throughout the southern counties this winter. By far the best effect is obtained when the flowering shoots are not rigidly trained to the wall or other surface, but allowed to hang gracefully down.

— THERE are just now some two or three dozen very showy hybrid *Amaryllids* in flower in Messrs. E. G. Henderson's nursery at St. John's Wood. They appear to be intermediate between *A. allica* and *A. pardina*, and, during the winter season, their large flowers will prove useful, either in a cut state, or for ordinary decorative purposes.

— MESSRS. BLACKWOOD & SONS announce a new illustrated work on "Domestic Floriculture, Window Gardening, and Floral Decorations," by Mr. F. W. Burbidge. The subject of indoor floral ornamentation is now becoming one of general interest, and any work in which it is well treated can hardly fail to be received with favour.

— WE have recently seen the rare and beautiful Palm called *Mauritia carana*, growing freely in the Wellington Nursery. It has slender smooth cylindrical leaf-stalks, from 1 to 2 feet high, from the apex of which the umbrella-like segments of its leaf diverge equally on all sides. Above, the foliage is of a glaucous hue, but below it has a bright silvery aspect, which gives it a very interesting appearance; like its congeners, it requires treating as a sub-aquatic.

— THE different varieties of greenhouse *Rhododendrons*, such as *R. Princess Alexandra*, *Princess Eleanor*, *Brookel*, *jasmiioides*, and *javanicum*, are now flowering freely in the Royal Exotic Nursery, Chelsea. They grow freely in a warm greenhouse, and bloom for months together, while their clear waxy flowers are invaluable for bouquets and for other kinds of floral decorations.

— WE are informed, by M. H. J. Van Halle, that the Elms on the Boulevards at Ghent are at present threatened with total destruction from the ravages of what appears, from M. Van Halle's description, to be the caterpillar of the goat moth (*Cossus ligniperda*), described at page 203, vol. III. of THE GARDEN. Young trees (of from seven to twelve years old) chiefly are attacked, and many of them are already dead. The caterpillar of the goat moth is the special scourge of the Elm and the Poplar, and, when it has once established itself to any extent in a tree, we believe there is no remedy for it.

— MR. C. S. SARGENT, of Boston, who is now in this country, and who is well acquainted with American plants, informs us that *Aquilegia chrysantha* is the finest herbaceous plant yet introduced from America. We subjoin Dr. Gray's remarks on the plant from a late number of the *Proceedings of the American Academy*, for which we have to thank Mr. Sargent. Upon first acquaintance with this plant in dried specimens, I regarded it as a variety of the blue, long-spurred *Aquilegia* of the Rocky Mountains, some forms of which are almost or entirely white-flowered. In view of the diversity of colour, and this more remarkable deviation to yellow, I was the more disposed to follow Sir William Hooker in preferring Nuttall's appropriate name of *A. leptoceras*, trusting that the *A. leptoceras* of Fischer might not be a good species. But now that we have this golden Columbine in cultivation for the second season, and can review its characters, we must conclude that it may claim a distinct specific name, although the technical characters may seem to be slender. Its geographical range is different; it occupies a more southern range, and is found at less elevation than *A. cærulea*. Here, at least, it is more hardy, probably because it bears our summers better than its Alpine relative, and endures our winters perfectly. It is much taller, rising to the height of 4 feet in the rich and moist soil which it prefers; it comes into flower nearly a month later, branches freely into a panicle, and continues in bloom through the whole summer. The colour of the blossom is a clear yellow, the petals of a rather deeper hue than the sepals. The sepals and the limb of the petals are not so ample as in *A. cærulea*, the former hardly exceeding an inch in length and five lines in width; they barely equal the latter in breadth, and do not much exceed them in length. The long spurs are similar, very slender, and over two inches in length. If the flowers individually are not so showy as those of *A. cærulea*, they make it up in their number and longer continuance, and are remarkable for their colour. It is a native of Eastern New Mexico (Organ Mountains not far from El Paso, (Tharber, Wright; and further north, Parry), to Arizona (Mabibi, Parry, &c.) Also in South Utah. Now in cultivation from seeds collected by Dr. Parry, and distributed from the Botanic Garden of Harvard University.

THE GARDENS OF ENGLAND.

CHATSWORTH.

It was just fifty years, last June, since we first became acquainted with this Palace of the Peak, about the time when the late Duke of Devonshire had commenced those extensions of the mansion which took so many years to complete. Then Chatsworth was comparatively a small place, and, from a gardening point of view, was not equal to many other places in the midland counties; indeed, it was not until Sir Joseph, then Mr., Paxton took charge of it, that any decided steps were taken in gardening, and those steps were not in the happiest direction. The great error which Paxton committed was that of not removing the forcing-garden from its present ill-chosen position; for, make the best you can of it, the situation is as bad as could be found upon the whole estate; low, cold,

produces from ten to fifteen hundred magnificent fruits annually, and those of the finest possible quality. (If you want a superior Peach or Nectarine go to an old tree, as they will always afford the finest-flavoured fruit.) In the history of this Peach, and, indeed, of many more at Chatsworth, the fact cannot be resisted, that the roots during wet seasons must be constantly immersed in water, and yet Peaches are forced both early and well. This is a singular anomaly, over which young gardeners may ponder possibly with profit. In the management of his early Vine borders, the gardener, Mr. Speed, finds it expedient to cover them, so that between autumn and the advent of warm spring showers, not a drop of water falls upon them. For this purpose he uses what are called common pantiles, and these, while allowing a free passage of air to the soil, carry the water all off effectually. It was in a border thus protected, and from the rejuvenated old Vines of thirty years' growth, that Mr. Speed exhibited the bunches of



Interior of the Victoria House at Chatsworth.

and always damp, being but a few feet above the level of the Derwent, which runs close by, the finer varieties of fruits refuse to ripen, while vegetables are weeks later in coming to maturity than in other gardens close by; this is very disheartening to a gardener, but he has no remedy except patience, and the protection of glass, which cannot be used with advantage everywhere. Paxton tried the scheme of throwing the surface of the garden into broad ridges sloping to the south, but after several years trial it was abandoned. A low and damp garden is, however, not an unmixed evil, for in the parching summer of 1868 the crops of Strawberries and vegetables at Chatsworth were magnificent, and the envy of all who saw them. This gain, however, was but transient, for, when the rain and frost came, vegetation suffered severely. Still, for all this, there are some fruits which do well under glass at Chatsworth; as for example that grand old Royal George Peach, which, filling two or three houses,

Grapes which created such a sensation at the Oxford Meeting of the Royal Horticultural Society in 1869. Bunches such as these were, for size of berry and finish, are rarely seen; in fact the house taken as a whole from that time till now, has been year by year equal to the best we ever saw.

The Victoria and Amherstia Houses.

We cannot leave the kitchen-garden without saying a word about the Victoria and Amherstia houses. The former is a very suitable and handsome building, but, like all similar buildings which have to contend constantly with the alternations of heat and moisture, it is fast going to decay, and must at no distant date be renewed. Seen in the summer season with the broad and singular leaves of the Victoria floating upon the water, and the different varieties of *Nymphaea Lotus*, *Limnocharis*, &c., in the corner tanks, and the immense masses in baskets depending from the roof, this is certainly one of the most interesting houses in a very interesting place.

The *Achimenes*, and here let us remark that the older species and varieties only are grown, or rather are found suitable for basket growth, are in their season most effective. They consist of *A. grandiflora*, *longiflora* and its white variety, *Verschaffeltii*, and the old *coccinea*. To say that these plants at Chatsworth are used by thousands, is not to exaggerate, for no doubt thousands of each kind annually find their way into these baskets, which form globes from 5 to 7 feet in diameter, and as much high. Some conception may therefore be formed of the truly regal manner in which the *Achimenes* is grown at Chatsworth. The *Victoria* house is square in form, and has a flat ridge-and-furrow roof, 61½ feet long, 46½ feet broad, and about 23 feet high, and contains a circular tank 33 feet in diameter, surrounded by a pathway, whilst the four angular corners are each divided in the middle by a path, thus converting them into eight compartments, which are used as tanks for the growth of *Nymphæas*, *Nelumbiums*, and other tropical aquatics. The large or central tank contains another tank 16 feet in diameter, and considerably deeper than the outer portion; this contains the soil in which the *Victoria Lily* is planted. The walls of the tanks are built of brick, and the bottom is paved with stone; the tanks are lined with lead throughout, and the 2-inch hot-water pipes which supply them are also made of lead. Whilst the plant is growing, a little wheel, in the form of an overshot mill-wheel is fixed near the edge of the tank and continually kept in motion by a small jet of water from a tap immediately over it; thus the surface of the water is always rippled. The *Victoria regia*, being an annual, dies in November, when the water in the tank is drained off, and the soil contained in the inner part removed. The *Lilies* in the angular tanks, being also out of season, are, about the same time, mostly cleared away and stored in troughs filled with water in the Cucumber-house. The aquarium, thus stripped of its summer occupants, is filled in winter with large *Chrysanthemums* for furnishing cut blooms. As the *Victoria Lily* annually produces and ripens a good stock of seeds, these are preserved in vessels of water until sowing-time comes round, which is generally about the middle of December, or between that and January. The plants are potted singly, and re-potted as they advance in growth, until they have attained sufficient strength, when the best plant is planted out in a heap of fresh soil. Just now two pots containing loamy soil and sown with seeds of this noble *Lily* are in the tank containing the *Nymphæas* in the Cucumber-house. At Chatsworth this Royal Water *Lily* luxuriates better and flowers more freely than it does in any other place in the country; the largest leaves in summer measuring as much as 7½ feet in diameter.

Of the *Amherstia*, well, perhaps, not this, but the first introduced into the country by Gibson, we had the first charge on its arrival in England. Its early history was a struggle for existence; the first blooming, not of the Chatsworth plant, but of that at Ealing Park, a triumph; now, however, it blooms so freely every summer as almost to have ceased to be a novelty. It is a tree of noble aspect, with large pinnate leaves, unfortunately highly attractive to thrips, red spider, and other insect pests. To subdue these requires almost daily attention with sponge and soap, but the glorious inflorescence when it comes, in long spikes of bright and singular flowers, fully repays the trouble. At Chatsworth the house is much too small for the plant to be seen in a proper manner. To grow the *Amherstia* properly would require a house, circular or octagonal, at the least 30 feet in diameter, and 20 feet high. Then the noble proportions of this plant could be seen, and its cultivation be developed in the best manner. The *Amherstia* is a difficult plant to propagate, hence its scarcity. At Chatsworth some few plants have been rooted from layers, but not in any great quantity. The tree at Chatsworth is planted in a bed of good loamy soil, and is regarded as the finest in the country. The spread of its branches covers a space of some 26 feet, and in March it is one mass of bloom. The young leaves, being of a pale reddish hue, are also very beautiful. Beneath the tree, placed on the surface of the soil, are many varieties of *Marantas*, *Alocasias*, *Dracenas*, &c., that grow and thrive apace in the hot vapour bath in which the *Amherstia* delights and under its partial shade. Here, too, in a corner, and growing in a

pot, is a very tall plant of the *Upas* tree of Java, which has a clean stem several feet in height, surmounted by a much-branched, leafy, and healthy top. Two sides of the octagon form a wall, to which adhere a variety of climbers, such as the *Cissus discolor*, *Æschynanthuses*, *Vanilla*, and others. Associated with the *Amherstia*, is a collection of *Pitcher-plants*, perhaps the best grown in the country, inasmuch as from the smaller species, such as *lævis* and *phyllamphora*, pitchers may be cut by the thousand. These stand upon a raised platform over the hot-water pipes; consequently the heat is considerable, and the moisture abundant. The plants are trained perpendicularly, close to the front glass, and Mr. Speed has found that the less they are shaded the finer is his crop of *Pitchers*. Well, this is just a natural consequence. Our past, and to some extent present, rule of shading tropical plants is a mistake, and in no place can one have the fact more fully demonstrated than at Chatsworth, for there, in the large conservatory, shading is impossible, and yet one finds in it some of the finest tropical plants in Britain. As regards *Pitcher-plants*, the less they are shaded the more profusely do they produce *Pitchers*. They enjoy a porous soil, through which heat and moisture will pass freely, indeed, if you allow a root to stray into the trough of a hot-water pipe, the amount of heat that it will stand and enjoy is something extraordinary. *Pitcher-plants* strike readily but not rapidly from cuttings made of free-growing wood and placed on a brisk bottom-heat, and the best medium for the purpose is the Derbyshire spar broken to the size of Peas. In that they will form a bunch of spongioses or rootlets almost as fine as a sponge, and with them carry the spar. The best compost for them afterwards is *Sphagnum*, spar as before stated, charred cowdung, and just a little turfy Peat. These intimately mixed and used in a rough state, with a brisk moist bottom and plenty of water in the growing season, will produce *Pitcher-plants* in first-rate style.

The Conservatory.

This magnificent curvilinear structure is one of the largest plant-houses in the kingdom, and is entirely glazed on the ridge-and-furrow system. It is 282 feet long, 120 feet broad, and 60 feet high, with a balcony surrounding it inside, like that in the Palm House or Winter Garden at Kew, and ascended by means of a winding staircase rising out of a great mass of rock-work. It is heated by means of hot-water pipes contained in chambers underneath the floor, the heat having access through gratings to the body of the building. The flue for conveying the smoke from the furnaces does not rise in or near the conservatory itself, but the smoke is conveyed in a tunnel for a considerable distance away, and then is emitted through a large chimney-stalk. The house inside is surrounded by a walk, between which and the glass there is a broad plant-supporting shelf. Walks also intersect the enclosed space lengthwise and across. On the surrounding stage or shelf are arranged many sorts of plants, particularly *Yuccas*, *Aloes*, *Epiphyllums*, and other succulent plants, together with a miscellaneous variety of Ferns and pot-plants. At the north end of the body of the building, a massive rock-work, built of immense boulders of stone so abundant in the vicinity, and displaying a very bold and picturesque appearance, has a fine effect. It is well clothed with the *Creeping Fig* (*Ficus repens*), Ferns of many kinds that yield an unfailing supply for mixing with cut flowers, different kinds of *Begonias*, particularly *B. nitida*, which rambles about everywhere, enjoying its loose position, and which blooms profusely, and *Euphorbia splendens*, which, growing in the crevices, assumes a pendent and pretty habit. A very large plant of *Monstera deliciosa* surmounts this pile of stones and earth, and, in this high position, it grows apace and is never without fruits in some stage of growth; indeed, no more fitting subject could be selected to crown the mass. At the base of this rock-work, and on its western side, is a pond, bounded by high and rugged rocks at the back, and a rocky parapet in front. Its margins are clothed with *Club Mosses* and self-sown Ferns, and, planted here and there, is the *Papyrus Antiquorum* or Egyptian Paper Reed, whose Grass-like tufted heads are very ornamental. Out of a little swampy bank in this water-basin, the white *Trumpet Lily* or *Calla aethiopica* is growing in unusual vigour and in dense clumps, now thickly furnished

with flowers. *Caladium esculentum*, and a few of the Philodendrons, are also serviceably employed in the decoration of this aquarium. All the rest of the space in this building is planted out in a tasteful and becoming manner, and the proportions some of the plants have attained testify greatly in favour of this system of culture as compared with that of confining the roots in pots or tubs. The Bananas form a remarkable feature here, for they are lavishly employed, and not as solitary specimens, as we commonly see them, but in the more appropriate fashion of miniature plantations of each species; and, thus treated, they confer a truly tropical aspect on their adopted home. *Musa Sapientum*, which is a tall grower, and a ready and heavy fruiter, borders the central walk that intersects the conservatory, and its massive entire leaves form a pleasant canopy or archway over the path. Several are not planted individually, as might be imagined; but those that have yielded their fruit, and begun to assume a decaying look, are cut down, and the suckers, of which there are always a more than sufficient quantity, are thus only too ready to develop themselves, and this they do in one or two years, if liberally treated. The quantity of suckers, however, is limited by thinning out the weakest; for, were all permitted to exist, they would form such an impenetrable forest, and become so weak and spindly, as almost to necessitate their entire removal and replanting before they could again be got into a satisfactory condition. When the soil becomes impoverished, as it soon does, a top-dressing of dung and loam is applied, and stimulants in the form of manure-water given, and at no season of their existence is the watering-pot withheld—hence their luxuriance. The Chinese Banana, or *M. Cavendishii*, which is the sort commonly cultivated in gardens on account of its good fruiting qualities and accommodating nature, is also here largely grown in clumps along the sides of the outer passages, and its stiff, succulent, and flourishing character makes it particularly effective amongst the other plants. The specimens of *M. coccinea*, however, of which there are some very large clumps, are certainly amongst the finest and most brilliant flowering plants in this gigantic conservatory. They are of a more spindly nature than *M. Sapientum*, *Ensete*, *Cavendishii*, &c., and are only remarkable for their flowers, which are freely produced from every stem in summer. *M. rosea*, another beautifully-flowered species, is also here abundantly grown. The Palms, however, are more remarkable than the Bananas, considering the slowness of their growth, as the stems of many of them have here attained the dimensions of sleeper-sized timber. Perhaps the finest specimen is *Corypha australis*, which is about 50 feet high, and with a trunk-base over $2\frac{1}{2}$ feet in diameter; there are, besides, *Chamaerops Griffithiana*, *Livistona borbonica*, and several others. Of *Dracaena Draco* or the Dragon-tree, we noticed a fine tall specimen, some 20 feet high, and with a clean trunk for a considerable distance; *Beaucarnea recurvata*, about 20 feet high, with a clean stem, long pendent leaves, and very large bulb-like roots; and a specimen of *Araucaria braziliensis*, planted some yards from the north-end of the house, which had grown so tall as to necessitate its decapitation in order to prevent it from bursting through the glass roof. It has a clean and even stem, about 15 inches through at 3 feet from the base. The Aloes, planted out at the north-west corner, are in a luxuriant condition, with very thick dark green leaves from 8 to 9 feet long, and quite surpassing in health and strength anything of the kind we have observed growing in pots. Of *Fourcroya gigantea* there is a very large plant growing at the base of the rock-work, and which has lately bloomed, the flower-spike being nearly 30 feet high; but it is now bent in two, and densely laden with little young plants attached like bulbils, which, when separated and potted, at once become independent plants. Some of the specimens of the Caffre Bread have trunks over 6 feet high and 15 inches through, and a few of the Tree-Ferns are of fair size, while the Sugar Cane grows freely in the borders. Of Bamboo there is a large variety, but there are none of the large-stemmed kind seen at Kew or Syon House. *B. arundinacea* is the sort most employed, and at the southern end of the house, opposite the door, is a massive pruned archway of the same, formed of great clumps of the Bamboos planted on either side of the walk, and trained and cut into shape, and which reach to the roof. The *Hibiscus rosea*

is one of the most useful plants grown here, and of it there are large bushes that seldom or never fail to yield an abundant supply of brilliant red flowers in summer. Of the Cinnamon tree there are some large specimens thickly foliaged, which are particularly pretty when they begin to grow and produce their young leaves, which are at first of a pinkish tint. There are also good specimens of the *Adamia cyanea* coming into bloom; *Heritiera macrophylla*, or Looking-glass tree, with its large shining leaves; *Franciscea uniflora* has bushes 6 and 7 feet high, and *F. latifolia* has a large dense bush some 13 or 14 feet high, and just coming thickly into flower; *Xylophylla latifolia*, which, when in bloom, is one of the most beautiful and profuse-flowering evergreens cultivated; *Barnadesia rosea*, coming into bloom; and different kinds of *Brugmansias* in flower. There are also some very fine specimens of *Strelitzia ovata* that yield an abundance of long-lasting blooms; *Gold fussia ammeloides*, bushes of which, planted out near the walks, are about 7 feet through, and much more healthy, vigorous, dense, and floriferous, than we previously remember having seen; but the gayest of all flowers in this conservatory at this season, is the *Linum trigynum*, bushes of which are planted here and there all along the front borders, and are one mass of golden yellow showy flowers. Whether grown in pots or borders, this is one of the best of indoor winter decorative plants as well as the most easily cultivated. The *Cyanella ensifolia* is now extremely pretty, bearing dense masses of beautiful blue berries; and the *Renanthera coccinea* here clings to stakes about 11 feet high, and flowers abundantly, whilst it refuses to blossom in the Orchid-houses.

The Grounds.

Chatsworth, from a landscape point of view, has, both in the park and dressed grounds, many noble features, but still in both, especially in the former, much more might have been done. As a *confrère* of Douglas, the great Californian explorer, both being at Chiswick at the same time, one might have expected that Paxton would have done more to illustrate in the park the arboreal riches of that country; but, instead of that, you scarcely find an example of evergreen vegetation, except of the most common kind. Possibly climate may be pleaded as an excuse for this, but, when we look to the glorious examples of *Picea nobilis*, and many other *Coniferae* in the pleasure-grounds and Pinetum, it is apparent that that plea will not hold good. The omission just adverted to is undoubtedly an oversight, and one much to be regretted. The most impressive view of Chatsworth is from the Rowsley side entrance, and, if you can catch it when the cascades and fountains are in full force, it is a sight never to be forgotten. The wealth of water as it rolls headlong through the wood from the reservoir many hundred feet above, splashing, dashing, foaming, is a sight to be wondered at, the quantity of water necessary for this purpose being, we are told, 60,000 gallons per minute. Thus associated with living waters, with splendid timber, velvety lawns, and spar-bespangled walks, Chatsworth is a fairy scene which must be seen to be appreciated. But hundreds of people who go to Chatsworth never realise its full beauty. To do so you must get away from the mansion, view it from the park and Stand Wood, and then you may get some idea of the extent of this fine ducal residence of the Cavendishes. Nor will a visit to the Stand Wood be thrown away, for there, surrounding the reservoirs which supply the fountains, will be found groves of Spruce Firs of such colossal height and noble proportions as to take one, involuntarily as it were, into a primeval forest. There is no finer sight in the gilded halls of Chatsworth than these superb trees. The main entrance from the porter's lodge to the house is margined by Tulip-trees, not of large size but in fine condition. Here, too, standing in the centre of the drive perched on a mound, is a plant of Weeping Ash, removed some forty years ago from the Mill Ash Nursery, near Derby; this, at the time, was considered a great engineering triumph, as its weight, with its many tons of earth, toll-bar gates, and other obstacles had to be removed to make way for it.

Our illustration (see p. 13) represents one of the many noble aspects of this princely mansion as seen from the right bank of the Derwent. Of the pleasure grounds, Pinetum, rock-garden, and one or two other matters of interest we shall endeavour to furnish some account next week.

THE INDOOR GARDEN.

TREE-FERNS.

(Continued from p. 527, Vol. IV.)

Cyathea.

This genus has a wide geographical range, and contains many species, some very beautiful members being yet strangers to cultivation. As a group, they are distinguished by their arborescent growth, by their veins being forked and free, and by their axillary sori. The involucre when young is entire, and completely covers the sori, but ultimately bursts, and assumes a cup-like form; this, however, is very fugacious, and, in some species, soon falls away, and, as this is one of the chief points of distinction between *Cyathea* and *Alsophila*, it often becomes extremely difficult to determine, with any degree of certainty, which particular genus an unknown plant may belong to. The various species of *Cyathea* which are at present in cultivation form splendid objects when well grown; indeed, I do not think there is a single one which is not beautiful in character. Those kinds which are natives of temperate regions, as a rule, form the stoutest stems, but even these vary much in circumference, as well as height, whilst the kinds from tropical countries are frequently more or less armed at the base of the fronds with sharp spines. As a rule, these have slender stems, which are built up rather quickly, showing large scars where the old fronds have fallen away, and which materially add to the beauty of the trunk. *Cyatheas* should be potted in the same compost as that recommended for *Dicksonias*, and should receive the same treatment.

I.—TEMPERATE-HOUSE SPECIES.

C. dealbata.—This is the "Silver Tree-Fern" of New Zealand, and is now tolerably plentiful in this country. A friend, writing to me a short time since, says, "You have neither a description nor a figure in any book in England which renders anything like an adequate idea of the rare and majestic beauty of this Fern, as I see it in my every-day walks," and, therefore, I fear my attempt to render it justice in these pages will also fall short of its deserts. The stem, as we have it sent to us, is stout and clothed with the bases of the old fronds; it is said to attain a height of 20 or 25 feet; the tallest, however, which I have seen in this country have not exceeded 11 feet, and they are seldom found so tall; the base of the fronds is unarmed, and the rachis is profusely clothed with deciduous ferruginous scales or down, which also thickly clothes the crown of the plant. The fronds are from 4 to 10 feet long, or even more upon well-developed specimens, and bi-pinnate; the pinnules narrow and deeply pinnatifid on the upper side; they are dark green, but of the brightest silvery-white underneath, a character which at once distinguishes it from all others, and adds so much to its beauty. It seems to be quite peculiar to New Zealand.

C. princeps.—A truly majestic plant, usually grown in the stove; but, having seen it succeed for several successive seasons in a cool conservatory, I can conscientiously place it in the list of temperate-house kinds, and thus those who do not possess a stove, may, without hesitation, introduce it into their greenhouses. The crown of the plant, base of the fronds, and also the rachis, are densely clothed with a profusion of large white or ash-coloured chaffy scales. The bases of the fronds are quite unarmed and very stout. The fronds in young specimens are some 2 or 3 feet long, but on fine old plants reach a length of 12 or 14 feet. They are tripinnate, and bright green in colour on the upper side, but below almost glaucous. The grand beautifully-arching fronds of this fine species cannot but elicit the admiration of all beholders. It was first introduced into our collections under the erroneous name of *Cibotium princeps*, and, indeed, is still to be found in many gardens so named, but, having produced fruiting fronds, its correct relationship has been determined. Native of Mexico.

C. Burkei.—This plant has been recently figured in THE GARDEN, and it will eventually prove, I am sure, the most beautiful species in the whole family. I have recently seen this plant in some quantity at the Victoria Nursery, Upper Holloway, and all lovers of Tree-Ferns have much need to thank Mr. Williams for having introduced to commerce this truly beautiful plant. It forms a stout erect stem, and the manner in which its splendid fronds sweep downwards as they unfold renders the name of the Weeping Tree-Fern peculiarly applicable. The stipes are very dark in colour, rough at the base, with numerous very short blunt spines or tubercles, and profusely clothed with large shining brown chaffy scales. The fronds are bipinnatifid, from 2 to 4 or 5 feet in length, and bright green in colour. Native of South Africa.

C. Dregii.—Some few years ago I had a small plant of this species; which, however, made but little progress, and it was not until I saw it at Mr. Williams's, upon stout stems, that the beauty of this plant was discernible. It is very distinct from the preceding

species. The fronds are bipinnate; pinnules, pinnatifid, dark green above, rather paler beneath; stipes, reddish-brown, and somewhat sparingly clothed with reddish-brown chaffy scales. Native of South Africa.

C. Smithii.—A very handsome and rather rare plant in collections. Although I have included it here amongst the temperate-house kinds, I have invariably found it to succeed best with a little extra heat during winter. The stems are somewhat slender, and very elegant, attaining a height of about 20 feet, the crown of the plant and the stipes are profusely clothed with bright reddish-brown chaffy scales. The fronds are beautifully arched, and from 6 to 10 or more feet in length, twice or thrice divided. The segments being delicately cut, and the shade of green being peculiarly cheerful, tend to render this an extremely handsome member of the genus. Native of New Zealand.

C. medullaris.—This is a strong vigorous-growing and handsome plant, and, if space can be afforded it, will soon produce a splendid effect. In its native country the aborigines seem to make a dainty dish of the crown and inside of the stout stipes; it is very questionable, however, if the New Zealander, who is to take his seat on London Bridge and view the ruins of this city, will not even then be able to find here a more palatable dish. The stems are rather stout, attaining a height of from 20 to 30 feet; the stipes and rachis are black, the former slightly muricated, and these, as well as the whole of the frond before it unfolds, are completely enveloped in large black chaffy scales. The fronds are bi-tripinnate, and from 10 to 15 or 20 feet long; the pinnules leathery in texture, and deep green in colour. Native of New Zealand, but not peculiar to that country as most of its Ferns are.

C. funebris is a plant of somewhat recent introduction in our collections. Very little can, therefore, be said by me respecting it. The stem is stout and dark-coloured; the fronds broad and massive, leathery in texture, and dark green. It is very handsome in a young state, and entirely different from the preceding species, although it would seem to have many features in common with it. Native of New Caledonia.

C. Cunninghamii.—Our illustration of this extremely rare Fern was taken from the unique specimen in the rich collection of Mr. Williams, of the Victoria Nursery. It is a very handsome species, and as rare as handsome, for all the stems which I have seen offered for sale have been those of *Alsophila capensis*, a proof that this plant is little known and understood. Young plants of it are very rare, but well deserving the attention of Fern-growers whenever they can procure it. The stem is medium-sized, and gives one the idea of the plant being mid-way in its relationship to *C. Smithii* and *C. medullaris*. The stipes are slender and black, adhering to the stem like those of *Dicksonia squarrosa*; their base is slightly muricated. Fronds, tripinnate, finely divided, and feathery in appearance, from 5 to 10 feet long, and bright green in colour. Native of New Zealand, but, as far as I can ascertain, by no means common even in a wild state.

II.—STOVE SPECIES.

C. canaliculata.—We now come to those which are natives of tropical climes, and I have chosen to begin the enumeration with a species at once extremely beautiful, extremely rare, and extremely limited in its distribution, and which should, therefore, be the more highly prized by those who may be the happy possessors. It is not a very large-growing kind. The stems are only moderately thick, or they may, perhaps, be better described as rather slender, and very dark-coloured; stipes, black, unarmed, but densely clothed at the base with large, dark chaffy scales; fronds, bipinnate, and coriaceous in texture, from 5 to 8 or 10 feet in length; pinnules, very broad and deeply pinnatifid, from 8 to 10 inches long and upwards, of 2 inches broad, intensely deep green on the upper side, but much paler beneath. The sori are large and very ornamental. Native of Bourbon, Mauritius, and Madagascar.

C. arborea.—A majestic plant, attaining a height of from 20 to 30 feet, and bearing a large crown of beautiful plume-like fronds some 12 feet long. These, however, are only its dimensions at its greatest size. Handsome young trees exhibit all the grace of the old ones, with all the measurements considerably curtailed. Stem, slender, unarmed; the stipes, however, have a few short blunt spines at the base; these, together with the crown of the plant, being clothed with large white chaffy scales. The rachis is also furnished with smaller scales, of the same colour, for some considerable distance up. The fronds are from 3 to 6 feet long, and, upon old well-developed specimens, attain a length of even 12 feet. They are broad, plume-like, twice or three times divided, and arch over in a very graceful manner; pinnae, from 1 to 2 feet long, the pinnules being very finely divided, and vivid green on the upper side, paler below. It seems to be abundant throughout the West Indian Islands.

C. Imrayana.—A somewhat rare plant in collections, independent

of which, however, it is very elegant; stem, slender; the bases of the fronds are armed with short prickles, and, as these adhere to the trunk for a considerable time, they give it the appearance of being spiny; crown of plant and stipes clothed with large ferruginous chaffy scales; frond, twice or thrice divided from 3 to 6 and 12 feet long, and bright green. It varies considerably in the breadth of the pinnae and pinnules, but all the varieties are beautiful. Native of Jamaica, Dominica, &c.

C. aculeata.—This is another of the slender-stemmed West Indian species, the base of the fronds-stalks being furnished with numerous short prickles; crown of plant furnished with brown chaffy scales; fronds, from 3 to 6 or 8 feet long, broad and handsome, bipinnate, the segments being furnished beneath with a few short hairs. It is a very handsome species, but does not appear to produce a very large crown.

C. serra.—A truly beautiful and massive-looking species, attain-

ing some 20 or 30 feet in height; the stipes are stout at the base, furnished with a few short blunt spines, and densely clothed with very large chaffy scales, as also is the whole crown of the plant; the fronds are twice or thrice divided, long, broad and deep green in colour. Native of the West Indies and Caracas.

C. excelsa.—This beautiful and rare species is often confounded with *Alsophila excelsa*, but no two plants can be more distinct. The species in question forms a somewhat slender dark-coloured stem, bearing a grand head of rich deep-green fronds, which are twice or thrice divided, the chief divisions being from 1 to 2 feet long, or even more on finely-developed plants. It seems peculiar to the islands of Mauritius and Bourbon.

C. integra.—It is a remarkable fact that very few species of Tree-Ferns from the East have, up to the present time, become established in our collections. This one, however, is an exception, and, although acquainted with it only in a young state, I shall be only within the bounds of moderation when I say that it bids fair to rival any of its Western relatives. The stipes are unarmed; fronds, broadly-lanceolate in outline, twice or thrice divided; the segments broad and deep-green. It is a rare plant in cultivation. Native of the Philippines.

C. Hookeri.—This is an extremely elegant little species, and very rare in cultivation. It forms a slender stem; but I know nothing of it, saving in a young state. When seen fertile, it may prove to belong to *Schizocæna*; but this is only conjecture on my part. The fronds are pinnate below, pinnatifid towards the apex; the rachis is, however, winged nearly to the base; lower pinnae, obtuse, upper ones longer and more acuminate, slightly serrate at the edges; colour, bright green; the base of the stipes is furnished with a few black chaffy scales. The fronds of this truly elegant species are somewhat membranous in texture; and, consequently, it requires the atmosphere to be well charged with moisture, and should be kept well shaded. I have been told that, during the dry season in tropical countries, all such plants have their fronds shrivelled up, and very little is seen of them, and that my practice of keeping Ferns watered and growing in winter is a mistake; but, as it is the fashion to want Ferns in a healthy-looking state summer and winter, and, moreover, as the plants thrive admirably under this régime, I can see no use in killing in winter that which has been produced during summer. I would rather endeavour

to preserve the fronds upon the plants as long as possible; for, by so doing, a far better display is made, and the plant or plants rendered more ornamental. Native of Ceylon.

C. microlepis.—I have neither found this name nor plant anywhere, saving in German gardens, so that of the correctness of the name I am not certain, but of its beauty there can be no two opinions; the fronds are long and broadly lanceolate in outline, tripinnate; pinnae, 18 inches long, the segments being somewhat falcate and obtuse, the upper side is dark green, but beneath they are clothed with a quantity of small scales, which give it a somewhat ferruginous aspect; the sori also are very peculiar, being apparently confined to the vein next the mid-rib of the pinnules; the stipes and rachis are both furnished with prickles. It requires the temperature of a stove, but I am totally unacquainted with its native country.

C. muricata.—This is a magnificent plant, although I have not seen it large in this country. Specimens now before me show the

fronds to be bi-pinnate with the segments deeply divided. The pinnae are from 12 to 18 inches long, and oblong-acuminate in shape, the segments being obtuse and crenate at the edges, deep green on both sides, the upper being, however, the darker. The stipes and rachis are armed with short prickles. It carries a beautiful head of dark green plume-like fronds, which renders it very attractive. Native of the West Indian Islands.

C. Schanschin.—Stipes and rachis armed with short spines; fronds, long and bi-pinnate; segments, linear oblong and obtuse; very slightly crenate, deep green above, slightly paler below. There is something in this plant which strikes one that it is distinct, and yet its characteristics are difficult to define; nevertheless it is very handsome, although I fancy somewhat rare. It seems to be a common species throughout tropical America.

C. nigrescens.—This is at once a very massive, distinct, and beautiful plant, unfortunately very rare in collections. Indeed, the true plant would seem to be very little known. The stem is somewhat stout, and, together with the frond-stalks, armed with very stout black spines; fronds broad and massive-looking, twice or thrice divided; pinnae, from 12 to 15 inches in length; pinnules, deeply pinnatifid, segments obtuse, very deep green on

the upper side, paler below. It is a grand species, and very distinct amongst a collection of arborescent kinds. Native of Jamaica, &c.
(To be continued.) G.



Cyathea Cunninghami.

NEW VARIETIES OF CALADIUM.

The following varieties, raised by M. Bleu, an eminent Caladium grower, and exhibited this summer at Paris, are described and highly spoken of by M. E. André, in the *Illustration Horticole*:—

Onslow.—Plant, small-sized; centre of the leaf, blood-red, as in *C. bicolor*; margin, green; surface dotted with white, shaded with rose-colour.

Lepeschkinei.—Leaves, convex, slightly larger on one side, as in the variety *Ed. André*, but finely marked with vivid red, especially on the veins.

Emilie Verdier.—Plant, strong and tall; leaves, small, hastate, half rose-colour and half white, veined with brilliant dark green.

Felicien David.—A very vigorous plant. The heart-shaped

leaves are borne horizontally, and have very large basal lobes; margin green, centre white, with strong radiating veins of a carmine-lake colour.

No. 1.—Plant, vigorous; leaves, green and white, with a broad network of handsome green, and veins of a deep blood-red colour.

No. 2.—A hybrid, between Leplay and Ad. Bleu; leaves very large, of a charming transparent rosy-white colour.

No. 5.—Leaves very numerous, opaque, white; principal veins of a fine vivid carmine.

No. 7.—A very remarkable hybrid, between Marquise de Cazeaux and Triomphe de l'Exposition; leaves of a brilliant crimson in the centre; margin deep green; veins crimson; surface marked with very white spots. All the shades of colour fine.

No. 16.—A hybrid, between the Duc de Ratibor and bicolor fulgens: leaves white, with a green margin; centre perfectly translucent, and of a charming rose-colour; veins, delicate rose.

No. 18.—A hybrid, between Belleyme and Ch. Rouillard; leaves elongated, rather slender, of medium size; centre white; margin green, with stripes and network of the same colour; veins of a deep blood-red.

CŒLOGYNE CRISTATA.

THIS chaste and beautiful plant is certainly the queen of cool Orchids, and was introduced by the distinguished plantsman and traveller, Hartweg, who found it in woods near Guatemala la Nueva, a province in Mexico, possessing a very equable temperature (the maximum rarely exceeding 80°, and the minimum 60°). Coming, as it does, from this temperate region, it is surprising that many cultivators adopt a high temperature in its cultivation. I have at this moment two specimens bearing respectively 160 and 230 pseudo-bulbs, upon each of which is a fine robust spike of flowers. Opening at this season, they are invaluable for all purposes where chaste and refined flowers are required. My plants have been grown throughout in an ordinary Mexican house, where the temperature rarely rises to 60°, except during the hot summer months. During the autumn, the plants stand in a cool Vinery or similar place, and are not introduced into artificial warmth till the middle of November, when they are placed in the cool Orchid house, and kept at a temperature ranging from 50° to 55°, in which they now (Christmas week) commence to expand their lovely dove-like blossoms. As soon as they have done flowering, they are re-potted, or the roots examined, and supplied with a little admixture of fibrous peat, leaf-mould, and Sphagnum, chopped very fine, and silver sand. They are then well watered and kept in the same temperature till the summer months, when they are comparatively dried and exposed to the vicissitudes of weather we usually have during the autumn months, merely receiving the shelter of the house they stand in. There is no plant I am acquainted with more easy to manage, and, were we to receive each introduction *ad libitum*, as in the case of many Orchids, we should find this queen of the Guatemalan forests reigning in every British garden in which Orchids are cultivated to any extent.

The Nurseries, Epsom.

RANSLEY TAXTON, F.R.H.S.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Double-flowered *Lilium auratum*.—At a meeting of the Central Horticultural Society of France, held on the 11th of last September, M. Duchartre read a letter from M. Boisgiraud, of Tours, in which that gentleman stated that, amongst the plants of *Lilium auratum* in his garden, one had produced double flowers. This makes the fourth species of Lily which has produced a double-flowered variety, the others being *L. tigrinum*, *L. candidum*, and *L. Thunbergianum*.

***Agathæa cœlestis variegata*.**—A friend of mine sent me a plant of this last spring, growing in a large 60 pot, and I placed it in the conservatory, and allowed it to flower during the summer. It was thoroughly pot-bound, and it bloomed freely. It has now quite a charming appearance; it has made a dense wiry growth, the leaves are prettily variegated or marbled with cream and green, and it is beginning to flower again from the points of the shoots. It appears to be almost, perhaps quite, hardy, and I think it will yet prove a useful plant for winter decoration.—R. D.

Plants for Forcing.—We have many plants suitable for this purpose well known for their value as early bloomers, and there are doubtless many others well adapted for spring forcing if tried. Of these, *Saxifraga crassifolia* is one, while only the other day I saw some fine pots of *Scilla siberica*, covered with their beautiful blue flowers. The scarlet-flowered *Schizostylis coccinea* blooms well in the conservatory during the winter season, and deserves growing for the last-named purpose. Doubtless further experiments with some of our hardy herbaceous plants would furnish many admirable subjects or early bloom. One of the best of all plants for spring forcing is the rosy-flowered *Dielytra spectabilis*, and its white-flowered variety, although rare, is also very attractive.—J., *Whalley Range*.

THE FLOWER GARDEN.

SWISS FLOWERS.

No Canton in Switzerland, probably, can boast of rarer flowers than the Valais, unless it be the Grisons: and of all the glacier streams, none waters a richer flower valley than the Visp river, as it rolls on to join the glorious Rhone. I purpose ascending the river to Zermatt, thence to its source in the ice-caves under the Riffel, onwards to the glacier that stretches so silently under the Matterhorn, and Monte Rosa; and I shall gather as I go some of the rarities often scattered by Nature with no unsparing hand. Many of your readers will be able to follow me in my explorations; others may be induced to do so, some coming summer. I shall simply enumerate the rarer flowers, whether Alpine or otherwise, that, amid many treasures, more especially attracted my attention. Soon after passing the village of Stalden, a yellow Vetch, with a solitary yellow flower and square seed-pod, peered out from among the Grass on the bank—it was *Tetragonolobus siliquosus*. The narrow road was bordered by a Milfoil that bore a strong family likeness to our own *Achillea*. My Swiss Flora soon revealed its name; it was *Achillea dentifera*, of slimmer habit than ours. Among a *débris* of rocks I recognised a yellow Rest-harrow: there could be no mistake about it. Its glutinous stems and veined petals spoke for it. I found it was *Ononis Columnæ*, and local in its distribution. Near it I noticed *Asperugo procumbens*, and a curious *Centaurea*, which proved to be *maculosa*. On passing St. Nicholas, the half-way house as it is called, I gathered an old garden friend (*Lychnis Flos-Jovis*), with its woolly-leaved stem. This flower occurs also in the Grisons and Tyrol. Just as I reached Zermatt, I noticed a pretty blue Lettuce, with leaves cut like the Endive, growing in crevices of the rock. It was *L. perennis*, and it might be introduced into our rock-gardens with good effect. Before ascending the Visp above Zermatt, we must make a détour to the right and explore the Trift Glacier and its surroundings. As we ascend above the little English church, we gather *Buplerum ranunculoides*, with its grassy leaves and little umbels of flowers, reminding you somewhat of *Astrantia*. Near the cleft, through which the glacier waters come rolling down, is a beautiful white Lily-flower (*Anthericum Liliago*) growing in wild craggy ground in company with *Campanula spicata*, another of our Tyrol plants, with blue and sometimes dingy white flowers. We have now arrived at the gorge, and crossed the wooden bridge over the roaring waters below. Here the truer Alpines begin to put in an appearance, but not as they do on ascending to the Riffel. Still there is enough to interest one: an unrivalled bed of the Glacier flower (*Leontopodium*), as it never grows on our rockeries, but covered with its felt dress; *Kernera saxatilis*, close to the edge of the glacier torrent; beautiful *Linaria alpina*, with its glaucous leaves, and Nature's strangest harmony of colours in the corolla, purple and orange; another Crucifer, *Draba Traunsteineri*, peeping out from under a ledge of rock, with its cousin *Draba frigida*. A little further on, under a similar ledge, is *Saxifraga aspera*, whose leaves are like little saws. The Trift is well worth a visit, if the narrow gorge will allow of your going high enough, and your nerves are strong enough to endure the tumbling of the glacier-waters. But we must now ascend to the flower-land of the Alpines, which we so love to torture into cultivation in old England! Here we revel in a very Eden of Alpines. I know not which first to gather, perhaps *Lloydia serotina*, as it is a reputed British species. Well, the little gem grows as Daisies do in England in some parts of the ascent. I got up several of its tiny bulbs; it was such a lovely Lily-bell. All around you are those prettiest of the Primulaceæ, the Androsaces. At least half a dozen kinds greet your eye. And two of these are *A. carnea* and *A. glacialis*, with their cushions of Lilac contrasting with the blue of the bluest Alpine Forget-me-not (*Eritrichium nanum*), the gem of Pitz Languard in the Engadine. But I must not omit another Alpine I never saw in this country, the local *Aretia Vitaliana*. This is one of the Primrose tribe. He who would grow it well must plunge it in its own granite silt. Which must I tell of next? *Campanula cenisia*, or *Phytanum humile*, or the cushion-like tufts, all flowers, of *Thlaspi*

rotundifolium—or *Saxifraga oppositifolia*, which so often dis-appoints us on our rock-work after seeing its purple masses in the Alps. Then again, fancy the mountaineer, *Astragalus aristatus*, brought away to dwindle in the plains. This is a glorious plant in its home, high up in the mountains. Time and space would fail me to tell of *Anemone baldensis*, *Phyteuma Halleri*, *Soldanella Clusii*, alpina, and pusilla peeping through the snow; *Gentiana utriculosa*, *Phaca frigida* growing in the upper pastures where the highest chalets are built, *Paradisica Liliastrum* fair as its name—so I must stop and promise you a ramble through the Engadine if you are not already tired of the long walk I have taken you.

The Lodge, Hovingham, near York.

PETER INCHBALD.

THE GREAT THRIFT.

STATICE PSEUDO-ARMERIA, otherwise known as. *Armeria cephalotes*, of the "Hortus Kewensis," is unquestionably the most gigantic representative of the Thrifts or Sea Pinks. Of these two trivial names the latter is by far the most appropriate. The true normal habitat of all the species of this family is on the sea-shore or the margins of our large tidal rivers, where they luxuriate in the adjacent saline swamps, becoming so far impregnated with saline matter as to possess a brackish taste. Though, as I have stated, the sea-side is its normal habitat, yet it possesses, like other littoral plants, a tolerably cosmopolitan character, and is not unfrequently met with on the sunmits of some of our loftiest mountains, where, doubtless, it bears a certain, though undemonstrative, testimony of the change that has taken place during by-gone ages in the relative land and sea levels. The name Sea Pink is appropriate for two reasons—one of these will be obvious to any one who has seen the lovely roseate hue given to the shelving ledges of our sea-coast, where the common *Armeria vulgaris*, the species with which, in this country, we are most familiar, flourishes. Another is indicated by its generic title *Armeria*, which was the classical name of the Sweet William before the Knight of Normandy, whose name it bears, had essayed to tread the rosy carpet which is so characteristic of our shores. That botanists have made a happy distinction in separating the Sea Pinks from the Statice, popularly known as the Sea Lavenders, will be disputed by no one who is familiar with the characteristics of the two plants. Setting aside all the minute technical distinctions, which are neither few nor unimportant, the uneducated eye would have much greater difficulty in understanding the similarity than the more obvious dissimilarity in outward appearances that is presented by the respective genera *Statice* and *Armeria*, or to use common English parlance, between Sea Lavenders and the Sea Pinks. Of all the species of *Armeria*, and they are not few, there is none more showy than that represented in the accompanying figure of the true *Armeria cephalotes*. Be it noted that I here use the term true advisedly, for, so subject are the species

of this genus to hybridisation and variation that the cultivating of many species in close juxtaposition leads to such an indiscriminate blending of the specific characters as to place the descriptive botanist in a mental atmosphere very little better than a London fog. Where specific variability is so prevalent it will not be at all surprising when I say that the colour itself varies, in the species here represented, from pure white (somewhat rare) to a deep crimson-pink. The large heads of bloom supported on slender stalks, from 15 to 20 inches in length, when over-weighted by the moisture of a passing shower, are liable to claim too close an acquaintance with mother earth—and more unshakeable plants there cannot be—still supports are necessary, and, seeing that a single stake and tie of matting is the gardener's usual solution of the difficulty, and that such a mode of support is essentially ugly and unnatural, it behoves me to suggest some more effective mode

of dealing, not only with this plant but with many others of a similar character. With this end in view, I know of no more effective arrangement than the following:—Take a Hazel rod, say $\frac{1}{2}$ inch diameter, cut it into lengths of 12 or 15 inches each, square across at one end, pointed at the other; then take lengths of galvanised iron wire, say 15 inches each, bend one end at right angles, about 1 inch, and hammer the same into the flat end of the Hazel stake, then bend the other end into a circle about four inches in diameter; having previously doubled the other end in form of a short hook, which will readily close on to the end, let into the upright stake, thus forming a girdle about 4 inches diameter, which will encircle the flower stems about 9 inches above the ground level, and thus support them without any stiffness of contour. Permit me to remark, that the same mode of support by enlarging the wire cincture may be used with advantage, for many of the dwarf-growing herbaceous plants, and especially so for Pinks and Carnations, and other plants of the same typically slender-stem formation, where individual stem-staking would be almost impracticable. The *Statice Pseudo-Armeria* is a native of the South of Europe, and, though generally considered a distinct species, is looked

upon by some as a large form of the old *Statice plantaginica*.

J. C. N.



The Great Thrift.

ALPINE PLANTS AT BENTHALL HALL.

By J. C. NIVEN, Botanic Gardens, Hull.

(Concluded from p. 477, Vol. IV.)

I do not think that I can pay a higher compliment to Mr. Maw's gardener, on whom the detail of staking and tying must necessarily devolve, than to say that, though neatness and trimness were visible through the whole collection, the staking, or the mode by which the plants were supported was scarcely ever to be seen, or at least never obtruded itself on my observation. All the plants, though amenable to certain cultural laws, were

allowed such latitude that their natural character was well exemplified; nor should this fact pass without receiving its full modicum of appreciation, seeing that we more often meet with an infringement of Nature's laws than the reverse; as an illustration, during my ramble in the south I saw an instance of the beautiful Campaulacous plant, *Symphiaudra pendula*, whose true position is on a ledge of rock, with its flowering branches hanging pendulous, in character with its very appropriate specific title, just reversed and carefully tied to a very thick stake, its large cream-coloured flowers gaping upwards as though they were bells that had lost their tongues, and were silently beseeching to be relieved from their upright bondage; nor is this, though a marked example, by any means a solitary one.

The mode by which the individuality of plants, as regards their nomenclature, is maintained is a point of so much importance, whether the collection be small or large, but especially as in a collection of 5,000 or 6,000 species as we found here, that it behoves me to make a remark or two concerning it. Messrs. Maw's terra cotta labels have a wide reputation, and as would naturally be expected, their services are here called into requisition. As used here, they consist of labels about 6 inches long by 1 inch wide; on these the name is neatly written and burnt in, so as to be perfectly indelible; and here is a most important advantage—the tally may be absolutely buried, without in the least degree affecting the legibility of the writing. In my opinion, an increase in length, and also slightly in width, would be an advantage; but possibly this has been regulated by the practical experience acquired in dealing with a material of a somewhat brittle character—the greater the size, the greater the risk. One very important item, which occurs on the lower end of each tally, and which is only visible when the information is required, consists in certain letters, which indicate the source from whence each plant has been obtained. This, bearing in mind the diversity of nomenclature that still exists, and will ever exist amid a host of synonyms, is information not by any means to be despised, and but too rarely chronicled. Though in public collections, such as those of botanic gardens, small labels would be almost useless, they answer all purposes in a private collection, and with their use the usual churchyard appearance that a herbaceous ground presents during the winter time is altogether obviated. Mr. Maw has some nice span-roofed pits with the interior sunk some 15 inches below the ground-level, which are invaluable for growing many of the rarer plants; and here we find pans in use that for general Alpine culture have everything to recommend them, if we omit the matter of cost. These are made with double sides, giving a space of about half an inch between the outer and inner skin, which space, during the summer time, is filled with water, and offers two most important advantages. First, the roots are kept moist and cool; and whoever has delved his fingers into a mountain bog on a hot summer's day, to lift a fresh-found floral treasure, will readily appreciate the value of such conditions, even though artificially obtained; secondly, the water surface forms a glorious protective cordon against slugs—those double-distilled pests, which all cultivators of Alpines will cordially unite in denouncing. I might here suggest the utility of pans so constructed for rearing seeds generally, but more especially for those of Alpine plants such as *Primulas*, *Gentians*, *Soldanellas*, the more choice *Saxifrages*, &c., in fact, all those seeds that do not vegetate till the second year. The reason will be obvious to anyone who has had to deal with such seeds, but to those who have not had an opportunity of acquiring that experience which practice gives, I may explain, that, under ordinary treatment, the continuous watering on the surface, during the long summer, lays the seeds bare, and, if vegetation during the latter part of the first season should take place, the early embryonic development is too often "nipped in the bud," and hundreds and thousands of seeds and, under favourable circumstances, ultimate plants perish. With pans constructed as I have above described, the whole body of the soil may be retained in an equable state of moisture, without a particle of surface moisture, merely by filling-up with water the cavities between the two skins, which may be readily done with a small narrow spouted can. The material of which all garden pots is made is essentially porous,

and so long as the space is filled with water so long will the body of the soil on which the seeds are placed retain an equable state of moisture, anything like sourness being checked by the perfect drainage, which is maintained in the usual way; the alteration in the character of the sides does not, in the least, affect the ordinary arrangements made for this purpose in the bottom of the pots. I might, and perhaps ought to, bring my short sketch of Benthall Hall to a close with a list of the more showy plants in bloom on the occasion of my visit; but as it occurred so late in the season, any such list would give but a faint idea of the extent and interest of the collection here cultivated. I have, therefore, thought it better to record generalities rather than details, and will bring my remarks to a close by saying that, in everything about the place, neatness, order, and method are visible to a degree rarely met with in gardens, and when met with worthy of the highest appreciation.

Hardy Plants in Flower.—The following were in bloom at Salvington, near Worthing, on Christmas Day, viz.:—*Anemone sylvestris*, *Lobelia speciosa*, *Veronica decussata* and *lanceolata*, *Valeriana alliarifolia* and *asarifolia*, *Candytuft*—*White Rocket*, *Gazania splendens*, *Nasturtium*, *Calceolaria*—yellow and dark, *Pyrethrums*—three varieties, *Primula acaulis flore pleno*, lilac and white, *Geranium nodosum*, *Echeveria secunda glauca*, *Silene Schaffii*, *Roses* (Tea)—various, *Stocks*—*Scarlet East Lothian*, *Queen Brompton*, and purple *Queen Brompton*; *Agathæa cœlestis*, *Violet Czar*, *Malva crispa*, *Godetia Whitneyi*, *Lupinus subcarnosus*, *Ceanothus americana*, *Antirrhinum*—various, *Chimonanthus fragrans*, *Escallonia macrantha*, *Berberis Darwinii*, *Ligustrum japonicum*, *Garrya elliptica*, *Mignonette*, *Vinca major*, *Myosotis dissitiflora*, *Omphalodes verna*, *Lavender*, *Marigolds*—common, *Wallflowers*, *Pansies*, *Anbrietia purpurea*, *Daisy*—scarlet, *Schizostylis coccinea*, *Coronilla glauca*, *Genista fragrans*.—F. T. GADD.

—At Wardio Lodge, Edinburgh, the following were in blossom on the 25th ult., viz.:—*Arbutus*, *Laurustinus*, *Ivy*, *Garrya elliptica*, *Desfontainea spinosa* (one flower), *Erica carnea* and others, *Rhododendron dauricum*, *R. atrovirens*, seven herbaceous *Asters*, *Feverfew* (single, double, and rayed), *Achillea anrea*, *Cardamine rotundifolia*, *Arabis procurrens*, *Aubrieta* (Belvoir seedlings), *Violas* (Dickson & Co.), *V. odorata*, *Anemones* (single red and white), *Hepaticas* (single, red, blue, and white), double *Daisies*, *Roses* of different sorts, *Chrysanthemums*, *C. frutescens* (yellow and white), *Myosotis dissitiflora*, *Primulas* (*Anricula*, *Polyanthus*), fifteen varieties, *Oxlip Priuurose*, six do., *Helleboms* (*H. abchasicus*), *Tritoma grandis*, *Campanula*, *Potentilla*, pot *Marigold*, *Tussilago fragrans*, double *Colchicums*, *Carnations*, *Jasminum nudiflorum*, *Phlox* (autumn-flowering), *Mignonette*, *Stocks*, *Wallflowers*, *Snowdrops* showing colour, scarlet *Pelargonium*, *Calceolarias*, *Salvia fulgens*, *S. variegata*, *Sweet-scented Geraniums*, *Balm of Gilead*, *Sweet Verbena*, *Agathæa cœlestis*.—F. J. HOPE.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The Tree Heath (*Erica arborea*).—We have seen plants of this very hardy Heath during the past week in full bloom in Messrs. Lee's Nursery at Feltham, and cannot but wonder that it is not found in abundance in our flower markets during this period of the year. It is, without doubt, one of the most charming hardy winter blooming plants we have, both for house decoration, for the open border, or for cutting from for bouquet or table uses.

Ranunculus asiaticus.—I should like to know whether the single variety of this *Ranunculus* is in cultivation or not. It is said to be abundant in the neighbourhood of Jerusalem. There is a figure of it in Sibthorp's "*Flora Græca*," and in the "*Theatrum Floræ*" are figures of three sorts, the white, the scarlet, and the yellow. I have never seen it, but I should think it would be a desirable addition to hardy spring-flowering plants.—H. N. ELLACOMBE, *Bilton Vicarage*.

Polygala Chamæbuxus.—This valuable winter-blooming plant is just now covered with buds, which will burst into flower in a few days. It is perfectly hardy, is evergreen, and grows in a continuous spreading manner. It does not exceed 3 inches in height, and it propagates itself with great rapidity. The flowers are pale yellow. It makes a capital edging plant for shrubby borders, but needs to be occasionally lifted in order to keep it within bounds. Nice rounded tufts of it lifted and potted up early in winter, are very useful in a cool greenhouse or conservatory when other blooming plants are scarce.

Myosotis dissitiflora.—Strong seedling plants of this early spring flower are already bursting freely into bloom in the open ground, at least a fortnight earlier than propagated plants, and they are far more robust in growth. I have planted out about 1,000 of each on a warm south border, and shall thus be able to give the two forms of plants a fair trial, but present appearances are largely in favour of seedlings. These were raised from seed sown in boxes under glass early in July, and were transplanted to the open ground at the end of August. The bulk of them are now 6 inches across, and they have seven or eight points, all of which are showing bloom. Such plants as these lifted into 32-sized pots now, and placed in a cool house, would soon be a mass of flower, and make lovely ornaments for any place or position.—A. D.



CHATSWORTH FROM THE RIGHT BANK OF THE DERWENT. (See p. 7.)

THE ARBORETUM.

THE CULTIVATION OF THE SCOTCH FIR AND ITS VARIETIES.

By WILLIAM GILCHRIST, Cluny Castle, Aberdeenshire.

The Pine is king of Scottish woods,
And the queen, ah! who is she?
The fairest form the forest kens,
The bonny Birken Tree.

It is considered probable by some writers, that in early ages the greater part of Britain, with those islands towards the north, in which there is now hardly a shrub, were covered with Pine forests. The remains of Pines are still found in the peat bogs of the northern counties, so much so, that Pine roots form an article of commerce, not only in the villages near which they are found, but also in the principal towns. It would be interesting to consider these ancient Pines historically, and endeavour to form some idea as to what climatic changes our country has undergone since the time when they luxuriated in situations where it is now almost impossible to grow them; but the subject being "the Scotch Fir, its cultivation and varieties," the following remarks must be devoted to the consideration of the present instead of the past. To make this report as concise as possible, we will consider it in the following order:—1. The descriptive character of the Scotch Fir, and the varieties most adapted for use and ornament.—2. The soils and situations where found growing, and best suited for proper development.—3. Cultivation and value at different periods of growth.—4. The purposes to which it is applied in the arts and manufactures.—5. The diseases to which, as a forest tree, it is most liable.

The Character of the Scotch Fir (*Pinus sylvestris*), and the varieties most adapted for use and ornament.

There are many specified varieties, but most are only cultivated for variety's sake. These are chiefly produced by cultivators, and can scarcely be called specific. Botanists are agreed as to one variety, and, when they agree, the cultivator's opinion can only be regarded as a theory. G. Don, of Forfar, tried to prove that there are at least two varieties; but Grigor, of Forres, an equally good authority, maintains, that though there is variety, it is the result of degeneracy, and that the alleged varieties do not keep their distinctive character at all stages, and fail to reproduce themselves. The author of "The Forester," another close observer, seems to declare in favour of Grigor's theory. Granting that there is only one distinct variety, and that other differences in appearance are only sports, or the result of degeneracy, or the exhaustion or unsuitableness of the soil, we have still to account for the quality of timber, which is often, in the natural forests, different in two trees growing side by side—the wood of the one being white, soft, and brittle; and of the other, resinous, tough, and durable, with full-developed heart-wood. The cones of the former are longer and more tapering towards the point than the other, and are so distinct that a practised eye at once distinguishes them, and yet the one often produces the other. The same phenomenon occurs with other trees, and if a few distinct specimens would constitute a variety, they could be had in any number. We grant that there are variations in leaves, cones, bark, wood, and general character, but as these fail to reproduce themselves, and are more or less affected by soil, situation, age, &c., we conclude that they are not specific varieties. However, there are several varieties cultivated whose distinctive characters are maintained by propagation, and were attention directed to this point, any number of varieties might be got. The most distinct of this class are the *Pinus sylvestris* *unrea* and *argentea*, both robust, compact, and ornamental. They are both the production of Messrs. Dickson and Co., Perth Nurseries, but the slow and uncertain means of propagation prevents their coming into general use. This is not to be regretted, as their proper place is the lawn or Pinetum in single specimens or small groups. It is doubtful if they would ever equal the common Scotch Fir as a useful tree, even if they could be produced at the same rate. The *Pinus sylvestris* *haguenensis*, common on the continent of Europe, and extensively used in Britain as a nurse for hardwood trees, &c., may be noticed as a special variety, and a rapid grower; but as "attention is particularly directed to the selection of any special variety adapted for use and ornament," we at once cast in our lot for the *Pinus sylvestris* *rubra*, as we consider it to be that from which all the other so-called varieties have sprung, and the only one adapted for use and ornament combined. Its character, according to Loudon and Don, is thus given:—Leaves, from 1½ to 3 inches long, generally in pairs, stiff and twisted, of a pale green or glaucous colour, concave on the upper and convex on the under surface, serrulated on the edges, but not margined; buds, ovate, blunt pointed, ¼ to ½ inch long, and ¼ inch wide at the broadest part, the centre bud generally with five or six smaller ones round it; flowers, of a

yellowish tint, appear in May and June; cones, 2 to 3 inches long, and 1 to 1½ inch broad, more equal in thickness and smoother than those of the white-wooded variety, which are more elongated and tapering; seeds, black, and garnished with a reddish wing, and ripen the second year; branches, horizontal, with a tendency to bend downwards; bark, comparatively smooth and light in colour, not so rugged as in the degenerate variety. As an ornamental tree it is generally found single or in small groups, height 30 to 60 feet, with wide-spreading horizontal branches reaching almost to the ground. When seen thus there are few trees having such a picturesque appearance, and so distinctive a character. As a forest-tree it averages 60 to 80 feet in height, with a clean trunk, occasionally inclining to be flat-sided, but with little taper, and the branches at the top small, and disposed in regular whorls. Of course any or all of these characteristics may vary slightly according to soil, altitude, exposure, and extent of plantation, but we consider them sufficient to guide the practical forester in the selection of the true variety of our native Pine.

The Soils and Situations where found Growing, and best suited for its Proper Development.

The *Pinus sylvestris* is now found, either wild or cultivated, throughout the greater part of Europe. It is the only Pine indigenous to Britain, and its chief native habitat is the Highlands of Scotland—hence the name "Scotch Fir." But though it is termed the Scotch Fir, it is by no means peculiar to Scotland. It has a very wide geographical range throughout the northern part of the eastern hemisphere, where it forms vast natural forests, extending from the middle of Europe to the 70th degree of north latitude, but ceasing in Asia at 63°. It is only in temperate regions that it luxuriates, and there the most extensive and valuable forests are found. In Scotland these give a character to the landscape, so that the noble Pine has been termed "the king of Scottish woods." While granting that title to be due as regards the Scottish woods, if we cross the border we must not presume to give our favourite Pine any such designation, as all authorities allow the Oak to be termed "the monarch of the woods;" but, as there is nothing essential in a name, we are content when conversing with our southern neighbours to call it "our native Pine." In the lowlands of Scotland few plantations or forests, composed entirely of Scotch Pine, are to be seen, it being chiefly used in that part of the country as a nurse for other trees, or for making up mixed plantations. It seems evident that it must have been used in this way at an early period, and, at present, most of the finest specimens of the Scotch Pine in the Lowlands have been grown amongst hard-wood trees, principally Oaks. These Pine trees, though considered handsome in their own locality, are not to be compared with the noble specimens found in the north of Scotland. It is a matter of regret that some of the noblest of these are disappearing before the woodman's axe. We agree with the general rule that trees should, like any other crop, be cleared off the ground when they arrive at maturity, so that the ground may again be turned to profitable account; but we think that regret will be general with the members of the Scottish Arboricultural Society that so many fine old specimen trees of our native Pine are ruthlessly cut down. Every available means ought to be resorted to for their protection and preservation; in fact the words, "Woodman spare that tree," should be displayed around them, so that the casual observer might know that the tree before him was a "king of the Scottish woods." The proprietor of Invercauld, with praiseworthy zeal, has had a number of the best Scotch Pines on his estate photographed, and through the kindness of Mr. Brown, his late factor, these have been presented to the Scottish Arboricultural Society, so that their shadows may be preserved when their substance is gone. The most famous districts in the north of Scotland for the growth of Scotch Pine are the valleys of the rivers Spey and Dee, with their tributaries, the chief places being Rothiemurchus, Duthill, Abernethy, and Glenmore on the Spey, and Invercauld, Braemar, and Glentanner on the Dee. These famous Scotch Pine producing districts, though far apart, have a great deal in common as regards the natural formation of the ground, hill and dale alternating with wide-stretching valleys, sheltered by neighbouring hills, soil light and gravelly, inclining to clay in the valleys, and the sub-soil granitic, geological formation chiefly grey and red granite. The comparison also holds good from a financial point of view, for in these districts wood has been the chief source of revenue to the proprietors, and affords a staple industry to the people. Again, in comparing the recorded sizes of the famous trees, each district vies with its neighbour in producing large specimens and good timber. At present Ballochbuie at Invercauld is considered the best and most valuable Pine forest in Scotland. Most of the others mentioned were at the zenith of their maturity about the beginning of this century. We have enumerated several of the most famous Scotch Pine producing districts, but there are other localities, as Monymusk on the Don, and the Scotch Fir planta-

tions near Fochlabers, belonging to the Duke of Richmond, where timber scarcely inferior in quality has been produced. During this century the quantity of Pine wood that has been cut and manufactured in the north of Scotland is very great, so that it has been a chief staple of commerce. Notwithstanding all that has been felled, there is at present a greater extent of land under Scotch Pine than at any previous recorded period. Of course the greater the area, the more diversified are the soils and situations, and it is not to be expected that all the plantations will produce large trees. Judging from the soils and formation prevalent in the districts where the best specimens occur, it is evident that a light gravelly or sandy loam, with a granitic formation and north exposure, at an altitude of 500 to 800 feet, is the most favourable situation for the proper development of the Scotch Pine. Although this is undoubtedly the best, still the Scotch Pine is suited to a great variety of soils and situations; in fact it will grow, and that profitably, on any soil (except chalk) from a sand to a clay or Moss, provided there is no stagnant water, and the sub-soil is rubble or rock. In some natural forests this Pine grows on poor sandy soils, but it does not follow that, because found on these poor soils, they are adapted for its proper growth. This is only the result of seeds blown about by the wind, germinating more freely in sandy than in retentive soils; and, when once established, the Scotch Pine grows more freely in these light sandy soils than almost any other tree.

Except as a nurse for more valuable trees, the Scotch Pine should never be planted on wet tilly soils, for whenever the roots have exhausted the upper portions of these soils, and penetrate to the cold sub-soils, the vital energy of the plant is checked, and, as a natural consequence, it languishes and dies. Light gravelly soils, with a moorband pan near the surface, are inimical to its growth. On ground of this description, left in its natural state, the Scotch Pine seldom grows above the shrub size; but as the surface soil is suitable for the growth of Scotch Pine, the moorband pan can generally be remedied, or got rid of altogether, by thorough drainage. Good specimen trees are found in most of the eastern and southern counties growing on strong clay soils and well-drained Moss. We know one instance where, for trees grown on a strong clay soil, a wood merchant offered £1,000 for 1,000 unpicked Scotch Fir trees. Trees grown on this sort of soil have been frequently sold at from 10s. to 15s. each. Of course the access to the plantation was easy. These may seem very high figures for Scotch Fir trees; but they are facts, and we think the policy of planting slow-growing hard-woods on soil of this description is questionable, especially as the market for slow-growing hard-wood, unless of a large size, is steadily decreasing. We are not prepared to affirm that the timber of Scotch Pine, grown on Moss soils, is as good and durable as the timber grown on more suitable soils; but, except for carpenter work, it is suitable for all the purposes to which the timber of the Scotch Pine is applied. In contracting for railway sleepers of Scotch Fir, it is generally stipulated that they are to be of the best description; but under close inspection, we have never known objections raised to timber grown on Moss or soft ground. Except for timber used in carpentry, any objection that might be raised as to the quality of Pine timber would be of little importance, as with the chemical appliances now used for the preservation of wood, the quantity of timber produced in a given time is the first consideration, and quality only the second.

No forest-tree with which we are acquainted adapts itself more easily to change of circumstances and variety of soils and situations; and the Scotch Pine may be considered the safest tree to plant in Scotland, especially on the waste and barren ground so prevalent in some parts. Some political agitators state that about the one half of the ground in Scotland is lying waste, and ought to be improved, so as to produce food for the people. Another class, who are arboriculturally inclined, maintain that all the barren lands ought to be planted—Scotch Pine being the tree most recommended to produce the wonderful transformation. On examination, both theories prove delusive, so far as the growing of either cereals or Scotch Pine on all the waste and barren lands of Scotland is concerned. After a careful and extensive examination of waste and barren land, we confidently assert, that on a large portion of these barren lands it is impossible to grow even Scotch Fir, owing to exposure and want of soil. We have observed that the Scotch Pine is most accommodating to soil and situation; but there are peculiarities as to altitude not easily accounted for. In "The Forester," p. 237, it is stated that "the Scotch Pine is found growing at an altitude of upwards of 2,000 feet." In the Rothiemurchus district, useful and profitable timber is grown at 1,500 feet; and in the Dee district, there are numerous localities where good wood is grown at from 1,000 to 1,200 feet. This fact is encouraging; but on some hillsides it is impossible to get it to grow above 800 or 1,000 feet. Our observations lead us to conclude that shelter and exposure must be considered in deciding

the altitude at which the Scotch Fir can be grown profitably. On a sloping hillside, fully exposed to the prevailing wind of the district, we have known Scotch Fir to fail, as a crop, at an altitude of 700 feet; while on the same hillside, but in a sheltered position, it grew freely at 1,000 feet. Again, on a sloping hillside, ranging from 500 to 750 feet, the trees, though healthy and good, are short, and only average 8 or 9 feet; while on the top of the hill, there is a good portion of flat or slightly hollowed surface, and the trees there of the same age average 14 to 15 feet. On another hill Scotch Firs are growing freely on the flat summit upwards of 1,000 feet; and on the exposed slope they are little better than shrubs. Some may think this overstated, and name instances where Scotch Pine grows freely on hillsides; but these hillsides are invariably sheltered by other, though perhaps distant, hills, and therefore the prevailing wind has little effect on them. These remarks are not made to discourage proprietors from planting exposed hillsides; but we would humbly say, be not too sanguine of success, nor expect the profit that is realised from trees grown on suitable soils and sheltered situations; for although the Scotch Pine will, for a time, grow on almost any soil and in any situation, like all other trees, it prefers a good suitable soil.

Cultivation and Value at Different Periods of Growth.

We have stated that the area of land under Scotch Fir is greater at present than at any formerly recorded period; but, when we examine the kind of cultivation it receives, we find that most of the plantations receive no attention from the time they are planted until they are of a size suitable for the many purposes to which the thinnings of Scotch Fir plantations are applied. Most plants are improved by cultivation, some so much so, that their character and constitution are completely changed. The Scotch Fir, perhaps, has improved less by cultivation than any other forest-tree; and it has been said to be one of those plants that receive no apparent benefit from cultivation. To a certain extent we indorse the statement; but the question arises,—Has the cultivation of the Scotch Fir been judicious or not? In some instances the cultivation has been all that could be desired, but generally the answer must be in the negative. To particularise instances of judicious cultivation would be invidious and personal, and at best could only benefit such as have opportunity of personal inspection. A standard of perfection to be aimed at will be more useful. We consider three operations to need special attention for the judicious cultivation of the Scotch Fir, viz., first, the selection of seed; second, the treatment in the seed-beds and nursery-lines; and, third, the thinning, &c., during the first twenty-five years of growth. Of these, the selection of seeds is the most important; but it is seldom performed in a way to procure the seeds of the best varieties. It depends chiefly upon seed collectors, whose only object is to procure the largest quantity of cones at the least possible expense. At no distant period, the nurserymen sent their own seed collectors to the principal districts; but gradually (as the result of keen competition and the demand for cheap plants) seed collecting became a distinct branch of business. Now nurserymen have not the same facility of ascertaining the particular district from which their seed are procured. Of course the district is mentioned, but the main consideration is the percentage of vital seeds. There are still some nurserymen who continue to collect seed and guarantee the forest from which it is procured; and it is creditable to know that these are much patronised, although their seeds and plants are charged at a higher rate than those procured from other firms. The method adopted by the professional seed collector is to arrange with district collectors to supply a given quantity of cones at a certain rate. These district collectors, in their turn, arrange with local agents; and generally, if the quantity of cones is procured, no questions are asked as to what plantation or kind of trees supplied them. It is not uncommon to see people of all ages, and of both sexes, scampering through Scotch Fir plantations, gathering cones, wherever they can be easily procured. Cones are often most abundant on deformed and worthless trees, the tendency to produce seed being a symptom of maturity, or, according to Darwin, an indication of disease. It, therefore, follows that a large portion of Scotch Fir seed is at present gathered ostensibly from the best districts, but really from the worst trees in these districts. The result is the natural consequence of the system, and will not be remedied till all seeds are gathered under skilled supervision. We have already dwelt upon the best varieties of the Scotch Fir, and how they may be known by their cones; and, as our standard for its cultivation, we recommend that the professional seed collector should personally, or by deputy, select not only the districts, but the forests or plantations; and to ensure the seeds being procured from the best trees, a responsible person should superintend the operation.

The treatment of the seed beds and nursery lines is generally well understood by practical arboriculturists. Instances occur where the cultivation is not skilful; but this operation being open to inspec-

tion at all stages, the observer may detect instances of bad cultivation, and avoid them accordingly. In general the cultivation in the nursery is fair. The principal errors are high manuring of the ground, overcrowding of the plants, and too much shelter. Highly manured ground is injurious to the development of the Scotch Fir at all stages, although its bad effects are not so observable at this stage. But when planted out, especially in exposed ground, the effects of high manuring are soon noticed. However, if the soil is good, and the plants get a fair start, the effects readily pass away. The case is different with Scotch Fir plants that have been overcrowded either in seed beds or nursery lines. No amount of care in after treatment can remedy injuries received at this stage. In fact, experience teaches us that under no circumstances will overcrowded plants attain the same robust habit or become as profitable a crop as plants that have been allowed ample space for the development during the early stages of growth. The reasons are obvious, and not peculiar to the Scotch Fir. They are—First, A want of roots, fibres, and spongioles, which are essential to the vitality of plants. Second, A deficiency of leaves, necessary for the transpiration or exhalation of the superfluous fluids, and for absorbing from the atmosphere the substances that are subservient to growth. Third, A contraction of the diameter of the stem, and consequent check on the formative cells or cambium, which forms liber, alburnum, and wood. Fourth, A slender habit and bad constitution, caused by a deficiency in these vital parts. It occasionally happens that the seed-beds are overcrowded unintentionally, and under the best management; but when such is the case, they should be thinned at once, and planted in lines or bedded as one-year seedlings. As to overcrowding in the lines, it should never occur. Too much shelter is often as injurious to plants as overcrowding; in fact, the two generally go together. Shelter does not injure a plant so long as it is in the nursery, but a plant grown in an over-sheltered place cannot be removed with safety to the open ground. Other causes of mischief occasionally occur in the nursery, as Fungus, beetle, mildew, &c.; but these are generally checked as soon as observed, although sometimes after great loss and disappointment to the cultivator. Our standard at this stage should be good habit, tapering form, and sufficient fibrous roots, leaves, and branches. A plant of this description will grow and succeed in any situation.

The thinning, &c., of Scotch Firs during the earlier periods of growth is the next point in their cultivation, and one which is seldom sufficiently attended to. Good seed may be procured, good plants produced, and planted in suitable soils and situations; but if thinning is neglected, they suffer more from overcrowding at this stage than in the nurseries, and there is less excuse for it. Generally Scotch Fir plantations are more neglected at this stage than any other. This may sometimes be attributed to the extent of these plantations, and the consequent expense of thinning, without any present adequate return. None, except those who have experienced it, know how difficult it is to get proprietors, who take no interest in their plantations, to expend money on thinning. There are, sometimes, difficulties in the way, even where the thinnings would pay the expenses. Another great drawback to the early thinning of Scotch Fir plantations is the opinion, sometimes freely expressed by men who ought to know better, "that to produce clean grown timber, Scotch Fir cannot be grown too crowded together." We have frequently seen plantations under the charge of individuals who hold this opinion, and we confidently assert, that instead of plantations treated in this manner producing clean timber trees, they scarcely ever produce a crop of profitable spars. A favourite argument against thinning Scotch Fir plantations is to point to some patches or groups of really good trees that may be growing in such a manner as clearly proves that they have not been thinned. We at once grant that such instances do occur; but they are the exception and not the rule, and only go to prove the Darwinian theory of the struggle for existence. Personally we have examined many Scotch Fir plantations, and have never met with an instance of a good crop of wood, even in prospect, where the trees had been planted at the ordinary distance apart, and their thinning neglected until they were a suitable size for propwood. If such an instance is known, we feel assured that it arises from exceptional causes. The practical operation of thinning has been minutely described in the "Transactions" of the Scottish Arboricultural Society; to enlarge on it would only be to repeat in substance what others have so well written; and those who neglect to thin their plantations cannot plead the want of sufficient information on the subject. Making due allowance for soil, situation, and exposure, we would say that Scotch Fir trees should have ample space for development of roots and branches during the earlier stages of growth. To ensure this, thinning is generally needful at eight to twelve years after the plantation has been formed. Occasionally we have thinned at an earlier age, where the trees had been planted at three feet apart on good soil. The first thinnings are not

worth removing, except they are required for brushwood, screen fences, &c. They are generally given at a nominal price to ensure their removal. The second and third thinnings are generally suitable for light propwood, and when conveyed to market are worth from 3s. to 4s. 6d. per hundred lineal feet. When the trees are from twenty to thirty years old, a thinning of full-sized propwood may be taken, which, when conveyed to market, are worth from 5s. 6d. to 7s. per hundred lineal feet. At this stage the standard crop of trees will be at an average distance of from 9 to 12 feet apart; and if the management has been judicious, the plantation may be allowed to rest, *i.e.*, the trees to get drawn, in the assurance that a full crop of good timber trees are in prospect.

The foregoing remarks express our *beau idéal* of the judicious cultivation of Scotch Fir plantations. Owing to the many changes that take place between the formation of a plantation and its maturity, it is difficult, often impossible, to procure exact information as to the early treatment of the best of our Scotch Pine plantations, consequently, many of the conclusions must necessarily rest on circumstantial evidence. However, we know several instances where we have been assured, by resident parties, that the treatment has been similar to the above recommendations.

The Diseases to which, as a Forest Tree, it is most liable.

One of the most fruitful sources of disease—stunted growth and premature decay—in Scotch Pine plantations is the total neglect of thinning when the trees are young, and then too severe thinning after they have come to be of useful size. We have already adverted to the importance of thinning, and the loss sustained by neglecting it. We would only add, in treating of diseases, that the neglect of thinning predisposes Scotch Pine trees to almost every disease to which they are liable. As an illustration, we would only mention that the small white protuberances (than which there are no surer signs of decay) in the bark of Scotch Fir seldom occur except on trees that have had their roots shaken and partly broken, by being too much exposed to the wind, and are always most common in neglected plantations the season after a severe gale of wind. The common causes of disease in Scotch Pine, and which tend to hasten premature decay, are—First, ground-rot caused by the tap-roots failing to obtain sufficient nourishment from the sub-soil, generally most prevalent on light gravelly soils, with a hard impervious sub-soil; deep drainage is the best preventive.—Second, roay or trunk-rot, most prevalent in old plantations, and is a sure sign that the trees have passed maturity, and, as a crop, ought to be realised.—Third, ulcers or resinous boils, generally caused by the bark being damaged, sometimes by accident, but more commonly by insect eggs being deposited in the bark, and as soon as the larvae begin to develop, they eat into the sapwood, and cause the natural juices to run out; trees seriously affected with this often break over at the disease part.—Fourth, want of drainage, and stagnant water; the remedy for this is not far to seek, but frequently the crop is sacrificed before the remedy is adopted.—Fifth, Fungus; this is a disease affecting the roots, and only met with in highly-manured ground, most common in the nursery. On highly-manured and cultivated ground (naturally poor) we have known fifty per cent. of the Scotch Pine trees die from Fungus and white bug before they were eight years planted. Some of the natural enemies of the Scotch Pine, when young, are ground game, field-mice, white bug, Pine-leaf caterpillars, black game, and brown beetle. This latter and its varieties prey on the Scotch Pine at all ages, and, if not checked, threaten to damage some plantations very materially. After a crop of Scotch Fir is cut, the ground is sometimes so much infested with them that it is found impossible to get a second crop to grow until the ground has been cleaned. The beetle generally injures young plants by cutting the bark near the surface, but in older trees it eats into the pith of the top or leading shoot, and the points of the lateral branches. We consider that the best preventive is to keep the surface as clear of rough herbage and superfluous branches as possible, as we have never seen a plantation that was regularly grazed much affected with beetle. Squirrels are also very injurious; the best remedy is to kill them, but not by shooting, as the trees are sometimes more injured by the cure than the disease. These are some of the diseases and their causes that are generally known; but unless where they are observed and checked at once, little is practised or known as regards their remedies, if indeed remedy is possible with some of them. We sometimes think that the "stamping out system," so strongly urged by the Aberdeenshire farmers during the cattle plague, must have been borrowed from the foresters, for it is seldom that any curative means are tried with diseased trees. They are generally cut down (*i.e.*, "stamped out"), and turned to account. However, we trust that the improvements begun in the art of forestry will continue, and tend to maintain the prestige of our native Pine as "the king of Scottish woods."—*Scottish Arboricultural Society's Proceedings.*

BURNHAM BEECHES.

THE picturesque and curiously interesting old wood, called Burnham Beeches, forms part of the manor of East Burnham, and adjoins a wild common distant about four miles from the railway station at Slough. Up to the time when railways were introduced, there was not a nook of the country, far or near, more secluded or less known than Burnham Beeches was. Londoners appear to have been entirely ignorant of this picturesque tract, although the poet Gray—whose favourite walks were in its shadowy depths—speaks of it in his letters. In Moore's "Life of Sheridan" will be found a series of letters, written from East Burnham Cottage, by Sheridan. At that time Burnham Beeches was one of the wildest and most romantic of our ancient forest remains; the axe of the woodman had left it untouched, and its owners, generation

may be reached by several roads, each very beautiful in its seclusion. We ascend a hill, and find a sort of table-land, forming a rude common with a few scattered houses. Gradually the common grows less open; we see large masses of wood in clumps, and now and then a gigantic tree close by the road. The trunks of these scattered trees are of amazing size. They are for the most part pollards, but, not having been lopped for many years, they have thrown out mighty arms, noble as well as beautiful in their grotesque proportions. As we advance, the wood thickens, and, as the road leads us into a deep dell, we are at length completely embosomed in a leafy wilderness. This dell is a most romantic spot; it extends for some quarter of a mile between overhanging banks covered with the graceful fronds of the Ash and the Birch, while the contorted Beeches show their fantastic roots and unwieldy



One of the Burnham Beeches.

after generation, had scrupulously preserved its primitive aspect. The oldest inhabitant alive, in 1856, one William Buckland, said for fifty years he had never known one instance of a tree standing on the waste or forest being cut down. After the year 1840, when the railroad came into use, the neighbourhood became better known and its sylvan solitude gradually became the favourite resort of summer pleasure-parties from the surrounding districts. The late Charles Knight, describing the place at this time, says—"We know nothing of forest scenery equal to Burnham Beeches. There are no spots approachable to it in wild grandeur to be found in Windsor Forest." Sherwood, we have been told, has trees as ancient, but few so entirely untouched in modern times. When at the village of Burnham, which is about a mile and a half from the railway-station at Maidenhead, the Beeches

trunks upon the edges of the glen in singular contrast. If we walk up this valley, we may emerge into the plain of Beeches, from which the place derives its name. It is not easy to make scenes such as these interesting in description. The great charm of this spot may be easily conceived, when it is known that its characteristic is an entire absence of human care. The property has been carefully preserved in its ancient state, and the axe of the woodman for many a day has not been heard within its precincts. The sheep wander through the tender Grass as if they were the rightful lords of the domain. We asked a solitary old man, who was sitting on a stump, whether there was any account as to who planted this ancient wood. "Planted!" he replied, "it was never planted. Those trees are as old as the world!" However sceptical we might be as to the poor man's chronology, we were sure that

history or tradition could tell little about their planting. The ancient tradition of the neighbourhood tells how the Beeches were pollarded by the Parliamentary army under Cromwell which encamped there during the great civil war, but some have denied that they ever were pollarded, although their appearance is certainly such as that process might have produced. At any rate the tradition helps us to estimate the age of the trees. Of course these quaint, grotesque, and picturesque old giants in their present deformed and maltreated condition have not the stately grandeur and symmetrical beauty of the Beech in its natural state. Their monstrous sizes—most of them must have a girth of from 14 to 18 feet, and some of them measure over 20 feet—their fantastic profiles, and wild weird-looking attitudes, giving them in the dim twilight of the wood an aspect calculated to awaken the wildest superstitions in the minds of forlorn and wandering travellers, have now long been the delight of artists, whose paintings and drawings have conferred upon them a species of immortality; but the gracefully arching branches, the tall straight trunk, with its smooth grey bark, and its seeming cluster of banded pillars, with other characteristics which have won for the Beech its title to regard as the grandest of forest trees, are altogether absent in these gigantic specimens.

Lichens on Trees.—I should be much obliged if any of your correspondents would inform me what conditions of atmosphere, soil, and temperature are most conducive to the formation and growth of Lichens on trees, stumps, &c. I had imagined that dampness of soil and atmosphere were the chief promoters of Lichen, but this theory seems rather contradictory to a fact I have lately observed, viz., a very inordinate growth of Lichen where the soil is chiefly sand and gravel, with a light peat on the surface. If damp causes it, wherein does this cause differ from the cause of the development of Mosses? and has vicinity to sea air anything to do with the formation? Is there any book on Lichens?—C. J. WRIGHT.

Gum Anime.—In an article on Amber in your number of the 13th Dec., I find it stated that gum animé is the produce of a North American tree, and is a modern secretion forming at the present day. As this was quite opposed to the account I had always heard of the gum animé of commerce, I have searched for some information on the subject, I find a letter from Dr. Kirk to the Linnæan Society, dated Zanzibar, March 20, 1868, in which he states that along the creek of Dan Salam on that coast he finds among many other shrubs the *Trachylobium Mossambicense* which produces one variety of Copal, and he proceeds to give his reasons for believing that in this tree we have the source of the older Zanzibar Copal, the semi-fossil or bitumenised resin known in the English market as animé, and which is the most valuable of all resins for the manufacture of varnish, exceeding anything produced on the west coast for hardness, elasticity, and polish. There are three distinct kinds of Copal in Zanzibar, the first the tree Copal; second, Copal dug from the soil in places where the Copal tree now exists; third, the animé, also dug from the soil, but harder, less soluble, and more than twice the value of the other kinds. The *Trachylobium Mossambicense* is found only along the creeks and becomes very rare at a little distance inland, and quite unknown long before the change in geologic structure offers an explanation of its absence. It requires the near presence of the sea and dies when far removed from its influence. The animé is, undoubtedly, the produce of forests now extinct, for there are no trees growing along the ancient sea beach which produces it, and which here fringes the Continent to a depth of 20 to 40 miles in general. It is dug up by the natives after the rains have softened the soil, and the supply appears practically unlimited.—W. H. MOBERLEY, 23, Great Winchester Street, E.C.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Chimonanthus fragrans.—This is now flowering very freely on warm sunny walls, and is one of the most useful of winter-blooming outdoor shrubs. The large-flowering variety is much finer in every respect than the common form, and intending planters should procure it if possible. We may again call the attention of propagators to the fact that this plant has never been struck from cuttings, a circumstance which induced the late Dr. Lindley to offer a guinea to any of the young gardeners at Chiswick who might bring him a rooted cutting of it.

Golden-tinted Spruce Fir.—This richly-coloured form of the common Spruce Fir bids fair, when abundant, to become a popular tree for planting in bleak and desolate localities, as the rich hues of the foliage are always best in the winter months. It is perfectly hardy, and is as robust in growth as the green variety. As it is not amenable to increase by the ordinary mode of cuttings, the stock is worked by means of layers, some large plants having been laid in the Fulham Nursery for that purpose. Under the name of *Abies excelsa aurca*, it has already received a first-class certificate at South Kensington.—D.

THE KITCHEN GARDEN.

CULTIVATION OF CARROTS.

THESE roots are in request every day in the year in all large kitchens, and are also a most valuable root for cattle-feeding and hog-fattening, as no other root that we cultivate produces finer flavoured beef and bacon than the Carrot does, which I have practically proved. I have grown above thirty tons to the acre of the Long Surrey Red and the Green Top, and considerably more of the White Belgian sort; but, to grow such heavy and clean crops, the soil should be a good sandy open loam, deeply cultivated, thoroughly pulverised, and kept rigidly clean. Sow moderately thin, and timely, on land that was manured the previous year. Never sow Carrots on newly-mannured land, as they are sure to become forked and branch-rooted, seeking after lumps of manure distributed amongst the soil; and, besides, they are very likely to get attacked with the maggot and canker, are bad keepers, rough and ill-looking, and consequently much reduced in their value. In order to get a heavy clean crop, cultivate the soil deeply in winter, and expose to the influence of the atmosphere the greatest possible surface of rough-lying ridges. Rout it about only in frosty or dry March weather; and, when all is in good order and in readiness for the seed, which should be sown for the main winter-storing crop by the last week in March, or the first or second week in April, according to season and conditions, have ready some hot air-slaked fresh lime, of which cast a moderate coat over the land, which should be harrowed well to incorporate the lime with the soil, and also drill in the seed with air-slaked hot lime, and the return will be a heavy crop of clean handsome Carrots, fit for any table or other use. To have young Carrots fit for table every day in the year, choose the Early Horn and French Early Forcing, and sow them, about the 1st of January, on slight hot-beds close to the glass in frames or pits, and also a succession in February for supplying the table from March till May. Sow also on a warm border out of doors in February, to be protected by some kind of covering; and, to keep up a good succession, sow every month out of doors till September. The largest sowing should be made in July and August for a good supply throughout the autumn and winter; but they will require some temporary protection when winter frost sets in. Make a small sowing on a slight hot-bed, in a pit or under frame-lights, the first week in October, and nice young Carrots will be the return for every day throughout the winter and early spring. In storing large bulks of Carrots for winter use, never place them too thickly together, as the roots are apt to heat and sweat very much. Place them between hurdles, not more than 3 feet apart, and finish the top in ridge shape, protecting the sides and top with bawns, or rough faggots, or Furze tied in bundles, and thatch the top with straight straw. If severe frost sets in in winter, protect the sides with additional Furze, litter, Fern, or Heath.

JAMES BARNES.

Exmouth.

LEEKES.

To grow these large, crisp, and of mild flavour, we require good rich land, well trenched, pulverised, and manured. Sow in the middle of March and again in April. In order to grow them large, and blanch a good length of them, throw out a shallow trench 18 inches wide, and plant them in two rows for the convenience of earthing up, in order to blanch them, and also for a slight protection when severe frost sets in. Fifty years ago they were but little grown in this country, and were only distinguished by the name of "Leek." Of late years, although many varieties have been brought out as new, or under new names, such as Henry's Prize, Large Rouen, Ayton Castle, Giant, &c., the old London-Flag, when well cultivated, would hardly be distinguished from the Giant, or any other kind with a new name.

J. B.

Early Peas.—On the 17th of November I sowed in a south border here, William the First, Sangster's No. 1, Sangster's Improved, and Racehorse. The three latter are appearing here and there, but the former, William the First, is fully up in the rows, which I have covered with coal-ashes. This is a fine hardy variety, of a deep green colour, and in flavour is all that can be desired. I should certainly recommend it to all my gardening friends.—R. GILBERT, Burghley

THE FRUIT GARDEN.

BIRDS VERSUS GRAPES.

IN THE GARDEN the other day I noticed an article under the above heading. I fully agree with your correspondent "B." as to the paper collar being a good protection to the fruit, as the top or "shoulders" of the bunches are sure to be attacked first, and the Robin is generally the bird that performs that operation. Will you kindly allow me to state what I have found to be a more effectual safeguard? I use neither bags nor paper; but to every alternate light, front or top, I have a perforated zinc light, made to fit inside the glass ones. The door of the house is made light, and the panels, instead of glass, have the perforated zinc as for the lights. When the fruit is gathered, they—the zinc lights—can be removed into store, and will last as long as the fruit-house itself. They save all trouble of sugar-and-beer bottles, muslin bags, &c., and effectually protect the fruit, so that I can leave the houses with air on day and night, at ripening time (in fine weather), without fear of mice, rats, birds, wasps, or bluebottle flies. I took the idea from the meat-safe principle, and my employer with whom I was living some eleven years ago, kindly gave me permission to have lights made at once. May I add that for fruit structures, especially Vine houses, I prefer those glazed to the rafters, to those with running lights; as one can have air on at front and back, no matter if it rains in torrents; a little fire-heat and you have no damp, and the perforated zinc, nicely breaks or filters the air. Whence comes the mildew? Why, in nine cases out of ten, from a damp stagnant atmosphere. A gentleman, visiting here the other day, told me he had had a large crop of Grapes, but had the greater part of them quite spoiled and eaten by wasps and large flies, although they had the wires between the Grapes literally covered with bottles of beer and sugar, and some bunches enveloped in bags, but the wasps made a way through to the Grapes. I do not write this thinking my plan may not be used by others, but I say to those who have not tried it, whether to the individual in a small way, or to those who have a large extent of glass, that they will find it beneficial and, in the end, economical.

JAMES BATTERS.

Chilworth Manor, Romsey, Hampshire.

PECULIARITIES IN GRAPE CULTURE.

THERE are several varieties of Grapes which are acknowledged by all to have their individual points and qualities of excellence, but which are very often subject to defects and faults; and we think that a few remarks relative to our experience with these may perhaps prove useful to some of our readers. The subject cannot be regarded as unimportant, seeing how very popular a fruit the Grape has become, and how many, comparatively inexperienced, are now attempting its cultivation. Certainly there has been a great amount of remark and information brought out in the gardening press from time to time on the peculiarities of culture most likely to ensure success in the case of several desirable Grapes; but that information lies in a very scattered form, and we propose to give in a brief, but, at the same time inclusive, shape, our experience with some of these varieties, and begin with one of the finest of late black Grapes.

Gros Guillaume.—In some instances, this showy and excellent Grape is rather a shy fruiter, especially when pruned on the spur system; and sometimes it does not colour well, and the berries swell unequally. We have found it develop these peculiarities on its own roots. To obviate such defects, some have recommended that it should be grown in poor sandy borders. We have found that grafting it on the Muscat of Alexandria causes it to fruit as freely as a Black Hamburgh when spur-pruned; every berry swells equally, and invariably it has coloured to the deepest purple. We consider the bunches more compact on the Muscat than on its own roots; the berries always larger and perfectly regular. Grafted on Black Hamburgh, it did splendidly for a couple of years; but each year degenerated in every respect till we cut it out. When calling at Chiswick Gardens last July, we were informed that there, on Hamburgh roots, it manifested the very same tendency. We consider that on Muscat roots, in Muscat heat, Gros Guillaume is one of our grandest Grapes. In 1872 we cut six bunches from a graft put on a Muscat in 1870. The largest of the six weighed 9 lb., and the least 5½ lb. The style of bunch was far superior to those on a

Vine on its own roots in the same house, and the quality was better.

Muscat Hamburgh (Black Muscat).—We have never met with this variety well set on its own roots but at one place—viz, Eccles, in Dumfriesshire, grown in a red-sandstone loam. Here every berry stones like a Hamburgh, and there has been produced a bunch 7 lb. weight; but the defect is that they never colour beyond a brownish-black. Grafted on the Black Hamburgh it sets perfectly, and colours as well as can be desired if not grown in too high a temperature. Like some other black Grapes, I have observed that in Muscat heat it does not colour well. The warm end of the Hamburgh-house is the place for it. Few Grapes can surpass this one either for appearance, flavour, or long-keeping qualities. We have had it 5 lb. weight on Black Hamburgh roots; but Mr. Fowler, of Castle Kennedy, has shown it heavier—and its size is its least valuable quality.

Black Lady Downes.—This, as is well known now, is a strong free-fruitering Vine, and chiefly esteemed on account of its unsurpassed long-keeping quality, and is largely grown for hanging till spring. But like most other Grapes, it is not perfect in its behaviour. In hot summers it gets sadly decimated by the berries getting scalded; and some of our scientific (?) but impractical men have attributed the affection to some defect in the root action; it is clever, of course, to know this, when it cannot be demonstrated nor seen. The cause of the scalding is more heat than this Grape can do with just at the stoning point, and the remedy is simply to give abundance of air till the stoning period is over. We have during the last few years had scalded bunches sent to us to inspect, and have heard from the senders afterwards that increase of ventilation had completely prevented it.

Alicante.—This Grape is among the most easily cultivated, and generally finishes well. We have noticed that when it chanced to be planted in the Muscat-house it did not colour well in the high temperature. The same applies to another not very desirable but free-fruitering Grape, Burckhardt's Prince, which never colours well in a high temperature.

Muscat of Alexandria.—There are varieties of this Grape which set and generally ripen and colour better than others. In many instances Muscats do not attain that high colour which indicates the best quality, and ensures their hanging well. It is about the best of all keepers. We have known it perfectly ripe in August and hang till the end of March. Some attribute the very high colour and quality which this grand Grape sometimes attains to soil and climate; others to bottom-heat. It is generally well coloured in the east of Scotland, where the climate is dry and the soil rather light. But we have seen it quite as finely finished in the gloomy south-west of Scotland in heavy soil. We have never failed in colouring Muscats well; and we attribute it chiefly to keeping the soil dry, or, at least, preventing its getting too much wet, and more especially to keeping the foliage rather thin over the bunches, and even tying it aside to let light at the bunches after colouring begins. Badly-ripened green Muscats are about the most worthless of Grapes, yet no one thinks of condemning them *in toto*. It is well worth while continuing to grow them, and to try every means of bringing them to the highest pitch of culture.

Frontignans, grizzly and white.—A few of these should be grown wherever there are a few Vineries. They are fruitful, early, and of exquisite flavour, and do pretty well on their own roots, but much better when grafted either on the Muscat of Alexandria or Black Hamburgh. They give finer bunches and larger berries than on their own roots. They are best in a Muscat temperature, but do very well at the warm end of a Black Hamburgh-house.

Golden Champion.—The great fault found with this Grape is that it spots. It is so noble-looking and luscious a fruit that it is well worth the time and patience, observation and experiment, which, as in the case of other Grapes, will establish for it a rule of culture that will grow it free from spot. It is a tender-skinned Grape; and, if grown in a Muscat-house—where it ripens before the Muscat—and subject to a high temperature, with moisture, with not enough of ventilation, it of course spots. The place for it is the Black Hamburgh-house—grafted on Muscat roots—where it will get abundance of dry air as soon as, or even before, it begins to change colour. Managed in this way, it ripens without spotting. It sometimes cracks in wet weather. The first indication of cracking should be the signal for cutting the shoot half through below the bunch, and, if possible, throwing the rain off the roots. It is well worth while to take these simple measures in the case of so noble a Grape as this is. We have never known it figure in the dessert yet, but it was praised as the grandest of Grapes.

Duke of Buccleuch.—Perhaps this may supersede the last named, and perhaps, also, it is too early in its history to speak of its peculiarities. We have, however, had opportunities of watching some of the finest examples of it that have yet been grown, and the

conclusion we have come to in reference to it is that, though a grand Grape, as it proves to be on its own roots, we think it better still grafted on the Muscat of Alexandria. The finest we have seen of it were on the Muscat stock in a Muscat-house. But it ripens so long before the Muscats, that the heat necessary for the Muscats is detrimental to the Duke; consequently, if grown in the Muscat division, it should be at the coldest end. Anywhere in the Ham-burgh-house is the place for it, where it hangs for months after it is quite ripe.—*Gardener.*

THE AMATEUR'S GARDEN.*

PALMS FOR THE DINNER-TABLE.

Few plants are so well adapted for the decoration of the dinner-table as Palms, and nearly every species in cultivation is valuable for this purpose when in a young state. Some of the slow-growing species may be used for several years in succession, while the other and quicker-growing kinds are easily grown on for this purpose from seeds. These elegant plants are not only as graceful as the most delicate Ferns, but far better fitted to withstand the aridity of apartments heated by either coal-fires or gas. I find plants from 1 to 2 feet in height are, as a rule, most useful for table decoration; but, in exceptional cases, where the tables are very large, plants 3 or 4 feet high may be employed with excellent effect. Palms for dinner-table work should be grown in small pots, a 48 pot, or



Dinner-table Palm.

at most a 32, being amply large enough for a plant 2 to 3 feet high. Much of their elegant appearance is lost if the pots are large in proportion to the plant, and the only extra labour entailed on the cultivator by the use of small pots is the necessity for watering them more frequently, especially during the dry hot summer months. If provision is made for letting the pots through the table-tops—a course as yet not very generally adopted—the size of the pots is not a matter of much consequence, since they are then concealed from view. The best soil for Palms of all kinds I find is a good fibrous loam, intermixed with sufficient sand to keep it fresh and open, and the pots must be thoroughly drained. Some cultivators add a little peat to the above, but it is not essential, except in the case of the more delicate kinds. In potting, press the soil down firmly; for, of all plants, Palms affect a stiff hearty compost, and will do far better in it than in any light loose soil.

For a small or moderate-sized dinner-table, three plants will be amply sufficient; but at large parties, where very long tables are employed, these plants can be multiplied in proportion to the space at command. These plants form an agreeable change from floral compositions arranged in March stands, and a table ornamented with Palms can be arranged very effectively in a few minutes, while no other plants whatever equal them in the freedom and grace with which their plumose,

glossy foliage springs in elegant curves from the snow-white cloth. Palms may now be purchased of any of the leading nurserymen at moderate rates, or the amateur cultivator may procure seeds and propagate his own plants year after year. By adopting the latter method, plants of all sizes may be obtained, and they will form useful permanent ornaments for the plant stove or conservatory, or even for the decoration of apartments, as practised in several continental countries, where facilities for their cultivation are less common than here at home.

Perhaps in no other class of plants can we obtain more agreeable variety than in the use of Palms if carefully selected with reference to their size and habit of growth. The Plumose section are, as a rule, best suited to our present requirements, but in practice we have repeatedly used small specimens of the Fan-leaved *Chamædoreas*, *Livistonas*, and *Geonomas* with good results. For a small table, a tall central plant of *Latania aurea*, or *Cocos Weddelliana* may be supported on either side by a plant of *Livistona altissima*, or small plants of *L. borbonica*. Next to the elegant *Cocos Weddelliana*, we have *Chamædorea graminifolia* or *C. elegans*, both very useful when in a young state; while nearly all the *Dæmonorops* are elegant Plumose species, admirably adapted for table work. *D. plumosus*, *D. accidens*, and the subject of our present illustration, *D. fissus*, being the best. *Geonomas* are very compact and useful, several of them forming miniature stems, something like *Chamædoreas*, but much dwarfer. Our illustration also shows the application of the new enamelled vases, which associate well with the other dinner table ornaments, or are pretty additions to the side-board in ordinary apartments. In practice, if ornate vases are not to hand, it is generally best to surface the pots with fresh green Moss, or *Selaginella*, or Drooping Fern fronds can be inserted round the sides, so as to hide the dull red mass of earthenware, or the pot can be wreathed with green and variegated forms of Ivy, *Periwinkle*, or the fresh young growth of *Myrsiphyllum asparagoides*. Amateurs, like myself, will, I am quite sure, find Palms a most tractable class of plants, and they come in for many useful purposes besides that of table decorations. I append a list of some of the best and most easily grown Palms for indoor decorative purposes:—

<i>Areca</i>	<i>Chamædorea</i>	<i>Geonoma</i>	<i>Martinezia</i>
<i>alba</i>	<i>lunata</i>	<i>Martiana</i>	<i>Caryotæfolia</i>
<i>Catechu</i>	<i>microphylla</i>	<i>pumila</i>	<i>Lindeniana</i>
<i>lutescens</i>	<i>Sartorii</i>	<i>Schottiana</i>	<i>Maximiliana</i>
<i>monostachya</i>	<i>Wendlandii</i>	<i>Guilielma</i>	<i>regia</i>
<i>Calamus</i>	<i>Cocos</i>	<i>speciosa</i>	<i>Morenia</i>
<i>asperinus</i>	<i>Weddelliana</i>	<i>Licuala</i>	<i>corallina</i>
<i>Hystrix</i>	<i>Dæmonorops</i>	<i>elegans</i>	<i>fragrans</i>
<i>Levisianus</i>	<i>(Calamus) acci-</i>	<i>peltata</i>	<i>Oncosperma</i>
<i>melanocharites</i>	<i>dens</i>	<i>Livistona</i>	<i>Van Houtteana</i>
<i>Carludovica</i>	<i>plumosus</i>	<i>altissima</i>	<i>Phœnix</i>
<i>rotundifolia</i>	<i>fissus</i>	<i>borbonica</i>	<i>reclinata</i>
<i>Ceratolobus</i>	<i>Elæis</i>	<i>humilis</i>	<i>syvestris</i>
<i>glaucescens</i>	<i>Guineensis</i>	<i>Jenkinsiana</i>	<i>tenuis</i>
<i>Chamædorea</i>	<i>Geonoma</i>	<i>Malortica</i>	<i>Rhapiz</i>
<i>elegans</i>	<i>congesta</i>	<i>humilis</i>	<i>flabelliformis</i>
<i>Ernesti Augusti</i>	<i>elegans</i>	<i>simplex</i>	<i>humilis</i>
<i>glaucefolia</i>	<i>ferruginea</i>	<i>Mauritia</i>	<i>Welfia</i>
<i>graminifolia</i>	<i>macrostachys</i>	<i>flexuosa</i>	<i>regia</i>

Sydenham.

F.

GARDENING IN AMERICA.

WHOEVER comes to America, thinking to find there gardens as pretty and as well-laid out as are to be found in Britain, will be disappointed. Everything is done in America on the spur of the moment, as cheaply as possible, in a temperary way, and only with a view to the enjoyment and satisfaction of the present proprietor. Draining, especially, is very badly done; every one is his own landscape-gardever, and hot-house building is performed in a miserable, though economic, manner. As an example of the way in which glass-houses are erected in the United States, I may mention that I lately visited the establishment of one of the wealthiest nurserymen in Philadelphia, where there are a great many hot-houses of all kinds, and where the proprietor informed me that he built all the houses himself, adding, that he never had a tradesman near his place. The houses are lean-to's, and, in forming them, the ground had been levelled a little, and about 8 inches taken out to accommodate a plank that supports the lower end of the rafters; then trunks of trees with the branches pruned off are sunk at the back, one end in the ground and the other end as high out of it as the height of the house is required to be. These posts are about 8 feet apart, and the space between them is boarded up, an operation which finishes the

* This department is written exclusively by amateurs distinguished for skill in various branches of gardening.

back wall. The rafters are made into shape with an axe, fixed to the back wall and to the plank on the ground in front, and spars are laid across them. The house is now ready for glazing, and, as the glass is bought cut and ready, it is soon fixed. The ends of the houses are boarded, not glazed, and no interior staging is required. The house it will, therefore, be seen, is now complete. When working inside of such houses, it is necessary to stoop, and, if the workman requires to straighten his back, he must kneel down to do so. I visited another famous nursery at Philadelphia, in which large portions of the roof were stuffed with Sphagnum where the glass had been broken, and the piping was laid along the passages in a zigzag form, necessitating, in passing along, the stepping from one bend to another. In these hastily-built houses, however, I observed some very fine plants, both as regards culture and quality. These ready-made houses prevail, with a few exceptions, throughout all the States, and in them good results are obtained; indeed, in a nursery, in a thriving manufacturing town in Indiana, where I acted as manager, I had in a few frames and a range of these lean-to houses, annually several thousands of fine Roses, and an incredible quantity of Pelargoniums and other plants. Fine Crotons, Dracaenas, Dieffenbachias, and other fine-foliated plants that gladden the indoor gardens of Old England, are comparative rarities in this country, and, as the majority of Americans know little about them, they only want what they do know, and what is gaudy. Camellias, Tuberoses, Lilies, Bouvardias, Myrsiphyllum asparagoides, Roses, and Pelargoniums are the greatest favourites with most people here. Nevertheless, I can see that Orchids and other European treasures in that way are gradually finding favour with us. Before an American buys or cares for a plant he must see it in perfection, and be impressed with its worth and beauty. There is, however, a grand *dépôt* of fine plants at South Amboy in the nursery of Mr. Sach, which is quite an English nursery, and a very extensive one. Here I met with the finest specimen Orchids I ever saw, and a larger plant of *Adiantum Farleyense* than I remember having seen in the old country, whilst other Ferns, Palms, and miscellaneous stove and greenhouse plants are equally fine. Mr. Taplin, an intelligent and excellent cultivator, is manager for Mr. Sach. As regards myself, I have the good fortune now to be in a private garden, which will soon be one of the finest plant establishments in the States. We have good houses, and my employer, a thorough business man, has taken an ardent fancy for Succulents, and for all the finer kinds of indoor plants, but, as the place is quite new, we have, as yet, only a limited number. My employer is, however, sparing neither pains nor money to make his plant collection complete. We have a fine plant of *Adiantum Farleyense*, and over two hundred tree and other Ferns, twenty varieties of Marantas, ten of Dracaenas, twenty-five of Orchids, four of which are now in bloom; also about one hundred Camellias and Azaleas, over thirty varieties of Agaves, some of the newest kinds of double Fuchsia, and many other plants, to which additions are continually being made, not only from neighbouring, but also from European, establishments. I may add that we have lately had 24° of frost.

New Jersey, Dec. 2nd, 1873.

A. M.

GARDEN DESIGN.

LANDSCAPE GARDENERS *VERSUS* ARCHITECTS.

THE relation between the architect and the landscape gardener has always been unsatisfactory; we are not surprised, therefore, to find an architect opening up the delicate question in last week's *Builder* :—

The danger to which I advert is the insidious encroachments of the landscape gardener upon the domain of the architect. It is true this is no new thing, but the encroachments have of late become more daring than before, and it behoves architects to put themselves upon their guard. The profession of the engineer has grown up chiefly through the extraordinary development attained by the railway system in this country, and however much architects may lament the fact, there can be no dispute that the engineer has fairly won the position he has acquired, and that he supplies a want which the architect was not fitted, either by taste or education, to supply. But this is not the case with the landscape gardener: his functions are essentially different from those of the architect, to which they are usually and properly subordinated, and there need not be any jealousy or any question as to jurisdiction between the two. Some landscape gardeners have, however, assumed the title of landscape architects, a palpable misnomer, which can only have been assumed to mislead, and have taken upon themselves to design and carry out buildings in addition to their other duties. The public, little accustomed to discriminate, are deceived by the assumption of the name of "architect," and the landscape gardener is not unfrequently entrusted with commissions for works of importance, to the manifest

injury of the architect proper. It may, perhaps, seem idle to complain of the preference of the public for these irregular practitioners, seeing that, as already observed, there is no recognised standard of architectural education, and that anybody is entitled to call himself an architect, and to carry out any work that he may be able to obtain; but that is not the point to which I desire to direct attention. It is, of course, impossible to coerce the public taste, and to lay it down as a rule that none but properly qualified men should be employed upon architectural works; that is clearly impracticable in the face of the attitude of the present Government, whose action with regard to architects is not only countenanced, but applauded, by the majority of people in this country. We must be content to take things as they are, and for the most part we have become accustomed to the present position of affairs; but the new danger consists in this, that while hitherto architects and landscape gardeners have been in the habit of working side by side upon the same work, without any risk of interfering with each other, it is now impossible for the architect to call upon the landscape gardener for his assistance, or to acquiesce in his appointment, without introducing at the same time a rival who may take away the most profitable portions of his work, interfere with his most cherished designs, or, perhaps, supplant him altogether. This could not have occurred under the old *régime*, but it does happen now, and the sooner architects become alive to the danger they incur in thus acting the better it will be for all parties. It comes about in this wise. An architect has prepared designs for a mansion, let us say; the site is bare and unadorned, and the client determines to employ a landscape-gardener to lay out the grounds. The landscape-gardener prepares a plan, showing not only the arrangement of the grounds, but terraces, conservatory, garden-walls, lodge, entrance-gates, stables—in fact, everything necessary for the completion of the mansion and its surroundings. This is submitted to the client, who is in all probability ignorant of the distinction between the duties of the architect and landscape-architect, the design is approved by him, and the landscape-architect is entrusted with the execution of the work. The architect is not, perhaps, consulted at all, or if he is consulted and objects, the landscape-architect makes the plausible suggestion that as he will have the control of the roads and paths, walls, &c., it will be desirable that the buildings which adjoin should also be placed in his hands; perhaps he suggests that the main building itself has not been properly treated, or that the expenditure has been excessive, or that he has carried out similar works for the Marquis of Blank, or Sir Humphrey Chose, and the client, as we have before said, ignorant for the most part of the practice in these matters, and dazzled by the achievements of the landscape architect, acquiesces, although perhaps reluctantly. It is not the mere loss of business to the architect which is to be looked to in this proceeding, although that is not to be disregarded; but it is to be borne in mind that it is in the power of the landscape gardener to interfere greatly with, or, perhaps, entirely destroy, the effect of the architect's design. The mansion may be Gothic, and the lodge classic, or, *vice versa*, the stables may dwarf the house; and it is also always in the power of an unscrupulous man to put his rival's work in the shade, or by means of colour, outline, or juxtaposition, to enhance the effect of his own compositions at the expense of his coadjutor's. This is not an illusory picture, and the danger is real and threatening. The remedy is in the hands of architects themselves; let them take care not to associate themselves with landscape architects, but choose a landscape gardener of the old type; let their respective duties be clearly explained to the client, and, if necessary, defined in writing; and, above all, let the architect assert his authority, and insist that all drawings, for whatever works, shall be submitted for his approval before being put in hand. This is the architect's proper position, and if he abdicates his right to being consulted upon everything relating to the house and its surroundings, he will inevitably lose the confidence of his client, and will find himself immersed in numerous unnecessary difficulties.—CIVIS.

OBITUARY.

THE announcement which we have this week to make of the death of Mr. Charles Lawson, ex-Lord Provost of Edinburgh, which took place on the 21st ult., will take few by surprise, though it will be received with general regret. Far advanced in life as he was, Mr. Lawson no doubt suffered severely in health from the anxieties connected with recent commercial misfortunes. For some eight months past he has been so enfeebled as to be quite incapable of any exertion. A shock of paralysis which he experienced about three weeks ago reduced him to a still more helpless condition. The paralytic seizure recurred on Saturday the 20th ult., and from this attack he never rallied, but slowly sank. He was born in 1794, and had, therefore, at the time of his death attained the ripe age of seventy-nine. He was the son of Mr. Peter Lawson, the founder of the firm in connection with which the name was destined to become so well known, not merely in Scotland, but throughout the world.

THE KING OF THE OAKS.

WHERE is the largest Oak tree in this country? There are many claimants; and, in the confusion of measurements—for, although they are frequently given, we are not always told at what height above the ground they have been taken—it is by no means easy to arrive at a certain conclusion. The third Lord Holland, whom Sir Walter Scott describes as of so bright and cheerful a temperament that “he came down stairs every morning looking as if some special stroke of good fortune had befallen him,” must have looked his brightest when he announced to his guests at the Ampthill breakfast-table—“I have just heard that Lord Bagot’s tree has been blown down, and now I have the largest Oak in England.” Lord Bagot’s Oak was at Blythefield, in Staffordshire. The rival tree still exists, and still bears its coronal of leaves and its few Acorns. This is the Oak which is mentioned in the current number of the *Quarterly Review*, where, by some oversight, it is described as in the grounds of Holland House. It is really in the park of Ampthill, in Bedfordshire; where the verses quoted by the reviewer may still be read, fastened on the gigantic trunk:—

Majestic tree, whose wrinkled form has stood,
Age after age, the patriarch of the wood;
Thou who hast seen a thousand springs unfold
Their ravell’d buds, and dip their flowers in gold,
Ten thousand times yon moon re-light her horn,
And that bright star of evening gild the morn,
Gigantic Oak! thy hoary head sublime,
Erewhile must perish in the wreck of time
Should round thy head innoxious lightning shoot,
And no fierce whirlwind shake thy steadfast root;
Yet shalt thou fall, thy leafy tresses fade,
And those bare scattered antlers strew the glade.
Arm after arm shall leave the mouldering bust,
And thy firm fibres crumble into dust.
The muse alone shall consecrate thy name,
And by her powerful art prolong thy fame,
Green shall thy leaves expand, thy branches play,
And bloom for ever in the immortal lay.

These lines are ascribed by the *Quarterly* reviewer to Rogers. We had always supposed them to have been written by Wiffen, the translator of “Garcilasso de la Vega,” who was much at Ampthill and at the neighbouring Woburn, and who has hung a garland of his certainly not immortal verse on the Oak tree in Woburn Park, which served as a gallows for the last unfortunate abbot. However this may be, the lines provoked a deserved retort from the late Lord Wensleydale, who made Ampthill his home:—

I’ll bet a thousand pounds—and time will show it—
That this stout tree survives the feeble poet.

This Oak, and its brothers scattered over the picturesque park, might well call forth the powers of a greater poet than Rogers or Wiffen. Ampthill stands on a ridge of high ground, overlooking the broad level of Bedfordshire—the plain of the Ouse. The ridge, so great is the contrast between it and the low country, and so wide are the prospects commanded from it, was not impossibly the prototype of Bunyan’s “Delectable Mountains.” The park of Ampthill extends over the sides and summit of the rising ground, and its sweeping glades and hollows, with much wood of later growth, display a greater number of venerable Oak trees than, perhaps, any other park in England of the same extent. They are for the most part shattered and wind-rent, and the sward beneath them is covered with broken fragments; but their main branches are still green and vigorous, and like the famous Oak of Yardley Chase—

The spring
Finds them not less alive to her sweet force
Than yonder upstarts of the neighbouring wood.

The two largest trees are near the house. They are nearly of the same girth—a little more than 35 feet at about a yard from the ground. But the tree which the poet has celebrated is by far the more striking of the two, and is marked by one long lateral bough which stretches nearly at right angles from the main stem, then dips sharply to the ground, and again rises. This Oak is full of leaf, and is, perhaps, more noticeable for its huge short bole and its indication of great age than for picturesque growth. Like other Oaks in the park, it has been pollarded, but at some very remote period. Of the age of these trees it is difficult to speak with even an approach to certainty. Dr. Hooker, we have been assured, has pronounced that they have not seen more than five centuries, but they had long passed their prime in the days of the Commonwealth, when a survey was made of the timber in Ampthill Park, and it was declared to be unfit for naval purposes. We may at any rate be quite sure that these venerable Oaks have many a time cast their shadow on Queen Catherine of Arragon, during her tenancy of Ampthill; and it may have been under the greatest of them that, during a hunting party held here before the coming of the unhappy

Queen, the Bishop of Paris and “Mdlle. Anne” were posted, each with a cross bow, waiting for the driving of the deer towards them. King Henry was himself in the heat of the chase. The bishop, in a letter to his own court, describes the scene and his conversation with Anne Boleyn—who, he adds, had made him a present of a hunting cap and frock, a horn, and a greyhound. The old castle of Ampthill stood on the highest ground in the park, looking far and wide over the masses of greenwood at its feet to the wide plain of the Ouse, fading away into a blue distance.

Leaving for the moment the question whether this Ampthill Oak is in truth the king of English forests, we may cross to the border of the neighbouring county of Northampton, and, penetrating the thickets of Yardly Chase, find our way to the Oak sung by Cowper, who, by the way, is not quite accurate when he talks of it as—

Survivor sole, and hardly such, of all,
That once lived here, thy brethren, at my birth.

Three large Oaks remain in an open “lawn”—to use the true forest term—near a farm in the midst of the Chase. The space is nearly level, and is fringed by younger growth; and the three giants stand out picturesquely as in a green “court” of their own. The largest and most shattered tree is Cowper’s. On it is fastened a gracefully apologetic warning—“Out of respect to the memory of the poet Cowper, the Marquis of Northampton is particularly desirous of preserving this Oak. Notice is hereby given that any persons defacing or otherwise injuring it will be prosecuted according to law.” The tree is a ruin, with hollow trunk—

that seems

An huge throat, calling to the clouds for drink.

broken through below and capable of holding many persons. There are two or three bare limbs, from which the bark has fallen, showing like whitened skeletons against the lichen and knotted rind of the trunk, and there are at least two large boughs which still send out their clusters of green leaves. The trunk is not lofty, and is not more than 30 feet in circumference at a yard from the ground. But the tree is a study for an artist, and its condition is wonderfully suggestive of the long course of time since it put forth its first feeble leadings:—

Thou wast a bauble once; a cup and ball
Which babes might play with; and the thievish jay,
Seeking her food, with ease might have purloined
The auburn nut that held thee, swallowing down
Thy yet close-folded latitude of boughs
And all thine embryo vastness at a gulp.

Many large Oaks are scattered through Yardley Chase, and two called “Gog and Magog,” are of especial size. But none claim to be the largest Oak in England; and although the great existing forest districts of this country—New Forest, Dean, Sherwood—abound in stately trees and in Oaks of vast girth and great evident antiquity, there is no known tree in any one of them of which the dimensions exceed those of the Ampthill Oak. For true Oak character indeed, and for the charm of deep untrodden greenwood, we must penetrate the recesses of the New Forest or Sherwood glades, where the great trees rise by thousands from a golden “lair” of Brake Fern, where the light quivers under the leafy vaulting, and where the scene is still much the same as in the days of Robin Hood or Glym o’ the Clough. But the largest remaining English Oaks stand comparatively alone, like that at Newland-on-the-Wye, which is said to measure 40 feet at a yard from the ground, and like that which we have reserved to the last, and which we believe to be in the truth the largest and most venerable Oak in this country—the Cowthorpe Oak, in Yorkshire.

This gigantic tree stands about a bowshot north-west of Cowthorpe Church, in a meadow on the right bank of the River Nidd. Its true measurements are as follow:—Circumference, at 5 feet from the ground, 36 feet 3 inches; close to the ground, 60 feet; extent of the principal branch (propped for safety), 50 feet 6 inches; girth of this branch close to the trunk, 10 feet; height of tree including decayed wood, 43 feet. In 1776 the height of the tree was 85 feet. An enormous bough, which extended 90 feet from the trunk, fell in 1718; and the owner of the tree, Mr. Montague, of Ingmanthorpe Hall, possesses a table made from this wood. Like that of the Ampthill Oaks, some of which has occasionally been used, it is full of knots and linings, and from its great hardness takes a very high polish. It may be added that the box in which the freedom of the city of York was presented to Lord Brougham was made of Cowthorpe Oak. The tree is a wonderful ruin, such as no words can fairly describe. It is a hollow tower into which you enter by an opening at the side, and the great ribbed masses of the trunk sweep round—the tree has twisted in its growth toward the south-east—in unexampled grandeur, resembling more than anything else the clefts of a sea-worn sand-rock. The sun-light falls through narrow openings, and flecks the interior of this literally

"worm-eaten hold," the colour of which, in the more shattered portions, is a deep amber. High above your head the blue sky—we last saw the Oak on a clear autumn day when the sky was cloudless—seems to roof in the tower, round the summit of which clusters a coronal of green leaves, still borne by the outer boughs. No silver Lichens or branching Polypody hang from this grandest of Oaks. The expression is that of the highest dignity, and of a strength almost unrivalled—a majesty that "smiles in death." Professor Burnet ascribed to this tree an age of 1,600 years; and if he is correct what changes it has witnessed—what worlds of thought and of feeling have passed away since the acorn fell from the old barbaric Oak, its parent? Its young boughs may have trembled to the march of Roman legionaries; it was a stately and even an aged tree before the first Christian missionaries arrived in Northumbria; it was extending all its wealth of boughs over the surrounding croft long before the first stone was laid of the adjoining church; and it has seen that church, like itself, crumbling into slow decay:—

Oh, couldst thou speak,
As in Dodona once thy kindred trees
Oracular, I would not enquire ask
The future, best unknown, but at thy month
Inquisitive, the less ambiguous past. —Standard.

[We are by no means certain that the Cowthorpe Oak, which we have seen, is the largest Oak in England; a very great width at the base is not the right test of the size of an Oak; the best place, if we are to measure at a given spot, is at five or six feet from the ground. Will any correspondent kindly tell us which is the biggest Oak in Warwickshire! If it has not the biggest Oak in England it certainly has more fine Oaks than we have seen in any other county.]

THE FUTURE OF THE ROYAL HORTICULTURAL SOCIETY.

WHAT is to be the upshot of all the agitation that is going on in the horticultural world—or, rather, amongst those connected with the Royal Horticultural Society?—a question that must be occurring to many besides myself, and one that requires careful consideration. If we are to believe what report says, the society is in a complication of difficulties of long standing. There are evidently a variety of schemes afloat for setting it to rights, but without either unanimity of purpose or action. In fact, it would appear that there are a number of cliques, each agitating on its own account for a something, and, as regards several of them, it is by no means apparent what that something is. We are weekly made aware of the existence of Mr. G. F. Wilson's clique, proposing the reduction of the fellows' subscription to a guinea, as a certain restorative; also, I believe, advocating removal from South Kensington; but Mr. Wilson does not state where he would take the society to. According to Mr. Wilson's statement, there is a clique of "competent agriculturists in London engaged in the work of reconstruction." Reconstruction of what? for I am not aware that any London society has as yet actually fallen to pieces; therefore, what does this reconstruction mean? Perhaps this clique meditates turning the present Council out in February, and the reconstruction means putting themselves in their places. If so, it would be well to know who these "competent horticulturists" are, and what their subsequent policy would be. Then, there is the vote-by-proxy clique, who, I believe, have requested the Council to summon a meeting of the fellows—to do what? Why, "to make a bye-law to give the power of voting by proxy." Now, if I read the charter aright, the fellows do not possess the power of making a bye-law at all; consequently, the meeting will be a futile one, independent of the fact of a similar proposal having already been negatived once this year. A clique of horticulturists which existed a short time since, called the Horticultural Defence Committee, took upon themselves (in conjunction with another clique, I believe) to go as a deputation to her Majesty's Commissioners—so the Defence Committee's report stated; but (query), did they not merely go to her Majesty's Commissioners Office. However, be this as it may, What did they go to do? Nothing but mischief, for they possessed no power to make arrangements with her Majesty's Commissioners, even if met by them, nor had they any authority from any one to attempt to do so; in fact, this movement on their part looked to me very like the rank and file rushing over to the enemy's camp without either the presence or authority of an officer, simply to be caught in a snare prepared for them. I read a proposal to build a club-house at Chiswick, for the convenience of the country gardeners, as a meeting place, &c.; this seemed to be in connection with Mr. Wilson's guinea scheme. Then there is what is called the Kensingtonian clique, a large and wealthy clique, too, and one that contributes largely to the Society's funds, who, it is said, desire that the South Kensington Gardens should be kept in first-rate order (at the society's expense) for themselves

and their friends to play croquet in, with frequent flower-shows, and band playing for their own, their children's, and their nursemaid's amusement. All these cliques are apparently pulling in different directions, the more they pull and waste their strength, or, in other words, the more they squabble and disgust the subscribing fellows, and consequently fritter away the society's means, the better, I guess, it will be liked by the mightiest clique of all—her Majesty's Commissioners, who, under these circumstances, will have simply to bide their time, and let these cliques go on fighting till, like the Kilkenny cats, there is nothing left but their tails; then they will be able to walk quietly in, and swallow up what little remains, and all they had been fighting over. This, I fear, will be the upshot of matters connected with the Royal Horticultural Society if we don't mind. I am not aware if any of these cliques have consulted the Council, which is the only body possessing any power to make arrangements with her Majesty's Commissioners or anyone else; whether this body is unanimous upon a policy, or is also divided into cliques, I know not; but it is whispered that they, too, either in their corporate or individual (a mode of proceeding as ruinous as the Defence Committee's) capacity, or both, have in some way or other endeavoured to induce her Majesty's Commissioners to come to some arrangement, if this be so, in which way, and with what objects in view? it is the duty of every fellow to make himself acquainted; and the duty, also, I take it, of the Council, in a business-like and straight-forward manner, to inform us; and not to follow the example of the previous Council of trying to sell us, and then expecting us, without consideration, to vote upon the instant the confirmation of the warrant for our own execution. If there are a few independent fellows who take an interest in the society's welfare, and who are desirous that it should be preserved intact, and that it should maintain the position which the Royal Horticultural Society of England ought to occupy; moreover, that it should be free to manage its own affairs, financial and otherwise, free, in fact, from all foreign control, and free to expend its income for the promotion of the science of horticulture, I say, if there are some who have not formed themselves into party cliques, but are desirous of promoting these views, it is time that they should come forward and sign a requisition also, requesting the Council to call another meeting (or to arrange for the continuation of the one already called), not to consider an isolated question, which can be brought to no issue, but to consider what can best be done to reinstate the society in an independent and prosperous position; at the same time, soliciting the Council to state plainly their views and policy, and to assist them in solving the problem. I cannot bring myself to believe that her Majesty and the Royal family can really intend to desert the society, the prosperity and maintenance of which at South Kensington formed a part of the late Prince Consort's scheme, both for the promotion of the science of horticulture in conjunction with other sciences there, and for the adornment of the Kensington estate. There can be no two opinions, I think, as regards the desirableness of coming to "satisfactory" arrangements with her Majesty's Commissioners, if possible; but what those arrangements should be require mature consideration, and I maintain that the whole body of the fellows should be consulted and given ample time to consider. We must bear in mind that we possess, for nineteen years, the control of most valuable property, property, too, that her Majesty's Commissioners want at once; in fact, bad as our affairs are said to be, I believe we possess the means of inducing her Majesty's Commissioners to come to us (instead of our going to them), and with such an offer of terms that would enable the society to maintain an honourable and independent position, and at South Kensington too. But if her Majesty's Commissioners will not meet us upon fair and honourable terms, then let us keep them out of every inch of ground belonging to us, and make no temporary arrangement whatever with them.

JOHN DENNY.

Stoke Newington.

WORK FOR THE WEEK.

PRIVATE GARDENS.

Flower Garden.—The chief attractions belonging to outdoor gardens at present are winter Aconites, Jasmines, and Christmas Roses, together with a few miscellaneous flowers that have been tempted to expand. Both evergreens and Grass have also an unusually fresh look for this season of the year. Unless, however, cleanliness and tidiness are maintained, the most charming arrangement cannot be in itself satisfactory; therefore, in order to have a garden enjoyable, the roller, broom, and rake must be frequently at work. Use the hoe amongst growing plants, for a loose and open surface is congenial to their health. Prune deciduous shrubs; but the pruning of evergreens should be deferred until spring. All kinds

of trees may still be transplanted, especially such as are deciduous. Proceed with any alterations that may have been previously determined upon. Any ground yet untended should be dug over as soon as practicable; if for Dahlias, Foxgloves, Hollyhocks, or other strong-growing gross-feeding plants, add plenty of manure; but if for Pelargoniums, or other plants that are required to produce abundance of flowers and to keep dwarf in growth, a dressing of leaf-mould will be more beneficial. Lay up the ground quite roughly, in order that the frost, wind, and sun may ameliorate and sweeten it; well pulverised soil is greatly superior to that newly dug. Break up the surface of gravel walks, but not so deeply as to disturb the rubble in the bottom; and, if necessary, apply a coating of fresh gravel. Roll Grass verges, so that they may not appear too high above the gravel when cut. Protect all tender plants with mulchings and temporary light coverings against frost.

Bedding Plants.—Pelargoniums must still be kept rather dry, with the exception of a few plants of them which should be placed in an intermediate house and moderately watered, in order to induce them to make young wood for propagating purposes. Keep all the finest-leaved kinds, such as tricolors and bicolours, near the glass, in light airy pits or greenhouses, and give them sufficient water to prevent them from flagging. Verbenas, Ageratums, Salvias, Tropæolums, and similar plants should be cleared of all decaying leaves, and dry wood-ashes or sand should be scattered over the surface of the soil in the pots or boxes that contain them. If the stock of them is short, introduce a few plants to a warm house, give them a fair quantity of water, and they will soon produce young wood, which may be made into cuttings. Indeed, from this time till the end of April, Verbenas, Ageratums, &c., may be forced and propagated in large quantities, for the cuttings root readily, and soon furnish tops and side-shoots which may be used for a similar purpose. Sow some Lobelia seeds in heat, and prick off the young seedlings as soon as they are fit to handle into pots, pans, or boxes containing light sandy soil well mixed with sifted leaf-soil. By sowing Lobelias, pricking them timely out, and pinching them a little before planting-out time has arrived, they will bloom early and long. Cuttings of Lobelias may also be inserted as soon as convenient. Leave Gazenias undisturbed till March, it being then soon enough to propagate them; for early-struck plants become long and weakly before they are planted out, unless a good deal of room and pains can be devoted to them. Calceolarias in frames and boxes should be well ventilated in fine weather, and all decaying matter removed from amongst them. Remove the points of any shoots that are growing too rankly, and prepare cold frames for purposes of propagation next month. Calceolarias strike as well in cold frames if inserted in early February as they do if inserted in October; but, if the operation is delayed till March, they require a little heat to induce them to root readily. Any kinds of Dahlias that are scarce may be started in heat at once, and cuttings of them may be taken off and rooted as soon as they can be obtained; next month, however, or even the 1st of March, is soon enough for starting the general stock. If a good stock of Caladium esculentum be required, start some of the rested plants in a brisk bottom-heat, and, when they have begun to grow, remove the top and insert it as a cutting, still retaining the old root-stocks in the plunging material. Before long the latter will push forth a numerous progeny of young shoots, which may be separated individually after they form a leaf or two, and used as separate plants. Rub over the incision with powdered charcoal, in order to counteract damp, and return the root to the position which it formerly occupied, keeping it there until it has exhausted every effort to produce another offset. Seeds of sub-tropical plants, such as Solanums, Wigandias, Ferdinandas, Urdcas, &c., should be sown in heat as soon as possible, in order to have good strong plants before bedding-out time; and all old plants of these genera wintered in pots should be plunged in bottom-heat, in order to produce young shoots to be used as cuttings. Prune back Hibiscuses, Cassias, Fuchsias, Abutilons, and similar plants, so that they may begin to grow slowly and hardily. Acacia lophantha, raised from seeds sown now, makes good plants before May for mixing with other plants in small beds. Keep Centaureas rather dry than otherwise, in open airy houses or pits near the glass, and remove every particle of damped-off leaves that may be hanging about them, sprinkling powdered charcoal or dry wood-ashes about their necks and over the soil. Echeverias, and other succulents, treat like Centaureas, with which they are equally, if even not more, hardy.

Conservatories.—Use only fire-heat enough to expel damp and frost, and no more; and when for the former ventilate the house at the same time. Maintain a temperature of 40° at night, with the usual daily rise. Water all overgreen plants moderately, and keep deciduous ones nearly dry. Plants in borders require watering very seldom at this season, there being but little demand upon the roots at this time of year; but pot plants, especially such as are near hot-

water pipes, require unremitting attention as regards water, for although apparently moist on the top the soil in the bottom of the pots may be dry. Such a condition would be extremely detrimental, as the greatest amount of roots is amongst and over the drainage. Rather than keep the conservatory too warm, in order to forward the plants therein, supply any deficiency there may be in the way of flowers by means of Camellias, Azaleas, Jasminums, Weigelas, Kalmias, Prunuses, Acacias, Dielytras, Lily of the Valley, Dutch and Roman Hyacinths, Tulips, Narcissi, Crocuses, and other plants from the forcing pits. Decaying leaves must be regularly removed, and a rather dry and healthy atmosphere is a good remedy for such an evil, and to effect this supply artificial heat and plenty of air. Keep Heathes, Epacrises, Chorozemas, Boronias, Tremandras, &c., in the coolest and freest ventilated portion; and forced shrubs and other flowers, Orchids, &c., in the warmest parts. Cut over Chrysanthemums that have done flowering, and keep a pot of each kind in a frame, if sufficient cuttings have not already been obtained. Plant the others in the open border, or, if not wanted out of door, throw them away. Shift herbaceous Calceolarias and Cinerarias as they require it, and keep them cool and well watered; never permitting a damped or decayed portion of a leaf to remain. Fumigate to destroy aphids, and keep in mind the old maxim, "prevention is better than cure." Keep Mignonette near the glass, and stake and tie it as may be necessary. Have a good succession of it, Violets, and other plants, in pits. Regularly train Tropæolums, and give them a little manure-water if they are making good progress. Continue to pot off singly good rooted early autumn-struck cuttings of Azaleas, Camellias, &c., but if neither time nor space can be spared for shifting them at present, leave them for a time in their cutting pots set on a side-shelf of a close pit or intermediate house. Any Statice becoming too long-stalked should have an incision made on each branch just at the base of the foliated crowns, after which some Moss should be tied around it. The Moss should always be kept damp, and if a little silver sand is mixed with it so much the better, as it helps to encourage root-production. Keep old and young Statice moderately moist and in a minimum temperature of 45°. Pot off cuttings of Libonias and keep them for a short time in a warm pit, and when root action again begins, transfer them to an intermediate house. Divide the rhizomes of the variegated-leaved Acorus javanicus, and keep the divided portions for a time in gentle heat. From male Aueubas in flower gather the pollen and keep it dry between bits of glass for future use. Start into growth, in a warm pit, tropical Crinums. Re-pot and start some Hæmanthus; they may be placed upon the floor in a warm house or pit, or on a back shelf.

Hardy Fruit and Kitchen Garden.—Proceed with the pruning and nailing of wall-trees, such as Plums, Pears, Cherries, and Apricots. All standards, if not already done, should be pruned as expeditiously as possible, and old unfruitful trees removed to give place to younger ones. Moss growing on the stems of old trees should be scrubbed off, and afterwards the trees and large branches should be washed with a mixture of lime-water, soot, and brine. Root-prune over-vigorous trees, taking care not to encroach too severely on the roots. Cut of shoots to be used as scions in grafting, and insert their ends in soil in some well-sheltered situation. Head back stocks, for if allowed to remain without being cut until the sap is in active circulation, the bark commonly dies back a little below the wound. Freely expose Lettuces, Cauliflowers, &c., in frames in favourable weather, protecting them from frost at night. Plant out some Lettuces, at convenience, on a warm border, and prick some Spruce branchlets amongst them. Plant in dry ground Ash-leaf Kidney Potatoes, and make new plantations of Horseradish and Jerusalem Artichokes. Sow some Parsley on a sheltered spot, and protect a portion of the old plantation with a frame-sash or two, so as to permit of the leaves being gathered in frosty weather, and likewise Cauliflowers under hand-lights. Lift in Broccoli that is living with good balls, and place them in cellars or sheds to protect them from frost. Uncover Celery ridges from the mulching of litter in fine weather, as its presence would generate dampness and promote rotteness. Sow some of Wood's Frame Radishes on a south wall border, and mulch it with litter; and Early Horn Carrots may be treated the same as Radishes, and some Early Dutch Turnips may likewise be sown on a warm border. Avoid sowing anything on sodden soils, as much harm is done by so doing, and whole crops frequently lost.

Gilbert's Protectors.—I notice in the advertisement columns of the gardening press, what I may call an extraordinary assertion on the part of Messrs. Boulton, viz.—That the judges at Birmingham gave them the only prize for protectors, when at the same meeting I was awarded a medal for Gilbert's hand-lights and protectors. Such assertions as these are apt to lead the public astray.—R. GILBERT.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

LANDSCAPE GARDENERS *VERSUS* ARCHITECTS.

By J. C. NIVEN, Botanic Gardens, Hull.

THE article which appears in your last week's number (see p. 21), in which "Civis" defines, no doubt, to his entire satisfaction, the relative positions of the architect and the landscape gardener, should not pass without comment at the hands of those whose status he somewhat rudely assails. The habit which some have of looking at things from only one point of view is tolerably well exemplified in the article in question, and, in offering the following remarks, I do so, not exactly as the knight champion of the landscape fraternity, nor as possessing the ability to define clearly, for all whom it may concern, that boundary line which separates the two professions, but merely to assert my individual opinion upon one or two matters in the article just alluded to, which, I think, ought not to pass unchallenged. Let me, in the first place, congratulate the "citizen" architect on his frank and free admission of the engineer to a fair professional recognition. I wish, when admitting the fact, that he had not qualified it by a sort of "lamentation," and hinted that he had been galvanised into existence by a sort of high-pressure railway development, but had honestly admitted that the engineer was a necessity of the iron age in which we live—a necessity which no sensible architect will, I think, deny. Remembering perfectly the onslaught which was made by the architectural journals when the construction of Westminster Bridge was placed in the hands of Mr. Page, the engineer; and admiring, as I do, the beauty of the bridge so designed and, in spite of all the ill-natured prognostications, still existent, I the more appreciate the recognition of the civil engineer's profession, and am further enlivened with the hope that at some future time the true status of the landscape gardener will be as fully recognised, and his services as highly appreciated, even by "Civis" himself, as those of the engineer. Permit me, at the outset, to demur to the somewhat novel title which some of us landscape gardeners have assumed—namely, that of "landscape architects." I have heard the title "garden architect" appended to the more general one of "landscape gardener," and a perfectly correct and intelligible addition it is, as both combined appear to define pretty clearly the work which devolves on the landscape gardener. I will now endeavour briefly to point out the respective spheres which the two professions should occupy—nay, I might almost add, do occupy, were I to speak from my own professional experience, which extends over some twenty years. Let us suppose, as in the illustrative case which "Civis" uses, that, as a matter of course, the services of the architect are called in to prepare the designs for a mansion. Here, of course, he is master of the situation; but has he not forgotten that, as a general rule, the "site" of the house—which has a somewhat important bearing on the style—is usually first selected? And here I claim the right of the landscape gardener to be heard—nay, to be fully consulted. Not only is there truth in the old adage, that "two heads are better than one," but so much of the picturesque character of the mansion depends on its surroundings, that the salient points, even "Civis" himself will admit, are more likely to suggest themselves to the practised eye of the landscape gardener than to the architect. Here, then, at the outset, let the two professionals argue out, if necessary, their *pros* and *cons*, with the client as umpire; and, the site having been determined, let them proceed on their separate courses, taking care that such courses run in parallel grooves, and not at cross purposes, in which case there is sure to be a collision. On the architect clearly devolves all the work in connection with the mansion and its outbuildings, the lodge, the gardener's house—and, in fact, any other cottage or building of that description on the estate; but, let me add that, as in fixing the site of the mansion, so, before the sites of all such buildings are finally determined upon, the landscape gardener should be consulted, as it devolves on him either to utilise them, if

ornamental, or to screen them from view if otherwise; and who more likely than he to know what are the natural advantages available for this important purpose? My practice is to indicate on the general plan of the estate, the positions for all such buildings, leaving everything else to the architect. The next point, namely as to the arrangement of terraces, terrace steps, fountains, &c., is one open to considerable difference of opinion, even amongst those of our own profession. I am clear on the matter that those immediate adjuncts of the mansion should represent the result of a happy combination of the two professions; the general lie of the ground, and the arrangement of the flower-beds, if any, should belong to the landscape gardener; the architectural details, which, of course, will be carried out in harmony with the details of the building, belong to the architect. Where the latter monopolises the whole arrangement to himself, he is not always happy in his results, and rarely is he practical, as many a poor gardener can testify to his cost. A conservatory, now-a-days, is almost invariably an adjunct to a country house, and properly so; but, as it has a use beyond its mere external appearance, namely, its true use as a means of extending and increasing indoor enjoyment, while it possesses sufficient architectural character to harmonise with the rest of the building, it ought to be equally well adapted for the growth and artistic display of plants. There should be means of maintaining a proper temperature and full power of thorough ventilation. Here it will be obvious that the grooves in which I proposed the two professions should run, again just touch one another; let the architect build the conservatory, consulting his brother professional as to the ventilation, and let the "garden architect" (here we give him his other name) complete the internal arrangement, including the disposal of the hot-water apparatus, &c. Of even more importance than the conservatory is the kitchen garden, with its forcing houses, plant-houses, and the various sheds which are necessary for the usual purposes of garden accommodation, including, of course, the walls. These belong, I most unhesitatingly maintain, to the garden architect. Here the architect, pure and simple, is out of place, just as much, and perhaps a little more, than the so-called "landscape architect" would be in dealing with the lodge or the stables, as contemplated by "Civis." The majority of our profession have been at one time practical gardeners, and thus know by experience what the essential requirements of such buildings are in all their detail. Should, however, the designing of these kitchen garden adjuncts devolve on the architect, as might possibly be necessary in the case of one or two of our most highly æsthetic landscape gardeners, I will give him one word of advice—let him not deem it beneath his dignity to submit his plans, before final completion, to the gardener, and avail himself of those practical suggestions which I will warrant he will obtain from that source.

Having thus indicated what, from my point of view, appears to be the relative position of the two professions, I have one or two points to touch upon before I bring my remarks to a close. Let me ask "Civis" for a straightforward answer to the following questions:—Does his so-called "Landscape Architect," against whom he has made out a case of professional poaching, represent the only class of poachers? Do architects never by any chance arrogate to themselves all the functions of the landscape gardener? If "Civis" declines to answer these questions, I will do so for him, after the Scotch fashion, by asking another question or two. Have we no terrace-gardens in the country where artificially variegated walks are made to wage war with the true contrasts and harmonies of nature's beautiful flowers? Have we no parterres that bid defiance to all the powers of the gardener, even with the most extensive resources, to plant successfully? I am of opinion we have, and for most, if not all, of them we are indebted to architects who have stepped beyond their calling and become poachers on the true preserves of the landscape gardener. Again, look at the hundreds of cemeteries scattered through the length and breadth of the land that have sprung into existence within the last few years. The great majority of these are illustrative of the result of architects undertaking to do what they possess no qualification for, with what result I

will not trust myself to say. The public have, in many cases, passed a true verdict, and more fully will it be endorsed by the descendants of the said public in future years, when they find that even the softening hand of time will fail to obliterate the incongruities that have been, and, indeed, are every day being, perpetrated by architects, and in many cases by architects of no mean reputation either. If I lay myself open to be challenged as speaking harshly of a profession in whose ranks I have personally always met with the most honourable and straightforward conduct, I must plead that they have been called forth by the insinuations from "Civis", derogatory to our profession. In conclusion, I would say, with reference to the "happy thought" broached by "Civis" "That the architect should assert his authority, and insist that all drawings for whatever works shall be submitted to him for his approval before being put in hand," that the profession of landscape gardener and garden architect is year by year assuming a more definite status, and, in spite of all "Civis" may do or say, will hold its own true position as independent of the whim or fancy of the "architect."

THE GARDENS OF ENGLAND.

CHATSWORTH.

(Concluded from p. 7.)

The Pleasure Grounds.

THESE, including the Pinetum, may be counted by miles, not by acres, and require a full day to pass through them, and far more to know them thoroughly. Paxton has done much; but, from an artistic point of view, he might have done more. We have seen many of his creations at Sydenham, Birkenhead, and at other places, and, with all due respect for his memory, we are bound to confess that Chatsworth, as a whole, is not the most meritorious of his works. This may not be his fault, but rather his misfortune. We all know that, with ancient families, interference with the past is more difficult than improvements for the future; and hence old landmarks must be retained, which, for real improvement, would frequently be better swept away. Many of these crop out at Chatsworth, but to detail them would be simply waste of time. Hence, much that has been done in the garden, or pleasure ground, properly so called, might have been better done. Smoothness, Burke, in the "Sublime and Beautiful," defines as one of the main elements of beauty; but in the walks at Chatsworth, especially in the strictly Paxtonian parts of the grounds, there is a want of finish and smoothness which is anything but pleasing to the eye of taste. The main fronts associated with the mansion are terraced, the retaining walls, and all belonging to them, being of the most substantial and appropriate character. Numerous specimens of vases, urns, and statuary decorate the piers, and the principal flower-beds are margined with massive stone walls of suitable design. When, in the autumn months, these beds are full of the flowers of the season, they have a brilliant effect. But bedding-out at Chatsworth is disheartening work, for the frosts are so late and so early that it is the end of June before it is safe to plant, and the end of August is certain to bring frost. However, while the beds are in perfection, the sight is a glorious one. Seen from the principal apartments, with the silvery Derwent meandering through the valley, amid fine timber, the scene is a charming one, and one which is worthy of the pencil of our greatest artists. But, fine as is the effect of bedding-plants during their transient season, it is when the garden can be seen with acres of the various-tinted Ghent Azaleas, Rhododendrons, and other American plants, backed by the variously tinted foliage of deciduous trees and the ever-grateful Hawthorns, that it crops out in full glory. Of timber trees, there is at Chatsworth a fine avenue of Limes, Spanish Chestnuts of more than usual size, and grand specimens of Oak, Beech, and Ash. Holly and Yew luxuriate there, associated with some fair specimens of Cedar of Lebanon, Wellingtonia, and the Lawson's Cypress; but the Deodar, Arancaria, and some of the tender Conifers, suffer much in severe winters. The lawns at Chatsworth are superbly kept, the turf being smooth and velvety; but, as you get away to the arboretum, less care is observed. The collection of trees and shrubs was at one time very complete; but the severe

winter of 1861 destroyed so many of the tender shrubs, that it was considered impracticable to replace them. Still, many interesting examples may be found in the three miles' walk which comprises the arboretum.

The Rock Garden.

This may be considered the ante-garden to the grand conservatory, and it is not until you get into it that you realise the Paxton idea of landscape work; and there you have a fair example of what may be effected by means of excavations, stones, and shrubs. The latter have now played an important part, having covered the nakedness of the rock-work, and, when they cover the whole, the garden will look none the worse. It was a bold act of Sir Joseph to enter into competition with nature in one of her strongest positions; and, though the conception was good, and in some respects well executed, one has only to take a run from Chatsworth to Buxton to see how futile it is for man to enter into such a trial of skill. The stone used is mainly of the boulder formation, piled together so as to form archways and rock pillars, the labour of moving such huge masses being not the least remarkable feature connected with the work. Except in the principal mass, some 30 feet high, from which drips a streamlet into a basin at its base, little attempt is made at stratification. In the strictly garden part, huge stones crop out from beds of American plants, and Ferns and some Coniferous trees play an important part in diversifying the scene. In fact, this is as much an American as a rock-garden, and the association is by no means bad.

The Plant Houses.

A collection of many hundred plants of *Epiphyllum truncatum*, and its varieties, is, at this season, one of the most remarkable features of the conservatory, to which we briefly adverted last week; while, in hanging baskets suspended in various parts of the house, they present a floral charm rarely to be equalled. Of the suitability of these plants for hanging baskets, those only who have seen them at Chatsworth can form an opinion: they are simply superb. As a non-flowering plant, nothing looks so well as the Elk's-horn Fern (*Platycerium alcicorne*), with a few *Adiantums*, and other Ferns of that kind. In their season, *Achimenes* also form a grand feature in baskets; indeed, it may be said that the baskets at Chatsworth are a feature always to be admired. Other plant-houses are numerous, and some of them of fine proportions. The Orangery, which adjoins the sculpture gallery, is a noble structure, and contains some remarkably fine trees in vigorous health. This house is, of course, architectural in character, and, when artificially lighted, and the trees are in bloom, it forms a charming promenade. From the Orangery extends a glass-cased wall of several hundred feet in length, which forms in stormy weather a very agreeable shelter. It is, however, very narrow, not being more than 6 or 7 feet wide, but we believe it is contemplated to make it 15 feet wide, and to continue it from the Orangery at one end to the plant-houses at the other, thus forming a very interesting promenade. In the central part of this case may be seen remarkably vigorous specimens of double white and other *Camellias*, which annually produce thousands of flowers. Here, upon this wall, may be seen the original plant of *Ceanothus puniceus*, first shown at Chiswick by Messrs. Young, then nurserymen at Epsom, and for which the late Duke paid fifty guineas. Here, also, is one of the first plants of *Brugmansia sanguinea* and a remarkably fine specimen of *Citron*, presented by the Duke of Rutland. On this wall many plants grow with wonderful vigour. *Ugenia Ugni* yields annually a heavy crop of fruit, and we never have seen *Mitraria coccinea* in such fine condition as it is when thus protected; in short, it blooms almost continuously. The *Camellia*-house is an architectural building, perhaps the oldest in the garden. It has heavy walls pierced with windows, and the roof consists of very small glass; the plants, however, many of which are very large, are in the finest conceivable health, and produce, annually, tens of thousands of flowers. Mr. Speed's plan is to deluge them, in the growing season, with weak soot-water, and never, at any time, to let them know the want of water at the root. Adjoining this glass promenade are three ranges of plant-houses, erected some five years back. Each range is divided into

three houses; the first range consists of stoves, the second of intermediate-houses, while the third, which is of considerable size, is devoted to Orchids. One house is occupied almost exclusively with Vandas, Aërides, and Saccolabiums, some of them being enormous specimens, which bloom in the most perfect manner. The plants stand upon slate shelves covered with spar, the extremes of heat and cold in summer and winter rendering isolation from the slate necessary. This house is heated by sixteen rows of 4-inch pipe. In the cool-house will be found a fine collection of Sarra-cenias in robust condition, and also grand masses of *Cœlogyne cristata*, *Miltonia spectabilis*, *Lycastes*, and some of the hardier *Dendrobies*. Of *Dendrobium nobile* and its allies, Chatsworth has many very large specimens, and the plants *D. Devonianum* and *Dalhousianum* and some of the rarer ones are also very fine. *Phalænopsis amabilis* and *Schilleriana* will be found in superb condition, while *Pleiones* and *Calanthes* for cutting flowers from are grown by the hundred.

Stove plants are grown mainly for the sake of their blooms, in a cut state, for table decoration, hence the object is rather to keep the plants small and healthy than to produce enormous specimens, and the same may be said of the greenhouse plants.

Upon the whole, Chatsworth is a most interesting place, but no one should expect to realise its full attractions without devoting, at the least, three days to the work of inspection. The keeping of the whole place reflects great credit upon Mr. Speed, and is yearly improving under his skilful management.

THE LIBRARY.

THE NATURALIST IN NICARAGUA.*

IN the beginning of 1868, Mr. Belt arrived in Nicaragua for the purpose of superintending the operations at the mines of the Chontales Gold Mining Company, situated near the village of Santo Domingo, and nearly in the centre of the republic. Here he resided for four years, during which time, in addition to the discharge of his professional duties, he employed himself in acquiring a thorough knowledge of the natural history of the country, and the manners and customs of the inhabitants. He says, "I had much riding about. The mines worked by us when I first went out extended from Consuelo, a mile higher up the valley, to Pavon, a mile below Santo Domingo, and even after I had concentrated our operations to those nearer to our reduction works, there were many occasions for me to ride into the woods. I had to look after our wood-cutters and charcoal-burners, to see that they did not encroach upon the lands of our neighbours, as they were inclined to do, and involve us in squabbles and law-suits; paths were to be opened out, to bring in Nispra and Cedar timber; our property had to be surveyed, and new mines, found in the woods, visited and explored. Besides this, I spent most of my spare time in the forest which surrounded us on every side, so that we could

not go a mile in any direction without getting into it; longer excursions were frequent. These rides and strolls into the woods were very fruitful in natural history acquisitions and observation." The result of these four years of constant and intelligent observation Mr. Belt has embodied in a handsome illustrated volume of nearly 400 pages, replete with the most useful and interesting information on the natural history and present condition of that part of Central America. Had we space, we might quote pages. We must content ourselves,

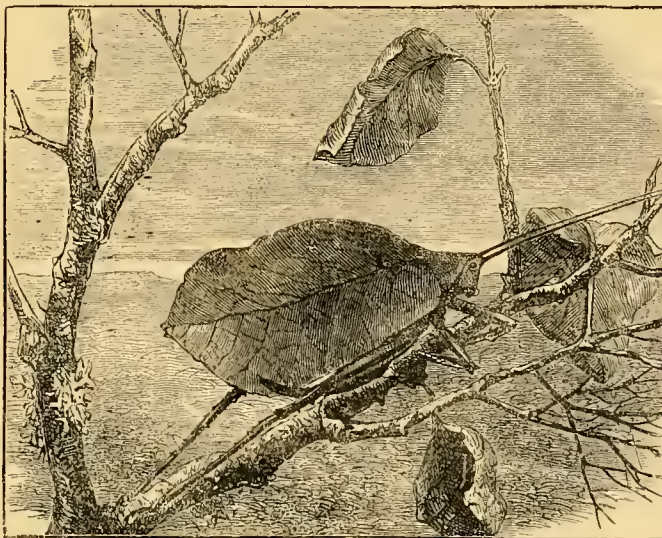
however, with the following short extracts, the first of which contains an account of the singular insects represented in the illustrations, for the use of which we are indebted to the courtesy of the publisher—Mr. Murray:—



Moss Insect.

Amongst the insects of Chontales none are more worthy of notice than the many curious species of Orthoptera, that resemble green and faded leaves of trees. I have already described one species that looks like a green leaf, and so much so that it even deceived the acute senses of the foraging ants; other species, belonging to a closely related genus (*Pterochroza*), imitate leaves in every stage of decay, some being faded-green blotched with yellow; others, as in the species figured, resemble a brown withered leaf, the resemblance being increased by a transparent hole through both wings that looks like a piece taken out of the leaf. In many butterflies that resemble leaves on the under side of their wings, the wings being raised and closed together when at rest so as to hide the bright colours of the upper surface, there are similar transparent spots that imitate holes; and others again are jagged at the edge, as if pieces had been taken out of them. Many *Chrysalides* also have mirror-like spots that resemble holes; and one that I found hanging from the under side of a leaf had a real hole through it, formed by a horn that projected from the thorax and doubled back to the body, leaving a space between. Another insect, of which I only found two specimens, had a wonderful resemblance to a piece of Moss, amongst which it concealed itself in the daytime, and was not to be distinguished except when shaken out; it is the larva stage of a species of *Phasma*.

Of the effect of corrosive sublimate on ants, the author writes as follows:—



Leaf Insect.

A little of it sprinkled across one of their paths in dry weather has a most surprising effect. As soon as one of the ants touches the white powder, it commences to run about wildly, and to attack any other ant it comes across. In a couple of hours, round balls of the ants will be found all biting each other; and numerous individuals will be seen bitten completely in two, whilst others have lost some of their legs or antennæ. News of the commotion is carried to the formicarium, and huge fellows, measuring three-quarters of an inch in length, that only come out of the nest during a migration or an attack on the nest or one of the working columns, are seen stalking down with a determined air, as if they would soon right matters. As soon, however, as they have touched the sublimate, all their stateliness leaves them: they rush about; their legs are seized hold of by

some of the smaller ants already affected by the poison; and they themselves begin to bite, and in a short time become the centre of fresh balls of rabid ants. The sublimate can only be used effectively in dry weather. At Colon I found the Americans using coal tar, which they spread across their paths when any of them led to their gardens. I was also told that the Indians prevent them from ascending young trees by tying thick wisps of Grass, with the sharp points downwards, round the stems. The ants cannot pass through the wisp, and do not find out how to surmount it, getting confused amongst the numberless blades, all leading downwards.

* "The Naturalist in Nicaragua." A narrative of a residence at the gold mines of Chontales, journeys in the savannahs and forests, with observations on animals and plants in reference to the theory of evolution of living forms. With maps and illustrations. By Thomas Belt, F.G.S. London: John Murray, Albemarle Street. 1874.

NOTES OF THE WEEK.

— WE are glad to announce that the new edition of Mr. Gordon's "Pinetum" is now almost ready for the press. The book is nearly re-written, and the information on the subject brought well down to the present time.

— WE learn that the autumn show of the larger Fungi at the Royal Horticultural Society has so steadily increased in interest and popularity that it is intended to considerably extend it this year. The most useful of the edible and easily obtained kinds should be shown in some quantity, and, if possible, in a cooked state also.

— WE have just seen a batch of single and double Chinese Primroses, which have been sent by express from Nice, where they were grown by Messrs. Stuart. Nothing could be more beautiful than their varied and rich hues. They are not grown in the open air at Nice, but in cool houses as at home.

— A PLAN has been prepared, which contemplates the making of a park for Boston containing 3 square miles of territory, or about 2,000 acres, and for this the cost, with improvements, is estimated at 5,000,000 dols. The site contains small streams and a large pond of water, and it is proposed to use the water-supply in making an artificial lake and a chain of lakelets, which will give variety to the scenery.

— THERE is now a fine specimen of *Angraecum sesquipedale*, bearing twelve of its great wax-like flowers on three spikes, in the Royal Exotic Nursery, Chelsea, the plant being one of the finest we have seen. The beautiful white-flowered variety of *Laelia anceps*, named in honour of the late Mr. Dawson of Meadowbank, "*Dawsonii*," is also in flower, as is likewise a fine rosy-coloured variety of *Cypripedium Roczlii*, while a good form of the pretty little *Colax jugosus* is in bloom.

— WE are pleased to hear that *Odontoglossum coronarium* is again showing flower (two spikes) in Lord Lonsborough's collection at Surbiton. This plant seems as shy in its flowering as *Renanthera coccinea*, and has, as yet, only bloomed in one or two collections in this country. Amongst other plants also in bloom in this fine collection are *Laelia autumnalis*, with seven flowers on a spike, and *L. albida rosea* with two deep rosy blooms in place of the white ones common to the species. A plant of the rare and beautiful *Sophranitis violacea* has also produced deep rosy-lilac flowers in the same collection.

— THE Royal Botanic Society of London have issued their programme for 1874. The arrangements are:—Exhibitions of spring flowers, Wednesdays, March 25th, April 22nd. Summer exhibitions, Wednesdays, May 20th, June 10th, and June 24th. Gates open at two o'clock. Special evening *fête*, Wednesday July 8th. American exhibition, daily, May 25th to June 9th. Promenades, every Wednesday in May, June, and July, excepting the exhibition days, commencing May 6th. Visitors admitted only by the special coloured orders. Lectures in the museum at four o'clock precisely, Fridays, May 15th, 22nd, 29th; June 6th, 12th, 19th, 26th; July 3rd.

— IN the January number of the *Botanical Magazine*, among other plants figured there, are three deserving of especial attention. Foremost amongst these is *Saxifraga peltata*, a native of California, a species which has great peltate-lobed leaves and erect cymes of rose-coloured or rosy-white flowers. It is found in moist localities, and grows best treated as a sub-aquatic. *Stoudnera colocasiaefolia*, a dark blotched-leaved yellow-flowered *Arad*, also deserves mention, as does likewise *Mesembryanthemum truncatellum*, a stunted swollen species from the Cape, of a brown colour, bearing golden-rayed blossoms; and the beautiful *Colchicum speciosum*, a native of the Caucasus, also to which we have already alluded as having flowered freely during the past autumn in Mr. Barr's collection at Tooting.

— AN account of the Hull Window Garden Society just received shows that, after paying all expenses, a balance of upwards of £14 still remains in the treasurer's hands, while last year the balance was little more than £3. Upwards of ninety money prizes have been given away this year, and in addition thirty-seven prizes, consisting of articles of various kinds and values—from a bird-cage or a pair of table-spoons to a flower vase. Besides these some three hundred well-established plants for window culture have been given to the exhibitors. It is likewise stated that every exhibitor, including the little children who brought their neatly-arranged bunches of wild Grasses (and of these there were some two hundred), received some reward for his labour. It is mentioned that no plants taken from the borders have been distributed this autumn, the committee being of opinion, from previous experience, that as much pain as pleasure is given by such distributions. So many of the plants die, that the effect is often discouraging as well as disappointing; they propose, therefore, to act in future years as they have done this year, viz.:—give away, at the flower-show, as many well-established plants as

they can obtain from their friends, who, like themselves, are desirous of promoting the culture of window-plants by the working classes.

— A PLANT of *Lycaste Skinneri*, now in blossom in the Royal Exotic Nursery, Chelsea, bears two flowers on one spike, as is occasionally the case with *Cypripedium barbatum*, *C. venustum*, and its variety *C. pardinum*.

— IF we wanted proof of the hardness of shrubby Veronics it might be had in Miss Hassard's garden at Upper Norwood, where there are plants from 4 to 5 feet high, that have been out in the open ground this two winters, and in no way protected during the hardest frosts.

— AMONG rare tropical fruits offered for sale in Covent Garden Market we have this week noticed fine samples of the white-fruited *Guava* from Madeira, *Psidium pyrifera*, the fruits of which are of a pleasant sub-acid flavour.

— THE *Botanical Magazine* for January contains a figure of *Bambusa striata*, a Chinese species, having deep green stems striped with bright yellow. It grows under cultivation 6 or 8 feet high, and forms a highly ornamental plant either for conservatory or greenhouse culture.

— THE new *Clarkia*, *C. integripetala limbata*, is well figured in colours in the new issue of Messrs. Carter's seed-catalogue. It is a large full-petalled kind, with its crimson petals evenly and distinctly margined with white, and it is likely to prove a very popular garden flower.

— AT a sale at Stevens' on Thursday last, single plants of the rare and beautiful white-flowered *Odontoglossum Roczlii* realised from £5 5s. to £16. Ten thousand bulbs of *Lilium auratum*, newly imported, also fetched good prices, notwithstanding other large importations lately received.

— AT a meeting last month of the Central Horticultural Society of France, M. A. Rivière, chief gardener at the Luxembourg, exhibited a very charming specimen of a *Bromeliad*, not too well known in our gardens, viz., *Vriesia brachystachys* Regel., or *V. psittacina*, var. *brachystachys* Hort., which was pronounced to be unequalled amongst *Bromeliads* for vigour of growth and beauty of bloom.

— WHEN completed, the new park at Eastbourne will be one of the greatest improvements at that fashionable town. The ground, nearly 13 acres in extent, is to be known as Burlington Park, and is situate close to Eastbourne College. The southern part is arranged in three terraces, and will be planted with shrubs and trees of various kinds. There will be a row of Elms all round the ground, while an avenue of trees, opening from the south on to the cricket-ground proper, will form the main entrance. The cricket-ground will be nearly 6 acres in extent, and surrounded by trees. It is intended to have ornamental water in the ground. The whole expense will be defrayed by his Grace the Duke of Devonshire.

— PROFESSOR ASA GRAY, in a paper read before the American Pomological Society, makes some interesting and apt remarks as to the origin of our cultivated fruits. He asks, "Were the fruits made for man, or did man make the fruits? These," he says, "need not be taken as mutually exclusive propositions; for as 'God helps those who help themselves,' and man's work in this respect is mainly, if not wholly, in directing the course or tendency of nature, so there is a just sense in which we may say 'the art itself is nature,' by which the greatest triumphs of horticultural skill have been accomplished. Moreover, I am not one of those naturalists who would have you believe that nothing which comes by degrees, and in the course of nature, is to be attributed to Divine power. The answer I should give to the question, as we thus put it, is: 1. Some fruits were given to man as they are, and he has only gathered and consumed them. But these are all minor fruits, and such as have only lately come within the reach of civilized man, or are not thought worth his trouble. Cranberries, Persimmons, and Papaws are examples. Whether even such fruits have or not been under a course of improvement irrespective of man, is another question. 2. Others have come to man full flavoured, and nearly all that he has done has been to increase their size and abundance, or extend their season. Currants and Gooseberries, Raspberries and Blackberries, Chestnuts, and, above all, Strawberries are of this class. 3. But most of the esteemed and important fruits, as well as the grains, have not so much been given to man as made by him. The gift outright was mainly plastic, raw material, time and opportunity. As to the cereal grains, it is only of the Oat that we probably know the wild original; of Wheat there has been an ingenious conjecture, partly but insufficiently confirmed by experiment; of the rest, no wild stock is known which is not most likely itself an escape from cultivation. Of some of them, such especially as Maize, not only can no wild original be indicated, but in all probability none exists. So of the staple fruits; of some, the wild originals can be pretty well made out; of more, they are merely conjectural; of some they are quite unknown and, perhaps, long ago extinct."

THE FLOWER GARDEN.

CLIMBERS FOR CORRIDORS AND VERANDAHS.

ARCHITECTURAL features, however beautiful in themselves, are improved both in appearance and interest when judiciously associated with climbing or trailing forms of vegetation. We have many plants suitable for covering balconies and pillars that add very materially to the charms of a well-appointed garden or landscape. The remains of some of our finest abbeys and castles owe much of their beauty to the Ivy that clings lovingly to the ruined arch, or that clambers rampant to the highest point of the massive keep or donjon tower; and what the Ivy is to our old castles and churches, ornamental climbers are to our more modern dwellings. In our town gardens more especially, these graceful plants should find a place, as they require but little attention after being planted, and do much towards softening down the rugged angularities of brick-and-mortar structures, the barren nudity of which is but too obvious in our streets and squares. We have a great wealth of material at hand for such purposes. In planting climbers for covering buildings, protect them from drip from the eaves, as this is fatal to their well doing. Among the forms of vegetation best suited for pillars, balconies, arbours, or porticoes, are Roses, especially the climbing varieties, all of which are very beautiful. The common white Jasmine is a great favourite with us, and the golden-coloured *Jasminum nudiflorum* is very pretty in winter, when trained loosely up a trellis on a fresh green background of the common Ivy. One of the best of all trailing plants is the fragrant lilac-flowered *Wistaria sinensis*, which, as most of us know, blooms very freely on a sunny wall, while its foliage keeps fresh and green until very late in the autumn. We generally see this plant trained horizontally along a wall, but it is much more beautiful when trained up the trunks of Larch, Scotch Firs, or other trees, and allowed to droop down from among their branches in elegant festoons, or its long branches may be trained along the tops of palisades and railings, where it forms fresh green wreaths of foliage all through the summer months. *Aristolochia Sipho* is one of the most noble of all climbers with which to drape balconies or outer walls of town houses, but, like the *Wistaria*, it is deciduous. Those who have seen this beautiful climber on Mr. Fleming's house at Clevedon, or in the garden at Ockham, will not need to be told of the unique effect which it is capable of producing. Mulready was greatly struck with the effect produced by the plant at Ockham, where it grows most luxuriantly, and a graphic pen and ink sketch of its foliage may be seen at South Kensington, the handiwork of that great artist. The common Grape Vine is one of our noblest deciduous climbers, either for corridors or for trellises, while the American and Canadian Vines are very attractive in autumn, when their foliage changes to the brightest tints of crimson and gold. The American Fox Grapes used to grow and fruit very luxuriantly on trellises in the Royal Horticultural Gardens at Chiswick, and they are useful for covering walls or low out-houses along with the green and variegated forms of the common Ivy. *Cotoneaster microphylla* is another excellent evergreen wall-plant, which is always fresh and cheerful, either in spring when covered with snow-

white flowers, or in winter when thickly studded with crimson berries. A very pretty effect may be produced by planting the last-named plant with the golden-flowered *Jasmine nudiflorum*, as the two contrast most effectually when seen together. For town gardens few deciduous trailers surpass the Virginian Creeper which succeeds so well in the neighbourhood of London. It grows quickly, and is invaluable for covering blank walls and trellises in the shortest possible time. Its foliage is fresh and green throughout the summer, and in autumn it dies off, tinted gloriously with glowing crimson, rich brown, and purple. Its congener, the Japan Creeper, is another fine wall plant, which clings firmly to masonry or brickwork. In the Royal Exotic Nursery at Chelsea this species of creeper grows very luxuriantly, covering a cottage and other buildings with admirable effect.

For walls, porticoes, arches, and corridors, such as those represented by our illustrations (from Mr. Delamotte's charming sketches of "Holland House," published by Messrs. Macmillan), few plants are equal to *Clematis Montana*, *C. Jackmanii*, *C. lanuginosa*, and many other varieties of that useful genus are well known on account of their profuse-flowering qualities, and we have seen them grow well and flower freely in exposed positions, even as far north as Leeds. The common Hop plant is also one of our best coverers, and of Honeysuckles there are several species that flower freely. *Solanum jasminoides*, *Bignonia capreolata*, and *B. grandiflora* are likewise all suitable plants for sunny walls on warm soils, where they grow and flower freely; nor must we forget the different kinds of *Magnolia*—*M. grandiflora*, *M. purpurea*, *M. Soulangiana*, and *M. glauca* being the best. *M. grandiflora* and its variety, *exoniensis*, are very useful in warm situations, having glossy evergreen foliage and large fragrant white flowers.



Colonnade at Holland House (exterior view).

THE FLOWER GARDEN IN WINTER AND SPRING.

It is during the winter season that we appreciate flowers most, since many of our favourites are then rendered conspicuous by their absence; but it really requires little trouble or outlay to obtain and keep up a stock of hardy winter and spring-flowering plants and bulbs. After the bedding plants are cleared away is the proper time to dig over the beds and see about planting dwarf evergreen shrubs, bulbs, and trailing plants, so as to hide the bare soil, even if nothing further is attained. If however, as frequently happens, this has not already been done, not a moment should now be lost in making up for loss of time. Those who have seen the beautiful effects obtained by the use of common spring-flowers at Belvoir or Cliveden, will best comprehend what can be done in this way by the judicious use of simple means. No time must now be lost in planting Tulips, Hyacinths, Crocus, and Anemones, the flowers of which do so much towards making the first bright days of spring enjoyable; while Hepaticas, Primulas, Arabis, Aubrietia, Forget-me-nots, variegated *Lamium purpureum*, *Stachys lanata*, *Cerastium*, and other plants equally hardy, will assist in producing an excellent effect. One of the finest of all spring or early summer-flowering plants is the pale blue *Myosotis dissitiflora*, which may be readily propagated in any quantity from seed, and it is simply invaluable for dry banks or beds, not only in the flower garden proper, but also in the

half-wild parts of the pleasure-grounds, where it can be associated with Primroses, Blue Bells, and other native plants. During the early part of the winter, say in November and December, Pompons and other Chrysanthemums are available for the decoration of flower-beds, more especially those nearest to the house. They can be readily propagated from cuttings in April, and may be grown on in pots outside all the summer, so as to be in readiness for removal to the flower garden as soon as the bedders are cleared off in the autumn. The centres of large beds are best filled in with groups of Conifers and evergreen shrubs massed together for effect, leaving margins round the side for spring-blooming plants and bulbs. The best shrubs for the purpose are Retinosporas and Thujas, green and variegated Hollies, and Aucubas. Ivies, and the gold and silver-variegated Periwinkles may be used with good results for edgings and borders. One of the best of all spring-blooming annuals is the *Saponaria calabrica*, the seeds of which should be sown in autumn, on dry banks or borders, and in such positions it will be found a charming companion plant to the blue *Myosotis dissitiflora*, before-mentioned, forming great breadths and patches of the most delicate rosy-lilac colour imaginable, and lasting in bloom for several successive weeks. Of the common Primrose, one of the finest of all spring-blooming plants, we have now many beautiful sorts, varying in colour from pale yellow, through all the shades of lilac and pale rose, to bright rich crimson; and these can scarcely be used too extensively in producing lively effects early in the year. They are easily propagated by dividing the clumps after flowering, when they should be planted in rows in some light deep earth, and well watered, especially during hot dry weather, when they are liable to suffer; for we must remember that naturally the Primrose is a moisture and shade-loving plant, and is too often neglected when the summer bedding-season commences. In partially neglected portions of the lawn or pleasure-grounds very pretty effects may be produced by planting yellow, white, or purple Crocus, Snowdrops, and yellow Daffodils. These peep through the herbage early in the spring, and produce a delightful effect, while the common yellow *Caltha palustris* is well worth naturalising on the margins of ponds, or in wet situations where other plants fail to grow. With the great wealth of material, both British and exotic, at our command, we may make our gardens as delightful in the spring as at any other time of the year, and even more interesting, since the number of distinct species we may employ is far greater and better suited for close examination than are those in general use for bedding purposes during the summer months.

F. W. B.

CARPETING BORDERS BENEATH SHRUBS.

IN places where greenhouse plants are used (says the *Farmer*) to decorate the grounds, whether they are turned out or the pots are plunged, the appearance of the border devoted to them is greatly improved if the surface of the soil be covered with some low-growing and rapidly spreading plant. We have seen *Portulacas* sown broadcast with very good effect, but the trouble with these is, that the seed germinates slowly, and the plants do not make much show until late in the season. The best attempt we have seen at carpeting was where *Gnaphalium lanatum* was used. This bedding plant is propagated with ease, grows rapidly, and soon covers the soil with a carpet of a neutral grey tint, against which bright foliage and flowers show to the best possible advantage. This is a point in gardening that has received less attention than its importance demands. If the soil of beds in which plants are temporarily placed be carpeted with some rapidly growing plant of a pleasing colour, not only is the general effect heightened, but of course much labour in keeping is saved. In permanent shrubberies, too, this is a matter of no little importance. The soil beneath our shrubs is either bare or covered with weeds. Why not grow some pleasing plant which shall cover the ground and save all trouble of weeding? We are trying two plants for this purpose. In one row of shrubs we have set plants of Money-wort (*Lysimachia Nummularia*), which always grows rapidly enough when allowed to become a weed, and which makes as dense a mat as can be desired. In another clump of shrubs we are trying *Cerastium Biebersteini* (a variety of Monse-Ear Chickweed). We have not had either of these long enough upon trial to be able to say more than that they promise well. The common Periwinkle (*Vinca*) would probably be useful in such places, and the Moss Pink (*Phlox*

subulata) might be tried. Could we get a set of low-growing plants that would flourish well beneath the drip of the shrubs, and completely cover the surface, it would not only greatly improve the appearance of our grounds, but do away with the necessity for weeding. When shrubs are set out to remain in one place for years, the soil should be so well prepared at the outset that there will be no need of the annual forking in of manure that many think it necessary to give their shrubberies every spring.

Wintering Alpine Plants in Pots.—The greatest enemy to Alpines in low-lying situations is excessive wet and damp. Accustomed as these miniature gems of the vegetable kingdom are in their native habitats to be frozen dry for nearly six months of the year, it is evident that what they require is not to be protected from cold, for no amount of frost will injure them, but to be sheltered from excessive rain and snow. Where there are large quantities of these plants to be preserved through the winter months, it is scarcely possible to place them all in frames under glass without going to a great expense; therefore, the following plan, which I have now tried for two years may be useful. I place a row of bricks or empty pots on the side of a north wall, and about 12 inches from it; on these I lay the plants with the crowns of foliage onward, in a horizontal position, tier upon tier, with a slight incline towards the wall, filling in between the pots and the wall with fine ashes or sand. It will, therefore, be seen at a glance that the rain falls on the sides of the uppermost row of pots, while the plants in them remain as dry as when they were first placed there. For some Alpines a south aspect is better than a north, especially such as have tomentose foliage.—R. P., York.

Propagation of *Scolopendrium vulgare*, var. *Wardii*.—Having been successful in propagating large quantities of this hardy Fern, which is one of the prettiest of the dwarf-crested and bulb-bearing varieties of the Hart's-tongue, I wish to record my experience for the benefit of your readers, as it very rarely, if ever, produces any fructification. My method of increasing it is as follows:—Procure some good established plants, place them in a warm pit near the glass, and let them remain there for three or four weeks. Then introduce them into the coolest end of the propagating house, still keeping them near the glass. Thus treated, in a short time they produce quantities of small bulbils on the edges of nearly every matured frond, and from these the stock may easily be increased. Prepare a small seed-pan or pot, and half fill it with finely-broken crocks, which cover with rough peat, and fill to within half an inch of the top of the pot with fine soil, consisting of two parts peat, one of well-rotted leaf-mould and another of loam, with a fine admixture of sand, and some finely broken potsherds, all well mixed and finely sifted. Distribute the small bulbils carefully over the surface of the soil in the pans thus prepared; water rather sparingly, cover with a square of glass, and place them in a cool part of the propagating-house case. Under ordinary circumstances, they will be ready in three months for transplanting into store pots, prepared as the pans were, and as they make progress in growth they may be potted and gradually hardened off, until eventually they are planted in a moist nook in the outdoor Fernery or rock-work, or even in a greenhouse, where they are seen to better advantage.—S.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Culture of the Double Primroses.—I have repeatedly failed to grow these well and increase them rapidly, and shall be greatly obliged if any correspondent of THE GARDEN will kindly tell me what is most essential to success with these lovely hardy plants.—J. N. H.

Crimson Chilian Beet.—This forms a beautiful indoor decorative plant if potted and removed to a warm greenhouse in autumn. It soon establishes itself and throws out its fine glossy crimson-veined foliage in great quantities, the colour being very bright and effective mingled with fresh green Ferns, Palms, and other fine-foliated plants. Grown in pots it is very useful for conservatory decoration during the winter season.—Q.

Adiantum Hendersonii.—I consider this to be one of the most useful of all the *Adiantums*, more especially for table decoration. Its young fronds are of a bright purple tint, and contrast well with those more fully developed, while the whole plant has a graceful appearance, its fronds drooping on all sides very elegantly. It will be found to be invaluable in pots for decorative purposes or for cutting, and it grows well in but a moderate temperature.—A.

Viola White Swan.—In my notice respecting this new bedding *Viola* in a previous number of THE GARDEN, I omitted to mention that it is an exceedingly early bloomer. As it was a seedling of the previous summer, of course that point in its character had not been tested, but now that we are passing through the chill season, it is gratifying to find that this *Viola* proves itself to be the very earliest variety in cultivation, every shoot of it being now in bloom, whilst not a bud is visible on any other *Viola* or Pansy. If this earliness to flower should prove to be of a permanent character, I am disposed to believe that this white-flowering *Viola* will become a most useful plant to grow for the supply of white blooms during the winter months.—A. D.

THE ARBORETUM.

ORNAMENTAL EVERGREEN BERBERRIES.

SOME of these come to us from the west, some from the east. America has contributed a large number, and has an abundance of others in store to reward the enterprising collector. Nor does the warmer part of Asia yield the palm in this respect. The evergreen Berberries should be divided into three principal groups, viz:—I. Those in which the leaves are simple, and the flowers solitary, or fasciated in the axils of the leaves.—II. Those in which the leaves are simple and the flowers in lengthened racemes or panicles.—III. Those in which the leaves are pinnated. In this order they are treated of here.

Leaves simple, Flowers solitary, or, if in Clusters, one only on a Stalk; the Stalks all springing from the Axils of the Leaves.

Crowberry-leaved (*B. empetrifolia*).—From the country lying between the Straits of Magellan and the Cordillera near Valparaiso. A little trailing bush, with stiff three-parted spines, and linear pungent leaves, not unlike those of *Genista anglica*, bright green, clustered, and about an inch long. From their axils appear, in the month of May, a few bright yellow flowers, growing singly or in pairs, on stalks shorter than the leaves. This is a well-known plant, suited for rock-work in a mild climate, but among the less valuable of the genus.

Box-leaved (*B. buxifolia*).—A very common plant all over the southern regions of South America, throughout Patagonia, Chiloe, Tierra del Fuego, and the Straits of Magellan. In gardens it forms a straggling bush, with small ovate, or oblong, spiny-pointed, toothless leaves, of a dull dark-green above, and somewhat glaucous with indistinct veins beneath. When the bush is old, it produces an abundance of strong three-parted spines, which are longer than the leaves, some of which are toothed, and obovate instead of ovate. The flowers grow singly or in clusters, are very deep yellow, and rather larger than usual in the genus. It is almost universally known in gardens by the erroneous name of *B. dulcis*; but I have it from Messrs. Veitch under its correct designation, they having raised it direct from seeds collected by Mr. T. Lobb. In its early state, the leaves are much rounder than in the more advanced stage. In "*Flora Antarctica*," is the following account of the wild plant:—"This is a variable species, especially in the foliage, exhibiting a different aspect at different seasons of the year. In spring, when the flowering commences, fascicles of new leaves are produced, which are pale green, membranous, and entire. At this period the leaves of the former season begin falling, while those of the present year gradually become larger, stiffer, coriaceous, and generally mucronate or pungent at the apex. They are not fully developed till autumn, when they are generally quite entire, attenuated at the base, and shortly petiolate, about half an inch long, rigid and coriaceous, reticulated on the upper surface; during the following spring these in their turn fall away. In seedling plants the leaves are larger than at any future time, on long petioles, broader, and here and there furnished with spinous teeth. The flowers are pale yellow, generally in threes, but sometimes solitary. The berries, about the size of a small Pea, were much used for tarts by the officers of the *Beagle* and found excellent. The *B. dulcis*, of Sweet, agrees with the common form of this plant, except that the flowers are larger in that author's figure, and the pubescence of the pedicels not visible in the wild specimens. The *B. inermis* seems a variety, some of the specimens being quite unarmed: indeed, the spines of this genus afford but an inconstant character." For the purposes of cultivators it may be desirable to distinguish the true *B. buxifolia* from the Straits of Magellan, from the *B. dulcis* from Valdivia. The latter has larger and more spatu-



Colonnade at Holland House (interior view, see p. 29).

late leaves, larger fruit, and is more deciduous. The former is also a dwarfer plant. They are not, however, specifically distinct.

Yellow (*B. lutea*).—A native of the mountains near Veto in Peru, at the height of 12,000 feet above the sea. Ruiz and Pavon say that it grows in coldish places (*locis frigidiusculis*). In its wild stations this is said to be an evergreen bush as much as 18 feet high; it has, however, all the appearance of being much smaller. The branches are downy, and thickly covered with small leaves the size and colour of *B. Darwinii*, oblong, with three or more spiny teeth when young, perfectly undivided, narrower, and mucronate in old plants. The spines are small and slightly three-parted. The flowers grow in fascicles from among the leaves, on slightly downy foot-stalks. It has stood out during two winters with Messrs. Veitch. It is a very pretty little species, and, if hardy, will almost rank with *B. Darwinii*, from which it differs in its flowers not being in racemes.

Wallich's (*B. Wallichiana*).—An evergreen of most beautiful aspect, with brown branches, a very dark green dense foliage, and long, slender, three-parted spines. The leaves grow in clusters, are about 3 or 4 inches long, with a sharp prickly point, and numerous fine serratures, ending in a straight point on each side; on the upper side they are a rich bright green, turning to a claret colour in the autumn, and remarkably netted; on the under side they are pale green and shining. Wallich describes the flowers as growing

on foot-stalks, clustered in a round dense fascicle, and pale yellow. As it is a Java plant, it may be the *B. xanthoxylon* mentioned, but not described, in Hasskarl's "*Hortus Bogoriensis*." If so, that name must give way to Dr. Wallich's.

Leaves simple. Flowers in Racemes or Panicles.

Ilex-leaved (*B. ilicifolia*).—Wild in Tierra del Fuego and about the Straits of Magellan. This very rare shrub is described as being a straggling bush about 8 feet high, and the handsomest species of the genus. It has bright glossy Holly-leaved foliage, large clusters of fine orange-coloured flowers, and berries of a deep steel blue tint. The leaves are described as being obovate, petiolate, acute, coriaceous, dark shining green, especially above, pale beneath; the margin coarsely and distantly serrated, and each serrature armed with a distinct spar. The plant which flowered

at Kew is unfortunately dead, and the species requires to be re-introduced. There is not a more ornamental hardy shrub in any of our foreign possessions.

Darwin's (*B. Darwinii*).—Chiloe and Patagonia. An evergreen shrub 3 to 5 feet high, of extraordinary beauty, and conspicuous for its ferruginous shoots, by which it is at once recognised. The leaves of the deepest green, shining as if polished, not more than $\frac{3}{4}$ inch long, pale green, with the principal veins conspicuous on the under side, with three large spiny teeth at the end, and about one or two more on each side near the middle. Although small, the leaves are placed so near together that the branches themselves are concealed. The flowers are in erect racemes, and of the same deep orange-yellow as in the Box-leaved species.

Small-flowered (*B. parviflora*).—Supposed to be a native of South America. It is a pale-wooded evergreen bush, with slender branches, small, rather fine spines, and bright green leaves, without a trace of glaucousness. The leaves are about $1\frac{1}{2}$ inches long by $\frac{1}{2}$ an inch wide, and have pretty exactly the form of a lengthened wedge, whose upper end is almost always divided into three nearly equal coarse spiny teeth; other teeth, however, occasionally appear at the sides. The flowers are unusually small, and grow five or six together in nodding clusters, whose stalks are nearly as long as the leaves. Among all the evergreen species this is known at first sight by the form of its leaves. Perhaps its nearest relation is *B. Lycium*. It differs from *B. virgata*, whose name it sometimes bears, in the form

of its leaves, and especially in the flowers being racemose, not solitary. It is a true evergreen, perfectly hardy, and rather handsome.

Loxa (*B. loxensis*).—If it were not for its smaller size and much more diminutive flowers, this would be regarded as a variety of *B. Jamiesoni*. It has small palmated spines, and very shining, blunt, obovate, bright green leaves, of nearly the same colour on both sides; they seem to have in all cases a spiny point, and very often several teeth at the sides. The flowers are unusually small, and stand erect in panicle racemes on a long peduncle quite clear of the leaves. Its hardness is uncertain; but its beautiful foliage makes it worth some protection if necessary.

Wavy (*B. undulata*).—From the mountains of Peru. This has slender branches, and weak palmated spines. The leaves are dull green, scarcely glaucous, oblong, tapering to the base, remarkably wavy, and furnished with a few spiny distant teeth, without any distinct trace of netted veins. In a wild state it is a stout stiff bush, with three-parted or five-parted spines, sometimes as much as 1½ inches long. The leaves are thick, narrower than in the cultivated plant, but still preserve their undulated appearance. The flowers appear in small roundish, nearly sessile racemes, which are scarcely so long as the leaves. In this state it is not unlike the figure of *B. flexuosa* in the "Flora Peruviana," but the spines are not corky at the base, the racemes are much shorter, the flowers smaller, and the leaves thicker. It is a hardy evergreen shrub, from 4 to 6 feet high.

Orange-flowered (*B. anahuacensis*).—Found in the province of New Granada, near the village of Anrahnae-Taquina, in the Sierra Nevada, or Snowy Mountains, at about 9,000 feet above the sea, near the snow-line. It is an elegant shrub, with straight erect branches, and to be distinguished by bearing leaves of two sorts: the lower cordate, slightly enlarged and angular in the sinus where they are joined by the petiole, which is very long; the upper obovate, elliptical, tapering to the base, coriaceous, wavy, with a few marginal spiny teeth near the end, very glaucous beneath. The flowers are in compact racemes, drooping, and very deep yellow.

Jamieson's (*B. Jamiesoni*).—This very beautiful Peruvian bush has leaves of the deepest green and most lucid surface; they appear in fascicles, and are nearly 3 inches long when full grown; in form they are oblong, a little narrowed at the base, with a spiny point, and a few spiny toothings on each side, or with scarcely any; beneath they are pale green without a trace of glaucousness. The flowers are in close, somewhat erect, panicle racemes, about 3 inches long. This must certainly be a plant of great value in gardens. Not so hardy as Wallich's Berberry.

Whitened (*B. dealbata*).—From the mountains of New Granada. A good-looking shrub, with stout brown branches, scarcely spiny, and undulated leaves of a bluish-green on the upper side, and almost white beneath. The latter are generally truncate, with three spiny teeth at the end, and two or three more at the sides, sometimes 2 inches long, and 1½ wide. In the "Botanical Register" they are not well represented, being much too small, and not distinctly enough truncate. The flowers appear in April, in short, oblong, very compact drooping yellow racemes.

White-backed (*B. hypoleuca*).—One of the stentest of the genus, with strong, very pale, erect branches. The spines are unusually small for the size of the shrub. The leaves are larger than in any other simple-leaved species, sometimes measuring 4 inches in length by 2 in breadth; they are leathery, strongly netted, dull dark green, and very white underneath; at the edge they are furnished with coarse rather spiny teeth. The flowers are about the size of those of *B. vulgaris*, and appear sparingly in long-stalked corymbs. It is a remarkably fine species, likely to rival the Kushmul in stature. It is truly evergreen, but is sometimes slightly injured in the foliage by a severe winter.

Kushmul (*B. asiatica*).—Found in all the mountainous country north of Hindostan, where it appears to be called Kushmul. It is correctly distinguished from the Chitra, or *B. aristata*, by Dr. Royle. This is the largest of the species in cultivation, growing quickly to the height of 8 or 10 feet, with pale erect branches, rather small spines, and a beautiful lucid, bright green, glaucous foliage. The leaves are oblong, tapering to the base, and a good deal netted when old; as in all the Indian species, they are toothed in various degrees, according to age or other circumstances; when toothed they are invariably scalloped, as it were, and not serrated as in the Chitra. The flowers grow in very short, roundish, sessile racemes, scarcely projecting beyond the leaves, and are succeeded by clusters of dark purple roundish berries, covered with a rich bloom like a Plum. In India these are dried and sold as raisins, which they much resemble, except in size. It is the best known of all the Indian Berberies, having been longest in cultivation, and in the south-west of England has become extremely common. Thousands of plants have been distributed by the Horticultural Society. Nowhere, however, has it

been cultivated, with so much success, or on so large a scale, as at Killerton, the seat of Sir Thomas Dyke Acland, Bart., from whose gardener I have received the following account:—"About eighteen years ago I received a packet of seed of *Berberis asiatica*, from which I raised about 100 plants. After keeping them two or three years in the nursery, I planted them out singly in different situations both at Killerton and Holmeate. The plants grew vigorously, were allowed to make their natural growth, and in a few years, at the latter place, began to seed. Being near the sea, the late spring frosts did not kill the blossoms; and from those plants we have now, for several years, obtained many pounds of seed, the plants being upwards of 14 feet high, and as many in diameter. From the commencement of their ripening with us, the seeds have been sown annually in drills, or broadcast in beds in the open ground, about the first week in March, in a light soil, letting them remain in the above situation until the spring after. I then plant them out in the nursery in rows, about 15 inches from row to row, and about 6 inches from plant to plant. In two years they make fine strong bushes for permanent situations. Finding the plants to be free growers, nearly evergreen, and very strong, and raising many thousands per year, I began, by the desire of my employer, to plant them out for hedges, and they succeed particularly well, either planted on banks or on the bare surface. The latter I can highly recommend for dividing allotments in cottage gardens, this Berberry being free from mildew; and it can be kept clipped with shears or shorn with a reaping-hook to any width required. When planted on a bank, it makes a beautiful hedge by cutting out with a knife the very luxuriant shoots about twice a year to within an inch or two from where they grow, allowing the side and weak growth to form the hedge. I have a hedge at Killerton so treated, which has been planted upwards of twelve years, and at this time is not more than 4 feet high and about the same width; and with the same treatment it can be kept to the same size. I should recommend, in planting hedges, to keep the plants a foot apart, and, if the hedges are to be kept shorn, in a single row; but if to be kept in the more natural growth, plant two rows, not more than 1 foot apart, and the plants the same, but put in alternately. When strong, this Berberry is proof against any cattle. Last spring I planted a stout bush in the deer park without protection. They have rattled it with their horns, but they have not killed it. It can be planted nearer a fence where cattle have access than any shrub I know." It is, indeed, a most valuable plant, and hardy enough to defy the rigour of any frosts south of the Humber. Many varieties are to be found in gardens, but they are not different in important characters.

Chitra (*B. aristata*).—Long known as a Nepal plant, and more particularly described by Dr. Royle as inhabiting the Himalayas at from 5,000 to 8,000 feet of elevation, from Jurreepanee to Mussooree, and on the Choor Mountain: its hill name is Chitra. It is also found on Nuera Ellia, in Ceylon, and probably grows along the whole of the Neilgherry range. By no means uncommon in gardens, where it forms a stout evergreen bush, with dark brownish-red spreading branches, and shining rich green leaves, usually fringed with bristle-pointed, fine, close serratures, whence its specific name. The flowers are large, bright, not dark, yellow, in loose, panicle, long-stalked racemes hanging down beyond the leaves. They are succeeded by an abundance of red, bloomless, oblong, acid berries, which hang on the branches till Christmas. The fine, close, bristle-pointed serratures of the leaves, the rich reddish-brown branches, and the long, loose, panicle racemes of flowers are quite peculiar to this plant, and separate it clearly from every other. Dr. Royle tells us that its fruit forms a part of the hill "raisins" of Nepal; in England they acquire no bloom, and would not readily dry. Like *B. asiatica*, this produces several varieties, one of which I propose to call the "entire-leaved Chitra" (*B. aristata integrifolia*). It is distinguished by the edges of the leaves being almost wholly destitute of bristles, and is known in some gardens under the false name of *B. Wallichiana*, to which it bears no resemblance. The plant figured in the "Exotic Flora" has the leaves of *B. petiolaris* of Wallich, a species which I have not myself seen alive; at least their toothed, not serrated, margin would lead to such a conjecture; at the same time the flowers are exactly like those of *B. aristata*.

Umbelled (*B. umbellata*).—Dr. Wallich's collectors appear to have first discovered this plant in Kamaon and Gossain Than. For its introduction to our gardens we are indebted to the East India Company. It is a hardy bush, about 4 feet high, with a spreading manner of growth, pale brown, angular branches, slender three-parted spines, and very narrow, bluish-green leaves, strikingly glaucous beneath; on an average they are 1½ inches long by ½ wide; sometimes they are perfectly entire, in which state they are represented in the "Botanical Register"; but they are more commonly furnished with a strong, marginal, spiny tooth or two, and sometimes with many. (Can this state be the *B. ceratophylla*?)

of G. Don?) The flowers are pale yellow, in drooping, narrow racemes, and are succeeded by an abundance of oblong purplish fruits. The species is very pretty, in consequence of its graceful manner of growth. It is best suited for growing among rough places, such as heaps of rock-work, where its spreading way of branching can best be seen. It is not, however, a good evergreen; the leaves being too thin and pallid.

Dyer's (B. tinctoria).—Found wild in the Neilgherry Mountains, whence it was lately introduced by the East India Company. The plants in gardens are slender brown-wooded shrubs, with small slender spines, usually three-parted. The leaves are thin, not shining, dull green above, glaucous beneath, oblong, blunt, with a spiny point, but scarcely spiny-toothed, except on the seedling plant. The flowers have not hitherto appeared. They are represented by Dr. Wight as standing erect in loose racemes scarcely longer than the leaves, and succeeded by an abundance of dull red fruit. In the absence of such evidence there would be some doubt as to this; for botanists have evidently misunderstood the distinctions of some of the Indian Berberies. M. Delessert, for instance, figures a *B. tinctoria*, declaring at the same time that it is nothing but *B. asiatica*; yet *B. asiatica* has no resemblance to the plant now described, whose leaves are glaucous, not bright green, thin, not coriaceous, almost veinless, not strongly netted. Dr. Wallich, on the other hand, distributed, under the name of *B. tinctoria*, specimens which in part at least belong to *B. aristata*. But the specimen from Leschenault in Wallich's Herbarium, deposited with the Linnean Society, is extremely glaucous beneath, and appears to agree with the garden plant, as it does with Dr. Wight's figure. It appears to be only a sub-evergreen, and to be tolerably hardy. Its name has been given it in consequence of its furnishing, like other species, a fine yellow dye. Vauquelin states that it is inferior to few woods for that purpose.

Ophthalmic (B. Lycium).—According to Dr.

Royle, this occurs in the Himalayas from Rajpore to Mussooree, at an elevation of from 3,000 to 7,000 feet; also from Nahn to Choor. This bush derives its name from having been discovered by Dr. Royle to be the real *Lycium indicum* of the Greek physicians. To this day its extract is used against ophthalmia with great success, as in the time of Dioscorides. Its branches are erect, pale brown, and angular, armed with three-parted spines of unusual length for the size of the leaves. The latter, when young, are glaucous on the under-side; but in winter they are nearly green, and become a dull, unpleasant, brownish-red. In form they are oblong-lanceolate, spiny-pointed, with several lateral spiny teeth; sometimes, however, they are toothless. The flowers grow in long, erect, somewhat paniced racemes, much longer than the leaves. This is a bad evergreen, but a pretty summer bush. It is perfectly hardy.

Leaves Pinnated, or Trifoliolate. Ash-leaved Berberies or Mahonias.

Three-leaved (B. trifoliata).—In the North of Mexico, among stunted Mimosa and Cacti, this plant is found occupying large tracts of country. It is a charming evergreen bush, with prickly, deeply scalloped leaves, having bluish-green variegated leaflets, in threes, sessile at the end of a stalk either longer or shorter than themselves. On the under side they are quite glaucous. The wood is hard, reddish-brown, and somewhat streaky. The flowers are pale clear yellow, growing from three to five together, in small nearly sessile racemes, in the axils of the leaves. The fruit has not been yet

formed in this country; it is said to be eaten by the children that inhabit its native wildernesses. It grows 3 or 4 feet high, and has hitherto proved hardy near London.

Thin-leaved (B. tenuifolia).—A Mexican shrub, from the foot of Orizaba. No probability exists of this graceful plant being hardy, it being destroyed by only a few degrees of frost. It is easily distinguished by the leaflets of its long pinnated leaves being ovate-lanceolate, pale bright green, and perfectly free from all trace of toothing. Its flowers appear in abundance in long, simple, erect, loose, open racemes, opening, in the month of December, in a greenhouse. It is said to grow 10 feet high in its native places, and is a good conservatory plant.

Pallid (B. pallida).—An evergreen shrub, from 5 to 6 feet high, from the mountains of Mexico. A handsome species, with pinnated slightly prickly leaves, and long paniced racemes of pale yellow flowers, succeeded by globular, dark purple, glaucous fruit, the taste of which is not only unpleasant, but particularly acrid. It makes a fine greenhouse shrub, but is too tender for the neighbourhood of London.

Prickly (B. fascicularis).—A species confined apparently to the lowlands of California and the north of Mexico. With much the appearance of the Holly-leaved Berberry, this is, I apprehend, a distinct species; when alive, distinguishable by its much more prickly leaves, and their want of lucidity, especially on the under side, which is as unpolished as in the Creeping Berberry. It is also more

arborescent; its inflorescence is much more compact, and it is far more impatient of cold, not living in the open air near London, except under the shelter of a roofed wall. A hybrid, between it and *B. Aquifolium*, exists in cultivation, said to have been raised by Mr. Rivers. It is of a larger growth than the prickly Berberry, and has its compact inflorescence and dull hard leaves, but all the habit of the Holly-leaved. This *Berberis hybrida* is a good-looking evergreen, and perfectly hardy.



Berberis nepalensis.

Nepal Ash-leaved (B. upepalensis).—A native of the mountains of Northern India, extending as far to the eastward as the Manipoor country, according to Roxburgh. It has, as will be seen by the accompanying illustration, pinnated leaves a foot and more in length, with five or six pairs of sessile, ovate, obliquely cordate, coarsely spiny-toothed leaflets, the largest of which are 3 inches long and 1 inch broad. From among them rise erect, simple racemes of large flowers, sometimes as much as 6 inches long. The fruit is oblong and dark purple. The leaves of the seedlings are glaucous on the under side. It was raised at Chiswick from seeds supplied by the East India Company.

Holly-leaved (B. Aquifolium).—All over the north-western parts of North America, both in the Hudson Bay Company's territory and in Oregon, this plant is found in woods. It does not appear to inhabit California. Than this we have no finer evergreen in cultivation. Hardy enough to bear all winters, putting forth its half-transparent rosy foliage in the spring, hardening it into a gloss and texture not inferior to those of the common Holly, and bearing in the autumn enormous quantities of large globular deep purple berries, covered with a bloom that rivals that of the finest raisins, this shrub is certainly one of the most valuable of the numerous species for the introduction of which Europe is indebted to the Royal Horticultural Society. It thrives in sandy or clayey land, in wet places, or on precipices, overshadowed by trees, or exposed unsheltered to the sun. In the latter situation it bears fruit most abundantly, and therefore may be ranked as the first among bushes

suitable for rock-work. This character applies however, strictly, only to the true Holly-leaved Berberry, the leaves of which are a bright clear green, very shining, even on the under side, and a rich vinous red along the leaf-stalks. In the nurseries are numerous varieties of inferior merit, with broader leaves, not shining on either side, of a duller green, and apparently hybrid varieties between this and the Creeping Berberry (*B. repens*). They, too, are fine evergreens, but not so handsome as the genuine original kind. It is desirable that they should be separated by the nurserymen who deal in them.

Creeping (*B. repens*).—A native of North-West America, according to United States nurserymen, by whom it was first sent to Europe. I suspect, however, that it is confined to the Rocky Mountains, for it is not among Douglas's plants, and it has lately been met with on the mountains of New Mexico by Mr. Fendler, by whom it has been distributed under the name of *B. Aquifolium*. It is the opinion of many botanists both in Europe and the United States, that this is a mere variety of the Holly-leaved Berberry. I cannot agree with them, unless they use the word species in the same sense as those who identify the dog with the wolf and jackal. The Creeping Berberry owes its name to its great tendency to form what are called creeping roots, for which it is much more remarkable than the Holly-leaved. It is a dwarf bush of no great beauty, scarcely exceeding a foot in height; its leaflets are not shining, are not sharp-pointed, are little prickly, but are roundish, of a dull glaucous green, and few in number. Moreover, it has few of the good qualities which distinguish the other. It is, however, to be observed that it breeds freely with the Holly-leaved, and from this mixed parentage has probably arisen the spurious form of the Holly-leaved to which I have alluded in mentioning that species. It can scarcely be said to be worth cultivating except in botanical gardens.

Chaffy-stemmed (*C. glumacea*).—Found in shady Pine woods at the mouth of the Columbia, N.W. America, where it is common. This well-known plant forms a close bush, about a foot high, and produces every year an abundance of upright racemes of pale yellow flowers, succeeded by globular purple berries, covered by a fine bloom. Their taste is austere and acid. The species derives its name from its stem being covered by the long persistent lanceolate scales of the leaf-buds, which continue to clothe the stem like coarse chaff for many years. (Something of the same kind occurs in Fortune's Chinese Berberry). The leaves are nearly 18 inches long, and bear about six pairs of sessile leaflets, quite similar in form to those of *B. nepalensis*, pale green on both sides, lucid on the under, with a reddish petiole. In the "Botanical Register" it is remarked that, although perfectly hardy, this little plant cannot bear that the extremities of its shoots should be removed. It seems to have little power of developing new axillary buds if the terminal one is destroyed; so that, if injured, it either dies outright or remains in a stunted state.

Acanthus-leaved (*B. Leschenaultii*).—Dr. Wight says that this is found in almost every clump of jungle about Ootacamund, in the Neilgherries, flowering during the S.W. monsoon and at other seasons; the fruit, which is bluish-purple, ripening in the dry season. As far as we know anything of this, it must be a still nobler plant than *B. nepalensis*, its leaves being almost 18 inches long, with eleven or twelve pairs of leaflets, which seem to be harder and shorter, and much more closely set upon the petiole, than in *B. nepalensis*; the fruit, too, is globular, not oblong.

Japanese (*B. japonica*).—The earliest account of this is to be found in Thunberg's "Flora Japonica," where it is mentioned under the name of *Ilex japonica*, that traveller having mistaken a leaf for a branch, and the leaflets for true leaves. He found it cultivated under the name of Sassa Nanting, in Nippon, where he observed it while on his journey to the Court of Japan. Dr. Robert Brown afterwards, in 1818, pointed out this strange blunder, which indeed was sufficiently evident from the figure of the so called *Ilex* published by Thunberg himself in the year 1802. Mr. Fortune states that it grows from 100 to 150 miles N. of Shanghai, and that it is the most gigantic of the Berberries. The leaves are of a stout leathery texture, large and handsome.—*Horticultural Society's Journal*. [Can any of our readers tell us how many other species of this fine family are in our gardens at the present time?]

TREE GROWTH IN SOUTH AUSTRALIA.

PERHAPS it may interest some of your readers, as illustrative of the rapid growth of some trees here, if I state that a *Cupressus macrocarpa* planted eleven years ago is now 33 feet through, and the same in height. This is considered the finest specimen here, but as it is growing in sandy soil, I presume it will not live very long. This, of

course, is the Lambertiana variety, as distinguished from trees raised from seed, which are far less spreading in their habit. In *Sequoia gigantea* you undoubtedly beat us. I have one planted eight years since, that now measures 12 feet through, the branches reposing beautifully all round on the Grass, and is 21 feet high; the girth of stem, 1 foot from the ground, is 42 inches. This beautifully symmetrical tree is growing in sandy ground only 2 feet deep, overlying a 6-inch bed of gravel, under which is a compact bed of clay, rather sandy than otherwise. I was surprised a few months ago to find that its roots had not apparently penetrated the layer of gravel in the bed of clay below, for, on transplanting an *Araucaria excelsa* that was becoming too near to it, no roots of either appeared even in the gravel; indeed, we had some difficulty in transplanting the *Araucaria* owing to the gravel dropping away from under the ball during the excavation, being upheld by no roots whatever. However, the transplanting was successfully performed, and the tree is now in perfect health, four months having since elapsed. But for its perfect symmetry I would not have ventured on so heavy a work, for which, however, I am now well repaid. This tree is not so very large, having been planted at the same time as the *Wellingtonia*, but I have seldom seen one so perfectly symmetrical. It measures through its lower tier of branches just 18 feet, and is 21 feet 6 inches high. There are many much larger trees here, but the extension of the lower branches is generally interfered with by small subjects being planted near the trees when young. I may, perhaps, add that I have never seen an *A. imbricata* here with branches apparently so intricate and crowded as the one figured at p. 398 Vol. III. of THE GARDEN; it must be a truly magnificent specimen, ours here are much more bare, each branch and branchlet standing out clearly and distinctly. *A. Cunninghamii*, as it grows here, is more like it. My garden just now is almost too strongly redolent of the odour from Orange blossoms. My oldest plants are now about eight years old, and have borne fine fruit for years; some of the trees are 11 feet through, and about the same in height. I allow the lower branches to lie almost on the ground, in preference to forming a clear stem such as you see in the Orange-boxes in France; the ground is thus kept cool above the roots, which I find always very near to the surface, but not so close as where a mulch is used.

JOSEPH SAYCE.

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A Good Hedge Plant.—In a prize essay on the subject of hedges, a Canadian writer recommends the Honey Locust (*Gleditsia triacanthos*) as a hedge plant for northern localities. He is "convinced from experience and observation that for a hedge plant suitable to the requirements of a very cold country, there is none superior to the Honey Locust. The following are a few of its superior qualities:—1. That it will stand the severest winters of this latitude uninjured. 2. There is no hedge plant that will grow with us and make a hedge in so short a time. 3. When it once becomes a fence, it will, with little care, remain so; not like some plants, in which, when kept constantly pruned, the lower branches die out, and thus make an ineffectual hedge. Some may imagine it to be only the common Locust growing here as an ornamental tree. It belongs, in fact, to a family of plants which do not sprout, and upon which the borer never works. The red bud and Kentucky Coffee tree belong to the same order as the so-called Honey Locust. There is a Honey Locust hedge at Elizabethtown, New Jersey, over forty years old. It is one mile in length, and has always been tight and strong, and is at this time known to be the best hedge on the continent. The hedges of J. L. Budd, of Benton County, Iowa, some four miles in length, are also beautiful, symmetrical, and a perfect protection against all farm stock. I mention these two instances because the one is in the rich prairies of the West, and the other in the sterile soil of the East."

NOTES AND QUESTIONS ON TREES AND SHRUBS.

A Fine Maiden-hair Tree.—In the Botanical Garden, at Pisa, Italy, is a Ginkgo, or Maiden-hair tree (*Salisburia adiantifolia*), which has attained the height of nearly 90 feet, and at 3 feet from the ground is 9 feet 7 inches in circumference. It was received from England and planted in 1788. It is a splendid tree, and very remarkable for the rich golden colour which the leaves assume before falling.

A New Beech Blight.—In Westphalia the Beech trees have been recently attacked, it is said, by a new form of blight, which commences on the bark, and finally covers it with a snow-white down, to the ultimate destruction of the tree. Under the microscope this blight is seen to consist of fine threads, among which there occurs a small insect, apparently an undescribed species. The threads, which are secreted by the insect, are of wax, which has a melting point of about 80 degrees, and the percentage composition of which is, carbon 81.39, hydrogen 13.65, and oxygen 5.03. Both as regards its composition and melting-point, this new wax is very near that of Chinese wax.

THE INDOOR GARDEN.

TREE-FERNS.

(Continued from p. 9.)

Cibotium.

This is a genus of Dicksoniæ, distinguished by its two-valved coriaceous involucre. The veins are forked and venules free, bearing dentiform reflexed sori, the receptacles being punctiform and terminal. The celebrated Tartarian Lamb, *C. glaucescens*, belongs to this genus, but, as its growth is decumbent and not arborescent, it will not be included in the present enumeration.

C. Schiedeii.—A beautiful cool-house Fern. Stem from 10 to 15 feet high, though trunks of this size must be very old, judging from the very slow progress they make in this country. Its fronds are spreading and pendent, from 6 to 12 and 15 feet long, bipinnate, the pinnules being small and deeply pinnatifid, light pleasing green on the upper side, and glaucous below. The involucre containing the sori are situated near the margins, and resemble little boxes. Stipes and rachis, as well as the crown, densely furnished with long woolly hairs of a light chestnut colour. Native of Mexico.

C. regale.—Until within a few weeks, it had been questionable with me whether this plant is a true *Cibotium*. Having, however, now found it in a fertile state, I have no longer any doubts on the matter. *C. regale* is at once a magnificent and elegant species, its broad erect arching fronds, with its finely-divided rich green pinnules, rendering it extremely ornamental. The stipes, rachis, and crown are densely clothed with long silky cinnamon-coloured hairs, which add materially to their beauty. It seems to form a trunk far more quickly than the last-named species, and, like it, thrives well in a cool or intermediate Fernery. Native of Mexico.

C. spectabile.—This plant resembles the preceding, in a young state especially; but, with age, I apprehend it will become very distinct. It is a free-growing handsome Tree-Fern, differing from *C. regale* principally in the colour of the long hairs which clothe the crown of the plant and the base of the fronds, which, in this plant, are ashy-grey or slightly tawny. Both these plants are undescribed in English books, so far as I am aware, but both are well deserving a place in every Fern collection. Native of Mexico.

C. Menziesii.—The first living plant of this species that came to this country, came under my care, and, as the genus was always a favourite with me, and the species belonging to it very few, those who are enthusiastic in their love for plants will quite understand the pleasure it afforded me. It is erect in growth and, in all probability, forms a stout stem, although I cannot speak positively on this point, having never seen a trunk higher than a few inches; the fronds are bipinnate, and leathery in texture; pinnæ large and pinnatifid, the segments being broad and obtuse. The involucre are very large and of great substance, and situated at the base of the sinus. The fronds are dark green in colour, the stipes and crown of the plant being clothed with short dun-coloured woolly hairs. Native of the Sandwich Islands.

Hemitelia.

A magnificent family of slender-stemmed stove Ferns, characterised by their simple or pinnately-forked veins and free venules, the lower pair of which, becoming united, form costal areoles. The sori are medial, enclosed in a half-cup-shaped involucre. This genus has always been to me a very fascinating one, the broad fronds, ornamented with the regular lines of large sori, rendering the plants very ornamental and very tropical in appearance. They require stove heat, and delight in an atmosphere well charged with moisture. The soil should be peat and loam in the proportion of two parts of the former to one of the latter, to which should be added a good portion of sand.

H. speciosa.—This species makes a stem tolerably quickly, but I am uncertain what height it attains in its native country. The fronds are very large, erect, and spreading, and are destitute of spines; pinnæ, deep green, from 12 to 15 inches long, broad and slightly lobed at the edges. The numerous large sori are situated near the margin in this species, forming a conspicuous broad continuous band. Crown of plant and base of fronds furnished with large dark brown scales. Native of Brazil and Caraccas.

H. grandifolia.—Stem 6 feet or more high. The fronds are from 6 to 7 feet in length, pinnate; pinnæ large, about a foot long, and pinnatifid; colour, bright shining green. The crown is furnished with scales, and the base of the fronds are spiny. It is a very noble plant. Native of several of the West Indian Islands.

H. horrida.—A truly grand plant; stem, some 8 or 10 feet high, perhaps more; fronds from 6 to 10 feet long, broadly lanceolate in outline, bipinnate; pinnules pinnatifid, and from 12 to 18 inches long, bright green on the upper side, paler below, where they are also slightly tomentose. The sori form a conspicuous and beautiful

ornament; the base of the fronds is scaly, and armed with long stout spines. Native of the West India Islands.

H. obtusa.—Nearly allied to *H. grandifolia*, yet distinct as seen growing side by side. The fronds are large, pinnate; the pinnules being deeply pinnatifid, and deep green in colour. The under side is furnished with a few whitish scales which, however, soon fall off. The base of the fronds is also furnished with short spines, as is the case with nearly the whole of the species. The sori form a beautiful ornament to the under side of the fronds. Native of the West Indian Islands.

H. Karsteniana.—This species is somewhat rare in our collections, but it must be a superb plant when it has arrived at maturity. On young specimens the fronds are very long, pinnate, with pinnæ from 10 to 12 inches long, obtusely lobed and deep green in colour. Native of Venezuela.

H. spectabilis.—Like the preceding, this is at present rare in collections, and only to be met with in the form of comparatively young specimens, so that it is quite impossible to judge of the height it will attain. It is a grand stove Fern, producing broad pinnate fronds from 12 to 15 feet in length, or even longer. The pinnæ are from 10 to 15 inches long, upwards of 2 inches broad, deeply lobed, the lobes being obtuse; colour, bright light green. Native of Venezuela.

H. Imrayana.—As a species, this would appear to be allied to *H. horrida*, but it becomes a very distinct and handsome species with age. I have only seen it in a young state. There are other kinds in cultivation, bearing the names of *H. subincisa* and *H. Klotschii*, but as they have not grown sufficiently large to determine whether they are distinct from those already enumerated, further notice of them must be deferred.

Thyrsopteris.

One species only has been found for this genus, and that is a native of the island known so familiar to every one as the residence of Robinson Crusoe. The plant in question,

T. elegans, is characterised by its broad de-compound, thick leathery bright green fronds, the fertile portion of the fronds being much contracted so that they appear like large paniced racemes of sori, whilst the involucre are calyciform, and the sporangia when magnified are seen to be each furnished with a little stem. It is an extremely beautiful plant, and as rare as beautiful, being only found in the best collections. It thrives in moderate heat, but likes abundance of shade and moisture. Native of Juan Fernandez.

Schizocæna.

A genus, having generally all the appearance of *Cyathea*, and to which the few species it includes are usually assigned, or of which it forms a sub-genus, I have the impression, however, that for all ordinary purposes, the well-marked characters which these plants have, entitle them to generic distinction. They differ from the former genus in their more coriaceous texture, in the sori being situated on the middle of a vein, and not axillary, and by the cup-shaped involucre becoming divided into (usually) about six obtuse lobes. A few species only belong to this genus, only one, however, as far as I am aware, being yet introduced, and the first plant of which I had the peculiar satisfaction of nursing into life in this country.

S. sinuata.—This real gem forms a very slender erect stem, not thicker than an ordinary walking-stick, but I cannot say to what height it attains. Those which have come under my own observation have not exceeded 2½ feet; they are black with the persistent bases of the frond-stalks; the crown of fronds is very elegant, they are simple and entire, usually from 10 to 18 inches long, and seldom exceed an inch in breadth, lanceolate in outline, the margins being beautifully undulated; they are somewhat thin in texture, and bright shining green in colour. When fertile, the sori upon the underside add materially to its beauty. It requires an abundant supply of moisture to keep its beautiful fronds from curling up, whilst the soil should be very light and open. This species appears peculiar to the island of Ceylon. One or two fine species of this genus are known to exist in Malacca, and I have recently received a beautiful species from Queensland, which would appear to be related also, so that I hope *C. sinuata* will not long be the sole representative of the genus in cultivation. G.

WINTER-FLOWERING ORCHIDS.

I HAVE just returned from a visit to the Orchid-houses of Messrs. Backhouse & Son, of York, and seldom have I seen Orchids in better health or better vigour! Mr. Marshall, who has these houses more especially under his own eye, has treated his beautiful nurslings with all the care they so eminently require, adapting to them just the conditions of growth and development that their capricious nature seems to demand to coax them into bloom. My attention was directed by

Mr. Marshall to upwards of a score of these beautiful flowers. *Odontoglossum Rossii* was well in flower and very lovely. It is a native of Mexico. The petals are beautifully spotted and contrast most happily with the pure white lip. Fine spikes of *Oncidium cucullatum*, with its hood of sepals and crimson spotted lip, were very conspicuous. Its inflorescence is extremely graceful. It is a native of Ecuador. The delicious fragrance of *Zygopetalum Mackayi* made itself felt on entering the house it occupied. It is a lovely dappled Orchid, and in its nature appears to blend and harmonise colours apparently incongruous. The *Masdevallias*, *tovarensis* and *coccinea*, white and crimson, natives of New Granada, exhibit curiously-formed flowers. To these I would seek to draw attention, without attempting to arrange or class them in their several groups, but simply noticing them as they presented themselves before me, irrespective of the gradations of temperature to which they are subjected. The *Calanthes* make a grand display, and I knew not which most to admire, *C. vestita rubra* or its very interesting hybrid, *Veitchii*, with its spike of rosy flowers. The curious *Angraecum sesquipedale*, a native of Madagascar, was staged in the same house. The flowers are of a waxy-white, and delicately fragrant. As the specific name implies, the spur often exceeds a foot in length, the upper sepal being cornute reflected or deflected in the several species. But I must not omit to notice a curiously marked Orchid, *Mormodes Claveringii*; as its generic name implies, it represents the imaginary outlines of some *Mormo* of antiquity. *Odontoglossum Insleyi Leopardinum*, very happily named by Mr. James Backhouse, is a most lovely flower, though it lacks fragrance. The *Laelias* in the Mexican house, *autumnalis*, *anceps*, and *albida*, form a beautiful group that must attract attention. But time would fail me to tell of *Lycaste lanipes*, *Phalaenopsis grandiflora*, *Saccolabium giganteum*, *Sophranitis grandiflora*, or *Mesospinidium vulcanicum*, a name that indicates its association with extinct volcanoes.

PETER INCHEBALD.

Hovingham Lodge, near York.

Cultivation of Gesneras.—Although these beautiful winter-flowering plants are generally to be found in our stoves, they are seldom so well grown as they ought to be. I usually grow from six to seven dozen of them annually, for the decoration of the stove or conservatory from December until March. The varieties which I use are *Exoniensis*, *Cinnabarina superba*, *Zebrina*, and *Splendidissima*, but many others are equally well worth growing. In addition to its floral beauty, I may mention that *Exoniensis* is one of the prettiest of foliage plants. I shake the tubers out of their pots in May, and place them thickly in a mixture of peat and loam, with a good sprinkling of silver-sand. As soon as they have made two or three leaves, I pot them singly in 60-sized pots, and place them in a Cucumber-house, shifting them into larger pots as growth progresses, until I get them into 16-sized pots, that is if large plants are required; but nice plants for decorative purposes may be grown in 32-sized pots. *Gesneras* are very partial to shade, and under that of Cucumbers they grow very rapidly. In watering, they require care, for if watered excessively they soon die. I prefer keeping them rather dry than otherwise. Liquid-manure, largely diluted with water, assists them wonderfully. In their successive shifts, the compost which I prefer consists of peat, loam, a little cow-dung, and plenty of silver-sand to keep the soil open. This I use in a rough state, potting moderately firm, and draining well. After they have done flowering, I place them on a shelf in the stove to complete their growth, and then dry them off gradually. Under this treatment, plants may be grown from 1 to 2 feet in diameter, and they will produce flowers in profusion.—D. S. GILLET, *Court Garden, Great Marlow.*

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Browallia demissa as a Winter Bloomer.—I have never seen this old-fashioned plant so attractive as at present in one of the warm houses in the Wellington Nurseries, where it has been full of its pretty blue flowers for some weeks past. It would seem to be most precious as a winter ornament, as, when flowered in summer among annuals and similar plants, it is not so conspicuous or so useful. Seed of this sown in May, and grown rapidly on in a spent dung-bed, and the strongest shoots taken off for cuttings, will flower beautifully through the months of November, December, and January.—R. H. B.

Cœlogyne cristata.—Mr. Tanton (see p. 10) is correct in stating that *Cœlogyne cristata* is one of our best winter-flowering Orchids, but he is wrong in describing it as coming from Guatemala. It is a native of Nepal; and the best of some thirty known species of *Cœlogyne*, all natives of the eastern hemisphere. Mr. Tanton tells us that he has two plants, one with 160, the other with 230, bulbs, each bearing a spike of flowers. The plant only flowers from the young bulb, which will not stand in greater proportion than one in five, so if he has fifty spikes carrying from five to seven flowers on his largest plant it is extremely good; but his statement, that he has got a spike on every bulb, is scarcely credible. Such statements as these are not worth notice were it not for the mischief they are likely to do in rendering people, who possess similar plants, but who are deficient in knowledge respecting them, dissatisfied with their own.—T. BARNES.

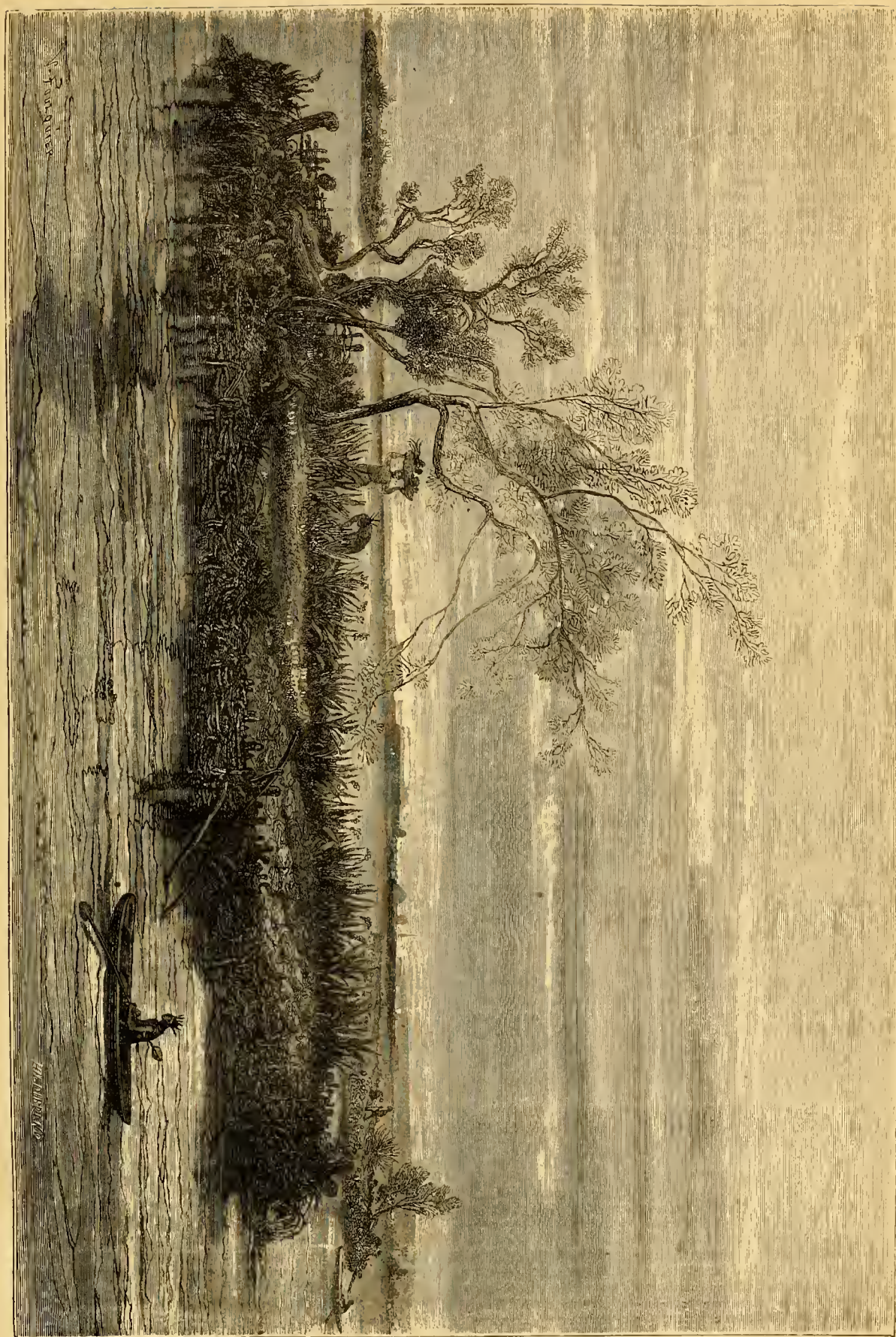
THE FLOATING GARDENS OF MEXICO.

WHEN the city of Mexico was taken by the Spaniards under Cortez in 1521, it occupied several islands in the lake Tetzcuco. The water, from various influences, chiefly volcanic, has since receded, and the city, although still retaining its ancient site, is now $2\frac{1}{2}$ miles distant from the lake. At the time of the Spanish conquest, however, it presented very much the appearance of Venice, a "city in the sea," "throned on her hundred isles," the margins of whose broad and narrow canal-streets were in many places lined with splendid mansions. According to the ancient Spanish historians, the native Mexicans had at that time attained a high degree of perfection in various arts, for which they do not appear to have been in any way indebted to the civilisation of the Old World, and which must have been an out-growth of unaided indigenous talent. Among the many novelties and wonders which met the eyes of the Spaniards, were the *chinampas*, or floating gardens, which abounded on the lake, and supplied the city with vegetables, fruits, and flowers, the latter being in great request amongst the Mexicans for decorating the altars of their gods. These gardens were formed by constructing a large raft from the reeds and other aquatic plants which grew by the shores of the lake, making it sufficiently firm and buoyant to sustain a quantity of soil which was spread over the surface, and kept in position by a low fence of wicker-work, or intertwined reeds and branches, which ran round the edge of the raft. The fertility of these little floating islands, owing to the constant supply of moisture, is very remarkable, and the old chroniclers describe them as being literally covered with flowers and fruit and verdure. The city of Mexico is still, to a great extent, supplied from these singular market-gardens, which form the sole support of some villages on the shores of the lake, inhabited by families of the descendants of the aboriginal race who fell beneath the treachery of the sanguinary Cortez. Two of these villages, Santa Anita and Ixtacalco, which are not very far from Mexico, are particularly noted for the production of beautiful flowers, and, at certain seasons, when their floating gardens are in full bloom, they are a favourite resort of pleasure-parties of the citizens. Our illustration affords an excellent idea of the structure and general appearance of these interesting horticultural contrivances, the sole heritage of the outraged people who once possessed the splendid city, the view of whose domes and spires, still proudly rising from the distant horizon on the other side of the lake, must often awaken in many a toiling breast sad memories of long-departed greatness.

W. M.

PLANT FLY-TRAPS.

Now that the Snudew and the remarkable phenomena connected with it have been once more brought prominently before the public at the recent meeting of the British Association, and it has been announced on good authority that Mr. Darwin has been making observations upon the same subject for future publication, it may be interesting to give a brief *résumé* of the phenomena of a more or less kindred character which are manifested by certain other plants. It will be found that, besides the species generally reckoned as fly-traps, there are others, widely separated in their affinities as in their geographical distribution, which manifest similar peculiarities in a remarkable degree. The confirmation by Mr. A. W. Bennet of the observations of former writers upon the Sundew, to which I shall again recur, will give a fresh impetus to observers of similar phenomena; and the list of fly-catchers will, doubtless, receive many additions. The vegetable fly-traps fall naturally enough into three groups—the first containing such plants as by their viscidities attract and retain small winged or other insects; the second embracing such as by their structure are peculiarly fitted to retain the insects which they have, so to speak, unconsciously entrapped; and the third, and most remarkable, including such species as effect the capture of the insects by a definite, special, and, I may say, sensitive contrivance. I shall treat of these in the above-mentioned order. The species which exude a viscid matter from the stem or leaves are very numerous, and need not be enumerated. Among them, however, the *Silene muscipula* is noteworthy as possessing this viscidinity in a remarkable degree, whence its specific name: it is especially the top of the stem of this species which is glutinous, and which retains small flies and other insects which settle upon it. The same thing is noticeable in our English *Silene noctiflora* in a somewhat less marked degree; and the English name for the genus, "catch-fly," as well as the French, "gobe-



THE FLOATING GARDENS OF MEXICO.

monche," refers to this peculiarity. This viscosity is occasionally turned to account, as at the Cape, where, according to Thunberg, *Roridula dentata*, a plant allied to the Sundews, is hung up in country houses for the purpose of catching flies; in Georgia and Florida, also, a heatful shrub, *Bejaria racemosa*, is known as "fly-catcher," and branches of it are collected in flower and used for a similar object, the racemes being remarkably glutinous.

The Pitcher Plant.

Passing on to our second group, we shall find it mainly, though not exclusively, composed of "pitcher-plants" of various descriptions. In the true Pitcher-plants (*Nepenthes*) insects are frequently found drowned in the fluid contained in the pitchers; many, no doubt, being detained as prisoners on account of the difficulty of egress, the margin of the pitcher turning inwards, and forming a peculiar inverted rim, which is toothed at the edge; the teeth, of course, meet any insect which is making its way out of the pitcher. In some species, as in *N. ampullaria*, this inverted rim is very broad, and projects a long way into the cavity of the pitcher, forming a trap in which numbers of flies and other insects are taken. Nor is this rim the only hindrance to their escape. In the common species, *N. distillatoria*, and others, the base of the inside of the pitcher is covered with reversed glands, which hinder their exit in a manner similar to that which is effected by the reversed hairs of the *Sarracenia*. Even animals are occasionally caught in the pitchers of some of the larger species: Mr. St. John tells us of a dead rat having been found in one of those of *N. rajah*, a gigantic species, native of Berneo, from one pitcher of which four pints of water were taken! Rumphius says that various little worms and insects crawl into the orifice and die in the tube, "except a certain small squilla, or shrimp, with a protuberant back," which lives there. In the species of *Sarracenia*, the pitcher-like leaves are smooth inside towards the top, but the lower part of the tube is lined with hairs, which all point in a downward direction; at their base is a sweetish watery secretion. Attracted by this, the insect enters the tube, finding no obstacle to its downward course; but when it attempts to return it is opposed by the points of the hairs; and unless it can escape by perpendicular flight (a rare occurrence) it perishes miserably in the liquid, after repeated efforts to escape. This peculiarity, common to the whole genus, is especially manifested in *S. variolaris* and *S. rubra*. The insects appear to be induced to enter the tube in the first place by a sweet viscid substance, which exudes from it near the mouth. In South Carolina the leaves of these species are sometimes employed as fly-catchers; and with such success that the tube is filled in a few hours, where flies are abundant, and the quantity of water it contains is insufficient to drown the prisoners, so that more has to be added for that purpose. Even butterflies are occasionally found among the contents of the tubes; and Dr. Macbride states that he has observed among them the fragments of a large *Gryllus* and several *Gyrini*. The same writer remarks that spiders descend into these tubes, probably for the purpose of preying on the imprisoned insects, being enabled to escape by the assistance of their threads; and that a small species of *Phalaena* appears to take shelter in them during the day, and is enabled to ascend at pleasure, perhaps by some peculiar structure in its feet. The putrid masses of insects in the tubes, which are often so dense as to render the swamps where they grow very offensive, usually contain one or more maggots in a very active state; and Dr. Macbride ascertained that a large fly was accustomed to make use of these masses as a rearing place for its larvæ. *S. flava*, although a larger, is a less destructive species, owing probably to the more spreading throats of the tubes; the orifices of those of *S. psittacina* are very small, notwithstanding which insects find their way in, and their chance of escape is even less than in the other species. A Californian plant of the same order, *Darlingtonia californica*, has leaves of a similar description in form and internal clothing; and each pitcher has usually at the bottom a layer of from two to five inches of the remains of insects—from minute beetles to large feathery moths—closely packed into it. Mr. Robinson states that the pitchers are regularly used in the houses in summer as fly-catchers. In cultivation in this country the plant is equally attractive and destructive, especially to blue-bottles, which keep up a buzzing noise for about half an hour after their entrance into the pitcher, and then die. What the attraction is appears doubtful, as the plant is scentless; and the entrance to the pitchers is almost concealed by two curious reddish appendages which it possesses. The third genus of the order, *Heliamphora*, a native of Guiana, has similarly constructed pitchers, and acts in the same manner. It is both remarkable and interesting to find among the *Rosaceæ*, an order considerably removed from the *Sarracenias*, an Australian plant, *Cephalotus follicularis*, with very similar pitchers, furnished with reflexed hairs like those I have been describing, and also acting as an insect trap, the victims in this case being principally ants. And in a yet more widely separated family, the *Araceæ*, we have in *Aram crinitum* (or *musciworum*), a native of

Minerica, a trap of the same class, although this plant possesses no pitchers. The spathe is covered inside with red reversed hairs, which are more crowded towards the base, so as almost to close the throat; the spadix, too, has remote violet-coloured bristles scattered over it. The flowers smell strongly of carrion, and flies are thus enticed to enter it; but the reversed hairs prevent their return, and they are there starved to death.

Sundews and Venus's Fly-trap.

Passing on to our third and most interesting group of fly-traps, it may be well to preface our notice by a brief *résumé* of Mr. Bennett's recent observations upon our common Sundew (*Drosera rotundifolia*). The assertion that this species captures insects has been doubted and even denied; but Mr. Bennett appears to have placed its truth beyond the possibility of doubt. He placed upon a leaf, at that time quite unencumbered, a very small species of thrips, which made violent efforts to escape, but only succeeded in entangling itself more completely. After about three hours its struggles ceased, and the glands, which had previously only slightly converged, began to bend over, and point the knobs at their extremities towards the insect. This experiment was made in the evening, and by the next morning almost every gland of the leaf was pointing towards the object in the centre, forming a dense mass over it. A second experiment was tried with a small piece of raw meat, and the same phenomena manifested themselves, although somewhat less rapidly. On other leaves a minute piece of wood and a fragment of worsted were placed, but in neither of these cases was the least change perceptible after the lapse of a considerable time; so that it would appear as if the organised structure of the fly and of the raw meat had some power of exciting this motion which is not possessed by matter of an inorganic description. These experiments are almost precisely similar to those made by Roth, nearly a hundred years ago, with the same results, upon this species and also upon *D. longifolia*; and Withering states that a Mr. Whately, in 1780, made various experiments with a pin, upon which he says that the glands contracted. Foreign species of *Drosera* possess the same peculiarity. *D. pallida*, a Swan River species, closes its leaves upon insects with great rapidity, and the same phenomenon is manifested by *D. sulphurea*, another Australian species. Reyle says that the glandular ciliae of the viscid leaves of *D. lunata*, an Indian Sundew, close upon flies and other insects which happen to light upon them; and many of the Cape species of *Drosera* have the same peculiarity, especially *D. trinervis*, which catches and retains the insects, when absorption commences, and the juices are completely drained by the many mouth-like glands, leaving in a short time nothing but small portions of dust.

The Venus's fly-trap (*Dionæa muscipula*), which Dr. Burden Sanderson's recent experiments have brought into prominence, is too well-known to need more than a reference. The two lobes of the leaf close upon each other when one of the three bristles upon the upper surface of each is touched, and thus insects are frequently captured. Dr. Curtis says: "The little prisoner is not crushed and suddenly destroyed, as is sometimes supposed, for I have often liberated captive flies and spiders, which sped away as fast as fear or joy could hasten them. At other times I have found them enveloped in a fluid of mucilaginous consistence, which seems to act as a solvent, the insects being more or less consumed in it."

Orchids and Grasses.

We pass now to a very different class of plants—the *Orchidaceæ*. The important services which insects render to the fertilisation of a large number of species is well known, and the remarkable arrangement which we are about to mention is probably a provision for that end. *Caleana nigrita* is a small terrestrial Orchid of the Swan River colony, discovered by Drummond in 1832. The following extract from an unpublished letter, in which he communicated his discovery to the great Robert Brown, will explain the remarkable manner in which this species acts as a fly-trap:—"The lower lip is shaped like that of a *Calceolaria*, and is about large enough at the lower end to hold a musket-ball. The part to which the anthers are usually attached in Orchids (the column) is lengthened out and forms a lid, which exactly closes the lower lip. When the plant is in flower the lid rises up, and the moment a fly or other small insect alights on the flower the lid makes a sudden revolution, inclosing the insect in the lower lip as in a box. This curious Orchid grows about half a foot high; it has a single leaf about three inches long, lying on the ground, smooth, lance-shaped, and of a fine red colour; it has a small bractea of the same colour on the stem, about half an inch below the flower. There is only one flower on each stem; the lower lip is of a waxy yellow colour, and transparent, so that it shows insects moving about inside, when held between the eye and the light. Every other part of the flower is of a dingy red; the inside of the lip is of a very dark red approaching to

black, covered with minute glands which secrete a viscous substance like honey, apparently for the purpose of attracting insects." Among the Grasses we find an example of a fly-trap in *Leersia lenticularis*, a native of Virginia, North Carolina, &c. Pursh appears to have been the first to observe it catching flies, and he communicated his discovery to Dr. Barton, who thus refers to it:—"The glume or corolla consists of two valves, a character which belongs to all the species of the genus *Leersia*. In the *Leersia*, which is the subject of my observations, the glume is of an orbicular form, inclining to lenticular, and is much larger than in any of the other American species that are known to me, or than it is in the *Leersia oryzoides* of Europe and America. The edges of the valves are very distinctly ciliated, or furnished with a number of fine teeth or delicate spinules. It is this ciliate structure that enables the plant to perform the business of a *Muscicapa*. When a small insect insinuates itself between the valves (probably in pursuit of a honeyed fluid), the valves close upon it, the spines enfolding each other, thus retaining the insect."

Apocynum and Asclepias.

The plants of the orders Apocynaceæ and Asclepiadaceæ are peculiarly fitted by the structure of their flowers to act as fly-traps, as will be seen from the following description of one of them, *Apocynum cannabinum*, a native of the United States. The five anthers converge around the stigma, and slightly adhere to it by their inner face, a small space being left between each. "When a fly inserts its proboscis between these anthers to plunder the honey, they converge closer, and with such violence as to detain the fly, which thus generally perishes." Such is Dr. Darwin's account, as published in his "Botanic Garden" in 1799, and this has been substantially confirmed by later writers. Curtis gives a more detailed account, and explains the capture in a somewhat different manner. He says that, the space between the anthers being wider at the bottom than at the top, the flies insert their probosces at this wider opening, and attempt to withdraw them in an upward direction through the upper part of the slit, which is too narrow to permit them to pass. Perhaps both observers are correct; at any rate, there can be no doubt as to the efficacy of the plant as a fly-trap, as a Belgian horticulturist has lately advocated its cultivation for that purpose. Dr. Barton observed that the flowers of the *Oleander*, another Apocynaceous plant, entrapped insects in a similar manner. In the Asclepiadaceæ it is clear that flies and other insects render important service in assisting fertilisation. For a detailed account of the mode in which this takes place reference should be made to a paper published by Mr. Mansel Weale in vol. xiii. of the Linnean Society's Journal. It is sufficient to note for the present purpose that this writer noticed that, on placing the blossoms of *Gomphocarpus physocarpus*, a Cape Asclepiad, in water, numbers of flies, attracted by the nectar, got attached to the stigmatic glands, and appeared unable to release themselves. "On allowing the flowers to remain until completely withered, I ascertained that the flies had not sufficient strength to extricate themselves, and eventually perished with the flowers." The remains of legs of small moths and other insects were also found adhering to the stigmatic glands. Dr. Barton, of Philadelphia, observed that some branches of *Asclepias syriaca*, another member of the same order, which he had gathered, entrapped sixty or seventy flies in the course of a few hours, many of them being caught by the proboscis, others by the legs. Some of the larger ones were able to disengage themselves; others only succeeded in doing so at the loss of a limb; while many were unable to escape, and ultimately perished. The pollen-masses which are characteristic of Asclepiads are removed by the visits of insects, and applied to the stigma, so that the latter play an important part in the fertilisation of these plants. Mr. Riley, the State entomologist of Missouri, has lately stated that bees, when they become excessively troublesome, may be destroyed by planting *Asclepias syriaca*, which is much visited by them; the wax-like pollen-masses adhere firmly to their hair and claws, and so impede their motions that many drop to the ground and die. Dr. Barton also observed that the common tropical *A. curassavica* captures insects in the same manner.

Such is, I believe, a summary of what is known regarding these vegetable fly-traps. Should it be inquired what purpose is served by so remarkable a provision, is it not, I think, difficult to see three ends which are obtained by it. In the first place, these plants must in some districts play an important part in preserving the balance of life, and in preventing the too rapid increase of insects. Should this seem exaggerated, it must be remembered that in some parts of the United States the river banks and sandy fields are covered "for hundreds of acres in close connection" with various species of *Asclepias*; the *Sarracenias* abound in the swamps of North America, and contain so many insects in their leaves that their putrescence sometimes becomes very offensive. Secondly, it appears that in some instances, at any rate (e.g., the *Droseras*), the animal food thus obtained is of benefit to the plant; and it is not improbable that future obser-

vations may show that all the leaf fly-traps serve this purpose. The third, and most important of all, is the service rendered by the insects to fertilisation in the case of the flower fly-traps. It is an ascertained fact that in many instances the agency of insects is absolutely necessary for the fertilisation of certain plants; and it would certainly appear to be so in some of the instances which are cited above. It may be well, in conclusion, to enumerate the plants which act as fly-traps, with their native countries, so as to show at a glance their distribution and the families which produce them; our first group of species, which simply retain insects from their viscosity, is excluded from this list:—*Sarraceniaceæ*. *Sarracenia*, various species, (North America); *Darlingtonia californica* (California); *Heliophora nutans*, (British Guiana).—*Droseraceæ*. *Drosera anglica* and *D. rotundifolia* (Britain, Europe, West Asia, America, Columbia); *D. trinervis* (South Africa); *D. lunata* (East Indies); *D. pallida* and *D. sulphurea* and doubtless many other species (Australia). *Dionaea muscipula* (North Carolina).—*Rosaceæ*. *Cephalotus follicularis* (Australia).—*Apocynaceæ*. *Apocynum androsaemum* (North America); *Nerium Oleander* (East Indies).—*Asclepiadaceæ*. *Asclepias syriaca* (America and Canada); *A. curassavica* (Tropics); *Gomphocarpus physocarpus* (South Africa); and, doubtless, many other plants of this order.—*Nepenthaceæ*. Various species of *Nepenthes* (Indian Archipelago, Continental Asia, Ceylon, and Madagascar).—*Araceæ*. *Arum crinitum* (Minorca).—*Orchidaceæ*. *Caleana nigrita* (Swan River, Australia).—*Graminaceæ*. *Leersia lenticularis* (North America).—[Although the above article by Mr. Britten in the *Field* is calculated to widen our views and make us more observant in this interesting, and it may be important, matter, the probabilities are that a very much greater number of plants than he mentions possess this curious property of fly-catching. Gardeners, who have better opportunities of studying living plants than botanists or any other set of men, may throw much light on this subject in the future, as some of the most famous fly-catchers are popular stove and greenhouse plants, and the *Apocynum* is a pretty border-flower. The North American Asclepiads are also quite hardy in our borders, and as for the as yet very rare *Darlingtonia*, it will probably prove hardy in the south of England, as we found it growing pretty high on the foot-hills of the Sierra Nevada, in places deeply snowed over in winter. The *Droseras*, hardy and tender, are, we think all capable of cultivation. The hardy ones are not usually considered so, because a bog or swamp is rarely successfully imitated in our gardens.]

THE KITCHEN GARDEN.

OLD GARDENS RENOVATED.

LAND under cultivation for the production of kitchen-garden crops forms no exception to the general rule of soil being unable to bear, for an indefinite period, a repetition of the same or a limited succession of crops. True, there are frequently local causes in the shape of natural superiority and greater depth of soil, accompanied with deep cultivation and a judicious rotation of cropping, such, for instance, as we see carried on by the London market-gardeners in the valley of the Thames and other places, where the soil is a rich, deep, alluvial deposit, cultivated on that all-essential principle of deep cultivation, with a liberal use of manure, and the return, as far as possible, of the soil's own production in the shape of the refuse vegetable matter worked deeply into the soil in the operation of trenching. But, with all possible natural advantages, assisted by the most skilful and intelligent system of cultivation, the time comes when the land gets tired, and becomes less profitable—a condition best described as wanting rest. Such is the state of very great numbers of old private gardens, where too often every load of manure required by the gardener is meted out with a grudging hand. The expedient not unfrequently resorted to, is the making of a new garden altogether. When the area required is large, say from 10 to 20 acres, this is in all probability the best course when a suitable site can be got; but even where such is the case, the making of, and inclosing with walls, a kitchen-garden is a costly affair. But it often happens that the existing garden is placed in the only situation available; where such is the case, and more especially if the area is not too large, and the material in the shape of new soil is obtainable,

Renovation

is the only course to follow. Introduce from 8 to 12 inches of new soil. Within an easy distance from large towns, where building operations are in progress, the top spit from Grass

land can frequently be got for little more than the cost of carriage; but in country districts it is not so easily obtainable. No one is fond of breaking into Grass land and removing the best of the soil in such quantity as the extent this operation will require. I must confess that I never yet removed from a pasture, or meadow, the comparatively small quantity of turf required for making or renovating a Vine border without feeling that it was making a sacrifice, even if an unavoidable one; and, before commencing, it is as well to see if the material can be got from any other source. Where there is common land that can be got at within a reasonable distance, the thing is simple enough; such failing, there is yet another source. In many country districts, on the sides of the roads, there are continuous banks of earth, the accumulation of years of road-scrappings and ditch-scurings, still increasing, and grown over with a luxuriant sward of Grass. These said accumulations do very great injury to the roads, above which they are in many places from 1 foot to 15 inches higher, preventing most effectually the water from getting away. In the adjoining county of Hertfordshire this is the condition of the roads for scores of miles in any direction. The gritty character of these road-side accumulations renders them for some soils even superior to the surface soil from cultivated land. Old gardens are greatly benefited by a dressing of good sound clay, or marl.

Draining and Trenching.

When the question of material for the renovation has been settled, the first essential is to ascertain that the drainage is efficient. Even where there is little apparent stagnant water in the soil, it frequently happens that a more complete system of drainage would greatly improve the land in several ways, by rendering it much more workable at all times, as well as allowing the production of spring crops much earlier. Then as to the depth of the drainage. This is a subject that for the last thirty years has received the attention of those connected with land cultivation on both farm and garden. Various depths have found advocates, from 2 feet 6 inches up to 6 feet. For most soils a medium depth, between the two extremes, will be found nearest the mark. But any uniform depth of drainage for soils of the different descriptions, such as are found in almost every parish in the kingdom, is about as inconsistent with common sense as it well can be. For all practical purposes, it will be sufficient to say that the bottom of any drain should be something like 9 inches below the pan, or stratum, that holds water; and, for a garden, something more is required than the simple pipe-drain alone, inasmuch as roots of the fruit trees, and some culinary vegetable crops, such as Beet, are subject to get down into the pipes and choke them. This is a matter that should be guarded against. After the pipes are laid, 6 inches of scoria, brick rubbish, broken stones, or flints, should be laid on the top; such not being available, faggots to the same depth should be used. This, in a great measure, prevents the danger of root-choking, for, even if the pipes were grown up with roots, the material above would act as a drain. To render the drains more perfect before the earth is filled in, there should be two inches of straw, Gorse, or hedge dressings placed over the drainage material already in, and then fill up. If the new soil used is of such description as to admit of its being incorporated at once with the soil already existing, this should be done by commencing at one side, and regularly trenching the whole garden right through, mixing the new soil well with the old to the entire depth the ground is stirred, adding at the same time a liberal dressing of manure. The question of depth in this operation of trenching will altogether depend upon the natural depth and character of the soil, and also the depth that has been gone to in previous trenchings. If the sub-soil is bad or inferior, no portion of it should be brought to the surface; but a few inches of it may with advantage be stirred and left where it is for the present; the soil above it, and the essence of the manure washed down by rains become mixed with and gradually improve it by the time the land again requires trenching. In, say, three years, those few inches of bottom soil can be brought to the top, and a little more of the bottom loosened up and left as before. Where the sub-soil is ordinary clay, a couple of inches at this and every subsequent time the land is trenched, may with advantage be brought to the top; but,

where this is done, the work should be carried out in the autumn, or early winter, so as to allow of the clay getting mellow, and in a fit state to be forked in previous to the time of cropping.

Re-planting and Re-cropping.

As the work proceeds, any old useless bush fruits, such as Gooseberries and Currants, that are too far gone to be of any further service, should be destroyed, as also worn-out unfruitful Apples, Pears, Plums, &c.; but, in this removal of fruit trees, let there be due consideration as to the requirements of the spot, and what there exists to supply their place, remembering that however unsightly a tree may be, if it be fruitful it is of more use than the beautifully symmetrical tree, that is not in bearing condition. Many a gardener has found when too late his mistake in removing unsightly trees before he has got others in bearing condition to supply their places. This is also an excellent opportunity for root-pruning any trees that are too vigorous; but in the case of such the operation should be completed not later than the end of January, or earlier if possible. I never yet saw root-pruning done late in the season without serious injury being the result. Wall trees at the same time should receive attention; if any require removal or replacing, it can be done now with advantage, as, when there is a general loosening of the soil to a depth equal to or greater than that required for the planting of trees, it prevents the occurrence of the serious injury that frequently happens to newly-planted trees, especially of considerable size, where, in planting, the soil is loosened for a greater depth, in the space their roots occupy, than in the surrounding ground. Where such is the case, if the soil is at all of a retentive nature, it will at once be seen that the space where the soil has been removed, and which is occupied by their roots, will act for a time as a drain to the surrounding ground. Unless in very light porous soils, no tree, however common, except a Willow, or other water-loving subject, should ever be planted, unless the surrounding soil is stirred as deep as it has been moved for the reception of the roots of the tree being planted. This renovating process will naturally cause an upset of many crops that cannot well be spared—things of a permanent character, such, for instance, as Asparagus. The ground occupied by this vegetable should not be disturbed until fresh beds have been made and got into bearing condition; this will take two or three years. The ground selected should be such as has been cropped with something as different as possible; say, where Gooseberries or Currants have been growing for a considerable time. If the soil is of a fair description, it need not all be removed to the full depth of the beds, as it is sometimes done; if 18 inches be taken from the surface, and 2 feet of new soil and manure be brought in its place, and well incorporated with 18 inches of the under soil, it will make ample preparation for growing this vegetable well. In the working of old gardens, a great deal may be done to prevent their becoming exhausted by continually, as opportunity occurs, adding something to make up for the continuous drain on the fertile constituents of the soil by the different crops that are taken from it yearly. Soils of a naturally light description have a tendency to become sterile much sooner than those of a heavier, more retentive character. Without the continual addition of the necessary, but not over-plentiful manure, to eke out which large quantities of leaves are generally used, in the course of time soil of this character gets exhausted. If, instead of year after year working on the exhausting system, no opportunity be lost of adding even in small quantities new soil whenever obtainable, a garden may be kept for almost an indefinite time, without getting in such condition as to require an operation of such magnitude as the addition of new soil in the quantities necessary, where complete exhaustion has taken place. It frequently happens that stable manure is used, to the exclusion of every other kind; for light, dry, sandy soils, cow or pig manure used alternately is preferable, and, with such, the soil will not so soon become exhausted. The high temperature which stable manure is often allowed to get to before use renders it little better than so much decayed vegetable matter. If the manure, of whatever description is used, could be taken fresh, and mixed with an equal proportion of loam or dry road-scrappings, it would be much more useful.—THOMAS BAINES.

MESSRS. F. & A. DICKSON AND SONS' UPTON
NURSERIES, CHESTER.

AMONGST the principal provincial nurseries this ranks as one of the most extensive and important, and one to which, at all seasons of the year, a visit must prove a source of great pleasure and instruction to all who take an interest in horticulture. In few nurseries is such an innumerable variety of plants to be found, and yet the most systematic order is observable in the arrangement of each department. The principal entrance to these nurseries is at the north-west extremity, about a hundred yards from the Bache Pool, which is one mile from Chester, on the main road to Birkenhead. From the entrance gate a fine broad drive, defined by a neatly kept Grass verge on either side, runs between borders containing many thousands of the finer varieties of variegated and green Hollies of different sizes, *Cupressus Lawsoniana*, *Thuja borealis*, *Wellingtonias*, *Cryptomerias*, *Deodaras*, *Golden Yews*, and

the finer kinds, of all sizes, many of them specimens in the finest health, well set with bloom-buds; another to *Azaleas*, amongst which we observed a number of large and beautifully-trained pyramidal plants, suitable for exhibition, besides many hundreds of plants of lesser size, full of vigour; another large house is filled with winter-flowering plants, such as *Ericas*, *Epacris*, *Cyclamens*, *Primulas*, *Daphne indica*, *Bonvardias*, *Cytisus*, *Dentzias*, *Solanums* (full of berries), and a number of other kinds, either in flower or covered with bloom-buds for later flowering. Roses in pots occupy another house, and consist of strong healthy plants of the choicest Tea-scented and Noisette Roses, as well as all the best and newest varieties of Hybrid Perpetuals, established in pots for forcing. In addition to these there are a number of other houses and an immense number of frames, &c., used for propagating and growing different kinds of plants, all fully stocked with healthy well-grown stuff. New houses



Specimen Conifers in the Upton Nurseries, Chester.

many others of the best kinds of Conifers and shrubs in large numbers; by following this road some distance, the offices and packing sheds, &c., are reached. The outer sides of the latter are skirted by a low rock-work, upon which are planted fine collections of the choicest Alpines, hardy Ferns, &c., and the walls are covered with the best varieties of green and variegated Ivies, &c., thus affording ample opportunity for parties to select for themselves, at the same time giving a clothed and neat appearance to the buildings at all seasons. Near this are the glass-houses, frames, pits, &c., covering about two acres of ground; these are filled with a great variety of exceedingly healthy and well-grown plants of all kinds, including those of recent introduction. Separate houses, of large dimensions, are devoted to stove plants and variegated-foliaged plants, all in perfect health; others to New Holland plants; another to Ferns, Palms, &c., in endless variety; another to Camellias, containing many thousands of plants of

and frames are being added almost every year; and, in some newly-erected span-roofed frames, we observed a splendid lot of young Camellias, Azaleas, &c., in the most promising condition. Large numbers of small propagating frames for increasing the stock of hardy Conifers, Rhododendrons, shrubs, climbers, &c., containing many thousands of young plants, are also to be seen. These plants are, when fit, transferred from their frames to small brick beds, which cover a large area of ground near the offices, and they are transplanted there for one or two seasons, previous to being planted out into the open quarters in the nurseries. In front of the greenhouses there are lines of geometrical flower-beds, which are filled at this season with Hyacinths, Tulips, and other bulbous roots, and spring-flowering plants, such as bedding Pansies, Daisies, Primroses, Hepaticas, &c.; in summer these are re-filled with the better kinds of bedding plants, succulents, &c. Opposite these beds there is a border filled with all the newest and most

select kinds of Conifers and hardy evergreen shrubs, planted so as to contrast in colour, and at right angles run other two borders planted in a similar manner; at the end of the walk, which divides the borders last named, there is a most beautiful and artistic specimen of artificial rock-work. Here are a pair of very large handsome specimens of Irish Yews, and not far distant stands one of the finest formed specimens of *Aranea imbricata* we have seen. It is some 30 feet in height, and is singularly robust in habit, and noble in character. This fine tree forms a prominent feature in the annexed illustration. Leaving this part of the nurseries, we come upon large quarters of choice named hybrid *Rhododendrons*, *Azaleas*, and other American plants, which are grown here in great numbers, and appear to thrive admirably in the natural loamy soil, without peat, which is usually considered essentially necessary for their growth. This, however, proves they will grow well in light loamy soils, and plants so grown have many advantages over those grown in rich peaty soil, as they are of a hardy nature and adapted for removal to places where peat is costly or difficult to procure. Next we come to a large breadth of all the new, rare, and choice Conifers in large and small plants. We find great care has been bestowed in the selection of these, and only such as prove to be thoroughly hardy, and in every way desirable, are cultivated. Amongst these we noticed many hundreds of large and handsome specimen *Cedrus Deodara*, *Cupressus Lawsoniana*, in its many forms, *Picea Nordmanniana*, *P. nobilis*, *P. lasiocarpa*, *Thuja borealis*, *Abies Clanbrassiliana*, *Cryptomerias* of sorts, *Wellingtonias*, and many others, all of which have been regularly transplanted and are calculated to give immediate effect. Adjoining this, is, what is known as the plunging-ground, where *Ivies*, *Clematis*, *Wistarias*, *Pyracanthas*, *Ampelopsis*, *Cotoneasters*, *Honeysuckles*, *Bignonias*, *Escallonias*, *Magnolias*, and other plants suitable for covering walls, trellises, &c., are kept in pots; these are plunged in beds. Many shrubs are also kept in the same way, such as *Arbutus*, *Sweet Bays*, *Buddleias*, *Escallonias*, white and yellow *Broom*, evergreen *Oaks*, *Forsythias*, *Euonymus*, &c. Plants so treated have the advantage of being safer for removal, and can, without risk, be transplanted at any season of the year. The culture of fruit-trees has long formed a prominent feature in these nurseries, and upon this department especial care is bestowed to render the collection as perfect as possible with regard to kinds, growth, and superiority of training. Acres of ground are covered with these, in standards, trained and untrained, horizontal-trained trees for espaliers, and all other forms adapted for the different purposes for which they are required. We were particularly struck with the pyramids, which really deserve that designation. The same care is taken with the horizontal-trained trees, and all the other forms of training, to get them as near perfection as possible. A finer lot of fruit-trees we could not wish to see in any nursery. Vines are most extensively and successfully grown here; and, at the time of our visit, we saw thousands of fine, strong, well-ripened canes of the leading kinds, in excellent condition for immediate fruiting in pots, and for planting out in Vine-borders in the usual way. The collection of standard and dwarf *Roses* grown here is something marvellous, and, the soil being admirably adapted to their growth, the plants appear very strong and healthy. Messrs. Dickson have been very successful exhibitors of cut *Rose* blooms at many of the leading shows, and they hold a great number of prizes awarded to them for their flowers during the past few seasons.

Standard *Limes*, *Horse Chestnuts*, *Elms*, *Cratægus*, *Purple Beech*, *Oaks*, *Maples*, *Platanus*, *Poplars*, &c., are also grown in many thousands, suitable for planting in ornamental belts or plantations, and also for single specimen trees. All the better kinds of flowering shrubs are to be found in great quantities, and this is a very desirable class of plants for mixed borders and plantations, as they furnish an abundance of flowers during the whole of the growing season, contrasting prettily with other plants and shrubs; they should, therefore, be planted more extensively than they are at present. Immense numbers of evergreens are grown, such as common and Portugal *Laurel*, *Laurustinus*, *Hollies*, *Box*, *Berberis*, *Rhododendrons*, *Yews*, *Aucubas*; and you see large breadths containing many thousands of each kind in the shape of

strong, bushy, healthy plants of all sizes. Forest trees, in all stages of growth, both as seedlings and transplanted trees, cover very many acres, and consist of many millions of all the leading kinds, such as *Larch*, *Scotch Fir*, *Spruce*, *Austrian* and *Corsican Pines*, *English* and *Turkey Oak*, *Beech*, *Birch*, *Sycamore*, *Ash*, *Hazel*, *Poplars*, *Chestnuts*, &c. They are planted thinly upon the ground, and are uncommonly strong, well-rooted, healthy trees. This portion of the nurseries, standing upon one of the highest and most exposed parts of *Cheshire*, renders the trees very hardy and particularly well adapted for transplanting to any part of the country. Judging from the enormous quantities of transplanted *Thorns* or "Quicks" grown here, the demand for these must be unusually great, yet we understand that the number required increases from year to year. Near the residence of the late Mr. Francis Dickson (who was the founder of this old-established and well-known business, and who was considered to be one of the most skilful nurserymen of his day) are some noble specimens of the *Aranea*, *Picea nobilis*, *Picea Pinsapo*, *Picea Nordmanniana*, *Wellingtonias*, and other handsome Coniferous plants of early introduction. Time would not admit of us taking further notice, but there are many other objects well worth inspection.

In the seed department, which is even more extensive than that of the nursery, the greatest attention is exercised to have everything true to name and the best of its kind, evidence of the truth of which may be found in the case of Messrs. Dickson's First and Best Early *Pea*, which has hitherto maintained the high character it at first received amongst a host of rivals. A new seed warehouse and offices, of imposing and somewhat antique appearance, and on an extensive scale, have recently been erected in the principal street in *Chester*, and much judgment and good taste have been brought to bear on the internal arrangements, so as to facilitate the execution and despatch of business. In several large warehouses adjacent are stored immense stocks of agricultural seeds, for the superior excellence of which, as well as all other seeds, Messrs. Francis & Arthur Dickson & Sons have, as is well known, achieved a wide reputation. One of the warehouses, we observed, was filled with hundreds of sacks of *Turnip* and *Mangold* seeds, amongst which we particularly noticed large bulks of their Improved *Purple-top*, or *Defiance Swede*, *Globe* and *Long Red*, and their Improved *Yellow Mangolds*. Natural Grasses, Italian and perennial *Rye-Grasses*, *Clovers*, &c., were also stored in almost endless quantities. At various exhibitions a great many important prizes have been awarded for roots grown from seeds supplied by Messrs. Dickson, in different parts of the kingdom. Their mixtures for sowing down land to permanent pasture are, we learn, in great request, and are highly commended by all who have used them. It will, therefore, be seen that the nursery and seed business of Messrs. Francis & Arthur Dickson & Sons stands in the first ranks amongst extensive establishments of this kind in Britain.

We may add, that a more enjoyable and instructive day we have seldom spent, than that on which we visited the Upton Nurseries; and, if any of our readers should have occasion at any time to go to *Chester*, we would advise them to take advantage of Messrs. Dickson's courtesy and follow our example.

A New Fuel.—The Belgian press speaks in terms of praise of a new fuel discovered by a countryman named Ramaeckers, of Schoonbeek, near Hasselt. It is composed of vegetable earth, small coal, salt of soda, and water, in certain proportions. The experiments made at Bruges, Liège, Namur, and Brussels, have been generally successful. A manufacturer at Louvain tried the new fuel in a fire-grate of a *Mariotti* steam-engine. He mixed three-parts of vegetable earth and one-part of small coal with a solution of $\frac{1}{2}$ lb. of salt of soda, in a trough capable of containing 61 lbs. of coal, and stirred these ingredients together till the composition acquired the consistency of mud. In a few seconds an intensely vivid flame swept round the boiler, producing so much heat that the manometer soon marked 4, 5, and 6 degrees, whilst the steam regularly carried on its motive function. Other experiments have been made in the use of this new combustible material by making it into balls and burning it in open grates with coal; and an opinion seems to prevail that a discovery has actually been made which will economise coal.

THE HOUSEHOLD.

EDIBLE STARCHES.

AN interesting paper on the subject of "The Edible Starches of Commerce; their Production and Consumption," was read a short time since by Mr. P. L. Simmonds at a meeting of the London Society of Arts. The lecturer pointed out that while the English use but one word to define all sorts of starch, even the minor classification of arrowroots, sagos, tapiocas, corn-flours, &c., the French have two words by which they distinguish the starch obtained from roots, stems, fruit, seeds, &c., from the amylaceous product obtained from cereals: the former they term *fecula*, and the latter they define as *amidon* or starch. The value of the edible starches imported into England, which was in 1860 \$206,438, in 1870 amounted to £366,570, and in 1871 to £485,706. The production of European starches was shown to be trifling, as compared with that of tropical and sub-tropical countries, though considerable quantities are manufactured in this country from imported Maize (or Indian corn) and Rice, and sold under the name of corn-flour. The island of St. Vincent is the only arrowroot-producing colony that has kept steadily progressing, the quantity exported to the United Kingdom having increased from 11,436 cwts. in 1863, to 16,919 cwts. in 1870. In 1850 the shipments were only 3,573 barrels, and 7,493 boxes. The other West Indian Islands, though at one time exporting considerable quantities of arrowroot, have gradually decreased their production, and the quantity exported has in every case but that of St. Vincent, dwindled down to a merely nominal figure. In Brazil, considerable attention is given to the production and manufacture of edible starches. A large and varied collection of these was shown at the Paris Exhibition of 1867, comprising starches made from Pumpkins, Maize, Bread-fruit, white and yellow Manioc, Brazil Potato, Denerara Potato-yam, Banana, &c. A variety of the Manioc or Cassava, from the tubers of which *feculas* are mostly manufactured, the *Maranta arundinacea*, was introduced into India about 1840, and is now cultivated to a considerable extent, the arrowroot made from it being extensively used in India, and some of it shipped to Europe. The consumption of sago in the United Kingdom is stated as 52,000 cwts. in 1850, 179,825 in 1860, and in 1870 the aggregate of sago and tapioca received from Singapore was 344,000 cwts., representing a money value of £283,541. The Australian colonies were also noticed by Mr. Simmonds as arrowroot-producing countries, specimens of this starch manufactured in the colonies having been exhibited at the Paris Exhibition of 1867, and the London Exhibition of 1872. The Pacific islands appear to be very rich in the *fecula*-producing arums and other plants, and a considerable trade is carried on in various *feculas* in many of the islands. Africa also shares to a considerable extent in the production of arrowroot, but Cape Colony and Natal are the only two districts that export it in any quantity. The *Maranta arundinacea* is the species cultivated, and it has also been introduced into the Mauritius, whence specimens of arrowroot were sent to the Paris Exhibition of 1867.

RECIPES.

Stewed Pears.—Sixteen Pears, eight ounces of sugar, half a bottle of common claret, a little water, twelve cloves bruised. These are best cooked in a fish-kettle, no two pieces one on the other. Pare the fruit and split them in halves, splitting also the stems. Make a syrup of the wine, cold water, sugar, and cloves; let it boil five minutes, then lay in the halves of the Pears, and stew them gently for two or three hours till tender.

How to boil a Vegetable.—The rule is simple, but must never be forgotten. Every kind of vegetable intended to be served whole should, when put to boil, be placed at once in boiling water; and this applies especially to Potatoes and vegetables from which the outer cover has been removed. Now it often happens that Potatoes, &c., are, to save time, placed in cold water and left to boil gradually. It is just this which allows the nutritious matter to escape, and renders the meal unsatisfying. When, on the contrary, the water boils from the moment the vegetable is immersed in it, the albumen is partly coagulated near the surface, and serves to retain the virtue of the vegetable. The reverse is, of course, the rule for making soup, or any dish from which the water will not be drained. By placing the vegetables in cold water the albumen is slowly dissolved, and actually mixes with the water—a process most necessary for the production of nutritious soup.—*Food Journal*. [This advice is not sound throughout, as the true way to boil Potatoes in their skins is to put them in cold water at first.]

Peach Brandy.—Last season 10,000 boxes of Peaches which arrived in a poor condition in Baltimore on a Saturday evening were sold at five cents a box to a Peach-brandy distiller.

THE PRICE OF COAL IN ITS RELATION TO HORTICULTURE.

HORTICULTURE is a luxury to most people; but the time is at hand when it will become a necessity; to certain classes of society it has, indeed, already become so. To many more it is in a transition state, trembling, as it were, in the balance between luxury and necessity, but, to most it is, as we have stated, a luxury. Now luxuries, upon any occurrence of a rise in prices, can be done without, upon the first feeling of tightness in the domestic exchequer. This, a philosophical friend of mine, assures me, is the reason why gardeners, as a class, seldom share in the general rise of prices. Other better paid classes make money, gardeners spend it. And it is the money makers, not the money spenders, that are most liberally paid. It would be easy to diminish the philosopher's argument by carrying it to an extreme length; but, nevertheless, it embodies a general truth of great importance, the effects of which are felt throughout the entire field of horticulture. Production is, in fact, ever tied hand and foot to cost. This is true, not only in trade and commerce, but also in the domain of luxury, and especially in horticulture, which is trade, commerce, luxury, and fine art all in one. Whatever cheapens production fosters horticulture; whatever adds to its cost fetters it. Of the first we had a striking example in the abolition of the excise duty upon glass. Nothing in modern times has given such a vigorous stimulus to horticulture as free glass. It made huge conservatories, greenhouses, winter gardens, Crystal Palaces possible, and also brought the luxury of glass structures within reach of every thrifty artisan who cared to possess them. It has increased plants and their cultivators ten thousand fold. The tide of progress has flowed on, growing wider, broader, and higher, until now, when it has been arrested by the high price of coal. The coal famine, although of short duration, has raised the cry, "Halt! back!" over the entire field of horticulture. It has well nigh doubled the cost of the production and preservation of tender plants and tropical or forced produce. The cost of heat—that most important factor in production—has been, in general terms, doubled. The consequence is that many have ceased to use it; some use half what they did before, to bring their expenditure within the old limits—nearly all use less; and the result is less horticultural activity, less progress, less produce. Nor does the evil of dear coal end here. It has raised the price of nearly all horticultural commodities, and thus limited the number of purchasers; plants and seeds are dearer than they were, and, therefore, fewer are bought; and so, if dear coal continues, it will mean choice fruits and vegetables at a higher price, and this, again, will limit the demand for them; and thus the coal famine checks horticulture on both sides, as it were. It checks production and limits consumption; and, by this compound compression, keeps demand and supply nearly abreast of each other, at a very low ebb. Were it not that the country is making money at an extraordinary rate, the evil effects of the coal famine must be still more keenly felt. As it is, there are but few gardens in the kingdom where the dearth of coal has not proved a barrier to progress—if, indeed, it has not quite stamped out some furnace fires, or hindered them from being lighted till a month or two later than usual. There is also a growing conviction that we have seen the worst of the coal famine, a conviction strengthened by a sight of the immense supplies piled at the different railway termini, and at the pits' mouths. For the future of horticulture it is to be hoped that this expectation will be confirmed. There is also great hope for horticulture in the substitution of other sources of heat for coal. Mr. Cowan's lime-kiln heating is an undoubted success. True, the philosophers say that it ought not to be so, that lime, being an inorganic substance, can generate no heat—that the heat of the coal is wasted in warming the lime that warms the boiler that heats the water; but the fact, nevertheless, is patent to all that, by placing a boiler astride a lime-kiln, thousands of feet of hot-water pipes are sufficiently heated to warm a whole series of hothouses with the caloric which would otherwise have been utterly wasted, whilst the lime drawn promises to pay the entire cost of the heating—a grand fact of immense importance to the present and future of horticulture. I also look hopefully to our thousands of acres of useless bogs in Scotland and Ireland. Surely, it is not too much to ask of the science and the commercial enterprise of the age, that they should warm the hothouses of the nation with compressed peat at a reasonable cost. Possibly, when these two things are done, it will be found that our lime-stone rocks, our numerous deposits of chalk, and our thousands of acres of neglected peat will prove to be amongst the most powerful stimulants to the advancement of that branch of horticulture which depends upon stoves and hothouses. But, should we remain much longer under our present deplorable dearth of heat-supply, I cannot but look forward to an increasing loss of interest in (and, in many cases, final extinction of) the culture of some of our choicest fruits, flowers, and vegetables. D. T. FISK.

GARDEN DESTROYERS.

A NEW POTATO ENEMY.

I wish to say a few words about an enemy which threatens to lay waste one of Europe's most valued esculents—the Potato. For a long time North America has had to contend against two foes, which devoured the early shoots and leaves of the Potato, and thus destroyed the hopes of the farmer and gardener. These were beetles belonging to the same family as the Blister-fly, and named *Lytta atrata* (or *vittata*) and *Cantharis viniaria*. They can be kept within bounds; but of late a third beetle has appeared among us which really threatens to drive the Potato out of cultivation altogether. It bears the name of the Colorado Potato-beetle (*Doryphora decem-punctata*); and should it once reach the Atlantic coast, and be carried unobserved across the ocean, then—woe to the Potato-grower of the old country! A man must witness the myriad legions of this insect, and the ravages of its never-tiring larvæ, in order to form an idea of the terrible danger with which Europe is threatened. For myself, judging from the tenacity of life exhibited both in its larval and perfect condition, I have not a doubt that it will soon overstep the bounds of North America, and make a home for itself in other lands. Its true domicile is in the Rocky Mountains, where it feeds on a species of wild Potato, *Solanum rostratum* (or *Carolinianum*). No sooner, however, had the edible Potato (*Solanum tuberosum*) been planted by settlers at the foot of these mountains, than *Doryphora* attacked it greedily; the more largely its cultivation extended westward, the faster did its insect foe travel in an easterly direction, and scatter itself over the land. In the year 1859 it was located one hundred miles west of Omaha city, in Nebraska; in 1861 it showed itself in Iowa; in 1865, not only had it begun to devastate Missouri, but it had crossed the Mississippi in Illinois, everywhere leaving behind it flourishing colonies. In 1868 Indiana was visited; in 1870 Ohio and the confines of Canada were reached, also portions of Pennsylvania and New York; and its entrance into Massachusetts was notified. During the year 1871, a great army of these beetles covered the river Detroit in Michigan, crossed Lake Erie on floating leaves and similar convenient rafts, and in a very short time took possession of the country between St. Clair and Niagara rivers. Having got thus far, in spite of all efforts to stay their progress, there is every reason to believe that before long we shall hear of them as swarming in the streets of New York and Boston (as they already swarm in the city of St. Louis), and then their passage across the Atlantic is a mere matter of time. Moreover, the beetle, in its different stages, is so entirely unaffected by the extremes of heat and cold, of wet and dry, which it has met with here, that I have no doubt it will care as little for the changes of climate which occur in the temperate zone of Europe, and, once settled, will quickly become naturalised. The devastations of the Colorado beetle are all the greater from the fact of its propagating itself with extraordinary rapidity, several broods following each other in the course of the year. The first batch of infant larvæ appears towards the end of May, or, if the weather be mild, of April. In fact, scarcely has the Potato plant shown itself above the ground, before the insect, which has been hibernating during the winter, also wakes to life. The female loses no time in depositing from seven hundred to twelve hundred eggs, in clusters of twelve or thirteen, on the underside of a leaf. Within five or six days, according to the state of the weather, the larvæ escape from the eggs, and begin their work of devastation, which goes on for some seventeen days, when the little creatures retire below the soil in order to undergo the pupal condition. After a delay of ten or fourteen days, the perfect insect comes into being, and the business of egg-laying commences anew. In this way, according to recent observations, three broods follow each other; the last, as just stated, wintering below the surface of the ground. No description can do justice to the marvellous voracity of this insect, especially in its larval state. When once a field of Potatoes has been attacked, all hope of a harvest must be given up; in a very few days it is changed into an arid waste—a mere mass of dried-up stalks. At one time the cultivator indulged in the vain hope that *Doryphora* was a mere passer-by, that he would do his worst and then

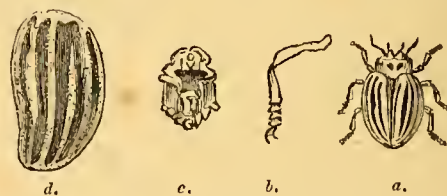
move on, without becoming a permanent nuisance. Others, again, fancied that a hot summer and autumn, followed by a long drought in the ensuing year, tended to diminish its numbers. But it has been proved incontestably that the diminution was only due to the circumstance of many of the larvæ perishing through being unable to enter the ground hardened and baked by the great heat; plenty were left to continue the breed. Of the many nostrums employed for the destruction of this beetle, one only has shown itself to be of any value. I mean, dusting the plants with the highly poisonous substance Paris green,—a compound of arsenic and oxide of copper. However, setting aside the dangers of inhaling this deadly mixture while spreading it over the fields, there is the



Colorado Potato Beetle in different stages, from egg to perfect insect.

additional peril of impregnating the soil with it,—a peril which experiments carried out at Washington have shown to be well founded. There remains, therefore, only the plan of hand-picking, day after day, the eggs, larvæ, and beetles. But even this operation requires considerable care, for the juice of the crushed insect and its larvæ produces bladders and blisters wherever it comes in contact with the skin. If a wounded spot be touched by it, severe inflammation ensues, which is liable to pass into ulcers, and an application of it to the eye endangers vision to a very serious extent.

Fig. 1 gives an idea of the Colorado Potato-beetle in its different stages. The eggs are of a deep orange-yellow. The larvæ, on first emerging, are of a blackish hue, which passes quickly into a dark red, with a slight orange tint. On attaining their full size, the colour varies between orange, reddish-yellow, and flesh. At c, fig. 2, is shown the pupa; at



a. Colorado Beetle. b. Foot of ditto. c. Pupa of ditto. d. Wing-case, enlarged.

a the perfect insect, natural size; a foot is portrayed at b; a wing-case, considerably enlarged, at d. The ground colour of the latter is creamy-yellow (rahm-gelb), with five black longitudinal stripes, of which the third and fourth unite at the base. *Doryphora* does not by any means confine itself to the Potato. In places where that esculent is wanting, it will support itself on any other member of the Solanaceous order—the Egg-plant (*S. melongena*), the Tomato (*S. lycopersicum*), or the winter Cherry (*Physalis viscosa*). Indeed, in the northern parts of Illinois and in Wisconsin—incredible as it may appear—it has established itself in the Cabbage-garden as readily as in the Potato-field.

FR. H., in *Hardwicke's Science Gossip*.

THE AMATEUR'S GARDEN.*

SPRING FLOWER BEDS.

WITH little trouble or outlay our flower gardens might be made to look gay during the spring months, instead of being blank and dreary. Gardens, which one has seen in summer as rich in colours as a kaleidoscope, if visited during the spring can hardly be believed to be the same. Now, when spring-bedding costs but a trifle, this should not be the case. When it is time to lift the plants that have flowered in spring to make room for those intended for summer-blooming, they may be planted in some back border, and when autumn comes round they may be lifted, divided, and re-planted in the flower-beds. This practice may be followed year after year, while others shed their seed, and their numbers are increased in that form. The first outlay is the principal one, as, with the exception of new varieties, the old stock will maintain itself. I have planted this season myself, in the centre of the lawn, a star-shaped bed; this I have filled as follows:—In the centre is a circle of Cliveden Purple Pansy, and the rest Cliveden Yellow; right and left of these is a large pair of beds, shaped like crossed compasses, these I have planted with blue Forget-me-not. Between the specimen shrubs are different-shaped beds, some circular; in these I have dark-coloured Polyanthuses in the centres, edged with Clevedon White Pansies. Then, I have a pair, shaped like a circle in the middle, the ends being two half-circles; the centres of these consist of Viola cornuta, and the two half-circles, which form the ground-work of the centre, are filled with variegated Arabis. The next are long squares (if I may so call them), with circles at the corners, and are filled with mixed Pansies; then I have some, formed like a Maltese cross, of variegated Arabis, with a square of Viola cornuta in the middle, where the points of the cross meet; then I have some of a circular form, with two square ends drawn out of each, in the circle are double scarlet Daisies, edged with Viola lutea, the ends being made to match; then I have some others of a diamond shape, filled with Auriculas. Besides the plants just mentioned, I have also Hepaticas, Tulips, Crocuses, Jonquils, &c., all of which tend to give my garden a gay appearance during the spring months.

A. HASSARD.

Upper Norwood.

WORK FOR THE WEEK.

PRIVATE GARDENS.

Stoves.—Maintain a temperature of 55° at night, and permit it to rise to 65° or 70° during the day with sun-heat. Plants of Poinsettia pulcherrima, whose beauty is past, should be removed to a dry corner and kept dry, but still in the stoves, or laid on their sides under the benches. Plants of Hexacentris done flowering, cut well back and induce them to go to rest. Give some weak manure-water to Eranthemum pulchellum, Statice, and other soft-wooded plants coming into flower. Lay plants of Lagerstromia indica on their sides in a cool house. Plants of Stephanotis, Allamandas, Passifloras, Clerodendrons, Cissus, Echites, and other climbers, if required to bloom early, should be pruned, and syringed daily to encourage growth. The general stock of these, however, should yet remain at rest. Start a few roots of Achimenes, Gloxinias, Caladiums, and herbaceous Gesneras for early flowering; keep the majority, however, for later work and see that no damp comes in contact with them. Decapitate all long naked-stemmed Dracenas; use the tops as cuttings, and place the pots containing the stumps on the floor along the passage in close proximity to the pipes, so that the heat therefrom may more hastily promote the production of fresh shoots. The shoots can be taken off as they attain the length of an inch or two and used as cuttings. This method economises room in the heated plunging material, which should be saved for more delicate subjects. Guard Nymphaea roots from the attacks of rats and mice; cats are the best and safest preventive against damage done by these vermin; and in order to encourage their presence a mouse or two should be given them in the place which they are desired to frequent; if this is done they will not fail to come again to look for more. Weasels are good friends to gardeners, and ferrets are useful for rat-catching; with traps and poison, and the other agents of destruction so familiar to most of us, their clearance may also be effected.

Pits and Frames.—Remove dead leaves from Auriculas, and

* This department is written exclusively by amateurs distinguished for skill in various branches of gardening.

give the plants plenty of air whenever the weather is favourable; but guard against heavy rains, strong drying winds, and severe frost. Water sparingly, but do not allow the plants to flag, and towards the end of the month, when root-growth begins more actively, water them more freely. Shift Calceolarias and Cinerarias, if necessary; keep them cool, moderately moist, and free from greenfly. Introduce a few Cinerarias into the forcing house. Carnations and Picotees can scarcely be grown too hardy, provided they were early potted and are well rooted; but they require to be protected from cold winds, rain, and severe frost. Little or no water should be given, except in very dry weather, and then only in the morning, and at a time when there is no danger from frost. Avoid as much as possible wetting the foliage, remove any decaying leaves, keep the plants thoroughly clean, and prepare the soil required for the plants to bloom in. It should consist of three parts good strong loam, and one of well-rotted manure, kept moderately dry and occasionally turned; it is generally a rule to prepare, in autumn, a sufficient quantity of soil to last through the year. This should be well mixed together, and laid by in a heap where it can be fully exposed and frequently turned. As the surface becomes frozen in severe weather, the crust should be removed, so that as much of the soil as possible may be subjected to the influence of frost; but the heap must be covered in wet weather. The loam should be carefully cleared of wire-worms; and, before using, a little coarse sand should be added to it. Remove any mould or decay that may be found on the stems or tubers of Dahlias. Hollyhocks, strong and healthy, should have abundance of air during fair weather, and keep them free from excessive moisture and decayed foliage. Late-struck cuttings will be found to winter best in a greenhouse or pit, near the glass, where they can have the advantage of a little fire-heat in damp or frosty weather. Cuttings from old stools may be propagated in gentle heat. From Pansies in frames remove the lights during favourable weather, but protect the plants from cold winds, rain, and frost. Dust with sulphur the foliage of any that may become affected with mildew, and remove decaying leaves. Give Polyanthuses in frames moderate moisture and free ventilation, and prick off seedlings, keeping them rather close for a short time afterwards. Pot a few Ranunculuses for early blooming, and sow some seeds in pans, which keep near the glass.

MARKET GARDENS.

The fine days that we have lately experienced have had a beneficial influence on market gardens. All hands have been set to work; those who cannot dig, trench, or shake up litter, place with the women and boys to loosen the soil amongst Cabbages, Coleworts, Lettuces, Parsley, transplanted Onions, and similar crops. Get August-sown Onion-beds thoroughly cleaned; women with half-sieve baskets, to put the weeds in as picked, soon go over a large space on a dry day. When finished, slightly dig or loosen the alleys, and transplant Lettuces or Cabbages therein. Get all empty quarters manured and trenched, throwing the soil into ridges 2 feet apart. Vacant ground under fruit trees manure and dig for Radishes, and be sure to have the trees thinned or pruned before the ground is interfered with. Radish beds sown early in December should be uncovered every morning, replacing the litter at night. Keep a boy for each series of beds to frighten off birds. Warm borders which contained Tomatoes in summer are well adapted for winter-sown Radishes. Under fruit trees the beds receive a little shelter, whilst the little shade caused by the naked branches does no harm. Prune Raspberry bushes leaving them about 3 feet high, and do not use stakes for them. Prune also fruit bushes of all sorts, taking care to leave a good stock of young wood and to thin out all decaying and old portions. Root out old and useless trees, and replace them with young and fruitful ones. Remove hand-lights and sashes from Cauliflowers, Lettuces, and Onions during the daytime, but replace them at night. The smallest amount of rain must be excluded from the Lettuces, as they are so apt to damp off if they become wet; therefore rather tilt up the sashes than remove them altogether. Thin and weed the plants, and stir the soil a little amongst them. Scatter some lime over all kinds of crops, more especially over those transplanted permanently, such as Cauliflowers under hand-lights. If ground is required, lift the Jerusalem Artichokes and store them; if land is not wanted, merely cut over the stalks and spread a layer of litter along the top of each drill. Dig the ground between lines of Rhubarb, and place a forkful of litter over each crown. Any Endive plants to spare plant in front of palings or walls. If the ground is required in which the general crop is growing, lift the plants, tie a piece of matting around each, and lay them in thickly in a bed for a time. Protect them from severe weather by shaking some rough litter over them. Look over Mash-room beds twice a week if bearing well, if not, once will suffice. This crop has borne remarkably well as a rule this year, owing to the winter being so dry. Frost is easily excluded by means of additional covering, but cold rains, no matter although the beds be covered with

mats, find their way into the Mushrooms, destroy the spawn, and ruin the crop. Examine Seakale beds, producing Kale, and by means of the litter in the alleys and that covering the beds maintain an equable temperature. If necessary, start two other beds by filling the alleys with fermenting manure, placing a covering of the same on the surface; over that put hoops and mats, to be covered with litter if wanted. Succession beds leave exposed. Treat Rhubarb in a similar way, but give the roots more room. Take the litter off sashes put over Mint frames during the day, but replace it at night. Make another hot-bed, and lift another lot of roots, and start them to succeed those already in bearing.

Indoor Fruit and Forcing Department.—For fruiting Pines maintain a bottom-heat of 80°, and a top temperature of 70° at night, and five or ten degrees less for succession plants. Pot suckers whenever obtainable, and keep the roots of all, except those swelling fruit, pretty dry. Begin forcing Figs with a night temperature of 50°, and thoroughly moisten the soil, for, if too dry, the young fruit is sure to drop. Peaches and Nectarines set their fruit much better if fire-heat and ventilation are given night and day during the time in which they are in flower, than they otherwise would do. Syringe the trees after the fruit has fairly set, and before the bloom has expanded, but not whilst they are in flower. Begin the forcing of Cherries with a night temperature of 45°, and give fresh air freely. Strip off the loose bark from late Vine rods, and apply a coating of some insect-destroying paint. Keep the unstarted houses as cool and airy as possible, and prune any Vines not already operated on. Syringe daily until the flowers begin to open, but not after that, for plenty of atmospheric moisture may be maintained by damping the floors and walls. Introduce into heat some Strawberry plants; 45° is sufficient at first, but, if a bottom heat of fifteen degrees higher than that can be given, it would be an improvement. Continue to introduce successional roots of Rhubarb, Seakale, Asparagus, Mint, Dandelions, and Endive into the Mushroom-house or hot-beds, where a temperature of 60° is maintained.

THE KITCHEN GARDEN.

Maintain everywhere neatness and order; trench all vacant ground, turning it up in as rough a state as possible, so as to permit frost to pulverise and sweeten it, and to clear it of the larvae of insects, which dislike exposure to hard frost. In trenching, open a thoroughly good trench and break up the ground well at the bottom of it with strong forks, allowing it to remain rough and loose. Turn into the trench all surface vegetation and rubbish, and over that lay the mould from the next trench, again well breaking up the bottom; and so proceed till all has been turned over. By well moving the soil and getting down deeper and deeper every year, good depth of soil may be secured, and thus not only will crops be supplied with abundant food, but also, in dry seasons, with moisture. With thorough drainage, deep culture, and surface stirring, luxuriant crops can be obtained from land at the first cropping. Whatever vegetable refuse may be lying about, or collected at the rubbish heap, keep close together covered with earth and salted—salt being a good deodoriser. If there is one thing more than another a gardener should feel an antipathy to it is a weed; not only do weeds impair the appearance of a garden, but their production costs a considerable amount of money, inasmuch as they rob the soil of that which should go to support profitable crops. Deep trenching is a good way of keeping them in check, and there is no doubt that by deep culture the amount of most kinds of crops might be greatly increased. Surface stirrings should also be constantly carried out on all suitable occasions. Where required, look out for a new stock of Bean and Pea sticks, and get them prepared so as to be ready for use when wanted. Seed lists, too, should be made out, in order to give the seedsmen time to get the goods put up in proper order before the busy season has arrived, and when you have the seeds home place them with the list methodically in thoroughly clean drawers or cupboards. See also that they are placed secure from the ravages of mice, and in a dry situation to prevent mildew or dampness.

Artichokes.—Still retain the mulching around the base of Globe Artichokes, and strew some straw or litter very thinly over the crowns. Lift whatever Jerusalem Artichokes are yet in the ground and store them in sheds or pits. Towards the end of the month, make another plantation in any out-of-the-way corner where their shade will not injure other plants, or where they will make a useful shelter.

Asparagus.—If last month's directions have been attended to, this crop will require no attention till next month; but if not, apply a good mulching of manure and seaweed, if obtainable, to the beds.

Beans.—Earth up whatever Beans have appeared above the surface soil, and make another sowing if necessary on a warm border, this time including some Long-pods.

Broccoli.—Take up such plants as are "turning in" with good

balls, and keep them in sheds or cellars until they perfect their heads, providing the weather be severe, but, in the event of fair weather, leave them undisturbed in the ground and break a leaf over the curd to protect it from sunshine. Clear away stumps of sprouting Broccoli from under the trees as soon as they yield their crop.

Cabbage.—Plant out according to demand from the store beds of the autumn sowings, and sow a sprinkling of some small early sort if necessary, either in a frame or in a warm border.

Cardoons.—Rather than encumber the ground any longer with these, lift and store them amongst clean sand in a shed, where they will become blanched, and be always ready for use. Occasionally examine them to remove any decaying leaves.

Carrots.—Examine the stored roots and remove all decaying ones, from which cut away the decaying portion, and use the whole, some part at once, either for culinary or farm purposes. Sow a few Early Horn Carrot seeds on a slight bottom-heat and on an open dry border, if free from frost; and have a sharp look-out for damping, shrinking, canker, mildew, and slugs, and dredge the plants occasionally with wood-ashes and dry dust.

Cauliflowers.—Sow some seeds in frames in a very gentle heat. Freely expose on every favourable opportunity those wintered in frames, and tilt up the sashes at back and front during rainy weather. About the end of the month plant them out, nine under a hand-glass, or in rows in borders, or warm sheltered quarters.

Celery.—Sow some seeds in pans of light rich soil in gently heated frames, and prick out the seedlings into boxes or large pans as soon as they can be handled. In case of hard frost, protect the Celery in ridges with litter or Fern, to permit of its easy access during all weather.

Endive.—Maintain a good supply of nearly full-grown plants lifted from the open air, in pits or frames where the temperature ranges about 50°, and where they can be darkened at pleasure.

Horse Radish.—Lift the old plantations of this and store the useful roots in sand in a pit or cellar, but every particle of the roots, small and large, should be removed from the soil, as they will only cause future annoyance by growing again if left. Make fresh plantations in deeply trenched ground.

Lettuces.—Sow some seeds of the white and green Paris Cos Lettuces in frames, and the Bath Cos in rows where they are permanently to remain, because they are somewhat liable to run to seed when transplanted. Draw the lights entirely off the frames containing late autumn sowings in favourable weather; but replace them in the event of frost, or cold rains or snow.

Onions.—If a frame can be spared for the purpose, sow some Tripoli, or white silver-skinned, Onions for salading, as they will come in nice and useful six weeks sooner than the main outdoor sowings; and what are not required for this purpose can be used for transplanting purposes, when they will produce larger bulbs by autumn than the ordinary spring sowings.

Parsley.—Keep this crop clean from drifting leaves, and protect a few plants with hoops and mats in case of frost. By sowing some seeds in a dry and warm border, a good supply of young Parsley can be had a month sooner than from the ordinary spring sowings.

Peas.—Draw some earth to those that are a little above ground, and also stake them in good time, not only for the support contributed thereby, but also for the shelter the stakes afford. Make a successional sowing, either in a border or sheltered quarter, keeping the rows about 4 or 6 feet apart, in order to permit of intercropping with Cauliflower or Spinach.

Radishes.—Sow some seeds amongst Potatoes in frames, or independently by themselves. Sow, also, in quarters or borders, and mulch them over with litter till the seeds germinate.

Rhubarb.—In fine weather, and when the ground is in a good workable condition, lift and divide some of the roots, and transplant them in deeply worked soil in rows 3 feet apart, and the plants 2 feet asunder. Place a large forkful of rank litter over the crowns of the old plants in order that the leaf-stalks may come up under it cleaner and more tender than they would if left quite exposed.

Seakale.—Those that prefer earthing up Seakale to blanch in preference to covering it with pots, or a framework of wood, and covering with leaves, should do so at once. Under any circumstances it is now time to cover up this crop.

Spinach.—In frosty weather strew some rank litter over the best rows of this crop, and in fine weather remove it and loosen the surface soil. About the end of the month sow some seeds of the round-leaved sort between rows of Peas, or in any other convenient but sheltered position where the ground is not too wet and cold.

Turnips.—Sow some early Turnips on a warm border, or between rows of Peas. Do not permit useless roots to occupy the ground at this season; rather lift all. Preserve the good in pits, and throw away the bad, and have the ground roughly dug, and in readiness for another crop.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

NOTES ON LANDSCAPE GARDENING.

By JAMES M'NAB, Royal Botanic Gardens, Edinburgh.

PERHAPS no subject is more interesting or more deserving of general attention than that of landscape effects produced by the aid of landscape gardening, and it is one upon which it is often impossible to get two individuals to form the same opinion. If the surface of the land to be operated on is varied and undulated, it will greatly assist the operator whose taste and skill are to be brought to bear upon it. To be successful in landscape gardening, one must have the eye of an artist, and the pencil of an artist, as well as a strong natural feeling for the beautiful, and even with these requisites much that may be done will not, for many years, realise the ultimate effect which a landscape gardener is anxious to impart to his subject. The designing of a picture on canvas, so as to have it well balanced and pleasing to the eye, requires from the artist himself much thought and consideration; and, if found to be faulty, it is easily put right by a few touches from the brush. In regular geometrical gardening, plans can be made and carried out to a nicety, even for avenues and carriage drives, but, as regards landscape gardening, in its full and true acceptation, no detailed plan can be executed on paper. The arrangement and disposition of trees and shrubs, for effects suitable for the undulating nature of the land, must emanate from the fertile brain of the qualified man into whose hands such works are entrusted. After all the work has been done, and the trees properly planted and grouped, it often takes years to produce the effects intended. It is not always the original designer that makes landscape gardening tell in every detail. His duty is to plant freely, both singly and in groups, using as many varieties as possible, so as ultimately to produce effective tints for spring, summer, and autumn, for which purpose numerous sorts of trees, now exist in cultivation. Care should also be taken to secure a diversity in the form of trees, such as the upright and weeping kinds, and those with spreading branches, always keeping in view a well selected proportion for flowers and foliage. Without these requisites landscape gardening is apt to be tame. To have all the varieties here stated planted promiscuously through each other, would be a great mistake. The successful grouping of such trees can only be effectually done on a broad scale, and on ground more or less undulating.

Suburban villa residences now occupy much of the time of the landscape gardener. For such limited space it often requires the utmost nicety in the arrangement, so as to give them a diversity of surface, as well as a feeling of extent. Some villas stand on level ground, are walled in, and command no views; for such places a simple form of laying out can easily be arranged by having, in suitable places, raised belts of evergreens, for the purpose of giving extent. When the ground is undulating and limited it requires very great care, when planting, to secure the distant landscape effects, which such situations were originally destined to command, without exposing such residences more than is necessary. In some cases such villas are built in situations so as to command views, and are planted up all round, under the plea of shelter. These shelter trees do not for many years interrupt the landscape effect; gradually, however, and by almost imperceptible degrees, they shut out the views. This planting up is so far correct, and what, under ordinary circumstances, may be looked for, provided due care be afterwards taken to open up vistas by the removal or branching of certain trees, not all at once, but by degrees. In some situations the full scope of landscape gardening can only be successfully carried out after the trees in such places come to be matured, and it is at this stage that the services of the practical landscape gardener are most required. I have frequently had occasion to point out to proprietors the advantage of these partial clearances, and it is often gratifying to see, that when one little picture is produced in a frame of foliage, either by the cutting off of certain branches, or the removal of a tree altogether, the desire generally increases to

multiply such views. It is possible, however, without proper guidance, to carry this too far, as, in some instances, fine trees are ruthlessly sacrificed for the landscape effects produced by their removal. Of course, such thinnings must be carefully and judiciously done, so as not to injure the outline of the picture intended to be produced, nor endanger the shelter of the place. For the smaller villas it is not absolutely necessary that they present a picturesque effect from the neighbouring country; but it is different with a nobleman's residence, where it ought to be a primary object to make such places tell from as many points as possible, groups of trees, as well as single specimens, being tastefully arranged around them.

On large domains apparent errors are frequently seen, or, if not errors, they are effects far from pleasing to the eye. A large old mansion, standing on level ground, having a long straight road or avenue in front, is very often to be met with, and is sometimes suited for certain styles of architecture. With all modern buildings, such straight roads ought to be avoided, and, more particularly, if the land is in the least degree undulating; such, however, is sometimes done, but whether from the wish of the architect or the proprietor, it is difficult to say. When a new house is placed in the neighbourhood of old and well-shaped trees, it may be difficult to get proper clearances made for a suitable approach without the sacrifice of some fine specimens, but such limited feelings should not be allowed to exist. If £100,000 has been laid out on a mansion, nothing should stand in the way of making the approach, and everything else around it, as perfect as possible. In the formation of large parks and pleasure-grounds round large mansions, and even with places of moderate extent, it would be desirable if the architect and landscape gardener could go hand in hand in the details of the outside work, particularly in the immediate neighbourhood of the house, instead of being antagonistic, as frequently happens: a harmonious feeling would often save a great deal of after-work, and consequent expense. I am not quite certain if the modern style of terraces and geometrical flower-gardens, in the immediate vicinity of a large residence, is altogether in good taste. A large expanse of Grass, and good grouping of trees and shrubs, have always appeared to me to give to large mansions a degree of stateliness which they cannot have by any style of geometrical flower-gardening placed immediately under the windows; to say nothing of the jar of the mowing-machine continually going on during early morning, and which often proves a great source of complaint to gardeners. But such terraced gardens, from their extent, cannot be made to look well without constant machine-work.

On large and level policy grounds, also in public parks, good effects are produced by the formation of large sheets of water, of a somewhat irregular form, so as to give the grounds a greater appearance of extent; such a sheet of water lying in sight of the chief windows, has, to me, a more pleasing effect than many of the modern flower-garden departments, placed immediately before the house. The soil round such artificial lakes should be placed in irregular waving mounds around the margin, but chiefly on one side; and these raised grounds planted over with trees and evergreen shrubs, having on the flat Grassy spaces a sprinkling of the various species of *Yucca*, *Cordyline*, *Phormium tenax*, *Gynerium argenteum*, *Arundo conspicua*, also clumps of evergreens and deciduous flowering shrubs and perennial herbaceous plants. If rock-stones are abundant in the neighbourhood, a shelving group of them here and there, close to the water edge, gives a pleasing effect, and, if narrowed in certain points, rustic bridges become telling objects.

In villa gardens, and moderate-sized mansions, geometrical flower gardens, or clumps placed near the house, are by no means objectionable. Such residences being often limited in extent, prevents them being put elsewhere. The flower plots, however, should not all be filled up with bedding-out plants. Three or four may be occupied with scarlet *Geraniums* or any other favourite summer-flowering plant, these to be removed in autumn, and their places filled up with the bulbs of *Hyacinths* or *Tulips*, for spring effect. The major portion of the clumps should be filled with peat soil, and planted with hardy Heaths,* or dwarf free-flowering American plants, or

* See article on hardy Heaths in THE GARDEN, 21st December, 1872.

others requiring bog earth, of which a large variety now exists in nursery collections, and some kinds of which will be found flowering so as to give a succession during the whole year. If the clumps are raised and arranged with rock-work sides, Mossy and other Saxifrages, Sedums, and Sempervivums, can be grown without much trouble. By this arrangement, villa-garden clumps would have a clothed appearance all the year round, which is not generally the case during the autumn, winter, and spring months, unless temporarily filled with coloured Kales, Acubas, and variegated Hollies, to be removed when the summer bedding plants are to be put in. This changing style of gardening is often attended with much trouble, for which the three or four months of bloom will scarcely compensate.

THE SPECIES OF TULIPS.

AS MUCH interest is now taken in the cultivation of bulbous plants, we believe that the following slightly abridged translation of an article by Dr. Regel, of the Botanic Gardens, St. Petersburg, which appeared in a recent number of the *Gartenflora*, will be acceptable to many of our readers. Very few persons, we think, are aware that there are so many distinct species of Tulip as are here enumerated, the greater number of them being, up to the present, quite unknown in our gardens. Many of them, however, are worthy of introduction, and we shall be very pleased if our notice of Dr. Regel's "Synopsis" proves the means of directing the attention of our cultivators to even the one very beautiful species, *T. Greigi*, the acquisition of which would form a very important addition to our list of fine flowering plants. Every lover of hardy-bulbs is, of course, familiar with the numerous and beautiful varieties of a few species that adorn our gardens in spring. The species to which we now call attention, while for the most part highly ornamental, may, in time, give rise to new races as important as those we already possess, in the various forms of *T. Gesneriana* and the bedding Tulips.

Synopsis of the Species of Tulips.

A. *Inner perianth-segments and the stamens bearded at the base.*

* *Leaves linear, or linear-lance-shaped, or narrowly-lance-shaped.*

a. *Bulb-scales thickly bearded on the inside towards the top, and sometimes at the base.*

1. *Tulipa sylvestris*.—Flowers, yellow; stamens, covered at the base with woolly hairs. Leaves, narrowly-lance-shaped or linear-lance-shaped, and somewhat flat. Anthers, usually linear, and about as long as the stamens. Perianth-segments, nearly 2 inches long. Flower-stalk from 8 to 16 inches high. Native of central and southern Europe.

a. *T. s. var. Biebersteiniana*.—Flowers, yellow, the outside or back of the perianth-segments being greenish or purplish; in other respects like those of the type, but smaller. Stamens, covered with weak hairs at the base. Flower-stem bearing one flower, seldom two. Native of South Russia, the Crimea, Podolia, Greece, the Caucasus, and Tarkestan.

b. *T. s. var. tricolor*.—Flowers, white on the inside and yellow at the base, greenish or dull purple on the outside. Stamens, covered with weak hairs at the base. Flower-stem, from 3½ to 12 inches high. Leaves, varying from linear to linear-lance-shaped, upright or reflexed, flat or undulating, as long as, or longer than, the flower-stem. Anthers longish or elliptical, twice or thrice as short as the stamens. This is a purely Russian species, its distribution extending from the Steppes of the Volga and the Caspian Sea to the Ural and Altai Mountains, Soongorie, Ili-gebiet, and Tarkestan.

c. *T. s. var. cretica*.—A dwarf species, with rose-coloured or pale rosy flowers. Stamens covered with weak hairs at the base. Flower-stem, only from 2½ to 4 inches high, leafy, one-flowered, shorter than the leaves. Leaves, like those of the preceding species, varying in shape, direction, &c. Native of the loftier mountains of Crete, and the Caucasus.

d. *T. s. var. pulchella*.—Another dwarf species, from 3½ to 5 inches high, with purplish-red flowers, marked with purplish-black spots. The one-flowered stem bears three or four linear-lance-shaped erect or reflexed leaves, which generally over-top the flowers. Found at Kotschy, in the Taurus Mountains, Asia Minor.

e. *T. s. var. Orphanidea*.—This species differs from the type only in having flowers of a saffron colour, shaded with purple. Native of the mountains of Greece.

f. *T. s. var. turkestanica*.—This looks very like a small-leaved dwarf variety of *T. s. Biebersteiniana*, but the bulb-scales are covered

with weaker and longer hairs on the inside at the top, all the other parts being quite smooth. Rather common in Tarkestan.

b. *Bulb-scales covered on the whole of the inside with a cobweb-like pubescence.*

2. *Tulipa biflora*.—Plants of this species are sometimes dwarf, and sometimes grow to 1½ feet high. The flower-stem is smooth, and generally bears two flowers (seldom one, or more than two). The flowers are at first bell-shaped, but, afterwards, the segments stand apart; the colour is white or bright yellow on the inside, the outside being greenish or reddish. Leaves, linear, or narrowly linear-lance-shaped, and usually reflexed (seldom erect). This species is very like *T. s. tricolor*, and is chiefly distinguished from it by mostly bearing its flowers in pairs, and by the woolly inside surface of its bulb-scales. Native of South Russia, the Steppes of the Caspian, Soongorie, and Aral, Tarkestan, the Caucasus, and Persia.

T. b. var. Buhseana.—Flowers, bright yellow, reddish on the outside.

c. *Bulb-scales smooth on the inside.*

3. *Tulipa Celsiana*, Redoute.—This species is entirely smooth, and, in its growth and characteristics, resembles *T. s. Biebersteiniana*. The flowers are yellow, edged with red or white, and are red on the outside. Its distinctive peculiarity is that the inner surface of the bulb-scales is quite smooth. Native of South-western Europe.

** *Lower leaves oval, or elongated oval.*

4. *Tulipa saxatilis*, Sieber.—Sieber collected two different kinds of Tulip at Cape Maleca, in Crete, and distributed both under the name of *T. saxatilis*. Of these, the dwarfer, small-leaved kind, which various authors have described under the name of *T. saxatilis*, should properly be referred to *T. s. Biebersteiniana*. The other approaches more nearly to the typical form of *T. sylvestris*, but is distinguished from it by its considerably broader leaves, by its stamens being brown at the base and covered with woolly hairs, and by its more deeply divided trifid stigma. We have retained the name of *T. saxatilis*, in the case of the latter form, as we have not yet seen the bulbs, and as the yellowish flowers are marked with a darker colour at the base. It is possible, however, that it may, hereafter, have to be referred to *T. sylvestris*.

B. *Inner perianth-segments and the stamens smooth at the base, or, the latter, in one species (T. Sibthorpiana) furnished with deciduous weak hairs, and the former in one species (T. Soongiana) ciliated at the base.*

* *Perianth-segments, marked at the base with a blackish or blackish-blue spot.*

a. *Perianth-segments, oval or elliptical, lance-shaped, blunt or shortly pointed.*

†. *Flower-stem smooth.*

a. a. *Lower leaves oval, or oval-lance-shaped, or lance-shaped, or linear-lance-shaped; upper leaves narrower.*

5. *Tulipa Oculus-solis*.—Bulb-scales tomentose on the inner surface. Flowers, funnel-shaped; segments, shortly pointed and covered with indistinct weak hairs at the point; colour, scarlet, paler on the outside; inside of each division marked at the base with a large, longish, oval, blackish spot, surrounded with a yellow zone. Native of France, Switzerland, Italy, and the east.

a. *T. O. s. var. malcoleni*.—Flowers, bell-shaped, purple (seldom streaked with yellow), the outer segments shortly pointed, the inner ones blunt; all slightly bearded on the points, each segment having a round dark yellow spot at the base. Lower leaves lance-shaped, generally ciliated at the margin.

b. *T. O. s. var. praeox*.—Flowers, bell-shaped; segments, all shortly pointed and bearded at the points; colour, orange-red or purple. In all other respects like the preceding variety.

c. *T. O. s. var. Strangwaysi*.—Flowers, oval bell-shaped; segments all blunt; colour purple, with an indistinct yellow spot at the base of each segment. Leaves lance-shaped.

6. *Tulipa Didieri*, Jord.—Bulb-scales thickly bearded on the inner surface towards the top. Flowers purple or reddish-yellow or yellow; segments shortly pointed, and covered with indistinct short hairs at the points. Stigma large, trifid, exceeding the ovary in diameter. Leaves bluish-green, mostly ciliated on the margin. It approaches very nearly to the form of the preceding species. Native of France and Persia.

7. *Tulipa Borszczowi*, Rgl.—Bulb-scales covered thickly on the inner surface with long, thin, brown, silky hairs. Flowers yellow or orange-red, with a dark blue spot at the base of each segment. Segments oboval-wedge-shaped, blunt or abruptly pointed. Stigma slightly trifid. Flower-stem from 8 to 16 inches high, one-flowered, bearing three or four leaves, and covered as far as the middle, or higher, with the withered leaf-sheaths of the preceding year. Leaves dark green, very much undulated, and edged

with a transparent cartilaginous margin. Native of the Aral Steppes and Turkestan.

8. *Tulipa Julia*, C. Koch.—Bulb-scales, as in the preceding species. Flowers, broadly bell-shaped; segments, oboval-wedge-shaped, blunt, or rounded, or abruptly short-pointed; colour, purple, with a blackish-blue spot at the base of each segment, often marked with several darker coloured dots; stigma, slightly trifid; flower-stem, from 2½ to 4 inches high, one-flowered, and bearing three or four leaves; leaves, lance-shaped, or narrowly lance-shaped, mostly undulated; upper leaves narrower; plant entirely smooth. Native of the Caucasus and Turkestan.

b. b. *Leaves linear.*

9. *Tulipa Boissieri*, Rgl.—Flowers, purple; outer segments, oval, shortly pointed; inner ones, oboval-wedge-shaped, margined in front with small points; each segment marked at the base with a dark-blue spot; flower-stem, one-flowered, bearing three leaves; leaves erect, ciliated, longer than the flower-stem. Native of Palestine.

†† *Flower-stalk more or less hairy.*

10. *Tulipa Greigi*, Rgl.—Bulb-scales, bearded on the inner surface at the top. Flowers, broadly bell-shaped, scarlet, or purple, or, more rarely, yellow; segments, reflexed, ovate, or oboval wedge-shaped, shortly pointed, or obtuse, or apiculate from the rounded apex, each segment marked at the base with an oblong blackish spot; flower-stem from 2½ to 8 inches high, one-flowered, bearing three or four leaves. Lower leaves, ovate or ovate lance-shaped; upper ones, narrower, all smooth, undulated, edged with a cartilaginous margin, and marked thickly with oblong tawny spots. A very handsome species. Native of Turkestan.

b. *Perianth-segments oval, the outer ones oboval-ligulate, pointed.*

11. *Tulipa Eunanthiæ*, Orph.—Bulb-scales, thickly bearded on the inner surface. Flowers, purple; segments, oval, with a long blackish spot at the base; the inner ones shortly pointed. Flower-stem, covered with short hairs, one-flowered, bearing three leaves. Lower leaves, oval-lance-shaped, or lance-shaped, all undulated and scarcely margined. Native of Greece.

c. *Perianth-segments lance-shaped, the outer ones narrowed into a point.*

12. *Tulipa aleppensis*, Boiss.—Flowers, purple; segments, narrowed at the sides, and mostly ending in a point, marked at the base with a longish, linear, blackish spot. Flower-stalk, smooth; stem, one-flowered, bearing three or four leaves; leaves, flat, not margined, the lower ones lance-shaped, or narrowly lance-shaped. Native of Syria, near Aleppo.

13. *Tulipa bæotica*, Boiss. and Heldr.—This species very much resembles the preceding, but is distinguished from it by its undulated leaves, its flower-stalk covered with short hairs, and its perianth-segments bearded in front. Native of Greece.

* * *Perianth-segments, without any blackish spot at the base.*

a. *Perianth-segments, blunt or shortly pointed.*

† *Flower-stalk, smooth. Flowers, erect.*

a. a. *Leaves, not margined; the lower ones oval, or oval lance-shaped, or lance-shaped; upper leaves, narrower.*

o. *Bulb-scales, smooth on the inner surface.*

14. *Tulipa Gesneriana*, L.—This species is the parent of the well-known late-flowering garden Tulips. It appears in an immense variety of forms, with red, yellow, and variegated flowers, single and double; and with slashed flower-segments, in the so-called Parrot Tulips. Native of Southern Europe and the East.

o. o. *Bulb-scales thickly bearded on the inner surface towards the top.*

15. *Tulipa Schrenki*, Rgl.—Flowers, broadly bell-shaped, yellow, or, more frequently, purple, somewhat smaller than those of the common Tulip; segments, blunt or shortly pointed, slightly bearded at the apex. Stem, 9 or 10 inches high, one-flowered, bearing three or four undulated leaves. Plant entirely smooth. Native of Soongorei, Ili-Flussgebiet, and Turkestan.

b. b. *Leaves, with a transparent cartilaginous margin; lower leaves, elongated lance-shaped; upper leaves, narrower.*

16. *Tulipa Lehmanniana*, Merckl.—Flowers, bell-shaped, yellow; segments, longish-oval, pointed or shortly so. Stem, one-flowered, bearing four leaves; leaves very much undulated or curled, and reflexed; bulb unknown. This species is closely allied to the preceding one. Native of the Steppes of Bokhara.

c. c. *Leaves not margined; lower leaves, linear lance-shaped; upper leaves, linear; sometimes all the leaves linear.*

17. *Tulipa Soogdiana*, Bunge.—Bulb-scales, densely covered with hairs on the inner surface. Flowers, broadly bell-shaped, apparently yellowish; segments, elongated-oval, blunt or pointed, very shortly bearded in front; inner segments ciliated at the base. Stem, from 3 to 5 inches high, one-flowered, bearing two leaves; leaves reflexed, flat at the margin. This species is nearly allied to

T. biflora, but is distinguished from it by the stamens being quite smooth at the base. Native of the Steppes of Bokhara.

18. *Tulipa armena*, Boiss.—Bulb-scales, thickly set on the inner surface with long stiff hairs. Flowers, yellow; segments, oboval, blunt, or the outer ones with a small point; stem, 3 to 4 inches high, one-flowered, usually bearing four leaves; leaves reflexed, undulated at the margin. Native of Armenia.

19. *Tulipa Clusiana*, Vent.—Bulb-scales, tomentose on the inner surface. Flowers, almost funnel-shaped; segments, lance-shaped, narrowed towards the base; outer ones pointed, white on the inside, and violet-coloured on the outside, near the point; inner segments, blunt, white. Stem, from 8 to 16 inches high, one-flowered, bearing from three to five leaves. Leaves, erect, far apart, flat at the margin. Plant entirely smooth. Native of South Europe, North Africa, and the East.

a. *T. C. var. stellata*.—This variety has the outer segments violet-coloured on the point only.

20. *Tulipa montana*, Lindl.—Bulb-scales, tomentose on the inner surface. Flowers, purple, bell-shaped, or broadly so; segments, all oval, pointed, and yellowish at the base. Stem, 9 inches high, or shorter, one-flowered, bearing three or four leaves. Leaves, reflexed, far apart, undulated at the margin. Plant entirely smooth. Native of Persia.

a. *T. m. var. maculata*.—This variety has the purple flower-segments marked with a small blackish spot at the base inside; outer segments, shortly pointed; inner ones, blunt.

b. *T. m. var. chrysantha*.—Flowers, of a golden-yellow colour; outer segments, pointed; inner ones, blunt.

†† *Flower-stalk, smooth; flowers, nodding.*

21. *Tulipa Sibthorpiana*, Sm.—Up to the present, this species is only known from Sibthorp's drawing, and, perhaps, should not be referred to the genus *Tulipa* at all, but to the genus *Orithyia*. Flowers, bell-shaped, yellow; segments, longish-spathulate, bluish; stamens, covered with hairs their entire length. Stem, one-flowered, bearing two leaves. Leaves, erect, flat, not margined; the lower ones, elliptical-lance-shaped. Native of Greece.

††† *Flower-stalk, covered with short hairs.*

22. *Tulipa suaveolens*, Roth.—Outer bulb-scales, covered with hairs on the inner surface; inner scales, quite smooth. Flowers, broadly bell-shaped, erect, generally purple (seldom entirely yellow), with a golden-yellow margin round each of the segments, which vary in shape from oboval to lance-shaped, and are blunt, or shortly pointed. Stem, from 9 to 12 inches high, one-flowered, bearing from three to six leaves. Leaves, erect, not margined, rather flat, the lower ones elliptical-lance-shaped. Native of S. Europe. In gardens it occurs with both double and single flowers, and with stems of various heights.

23. *Tulipa strangulata*, Reboul.—Flowers, pitcher-shaped and of various colours, yellow, purple, &c. Leaves, smooth or hairy, not margined. In all other respects similar to *T. suaveolens*. This and the preceding species are the parents of the numerous varieties of the early or forcing Tulips of our gardens, such as Duc Van Thol, &c. Native of Italy.

24. *Tulipa altaica*, Pall.—Bulb-scales, thickly covered with hairs on the inner surface. Flowers, broadly bell-shaped, yellow inside, greenish or light purple outside; segments, elongated-elliptical, pointed, or rounded, with a small projecting point. Stem, from 9 to 12 inches high, one-flowered, bearing two or three leaves. Leaves, bluish-green, erect or reflexed, covered with short hairs or smooth, curled at the edges, and surrounded with a transparent cartilaginous margin; the lower leaves longish-oval, or longish-lance-shaped. Native of the Steppes of Soongorei, Ili-gebiet, and Turkestan.

b. *Perianth-segments elongated into a long tail-like point.*

25. *Tulipa turcica*, Roth.—Bulb-scales, covered on the inner surface with long, brown, shaggy, silky hairs. Flowers, bell-shaped, erect, light purple, white, or yellowish; segments, narrowly lance-shaped, ending in a long bearded point. Flower-stalk, smooth. Stem, from 1 to 1½ feet high, one-flowered, bearing from three to five leaves. Leaves, linear-lance-shaped, erect, rather flat, not margined. Native of Persia and Turkey.

a. *T. t. var. media*.—The flowers of this variety are of a deep scarlet, chequered on the outside with white; the segments also are not bearded at the point.

26. *Tulipa undulatifolia*, Boiss.—Flowers, broadly bell-shaped; segments, oval, long-pointed, with short hairs on the point and also on the flower-stalk. Stem, one-flowered, bearing several leaves. Leaves, lance-shaped, reflexed, undulated and curled at the margin. Native of Asia Minor, near Smyrna. I have not seen this plant either in a dried or living state; the description here given is that of Boissier, Diagn. ser. 1, fasc. V. page 57.

NOTES OF THE WEEK.

— WINTER Pears are behaving curiously this season. Kinds on which the Covent Garden fruiterers usually depend in March are not only ripe, but, in too many cases, rotten now. This is generally true of all winter Pears, both English and French. There has been much loss, and, it is supposed, there will be a great scarcity of Pears by-and-bye. Does the mild season help to explain this?

— At a meeting, held the other day, of the Botanical Society of Edinburgh, Mr. McNab laid on the table 138 species of flowers picked in the Botanic Garden on the 1st of January this year. Of these thirty-five might, he said, be considered as winter and spring flowers, while the remaining 103 might be looked upon as summer and autumn plants still flowering.

— THE Early Mount Lebanon Iris (*I. Histro*), a near relative of *I. reticulata*, is just now in flower on a border in the herbaceous grounds at Kew. It bears beautiful blue flowers, spotted with deep purple, its fresh flowers just peeping through the surface of the soil. It is new to our gardens, and deserves general cultivation. It differs from *I. reticulata* in its smaller size, and much fewer, shorter, and broader leaves, and differently-shaped inner perianth-segments.

— ONE of the prettiest bouquet combinations now in Covent Garden Market consists of the pure white flowers of Camellias, Azaleas, Bouvardias, Lily of the Valley, and Tea-scented Roses, spotted here and there with blooms of the bright blue *Nemophila*. This common blue flower, now produced in hothouses, has quite as good an effect set in white ground-work as a blue *Cineraria*.

— WE have just received from Messrs. Hooper, of Covent Garden, some tasteful wreaths of artificial foliage and flowers made of metal, and carefully coloured after nature. It is considered that they will be much more suitable for the ornamentation of tombs than the wreaths of gaily coloured Immortelles, now so generally used for that purpose, as they will be more durable. Wreaths of this kind will also be found useful on festive occasions, for wall decorations not too near the eye.

— WE this week give an illustration of the seed-vessels of the Gladwin (*Iris foetidissima*), sometimes, also, called the Roast-beef plant, accompanied with a description by Miss Hassard. It is only this season that this very old plant has come into use for indoor decoration. We have long admired it for the sake of its brilliant seeds in winter, so useful in the wild garden. It may be well to mention that the variegated form of this is one of the most popular and most effective plants grown in rooms on the Continent. It thrives in the dry air of rooms; its white variegation is effective by artificial light, and it is sufficiently graceful in habit to associate well with the various plants used for room-decoration.

— AT Nassau, in the Bahamas, an establishment for canning Pine-apples has been put into operation this season, at a cost of £200,000. Six hundred hands are employed in preparing and packing the fruit. A million Pine-apples have been purchased this season, which were grown upon these islands, and were, therefore, procured in their greatest state of perfection, and over a million cans have been packed. The Pine-apples are purchased at from 18 to 40 cents a dozen, and the cans cost on importation thither 4 dollars 50 cents a dozen.

— IN a recent number of the *Gartenflora*, Dr. Regel describes a new species of Tulip, from Turkestan, which flowered last year in the Botanic Gardens at St. Petersburg, and which, he says, is so beautiful that he considers it the Queen of Tulips. The flowers are of a brilliant scarlet (in some varieties, purple, or, more rarely, yellow), from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, and from 1 to $1\frac{1}{2}$ inches broad, broadly bell-shaped, the points of the divisions of the corolla being much reflected. Flower-stalk from $2\frac{1}{2}$ to 8 inches high. The leaves are thickly covered with oblong tawny spots, reminding one of the leaves of *Orchis maculata*. A well executed coloured figure accompanies the description of this Tulip, which Dr. Regel has named *Tulipa Greigi*, in honour of Mr. S. A. Greig, the President of the Russian Imperial Horticultural Society.

— AMONG a number of rare plants collected by Herr T. von Heldreich in the course of a botanical excursion in Attica last year, was a very handsome species of Horned Poppy (*Glaucium*), which he found growing on the rubbish-heaps at the lead mines of Laurium, and named *Glaucium Serpieri*, in honour of Herr J. B. Serpieri, the founder of the mines. This Poppy is finely figured in a coloured plate in a late number of the *Gartenflora*, and described in an accompanying letter from Herr von Heldreich, in which it is stated that it grows from 1 to 3 feet high, and bears golden or crocus-yellow flowers (larger than those of the common *Glaucium luteum*), with a dark violet spot at the base of each petal. The plants grew in great abundance on the rubbish-heaps, and Herr von Heldreich was so fortunate as to discover amongst them a variety bearing very double flowers of the same deep golden colour (but without the violet spots),

and resembling in appearance the flowers of the double-flowered *Ranunculus asiaticus*, only of larger size.

— A MEETING of Fellows of the Royal Horticultural Society, was held on the 8th inst., to consider the question of voting by proxy, but was terminated without any definite result being arrived at.

— WE have received a new edition of the "Treasury of Botany," the best and most complete book of its class, and one to which we shall allude more fully hereafter. It is edited by Mr. Thomas Moore, a sufficient guarantee of its trustworthiness.

— A LADY correspondent tells *Moore's Rural* that for many years past she has had ripe Tomatoes in February—growing them in her kitchen from seed sown in midsummer in large boxes. She trains them on trellises, and they are ornamental as well as a pleasure to the palate.

— It is proposed to erect a winter garden at Torquay, and Mr. Eyles and Mr. Rendle have been consulted in reference to the project. A committee has been appointed to furnish a definite statement as to cost, and Mr. Eyles has been instructed to prepare three plans, to show what can be done for the respective sums of £10,000, £20,000, and £30,000.

— UNDER the name of *Eremurus robustus*, Dr. Regel describes and figures, in a recent number of the *Gartenflora*, a very handsome hardy Liliaceous plant which has flowered in the open air in the Botanic Gardens at St. Petersburg and Moscow. From a loose crown of narrow ribbon-like leaves, about 2 feet long, it sends up a leafless flower-stem to a height of about $4\frac{1}{2}$ feet, bearing on its summit a dense spike of rosy flowers, 2 feet or more in length, each of the flowers being nearly 2 inches in diameter. This very charming plant, which was discovered in Turkestan, is worthy of a place in the best collections.

— A COMMITTEE, consisting of Lord Cathcart, Mr. Whitehead, Mr. Turner, Mr. Wakefield, Mr. Brandreth Gibbs, Mr. J. Bowen-Jones, Mr. Carruthers, F.L.S., and Mr. J. Algernon Clarke, appointed by the Royal Agricultural Society to carry into effect the suggestions of the judges of the Potato-disease essays, held a meeting this week at Hanover Square. They will recommend the council to offer three prizes of £100 each for disease-proof Potatoes. Competitors will probably be required to send in one ton of each variety by the middle of February. Each sample will be distributed among growers in many different parts of England, Wales, Scotland, and Ireland; and the produce of Potatoes which resist disease during the first year's trial will be tested for two years longer. With a view of encouraging the production of new varieties, handsome prizes are to be offered also for disease-proof sorts raised from Potato-plums, to enter into competition in the spring of 1879. The terms and conditions will be decided upon at the next meeting of the council.

— THE finest kitchen garden in France, is that of Versailles, which belongs to the State, and brings in a yearly revenue, taking good and bad years together, of about 20,000 francs, the produce of the sale of the fruit and vegetables raised in this useful work of La Quintinye, gardener to Louis XIV. The Assembly has determined to apply this valuable property to the formation of a model market-garden and school of horticulture. The details of the institution are not yet arranged, but it is presumed that it will be self-supporting, and that it will render valuable assistance in the development of horticultural science in France. The industry, to the growth of which this school will, doubtless, largely contribute, is greatly on the increase in France. Fifteen or twenty years ago the exports of French fruit and vegetables represented a money value of from eight to ten millions. That figure has now increased to thirty-five or forty millions, a progression which would be become even more rapid if market-gardening in France were uniformly conducted on sound principles of horticulture, such as it will be the business of the proposed institution to exemplify and popularise.

— THE mildness of the present season, though unusual, bears no comparison to that of some winters "long gone by." In 1172, the temperature was so high that leaves came out on the trees in January, and birds hatched their broods in February. In 1289, the winter was equally mild, and the maidens of Cologne wore wreaths of Violets and Corn-flowers at Christmas and on Twelfth Day. In 1421, the trees flowered in the month of March, and the Vines in the month of April. Cherries ripened in the same month, and Grapes appeared in May. In 1572, the trees were covered with leaves in January, and the birds hatched their young in February, as in 1172; in 1585, the same thing was repeated, and it is added, that the Corn was in the ear at Easter. There was in France neither snow nor frost throughout the winters of 1538, 1607, 1609, 1617, and 1659; finally, in 1662, even in the north of Germany, the stoves were not lighted, and trees flowered in February. Coming to later dates, the winter of 1816-47, when it thundered at Paris on the 28th of January, and that of 1866, the year of the great inundation of the Seine, may be mentioned as exceptionally mild. In the woodbanks Violets and Primroses are in full bloom in many parts of the country.

THE INDOOR GARDEN.

ORIGIN OF DOUBLE ZONAL PELARGONIUMS.

I HAVE read with interest in THE GARDEN of December 27th Mr. Peter Grieve's article on Zonal Pelargoniums. He therein regrets being unable to give the name of the originator, or the precise date of the introduction, of the double-flowering varieties. As, in my opinion, it is very interesting in the history of floriculture that the date of the introduction of a new plant or new variety should be preserved, I seize this opportunity of informing English horticulturists of the origin of the first double Zonal Pelargonium. M. Henri Lecoq, director of the Botanical Gardens of Clermont-Ferrand, department of Puy de Dôme, France, wrote to me on the 1st of March, 1867, as follows:—"The first double Zonal Pelargonium has been cultivated here in my garden and many others, under the name of Triomphe de Gergovia, for several years (I cannot say how many), and nobody paid attention to it, thinking, like myself, that it was generally known." Seeds obtained from it were sown by M. Amblard, horticulturist, at Clermont-Ferrand, and produced several double-flowering varieties, one of which was named Gloire de Clermont, and sold to M. Louis Van Hontte, of Ghent, who changed the name and sold it under that of Ranunculiflora. Another double variety existed at the same time in the gardens of Clermont-Ferrand, under the name of Martial Champflour, which was of a rather deeper colour than Triomphe de Gergovia. In 1863, M. Emile Chaté, horticulteur, of Paris, went to Clermont-Ferrand, and was struck with the appearance of these double Zonal Pelargoniums, and bought the stock of Triomphe de Gergovia and Martial Champflour. In June, 1864, he sent some flowers of Triomphe de Gergovia, to which he had given the name of Auguste Ferrier, to M. Victor Lemoine, horticulturist, at Nancy, who immediately used the pollen of these flowers to fertilise Beauté de Suresnes, the finest single pink Zonal yet in existence, and obtained, from this artificial fecundation, in 1865 Gloire de Nancy, well known by all horticulturists, and till now the best formed double Zonal. In 1866, he obtained, by the same process, Triomphe; in 1867, Madame Lemoine, the first double cherry-pink Zonal, and Wilhelm Pfitzer, double scarlet; Marie Lemoine, one of the best of bloomers amongst the double Zonals; Le Vésuve, double red; Victor Lemoine, and Stella. National, Signet, Duc de Suez, Sapeur Pompier, Floribunda, Volcan, Prince du Teck, and several others sold in England by Messrs. Bull, Henderson, Carter, &c., are all seedlings of Victor Lemoine, although those who sold them did not acknowledge their origin. In 1869, I obtained by artificial impregnation from Boule des Hespérides, by Gloire de Nancy, Victoire de Lyon and Clemence Royer, the first of a purple shade, and the latter of a pure rose. In 1871, I obtained Charles Darwin, François Arles Dufour, and Emiliô Castelar, all three more or less crimson. In 1872, I obtained the first double white, Aline Sisley, by artificial impregnation of a grand-daughter of Madame Vancher by a double red of my seedlings. A great many double Zonals have been raised by Aléatière, Chaté, Crousse, and Aldebert, but all resembling, more or less, Gloire de Nancy and Madame Lemoine. The great and interesting facts are, that the first double Zonal Pelargonium was found, some fifteen years ago, at Clermont-Ferrand, where it had been overlooked for several years, and that the first improvement in form and colour was obtained by M. Victor Lemoine, of Nancy, and the first double white from seed by me

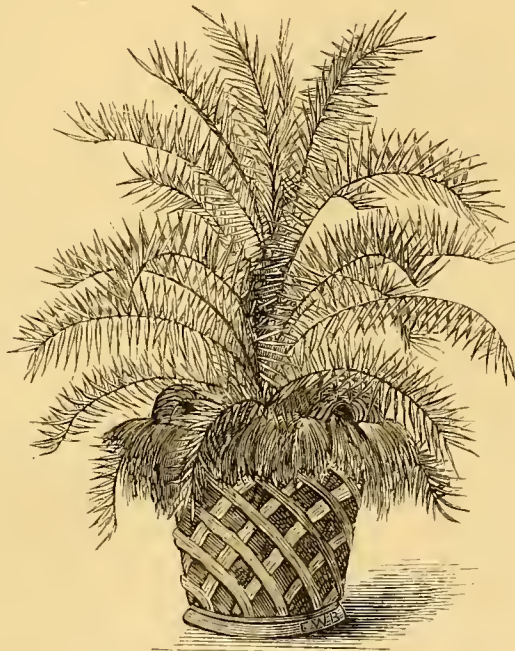
JEAN SISLEY.

PHŒNIX SYLVESTRIS.

NEARLY all Palms, when in a small state, are specially valuable for decorative purposes, and, for the indoor decoration of apartments they are preferable to nearly all other fine-foliaged plants. Their leaves, being of stout hard texture and having a glossy surface, withstand the dust and aridity of heated rooms much better than Ferns, Selaginellas, or similar soft-leaved plants grown for their beauty of form alone, while they are equally valuable for grouping along with flowering plants and early spring bulbs. In the culture of Palms great variety may be indulged in, as they vary considerably in habit. The species here figured has a rigid bristling habit of growth, and looks well in nearly any position in which it may be placed. I recently saw it in the Pine-apple Nursery, planted in an Italian basket, and neatly fringed with *Isolepis gracilis*, the effect produced by the combination being excellent. The foliage of this species is of a pale-green tint, and being of free growth, it is one of the best that can be employed for ordinary decorative purposes. It is of a dense dwarf character, and is useful for grouping along with *Chamædoreas* and other slender-stemmed species. It is nearly allied to the common

Date Palm (*P. dactylifera*), but it is more elegant in habit of growth than that kind. Like most other Palms, it grows freely in fibrous loam, and requires a liberal supply of moisture at the root. During the summer months, it may be planted or plunged outside, in sheltered positions, as a sub-tropical plant.

F. W. B.



Phoenix sylvestris in the Pine-apple Nursery.

VARIEGATED FERNS.

AMONGST the great number of Ferns which are now in cultivation, I can only find about a dozen which can be said to be variegated. These, however, are all very distinct and beautiful, and some few of them, if not all, should find a place in every collection of plants; indeed, I cannot too strongly recommend some of them for the beautiful effect which they produce in a Fernery, more particularly when planted out in a naturally constructed rockery, either under glass or in the open air, according to their hardiness. It is a remarkable fact that the genus *Pteris* should, up to the present time have yielded the greatest number of variegated forms, whilst that large and beautiful family of Maiden-hairs (*Adiantum*) have not, up to the present date, yielded us a single variety with

variegated leaves, except those whose young fronds assume a beautiful rosy-red. This, however, cannot be accepted as variegation, but it serves to heighten the desire to possess a plant which would always maintain such lovely tints. With one or two exceptions, variegated Ferns are easily grown. Like all Ferns, they must have good drainage and a liberal supply of water both from the watering-pot and syringe.

Dryopteris nobilis.—This is a member of a small genus remarkable for dwarf and compact habit. The present species, however, is the only member having variegated leaves, and, curiously enough, is the largest grower; the fronds in a young state are simple and entire, and sagittate in shape, deep green in colour, with a broad continuous band of white up the centre. As the plant increases in size and age, the fronds become palmate, whilst the centre of each segment retains the band of white. The under-side is light green, ornamented with a broad band of marginal sori, in the way of *Pteris*, from which genus it is distinguished chiefly by its reticulated venation. It requires the temperature of a stove, and should be potted in peat and sand, with the addition of a little light loam. Native of Brazil.

Elaphoglossum L'Herminieri.—This is a member of the *Acrostichum* family, distinguished by simple entire fronds, and free forked veins. It is a large genus, containing many fine ornamental kinds, this species being, perhaps, the most beautiful; indeed, its style of beauty is entirely distinct from that of all other Ferns.

The fronds of this species are from 1 to 3 feet in length, and from 2 to 3 inches broad, thick and leathery in texture, and of a most peculiar and beautiful bright lustrous blue, reminding one of the back of a mackerel. It forms a beautiful object when planted in a pocket in the Fernery, or when placed in such a position as will allow its long, ribbon-like, iridescent fronds to hang down over a prominent rock. It requires the heat of the stove Fernery, and should be planted in peat and Sphagnum Moss. It is a native of the West Indies, some parts of Brazil, and Central America.

Athyrium Goringianum pictum.—This has been proved to withstand unharmed the severity of our winters; nevertheless, I would always cover its crown with some old fronds or dry leaves. Here I would fain make a slight digression. I have often advocated the cause of cleanliness; but experience has taught me that it is possible to be over-scrupulous in matters of this kind connected with the hardy Fernery; for where too much attention has been paid to smart keeping, I have had complaints that even British Ferns were not hardy; and no wonder, for when old fronds are cut clean away, the crowns are so much exposed to cold that they are killed. Besides this, all the dead leaves are carefully raked and cleared away, and thus all the protection Nature gives them is removed. Under such conditions, it is not to be wondered at that many deaths occur in the hardy Fernery. To prevent this, I advise the leaves to be kept round about the crowns of outdoor Ferns. These may be kept from strewn about by having some fronds of the common Bracken pegged round and over them. The plant now under notice is a valuable addition to any collection of outdoor Ferns; the fronds attain a length of about 1½ feet, they are broadly lanceolate in outline, two or three times divided, and dark green; along the centre of each of the pinnae there is a deep reddish band, which is again bordered with white, rendering it very distinct and attractive. It is a deciduous plant from Japan.

Athyrium japonicum variegatum.—This is another Japanese plant, and, like the previously named one, perfectly hardy. It is, however, somewhat rare. In general appearance it resembles a lax form of our own Lady Fern, with a good proportion of the pinnae of a white colour. It is a deciduous hardy species.

Scolopendrium vulgare variegatum.—A dwarf variety of our common Hart's-tongue Fern, with fronds bright green and variously striped with narrow bands of white. It is very pretty, but as it does not assume large proportions, it should be planted in a snug place in the Fernery.

Asplenium Adiantum-nigrum variegatum.—This is another instance of our native Ferns putting on a parti-coloured coat in order to rival, it would seem, their exotic relatives: the deep bright green of the fronds of this plant are irregularly streaked and blotched with pure white. It is a distinct and beautiful form, unfortunately somewhat rare.

Polypodium vulgare variegatum.—This plant is rather apt to lose its variegation, and for a time to produce only green fronds; when variegated it is irregularly splashed with yellowish white.

Pteris argyrea.—This is, perhaps, the most beautiful of all the variegated Ferns. In a young state, it is very useful for table decoration, but, when mature, it forms a splendid object in the Fernery, and may be either grown in the cool or tropical house; the fronds are once or twice divided, and grow from 1 to 4 feet in height, the pinnae being broad and pinnatifid. The greater portion of the pinnae are of a bright lustrous metallic white, the edges forming a border of light green. Native of the East Indies, at considerable elevations.

P. cretica albo-lineata.—This is a very handsome Fern, and one that, from its compact habit and hardness, comes within the reach of all Fern lovers. It originally came to this country from Java, but was probably taken there by the Dutch. A friend, writing to me from Japan, mentions it as being a very common plant in that country. The fronds are pinnate, about 1 foot or 15 inches high, the pinnae long and pure white, bordered with bright green. It is a very beautiful greenhouse plant, and so hardy, that, with a little protection, it may be kept in the open-air Fernery. Of this I can speak confidently, having grown it so for several years.

P. aspericaulis tricolor.—Nothing can exceed the loveliness of this plant, if in good condition, but this if is a great drawback to its cultivation, and I am inclined to think most amateurs fail with this plant through not giving enough water to its roots. The fronds, however, should not be wetted. The fronds are pinnate, the pinnae broad and pinnatifid, the centre of each of the pinnae is bright rosy-red, bordered on each side by a band of white, which is finished off by an outer border of dark shining green. It is a truly lovely plant, a worthy subject for the amateur's skill in endeavouring to cultivate it. Must be grown in the tropical Fernery. East Indies.

P. serrulata variegata.—A somewhat robust form of serrulata,

marked in a similar manner to *P. cretica albo-lineata*, but narrower in the pinnae, and these are slightly serrate at the edges; it is a free-growing pretty plant.

P. nemoralis variegata.—This is a very pretty plant, somewhat resembling a small form of *P. argyrea*, but the white in the pinnae is beautifully suffused with rose; it may be grown in the temperate Fernery.—*Villa Gardener.*

THE DOUM PALM OF EGYPT.

(HYPHENE THEBAICA.)

IN Europe and America the food of the people consists principally of cereals, farinaceous roots, and meat of various sorts; but in Upper Egypt and in places extending to the centre of Africa the fruit of the Doum Palm forms for the poor their principal food, and its infusion with Dates both a pleasant and daily drink and an agreeable and reliable cure for fever. The Doum Palm yields neither resin nor gum, but its leaves furnish roofing and material for the construction of dwellings. The trunk split and freed from pith, forms the uprights, and all other wood used in constructing the house. It also makes water-troughs and palisades for enclosing houses and gardens. The down which is attached to the young leaves serves for filling mattresses and pillows. The ribs of the leaves and fibres of the root-stalk form baskets and brooms. In the year there are two harvests of the fruit, which is the size of an Orange, but of an irregular shape. The outer skin, which is red, is peeled off, and around a kernel is a spongy dry substance, which is the food of the poorer population of Upper Egypt. In the Thebais, the Doum Palm forms extensive forests, the roots spreading over the deeply-buried ruins of one of the largest and most splendid cities of the ancient world. The Thebais is a district situate in the south of Upper Egypt, on which stood the magnificent city of Thebes, erected, it is said, fifteen centuries B.C. When at its greatest splendour, Thebes extended over more than thirty-three miles. This magnificent city was constructed with gigantic blocks of stone, so calculated to withstand the ravages of time that until now it might have stood for the admiration of the world. But man destroys as well as creates, and Thebes was rained by Cambyses, King of Persia, B.C. 521. Few traces of the city were to be found in the second century of the Christian era; but the remains of other cities on the Thebais—Luxor and Karnak on the eastern side of the Nile, and the Memnonium and Medinet Habon on the western side, with other ruins—extend now over an area of nearly twenty square miles. Ruins of palaces and temples, colossal statues, pillars, and obelisks are still standing, or cover the ground in confusion, the sand drifting here and there, and occasionally covering some of them. These grand remains astonish the beholder by their size and magnificence, and among them the wandering Arabs, or the very poorest class, to whom the Doum Palm is food and drink, find shelter. Gourneu, in Thebais, was for centuries the burial-place of the Pharaohs. In these sepulchral tombs hollowed out of the rocks the poorer Egyptians have taken up their abode. Their once occupants, buried with all the pomp of a royal race, have had their remains long since scattered. The Pharaohs, the grandest rulers of Egypt, whose number was legion, and the conquerors of Egypt, of whatever nation—whether Persian, Babylonian, Greek, or Roman—have all passed into oblivion, and their works have followed them; while the bread of life for man flourishes above the ruins and lends its charm to a desolated region. [Of this Palm an illustration will be found at page 173 of our first volume.]

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Winter Covering.—I find a dozen or two good mats to be of great service during the winter months in protecting greenhouses from frost, especially from the white frosts so peculiar to our winters. In bright clear days, when the sun emits a little warmth, it is well to utilise this by closing the houses early, and whilst the warmth-giving rays are upon it. This heat will prove of great service in the event of frost at night, if, as the daylight begins to wane, a few good dry mats are carefully placed securely over the roof and ridges of the greenhouse; then several degrees of frost may be safely excluded, and, should cold, dull, frosty days prevail, the mats could remain on the glass, as a little extra darkness can scarcely injure them in a cool temperature and a state of rest. When the mats are removed it is well to have a convenient rail over which to throw them.—A. D.

Linum trigynum.—I am pleased to see in your account of Chatsworth (p. 7) favourable mention made of this useful winter-blooming plant, of which we have several in our conservatory, strong, healthy, and flowering profusely. My plants occupy a narrow border alongside the pathway, where they are a little warmer than they would be in an ordinary greenhouse. They receive no attention beyond a little pruning in March after they have done blooming, and before they begin to grow, and, throughout the summer, plenty of water, which I apply overhead through a fine rose as a preventive of red spider, to which this Linum is very subject. The soil in the border is a light turfy loam, in which most plants seem to thrive. I also grow these Linums in pots placed on shelves in the same house, and, although they grow and flower freely in pots, the preference is decidedly in favour of those in borders.—J. C. L., Aighurth, Liverpool.

THE FLOWER GARDEN.

THE WELSH POLYPODY.

(*POLYPODIUM VULGARE* VAR. *CAMBRICUM*.)

THERE are several varieties of *P. vulgare*, amongst which that here figured is, perhaps, the best and most distinct for ordinary decorative purposes. It is a very old variety, having been first described by Linnæus, and is easily distinguished from *P. vulgare* by its having broader fronds, of a light or golden-green colour, and its pinnae are also much more divided than are those of the normal form, which is one of our commonest British Ferns. It is very ornamental when planted out in a sheltered part of the outdoor or hardy Fernery; or it can be cultivated in a cool Fernery indoors, where its fronds come fresher and clearer than when planted outside. When well grown, it is very effective, often producing fronds 15 or 16 inches long, and about one-third that breadth. It grows well when planted in a compost of turf loam and peat, with the addition of a little leaf-mould and coarse sand. Its bright green fronds are very handy for arranging with choice flowers in the drawing-room vase, or for dinner-table decorations, and they are also very useful for variety in dishing up Grapes, Peaches, and other choice fruits. A remarkable fact connected with this plant is, that it never produces fertile fronds, it being always barren. In the latter respect it differs from *P. var. hibernicum*, the



The Welsh Polypody.

Irish Polypody, which also has broad bi- or tri-pinnate fronds. This last was discovered in the Dargle, county Wicklow, by Mr. Mackay, and is a fine and distinct form, deserving more extended cultivation. *P. vulgare* var. *serratum* differs from the normal form in its deeper and more marked serratures, and *P. vulgare* var. *bifidum* has its lobes or pinnae bifurcate at their apices, the apex of the frond itself being also so divided, although not invariably. Those above named are the most distinct of the varieties of *P. vulgare*; but between them there exist other less distinctly marked forms. B.

FLOWERS AT ZERMATT.

I HAVE read Mr. Inchbald's letter on this subject with much pleasure, and, having paid a visit to the same locality myself last year, at an earlier season than he appears to have chosen, I can say that the numerous lovely plants he mentions are only a few of the choice things to be found in the neighbourhood of Zermatt. The plant, which in my opinion is the most beautiful of all, namely, *Aquilegia alpina*, I found growing in abundance in one spot only, in a wood near the village; but, though I took up several roots with great care, only one seems at present to be alive. The seed, however, which is abundantly produced in August, will be the means, I hope, of introducing this gem into many English gardens, where, I believe, the true plant is very rare. It grows in dry stony ground under Fir trees, and has a long woody root stock,

stems from 18 inches to 2½ feet high, and very large purple flowers with pale blue centre and white stamens.

Another choice plant is *Primula longiflora*. This I found abundantly on a dry hillside, about three miles north-east of Zermatt, at an elevation of 6,000 or 7,000 feet. None of the plants had more than a single crown, and, though not so brilliant in colour, the flowers are much larger than those of *Primula farinosa*, to which it is nearly allied. Near the same place was growing a beautiful pale yellow Crucifer, which I believe to be an *Erysimum*, the flowers of which formed dense masses of bloom, about 6 inches high. A little further on, by the moraines of the Frudelen glacier, *Senecio uniflorus* was abundant. This plant has silvery-grey leaves in close tufts, and large bright yellow flowers. It was growing in dry gravel at an elevation of about 8,000 feet. The Riffelberg and the Schwartz-see are, however, the best localities for plants near Zermatt. *Primulas*, *Gentians*, *Soldanellas*, and *Drabas* absolutely cover the ground in many places, while several species of *Ranunculus* (among which *R. rutaeifolius* and *R. pyrenaicus* are especially beautiful) flower abundantly on the edge of the melting snow.

Near the top of the Goomer Grat, early in July, *Androsace glacialis* and *Draba rotundifolia* were in full beauty, growing in a mass of grit, through which the melting snow was constantly trickling. The magenta flowers of the latter, almost hiding the plant, surpass anything I have seen, but I fear the plant would be an extremely difficult one to grow in this country. Of Orchids I found but few, *O. nigra* being the only non-British one at all abundant, but the minute *Ophrys alpina* is also found near the Schwartz-see. It would be easy to go on writing of the beauties of the Alpine flora, but, now that the journey is so short and easy, there are few who cannot go and see for themselves. Two hints I may offer to intending visitors to Zermatt—First, try the Hotel des Alpes, the proprietor of which, Ignatz Biner, is the most obliging and attentive host I ever met, and the charges are extremely moderate. Secondly, use the collecting boxes invented by Mr. Atkins of Painswick, which, for bringing home Alpine plants, are admirable. They are nothing but a flat box 4 or 5 inches deep, with the sides cut away sufficiently to admit air, the lid resting on the corners. Plants taken up with a good ball, tightly pressed together and watered now and then, will keep for weeks in these boxes. H. J. ELWES.

NEW BEDDING PLANTS.

FOREMOST amongst plants suitable for carpet bedding or scroll work, is *Stellaria graminea aurea*, a beautiful dwarf-growing, yellow-leaved Chickweed, which rivals the now well-known Golden Feverfew for that purpose, as it does not want the pinching and stopping which that plant requires to keep it within bounds. In Victoria Park, it is used for scroll work, and for clipped edgings. It is perfectly hardy, and easily propagated either by means of cuttings or division. Being a fine-stemmed plant, it dislikes being confined in a warm temperature, in which it gets weak and straggling, and takes a long time to recover itself.

Golden Fleece Thyme.—This is another valuable acquisition for purposes such as have just been described. It grows a little taller than *T. citriodora anrea*, but is still very uniform in growth; it is much more hardy in constitution than that variety, and is consequently more easily wintered. Its leaves are also twice the size of those of the last-named variety. The time when it is in its full beauty is from the middle to the end of summer. It is easily and readily increased by means of cuttings struck in heat in spring, or in a cool frame in autumn; or it may be divided into tufts and kept close for a few days until they get established.

Abutilon nivenum aureo-maculatum.—This is a fine plant for mixing with *Celeus refulgens* or Emperor Napoleon in beds. Its leaves are much larger than those of *A. Thompsoni*, and more richly mottled and blotched with golden-yellow, cream-colour, white and green, these colours being beautifully blended together. It also has a fine effect planted in a circular bed, and belted round with *Cineraria asplenifolia*, or *C. maritima compacta*, which is one of the whitest-leaved varieties that is in cultivation, having a compact habit. The old *C. maritima* would not do for this work, as it grows tall, and, if cut back, appears ragged and dirty-looking; whereas, the newer and dwarfier varieties with their young tops are always in good order, and are very often taken for *Centaurea ragusina compacta*.

Cineraria ceratophylla.—This is the finest of all the white.

leaved varieties of *Cineraria*; it is beautiful as an edging-plant, as it does not grow more than from 9 inches to 1 foot in height. Its leaves are very finely cut, and of silvery whiteness. It also makes an elegant small specimen plant, planted out singly in small round beds on Grass, with a ground-work of yellow, consisting either of *Thymus citriodora aurea* or of *Stellaria graminea aurea*, both of which are dwarf bright yellow-leaved plants.

Sedum acre elegans.—This is a beautiful addition to carpet-bedding or scroll-work plants, especially when associated with Golden Fleece Thyme, *Alternanthera amœna*, and centre blocks of the beautiful *Coleus Verschaffelti splendens*. It differs in tint from *Mesembryanthemum cordifolium variegatum*, inasmuch as it has more of a pale green hue about it, and meets the eye at once. It is perfectly hardy and easily multiplied by division, as every little piece will grow; it must become a standard plant for carpet-bedding or for scroll-work.

Alternanthera amœna spectabilis.—This, when planted out, will become a very useful plant, as it is in every respect much more robust than *A. amœna*. Its colour is equal to that of that variety, but owing to its being much stronger and about the same style of growth as *A. magnifica*, it will be better to winter, and more easy to produce in quantity in a shorter space of time than these kinds. It is easily propagated in the months of March and April, by means of cuttings struck in a brisk bottom-heat.

Alternanthera paronychioides major.—This is a pretty sport from the older variety, and it comes in useful where a beautiful orange tint of colouring is required. In growth, it is stronger than the old variety.

Coleus Verschaffelti splendens.—This is a fine high-coloured sport from the good old *C. Verschaffelti*. It is several shades paler, and consequently produces a brighter effect than that kind. When this becomes generally known, it will be grown in quantity for bedding purposes in place of *Verschaffelti*.

Euonymus flavescens.—This, I am of opinion, will become a favourite. I saw it in excellent condition in Hyde Park, pegged down as an edging. Its bright shining yellow self-coloured leaves had a fine appearance as a marginal belt round a raised bed of the dark-leaved *Canna* (*rubra superbissima*), which is one of the very best of dark *Cannas* for a sub-tropical bed.

Lobelias.—Two of the speciosa type, with an upright kind of growth, have been very good this season, viz., *Mazarine Gem* and *Blue Stone*. The first of these has dark blue flowers with a tinge or shade of purple, and a small, but clear, white eye. *Blue Stone* is very dark violet-blue, blooms profusely, and has a nice upright growth. I like it very much and expect to see it used largely next summer.

Zonal Pelargoniums.—Of these I have only chosen such as are really first-class as regards habit, fineness of truss, good colour, and free blooming; strictly speaking, first-rate for bedding purposes, viz.:—*Belle Esquemoise*, pure white; centre, very large, and salmon colour. *Beau Villageois*, centre bright salmon, with white margin; very showy. *Blue Gem*, rose, with purple shade; fine, and free-blooming. *Corsair*, scarlet, a fine bedding variety, in the style of *Lord Derby*, but with finer flowers. *Crimson King*, truss good; a free bloomer, and fine bedder. *Florence Darand*, in the way of *Blue Bell*, but more rosy in colour; a beautiful free-flowering variety for bedding. *Mrs. Quilter*, fine bright pink, extra large truss. *Mrs. Lowe*, fine bright pink; an improvement upon *Lady Louisa Egerton*. *Mary Flower*, deep red; a very fine bedder. *Mr. Holo*, magenta shaded crimson; very dwarf and free. *Mrs. Holden*, trusses of flowers, rosy-pink; a very free bloomer, and fine bedder. *Mrs. S. Musters*, lilac pink; distinct and beautiful. *Sœur Bazille*, bright deep pink or magenta, clear white eye, extra large truss; a splendid variety. *Sparkler*, rich plum-crimson; a very fine bedding variety. *Triomphe de Stella*, leaves small, dark green, flowers of a peculiar yellow colour; a very distinct and beautiful variety, approaching in colour what the late Mr. Donald Beaton described as *Indian yellow*. *Shakespeare*, a fine bright scarlet, with a pip and truss of extra fine quality; this I saw in the dell near the end of the Serpentine, in Hyde Park, and I thought it the finest variety I ever saw. Among silver-edged varieties of *Pelargoniums* I noticed two very fine kinds, viz.:—*Bridal Bouquet* and *Miss Kingsbury*. The leaves of the first-named are quite equal to those of *Princess Alexandra*, and the flowers are pure white, bold, and freely produced, as in *Madame Vancher*. This is really a gem, with white-margined leaves, and fine trusses of white flowers. *Miss Kingsbury* has been one of the best of the season; a bed of it on the Park Lane side of Hyde Park has been very fine indeed this season, both on account of its whiteness of leaf and uniform habit. Among bronze varieties of *Pelargoniums*, I noted three very fine, viz.:—*Maréchal MacMahon*; this has a broad dark zone, belted with yellow colour, and excellent leaf, beautifully formed. *Black Douglas*, zone dark chocolate, with narrow yellow margin. *Bronze Queen*, zone very large, reddish-chocolate, with a small yellow centre and margin; a

distinct variety. Among silver tricolor *Pelargoniums* there are three varieties which I wish to recommend, viz.:—*Fair Oriana*; this has a broad white belt, small green centre, and a very narrow dark zone, habit free and robust, flowers bright pink; very attractive, and a good bedder. *The Graphic*, border white, zone rosy-carmine; good for bedding purposes. *Sabella*, margins white, zone broad, rose flamed; free and very effective.

Lantanas.—These, in favourable seasons, are good plants for bedding purposes, for which the following four splendid varieties are very suitable, viz.:—*Reine des Fleurs*, which, when at its best, is a large bright crimson, with a good medium habit of growth. *MacMahon*, flowers very fine yellow, changing to scarlet; habit free. *Jacques Minot*, yellow and scarlet-crimson; flower, very large; habit, dwarf; a beautiful variety. *Flambeau*, scarlet and orange, dwarf and free-blooming. One-year old plants of these are best for planting out.

Heliotropes.—Of these I can recommend *Heloise Delesalle*, because it has two good points; one is, that it has a stiff upright habit, and very large trusses or corymbs of lavender flowers, and the other is, that its odour is, I think, all that is required in this class of plants.

Cannas.—Amongst these, the new varieties of the past two years cannot be recommended for foliage so much as for their blooming qualities. The flowers of some of the kinds are now fast approaching in beauty those of the *Gladioli*. The finest are—*Prince Imperial*, a green-leaved kind, having fine rich crimson flowers. *Michel Bonnet*, also a green-leaved kind, with fine bright crimson flowers. *Compactum*, leaves green, flowers yellow, spotted with red. *Bihorelli splendens*, leaves dark bronzy-green flowers, bright crimson. *Gigantea floribunda*, leaves broad, green, flowers orange-buff. *Rotundifolia rubra*, leaves dark green, flowers orange. *Senateur Chereau*, leaves green, flowers yellow, spotted with red. These are all magnificent free-flowering varieties, of which I hope to see some fine beds at no distant date.

Wigandias.—These are also fine plants, but although *Caracasana urens* and *Mexicana* are good, they are surpassed by two newer varieties, viz., *imperialis* and *latifolia*. Of these the first has a sturdy kind of growth, with large thick leathery leaves, and is by far the best to stand against strong winds. The next grows larger than any of the other varieties; the leaves, which are of great size, are long and majestic, and are ornamented with a white mid-rib, which sets off the plant to much advantage.

Ornamental Kinds of Beet.—*Beta Cicla* or *braziliensis*, these, with their different-coloured leaf-stalks, are very beautiful for surrounding beds of sub-tropical plants, or for borders in front of shrubs. The finest collection of ornamental Beets which I have seen was in the Zoological Gardens, Regent's Park; it comprised scarlet, red, purple, yellow, cream, and white, as well as several possessing other shades of colour. These, besides making a fine show in summer, are invaluable in winter, if taken up from the ground, potted, and placed in a warm greenhouse. The new leaves which they push up are satiny and ribbon-like, some of them having two or three shades of colour in one leaf-stalk. If these which I saw in the gardens in question had been potted and placed indoors in a warm house, they would have had a charming effect. Beets are easily raised from seed sown in March, pricked off as soon as they are up, then potted singly, and gradually hardened off before being planted out. When potted, they should have a liberal supply of water every day. R. H. B.

DOUBLE PRIMROSE CULTURE.

If your correspondent, "J. N. H." (see p. 30), is growing only the common double kinds of Primroses, such as the white, the lilac, and the sulphur, he ought not to experience any difficulty in rapidly increasing them in any ordinary well-worked garden soil, especially if it has a sub-stratum of clay. I grew these freely quite in the open ground, exposed to the full heat of the summer's sun, on such a soil as I have here mentioned. The plants are lifted annually in October, cut into as many separate crowns as possible, and then planted afresh in another spot, to which a light dressing of rotten manure has been given. These bloom abundantly in spring and grow into several strong crowns during the summer. Advantage should be taken of a soaking rain to give the plants a top-dressing of old pot-soil, and occasionally, during July and August, if drought prevails, a good soaking of water may be given with benefit. All Primroses are somewhat impatient of annual removal, and, therefore, where that practice is adopted, a little additional nurture, such as is here mentioned, should be given. With the choicer and less robust dark-coloured kinds more care is requisite, as these only thrive freely in an atmosphere that is moister than our southern summers usually are. Thus they appear to thrive well in some parts of Ireland and in North Britain, but their comparative scarcity further south is, doubtless, chiefly attributable to the heat and drought of

our summer months. They may be cultivated with fair success on a cool north border during summer, but, if the stocks of these should be limited, it is best to lift them, soon after the blooming period is over, and to pot them up singly either into large 60-sized pots, or into small 48-sized pots, and then to plunge them in ashes under a shady wall, care being taken to have a slate or tile bottom for the pots to stand on, in order that worms may not get into them. In such a position, a soaking of water about once a week will suffice, and, if it consists of weak liquid-manure, so much the better. It is important that the plants should be kept growing all through the summer, and that the foliage should be green and vigorous; the blooming crowns for the succeeding spring will be all the stronger for it. About the end of September, if the pot plants have done well, they should be again re-potted, a division of the crowns being made. The plants should then remain either in a cool house or in a frame until the middle of February, when they may be turned out into their blooming quarters. This is the safest and surest mode of culture I can advise your correspondent to pursue. A. D.

THE GARDEN IN THE HOUSE.

THE GLADWIN AS AN INDOOR ORNAMENT.

UNTIL this season, this singular species of Iris seems to have been overlooked in this country, as far as its decorative properties are concerned. I never before used it myself for purposes of ornamentation; but I shall not lose an opportunity of doing so whenever I can obtain any of its bright and effective seed-pods. Arranged amongst evergreens, in stands of any description, it is very ornamental. For Christmas decorations, it should take a leading place amongst berry-bearing plants. Its brilliant orange shade of scarlet, and its graceful drooping habit, make it highly effective in garlands and large decorations formed of evergreens, such as are often used at that period of the year. The seed-pods are sold in bunches in Covent Garden Market at a very cheap rate, which makes them come within the means of all classes. I myself have had some spikes of this Iris, or Gladwin, as it is often called, in use in a stand amongst evergreens more than a month; and, with the exception of the berries having shrunk a little, they

appear quite as fresh as when first placed there, and their colour quite as bright. These seed-pods also look very well if employed in connection with fruit; but they must be mixed with Fern-fronds, or some other foliage. I have placed the pods in the Moss that covers the soil of pot-plants, selecting those which were opened out to their fullest extent, and, placing them so as to rest flat on the Moss; used in this way, they have a very pretty effect. If used in church decorations, they will form, I am sure, a very important adjunct. In "Pratt's Flowering Plants of Great Britain," this Iris is described as having leaves sword-shaped; perianth, beardless; its inner segments about as long as the stigmas; root, perennial. It is not nearly so showy a flower as the Yellow Iris, for its petals are of a dull blue, or, in some instances, a dingy yellow. The plant has a singular odour; but, while it is untouched, this is not disagreeable; but, if we break the stem or crush a leaf, its scent becomes extremely unpleasant. This Iris generally grows a foot or a foot-and-a-half high; and, though a local plant, is common in the west and south-west of England. It is abundant in the woods

and thickets of Devonshire, and grows in several parts of Kent in dry hedges, or, as in the neighbourhood of Hythe, along the cliff-coast, and on banks near Dover. It bears its flowers from June to August. Its seeds are very beautiful in winter, when their capsule shrivels, and displays them in all the lustre of brilliant scarlet. They are numerous, and most powerfully acrid. Mr. Sowerby, in "Our Useful Wild Flowers," after speaking of Iris Psend-acorus, says:—"The only other British Iris (*Iris foetidissima*), remarkable for its very peculiar scent, has been applied to the same medicinal purposes as the common species. It is abundant in some parts of the west of England; but it is local elsewhere. The leaves are shorter, narrower, and of a darker green than those of the other kind. The flowers are purple, and are followed by the triangular seed-vessels, which, when ripe, open, disclosing the beautiful orange-coloured seeds, and rendering the plant very ornamental in the autumn." Most of those exhibited in Covent Garden Market for sale come, I believe, from Essex, where, I should suppose, they are cultivated for that purpose; but *Iris foetidissima* is to be found in a wild state abundantly in many parts of southern England and Ireland, as well as in the localities above-mentioned.



Seed-pods of the Gladwin (*Iris foetidissima*).

Bulbous Plants from Seed.—Can any of your readers give me a few hints on the raising of bulbous plants from seed? I have great difficulty with the seeds of Liliaceæ and others, which require a long time to germinate, as, if sown in pots or frames, and constantly kept moist by watering, a thin crust forms on the surface and prevents the water from penetrating the soil. If placed in a moist shady place, the pots soon get covered with Moss and mould, and, if sown in the open ground, the seedlings are generally destroyed by wood-lice, slugs, and worms. I have tried soot, lime, and other plans to keep them off, without success—the worms being particularly troublesome, as they work up even through 8 inches of ashes. If the soil could be kept in a proper state for a year, I should not mind, as most seeds will come in less time; but some, such as *Polygonatum* and *Trillium*, will lie even longer. Has anyone succeeded in raising hardy Orchids from seed, and, if so, how? I believe it is the natural way to increase them, and the only one. I see the seed of several species is sold by the ounce in Germany, as though they were commonly grown, but they must be put in principally to swell the catalogues, like many other things. What a marvellous publication is the seed list of a great German firm! I am sure there are more than 10,000 species and varieties in one I received lately. Where do they all come from, and what becomes of them all? Sixty distinct classes of Asters, and other florists' flowers in like proportion! 1,500 species of hardy perennials, many of which I venture to say are not to be found in five gardens in Europe, if in any. How many of these are worth growing, even in the largest gardens; and how many of them represent nothing but a name? These questions no one can answer, though they may lead to some interesting reflections.—H. J. E.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Agathæa cœlestis variegata.—I have found this a very valuable addition to the flower garden either for lines or masses, forming, as it does, a compact growth from 4 to 8 inches in height, and being capable of being kept to any desired height with little trouble. It strikes freely in sand or soil, and, from one plant, many hundreds may be raised in this way in a season. I strike it in spring, in shallow boxes filled with sharp sand, on a gentle hot-bed, and winter it in a cold house. It will stand 5° or 6° of frost, but a greater degree of cold will kill it.—JOHN NANTCAWEN, *Hawkey Hurst*.

A New Allium.—A recent number of the *Gartenflora* contains a description and coloured figure of a new Allium (*A. oreophilum*), which flowered last season in the botanic garden at St. Petersburg. It was discovered by the Russian botanist Korolkow in the mountains of Akt-Tau in Turkestan. The flowers, which are borne in a moderate-sized umbel, are (as represented in the figure) of a charming crimson colour, with a depth and decision of tone very unusual in the flowers of the Allium family, and are far more striking and effective than those of any other species with which we are acquainted.

There is also a variegated form of this plant, suitable for the garden or conservatory, where, during autumn, it forms a very ornamental addition, its handsome scarlet berries being well set off by the surrounding foliage.

A. HASSARD.

Upper Norwood.

OLEANDERS AS WINDOW PLANTS.

VISITORS to Paris must have noticed the profuse manner in which this plant is cultivated for the decoration of windows, balconies, and the fronts of places of public resort, and, with a little management, it may easily be used for the same purposes in this country. Here at home, it does not flower so well or so generally as could be desired, and this is, doubtless, owing to the wood not becoming well ripened in the autumn. Of late years, some fine varieties of this plant have been raised on the Continent, where the hot dry summer climate suits it admirably. In this country it is rarely grown, although there is no reason why it should not prove a valuable decorative plant under good cultivation. It is readily propagated from cuttings of the last year's wood, which can either be inserted in sand round the rim of the pot, or they will root freely in water. After the cuttings are rooted, pot them off carefully in a compost of sandy loam and leaf-mould, using small pots. The newly-potted plants may now be placed on a shelf in the greenhouse, near the light, and must be liberally supplied with water at the root. When the pots become full of roots, set them in pans of water, adding a little liquid-manure occasionally to strengthen their growth. Cuttings struck in the summer make nice little flowering plants in a couple of years, and go on blooming every season afterwards. Where the older plants are set outside during the summer months, select the hottest corner for them, where full exposure to the sun will ripen their growth thoroughly for next year's bloom. It is no use expecting this or any other hard-wooded plant to flower well, unless thoroughly ripened in the autumn. When the old plants get too large or leggy, they may be cut back, and will soon throw out young wood, and form bushy specimens. The bright, rosy, sweet-scented flowers are nicely adapted for cutting, although their odour is by some considered rather too powerful to be pleasant; still, if the apartment is well ventilated, a moderate supply of these flowers may be agreeable. The plant grows vigorously out of doors on the Continent, and doubtless, like the common and double-flowered varieties of the Pomegranate, it would grow and flower well in this country, if trained along a warm sunny wall and sheltered from cold cutting frosts.

F. W.

A BEAUTIFUL BASKET.

A GREENHOUSE is a place for all kinds of half-hardy plants, but a sitting-room is designed for other purposes, and no plants should be kept in it except such as are highly ornamental. A room should not be subservient to ornaments of any sort, and a table of plants occupying the best place for sitting at the window can be tolerated only if the collection is very beautiful, free from dust, and the arrangement unexceptionable. Anything which interferes with the convenience and comfort of the family, anything which detracts from the order, tidiness, and beauty of the sitting-room should be regarded as a nuisance that ought to be abated. "But what shall I do with all my nice plants?" says the mistress of the house, "I have no other place for them." I will tell you what my neighbour did, and those who choose can do likewise. She made what she calls a basket of a very deep wooden bowl, painted it a delicate colour, and used wire for handles. She threw away her sickly plants, carried her Fuchsias and Geraniums into the collar, leaving the former in their pots, and hanging the latter up by their roots. Then taking a hint from the way florists fill garden vases in the spring—crowding in a great variety—she transferred the remainder of her stock, consisting of about twenty plants, to her basket, being careful not to break the ball of earth of the most choice kinds, and using a rich compost to fill the interstices. In the centre she placed one or two Callas, around them blooming Begonias, rich foliage-plants, and Geraniums like Mrs. Pollock and Mountain of Snow, disposing each so as to show its finest qualities. To run over the handles and droop from the sides so as to cover the bowl, she planted Ivy, Vines, Ivy-leaved Geraniums, Ferns, Maurandya, and whatever she happened to have. This proximity was favourable; perhaps the roots found their bed a little warmer than before; some-

thing seemed to stimulate the whole collection into active growth, and not many weeks had passed before the basket claimed special attention, and delighted every beholder. It was graceful, airy, exquisite in colours and shadings, and, were it seen behind plate-glass and between lace curtains, it would be thought in harmony with the appointments of the most elegant drawing-room. Perhaps some of us would have less taste in arrangement; we are not all blessed with an artist's eye, and do not appreciate the grace and poetry of climbing floating Vines, and the varying hues of rich foliage, but I am quite sure that measurable success would crown any effort of this kind; and the basket, bowl, vase, or whatever might be used, with its wealth of tender greenery falling from its edge, would look far better than twenty individual, ugly, earthen pots. In arranging cut flowers, we resort to many devices, so with growing plants we can combine them, harmonise their colours, and produce the finest results, and, if our work shows design, much thought, or what art critics call originality, all the better.

J. E. J.

A Niche or Bracket Vase.—A fine figure for a niche, or corner bracket, is a large vase filled with a tall bouquet. Flower-stalks of Gladioli are especially effective in such positions; also branches of Lilies, or individual Lilies of the larger sorts, together with panicles or spikes of medium or more minute inflorescence; Canna, Spiraea, Deutzia, and Delphinium, are always desirable, while boughs of pendent blossoms—Laburnum, Acacia, Dielytra, Salvia, &c., and all papilionaceous flowers, whether drooping or erect, add much grace to such collections. In filling the vase, it is well to select one elegant blossom or cluster for the centre, the remainder of the group diminishing gradually in size, the stems also of slightly lessening length, so that the bouquet shall present a pyramidal form. Fronds of the larger Ferns, branches of slender lanceolate leaves, and long ribbons of Grass, particularly of the variegated sorts, are the proper foliage. Long pieces of Convolvulus, Tropæolum, and other blooming trailers (only one or two handsome branches, and those of the same plant), should fall from among the group, over the edge of the vase, and wind carelessly around it, and about its support, thus giving an air of lightness and ease to what would otherwise appear stiff and formal. Stateliness is the idea to be conveyed by this grouping, hence the vase must not be crowded. Only a few stalks, and not more than two or three of a species, are required, while one splendid Lily, Peony, or cluster of Roses, is sufficient for the centre. For indoor decoration on a smaller scale, the most suitable flowers are Roses, always, if possible, Camellias, Carnations, Tuberoses, Fuchsias, Azaleas, or Balsams, Lilies of the Valley, and Hyacinths (in their season), with Heliotrope, Sweet Alyssum, and Mignonette; and feathery foliage, of the gentlest green, fringing the dish (a pendent spray or blossom breaking the outline here and there), and slightly pointing the collection at intervals. These flowers are equally suitable for the festive board, or the centre, or pier-table. When there is a large collection of plants, others, of a similar character to the above, will suggest themselves as appropriate subjects for arrangement in vases.

—*Horticulturist*.

NOTES AND QUESTIONS ON THE GARDEN IN THE HOUSE.

Tree and Climbing Carnations.—I shall be much obliged if you will give me some advice about these Carnations, of which I have read so much. I am an invalid, I love flowers constantly in my room, and particularly in the winter. I am anxious to know whether the Tree Carnations or the climbing kinds are the most continuous bloomers, and as I want three to bloom from November to April, which kind had I better buy?—K. B. [Climbing Carnations are merely a slender-stemmed kind of tree Carnations, and, like them, are continuous bloomers. For winter flowering, we would select La Belle, white, a kind that blooms profusely from November till April; Vulcan, a scarlet-flowered variety, blooming at the same time as La Belle, and having a habit similar to it; and Miss Jolliff, a dwarfish pale salmon-coloured Carnation, and a most profuse winter-bloomer.]

Dracænas in Sitting-rooms.—I shall be glad to know if *Dracæna indivisa*, *D. terminalis*, and *D. australis* will be hardy enough to stand the winter in a flower-stand in the drawing-room, where there is generally a fire.—K. B. [The three *Dracænas* named may be grown in a sitting-room window in summer, but during severe frosts in winter they would, we fear, suffer. If set, however, in a Wardian case they will keep fresh and healthy, and, if gas is used for illumination, they will thus be protected from its deleterious influences. Plants in rooms have aridity and dust to contend with, as well as extreme temperatures, and in order to keep *Dracænas*, Palms, and similar plants in health, they must be regularly sponged over with clean water at least once a week.]

Eupatorium ageratoides a Bouquet-plant.—The Montgomery Horticultural Society recommends the White Suako Root (*Eupatorium ageratoides*) for bouquets and floral ornaments. It combines the qualities of a profuse bloomer, is hardy, and effective in masses, and thus forms an attractive object for garden culture. The large compound corymbs of white misty-looking flowers are precisely what our professional florists desire, and we wonder its merits have so long been overlooked. It is quite common in the North, and continues in bloom for a considerable time during the months of August and September. A botanical friend, who has been in the practice for several years of gathering into his garden our finest native plants, says this is one of the best of all. It is readily propagated by division of the roots, and is never injured by the cold of winter or the droughts of summer.

THE COLOURS OF FLOWERS.

At a meeting of the Croydon Microscopical Club, held on the 17th ult., the following interesting paper on "The Colour of Flowers of Temperate as compared with those of Tropical Climates," was read by Charles Jecks, Esq.:—Mr. Wallace has stated in his "Malay Archipelago," that the colour of the flowers, and indeed of vegetation generally, is not so brilliant in tropical as in more temperate climates, and we also find it stated in a book on "The Chinese Seas," by Dr. Collingswood (if I remember rightly), that the same rule holds good with respect to sea-weeds. Now, it is true that these statements are quite at variance with those generally believed concerning the flora of tropical climes; but, coming from the source they do, we can scarcely, I think, dispute their accuracy. Indeed, when we consider the subject, we shall find that such a result might naturally be expected, for amid the dense gloom of a tropical forest but little light can penetrate, and it is, as we all know, light which gives colour. Even in our own climate the colour of flowers is not so brilliant *ceteris paribus* in a dense wood as in an open plain. The idea of brilliant colour especially appertaining to tropical flowers seems, as Mr. Wallace remarks, to have arisen partly from the accounts of travellers, and partly from the fact that in this country tropical plants are generally grown in conservatories, where they are exposed to abnormal conditions of light. It would seem, perhaps, indeed, that while the tropical regions are far richer in the production of vegetable forms, so far as concerns brilliancy of colour, we have the advantage, that is, the vegetation of temperate latitudes is more brilliant in hue than that of tropical regions. How are we to account for this? Partly, I think, as regards vegetation and the colour of flowers, by the following considerations, or, perhaps more properly, suggestions. We know that the colour of flowers depends in some measure, at least, upon the amount of radiation of light. Now, there are three distinct classes of rays from the sun; rays of light, rays of heat, and what are called actinic or chemical rays, which, combined with the others, are probably effective in the production of those chemical changes which all plants more or less undergo. It is then by the absorption and radiation of these rays of light that the colour of the flower is produced, and as in temperate climates, these rays seem to be in excess, while those of heat and actinism are subsidiary, especially, perhaps the former, the result seems to be that in such regions the colour of flowers is comparatively more brilliant than in tropical climates, where, besides the larger amount of heat and actinic rays, and the smaller proportion of rays of light, the effect of these latter is possibly much counteracted by the greater amount of moisture present in the air. It also seems possible that the greater richness of soil which generally prevails in tropical climates may be another reason of the comparative want of brilliancy in the flowers; for, wherever the soil is light and dry, indeed, even arid under the conditions of a clear blue sky and bright sun, we find the colour of flowers in proportion more brilliant, as in certain tropical regions is the case. Coming to our own climate, we shall, I think, find that these suggestions are in some measure borne out; as, for instance, in the generally brilliant colour of our wild flowers. It would seem, then, that a richer soil, combined with a damp atmosphere, and a larger proportionate amount of heat and actinic rays, has the effect of, as it were, deepening, and, perhaps, to a certain extent, fixing the colour of flowers. To refer to our practical experience in such matters, is it not generally true that a dry warm season, with plenty of sunlight and clear blue sky, is accompanied by a more brilliant colour in our flowers, which are also more abundant and true? Owing to the effect of these conditions, the seed is more plentiful; while, under the contrary conditions, the reverse is generally the case. It is true that the deeper colour generally accompanying a mountain flora may seem an exception to this; but it should be remembered that here we generally have the presence to a certain extent, especially on the lower slopes of the mountains, of more tropical conditions as regards a greater amount of moisture. Coming down to foliage, I think we shall find that the conditions above named as probably affecting the colour of flowers have here also a proportionate effect, for the foliage of tropical climates is generally of a deeper colour than that of temperate regions, that of the latter being of lighter hue; and, indeed, the farther north we go within the temperate zone, the more, as a general rule, do we find this to be the case, the comparatively greater amount of light rays being accompanied by a correspondingly lighter colour of the leaves. There is, however, one exception to this, and, so far as I know, but one—that of New Zealand—where the foliage is of a lighter colour, more approaching that of our own vegetation; but the climate of New Zealand is one nearly similar to our own in character, in the free access and circulation of air admitting more readily the rays of light, while it naturally increases the extent of evaporation, and also tends to check the superabundant presence of that moisture, which,

as a rule, in tropical climates, owing to the denser character of the foliage, which also helps to produce it, tends to perpetuate the condition of things which we find there, the prevalence of a deeper hue in the foliage. Again, it is, I believe, a fact that dull-coloured flowers generally have the sweetest scent, while bright and brilliant coloured ones have either no scent at all, or a disagreeable one. In our own country, for instance, we find those of brilliant colour, which is perhaps predominant, being comparatively scentless, and that this rule is generally borne out among wild flowers. I think the cultivated flowers are scarcely a fair test, as the colour, and, perhaps, scent too, can be modified to almost any extent. There are, doubtless, many exceptions to this rule, but still I think our own experience establishes it as generally correct. Now, may it not be suggested that the same causes, whatever they may be, which tend to produce more brilliant colour, tend also to lessen sweetness of scent, and *vice versa*? and in tropical regions we know the scent of the comparatively dull-coloured flowers is particularly powerful. The, perhaps, greater number of brilliant coloured scentless flowers found in a state of nature in our own climate, at least, I think, may be in part accounted for by the visits of butterflies, &c.; for as soon as any flower exhibits any tendency to variation in the direction of brilliancy of colour, it is probably visited by these insects, and its propagation thus ensured, the tendency to brilliancy of colour being increased by the law of heredity, and further confirmed by suitable conditions of growth; and it is true that to a certain extent this may take place with regard to dark-coloured flowers (by reason, perhaps, of their sweeter scent); but owing possibly to colour being generally more attractive to insects, and other causes, these latter seem to fail in the competition with their more favoured rivals. It is interesting to consider the rationale of this transportation of a germ from a plant of more or less brilliant colour to another, by the ultimate effects of which the stock is, as it were, established. Now, it is probable that flowers owe their colour to the fact of the existence of a very delicate tissue, which has the property of absorbing some rays, and rejecting others (for all flowers are naturally colourless before exposure to light), but in some cases, owing perhaps to various causes, this tissue absorbs rays of light of a different hue to those which we are accustomed to consider as belonging to the flower in question, and the result is a variation in colour. As soon then as this variation (however slight it be) appears, it is taken advantage of by butterflies, which, attracted, perhaps, by the difference in hue, visit the flower and transmit the germs to another flower in which, in course of time, the variation in colour becomes fixed, partly by the transmission of the germ having taken place at the proper time and under favourable conditions, and partly also from the action of the law of heredity, by which any variation in a plant is, under favourable circumstances, liable not only to be again produced, but absolutely increased in amount with each case of re-production, so that the variation is now developed in an ever-increasing rate, until it becomes more or less confirmed. In connection with this subject, the question suggests itself—do cultivated plants come under the same law as domesticated in contradistinction to wild animals? We know that the former, at least sometimes, are not so fertile as the latter, so that it would seem that by confinement or domestication, a certain degree of change is produced in the reproductive organs inducing partial sterility. Now, there seems reason to believe that, in proportion as a plant tends to vary, so does it suffer in its fertility. It is the domestication or cultivation of plants which often produces variation, and this probably means with cultivated plants, an increase in brilliancy of colour of the flowers, which would seem probably by inference to be attended (at least to some extent) by infertility. The same suggestion may, I think, also be applied to wild flowers, the brilliant colour of which we have seen, to be often caused by variation, but the tendency thus produced to decrease in fertility may be here, perhaps, in some measure counteracted by the continual intermixture or crossing of different species by means of the visits of butterflies, which possibly tends to prevent any excess in variation. Again, as our wild flowers seem to be generally noted for brilliancy of colour (in this respect possibly excelling cultivated ones), it may be suggested that this also is accounted for in part by the greater range of intermixture of different germs. Besides, supposing it to be true that bright-coloured flowers are less sweet scented as a rule than duller coloured ones, it would seem possible that as a flower becomes more brilliant in colour, it also generally becomes less sweet-scented, and it may not be an object with gardeners to produce a predominance of brilliant colour at the expense of sweetness of scent. Now, if the above theory of colour in flowers be correct, it would seem to follow that we have some reason for the supposition that, as in a comparatively equable, warm, and damp climate (the latter word implying the probable absence to some extent, at least, of the light rays of the sun)

brilliant colour in flowers and vegetation is rather the exception than the rule, so, as our own climate partakes more of these conditions, and becomes more equable and damp, and therefore probably more dull as regards light rays, will brilliant-coloured flowers, at least in a state of nature, become more and more rare. There would also seem some reason for the suggestion (supposing the laws of nature now in action around us to be the same in character as those of long by-gone ages) that, as the climate of the Carboniferous era is now generally believed to have been rather of a damp and equable than of a tropical character (somewhat, perhaps, resembling that of New Zealand, but probably more humid) the flora of that period was of comparatively dull colour, and possibly more sweet-scented than that of the present day, while the foliage was probably of a deeper green than now. As an example of this, we know that the principal part of the vegetation of that time consisted of various forms of Conifera, Cryptogamia, and Tree-Ferns (the two latter possibly of a darker hue than those now living, owing to excess of moisture, &c.) Now we find at the present time that Mosses and Ferns flourish most luxuriantly in damp situations and sheltered from the sun, so that, upon the theory I have advanced, we are thus enabled to suggest the probable effects of that dim uncertain light and atmosphere upon the primeval vegetation of the great humid coal formation. And now, in conclusion, I cannot but feel that the theories I have advanced must seem to many as somewhat wild, crude, and undigested; but I trust they will remember that they are only theories, or rather, perhaps, suggestions. I hope, however, that I have said nothing in any way of a dogmatic character; if it seem so, I trust it will be understood that any such utterance was quite unintentional. I have tried rather to suggest than to assert, and if I have been fortunate enough to throw out any fresh material for thought, I shall be amply repaid if it serves to stimulate anyone to further enquiry.

An interesting discussion followed the reading of the paper, in which the president, Mr. Cooper, Mr. Morland, Dr. Carpenter, Mr. P. Crowley, Mr. Perry, Mr. Taylor, and Mr. Haddock took part. The chief point touched upon was the action of light with regard to the formation of colour in flowers. Dr. Carpenter pointed out that flowers having different hues was evidence that they decomposed light, and fixed a certain portion of that light in their tissues. Certain chemical agents would produce a change in a flower; but without light, so far as lateral flowers were concerned, it would be impossible to get a variety of colours. He had not an acquaintance with foreign countries, but he had been under the impression that tropical climates certainly produced the most brilliant flowers, as they did birds of the most brilliant plumage. The possession of scent in a flower was generally accompanied with less brilliant hues; but this was not always the case. He did not think that much light was wanted for the production of colour, because some of the Fungi on which he had remarked at a former meeting, which grew in the deepest glades of the forest, yet had the most brilliant hues possible, and generally the darker the glade the brighter the hue of the Fungus that grew there. Dr. Carpenter also referred to the brilliant colours that could be obtained from gas-tar, showing that, although ages ago, when the vegetation of the coal formation flourished, brilliant colours were not produced, still the colouring matter was there, and could be obtained. He considered Mr. Jecks' paper a most suggestive one, and he highly commended it. Mr. Taylor expressed an opinion that light had but little to do with determining the colour of flowers. He mentioned that he once planted some Crocuses the wrong way upwards, and, as they did not appear above the surface of the soil, he made an examination, and found they had bloomed in the ground in their usual colours. This, he considered, disposed effectually of the Light theory.

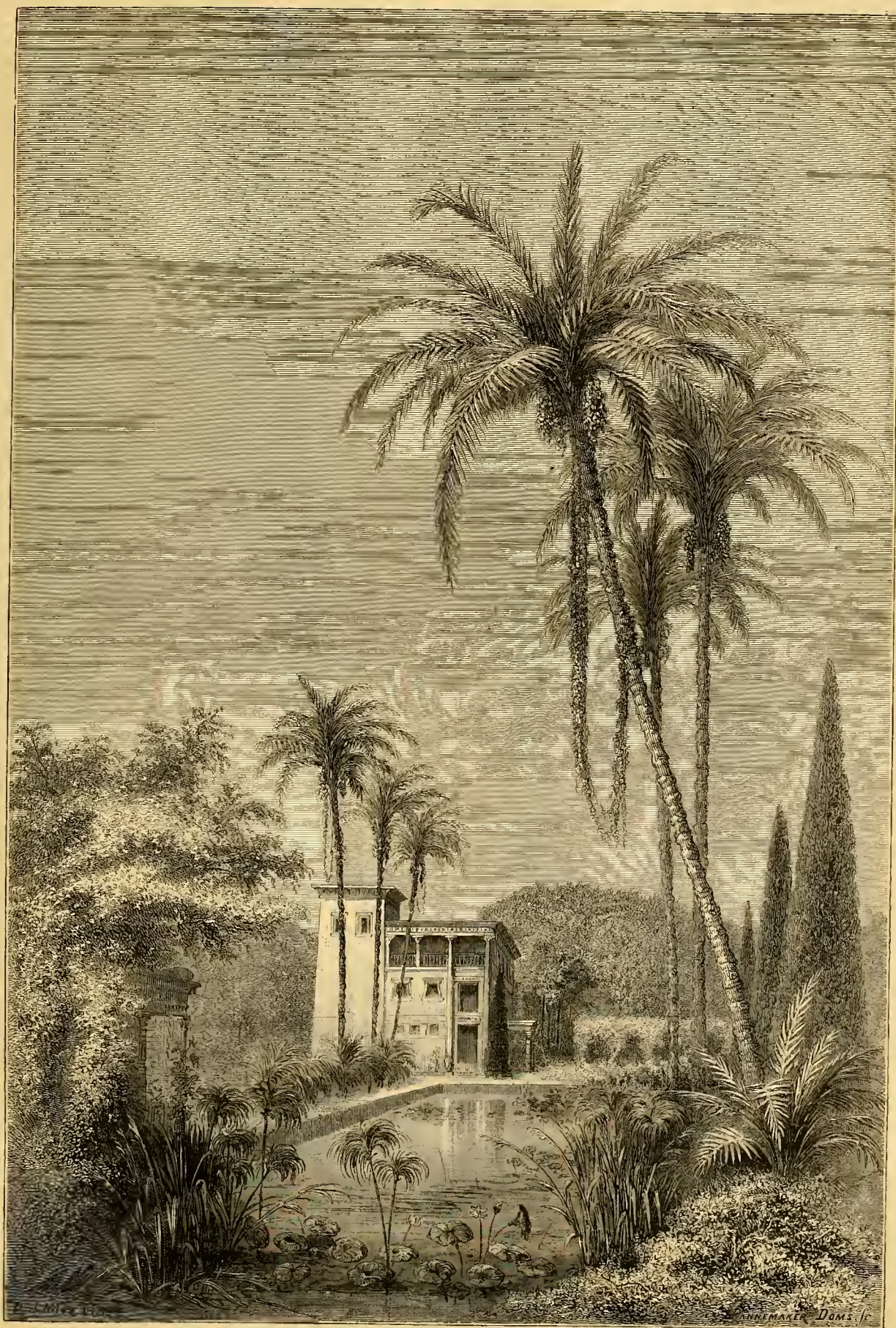
Blackbirds as Garden Destroyers.—My garden is infested with hundreds of blackbirds. In summer, fully half the fruit falls to their share; I have literally found a White Currant bush full of fruit cleared in two days, nothing but stalks remaining; and Gooseberries the same, nought but skins left in place of berries. In winter they give me also much annoyance, uprooting my spring beds of Daisies and other short-rooted plants. I wish some of your correspondents, who are so fond of the "small birds," had to suffer what I have from them. By comparing notes, I find none of my neighbours are as much troubled with them as I am. I am willing to preserve thrushes, sparrows, robins, tits (destructive as these are), and the finches, except, perhaps, the bullfinch; but the blackbirds must be destroyed. Can any of your readers give me a good plan of effecting this without the gun? I am a very bad shot and seldom hit them. There are many large trees in which they take refuge, especially on the other side of a river, where they fly when disturbed, returning again directly the coast is clear.—BARN SHOR.

MODERN EGYPTIAN GARDENS.

ONLY those who have visited Egypt during the winter months can form any idea of the calm repose that almost invariably pervades that wonderful country at that period of the year. The clear blue sky and quiescent atmosphere cause such a dreaminess to overspread, as it were, the whole country, that, except near the cities, one may easily imagine one's-self in a land of spectre palaces, villas, and mosques. The graceful heads of the Date Palm, poised calm and motionless in the air, relieve the towers of the country mansions of much of their monotony. It is winter, yet the Orange-trees are laden with golden fruit, the Jessamine, Rose, and Geranium are still in bloom. The leaves of the Vine and other deciduous trees have just begun to turn red and brown, and to prepare to fall. Our illustration is a good representation of a modern Egyptian villa and garden of the Mameluke period. The square basia and stately Cypress, the Vine-embowered path, producing shade and Grapes in abundance, and the little summer-house or kiosque in which the owner and his family enjoy the grateful weed and aromatic coffee, are faithful delineations of Egyptian garden-life. During the past thirteen years, gardening has made rapid progress in Egypt, the frequent visits of the Pashas, princes, and Kedhive to Europe having given the Egyptians of high rank quite a taste for European horticulture; and gardeners from England, France, and Italy have been employed in various localities, but more especially in the neighbourhood of Cairo and Alexandria, to carry it out. Ismail Pasha, previous to his becoming ruler of Egypt, began to garden in a very spirited manner at Gezira, an island in the Nile, and the improvements then contemplated have since been completed by the late M. Barillet, a French landscape-gardener, who was the Kedhive's chief commissioner for carrying out that kind of work. The Gezira garden is the best imitation of an English establishment in Egypt, and it has been created at an enormous expense. Artificial mounds, embankments, rock-work, and water are all very naturally introduced; good breadths of lawn, dotted with trees, shrubs, and parterres of flowers, produce, in this land of sunshine, a more pleasing effect than in our own country, on account of the rarity of Grass in Egypt. To achieve this desideratum, large tanks or reservoirs have been constructed of sufficient height to serve the fountains and to force water to every part of the garden, which, during summer, has to be kept in a state of perpetual irrigation. In the Gezira Garden is a magnificent collection of tropical trees—Palms of many kinds, Pandanus, Ficus, Cathartocarpus, Musas, Cycads, Acacias, and other things too numerous to mention. Among the vast variety of climbing plants in this garden, the most notable is Bougainvillea spectabilis, which grows with all the wild luxuriance of a Wistaria in our own country, and is annually covered with thousands of spikes of its lovely mauve-coloured bracts. In few countries is vegetation more rapid or luxuriant than in Egypt; i.e., where irrigation is attended to, consequently it takes but a few years to have a perfect garden.

The old swampy public garden in the Esbequia, at Cairo, has undergone a complete renovation under the Kedhive's rule. It was several feet below the high Nile level, and during full tide, if it may be so called, a great portion of it used to be under water. This garden has been raised above the high Nile level, fenced in with a suitable iron palisading, and is entered on the north and south sides by massive carriage gateways, and on the other sides by two smaller gates for pedestrians. It is divided into four compartments by the main drive and walks, having a large circular fountain in the centre. In one of the divisions is a good rock-garden. Trees are planted thickly to produce shade, and a portion is devoted to flowers, as is usual in French town garden-squares. All that could be left of the fine old trees were spared. The Esbequia garden was first planted by a Greek gardener, under Mehemet Ali, after the model of some of the old Dutch gardens, but it was much neglected under the rule of Abbas and Said Pashas.

In 1862, Halim Pasha, the youngest son of Mehemet Ali, who was at that time the proprietor of the celebrated Shubra Gardens, engaged Mr. Chapman, from the Royal Horticultural Gardens at South Kensington, to re-construct and make additions to this truly splendid garden, which had been the pride of Mehemet Ali. It consisted of about 60 acres



A MODERN EGYPTIAN GARDEN.

devoted, with few exceptions, to shady avenues and fruit-trees, fringed with Myrtle hedges and flowering shrubs. A large portion of the garden was devoted to Orange and other trees of the Citron family, and it contained the greatest variety of this useful and interesting class of plants ever seen, perhaps, in Egypt. The accounts given of the quantity of Oranges of every kind, Citrons, Shaddocks, sweet and sour Limes or Lemons, produced in this garden, seemed fabulous. This garden (as were all the gardens in Egypt that were made and planted at the time Shubra was formed) was laid out in square compartments, formed by means of straight and rectangular paths, broken by equi-distant circular groves of shade-trees, such as *Acacia Sedbeck*, *Ficus indica*, and *F. elastica*. Halim Pasha had completed a new palace at Shubra in 1862, round which Mr. Chapman formed some interesting terrace and other gardens, into which were introduced many fine trees and shrubs from Europe; yet a large portion of the Shubra Garden remains as it was in Mehemet Ali's time. The Orange and Lemon gardens are still there, and the beautiful marble kiosque, with its lions and fountains. This kiosque was a favourite lounge of the patriarchal Pasha, and consists of a raised square court, the parts seen from the garden being merely blank walls. In the interior, is a large marble basin, nearly an acre in extent, into which lions and griffins jet water. In the four corners of the building are a billiard-room, breakfast-room, bed-room, and library, a covered promenade connecting the whole, which is lighted by gas. Shubra is about four miles from Cairo, from which it is approached by a fine avenue of Fig trees. PETER WALLACE.

THE FRUIT GARDEN.

INFLUENCE OF THE STOCK ON THE SCION, AND VICE VERSA.*

BOTH theory and practice teach us that the relationship existing between the root and the top of a tree cannot be impaired, to any great extent, by any artificial intervention of man. The very moment that an inserted bud or graft commences to granulate and then unite, that moment the two parts of the embryo tree struggle, as it were, for the mastery. That is, certain idiosyncrasies, inherent either in the branches of the one or the roots of the other, will form a leading feature in the mature plant. Abundant proof of this is afforded by examining the roots of nursery-grown Apple trees, whether budded or grafted. Take for instance some well-known variety, as the Bellefleur, and the roots will be found uniformly long, slender, and very fibrous; other kinds will prove exactly the opposite. If we place a graft of some well-marked variety upon any ordinary stock, say 5 or 6 feet high, in a few years certain peculiarities of the bark will be found extending down from the branches to the body of the tree; as is instanced in the Newtown Pippin Apple and Van Mons Leon le Clerc Pear. Another curious feature respecting the influence of the scion upon the stock, is noticeable in some of the so-called "sports," or variegated-leaved plants. During the past season, a Mountain Ash, upon which was budded a variety with variegated leaves, commenced to push forth young shoots from the main body of the tree, below the point where the bud was inserted. In every case these had variegated leaves. Now, in view of the fact, that these *adventitious* buds were there in advance of the original variegated bud, the presumption is, that they were created green, and their normal condition yielding to the controlling influence of the new branches, caused the change to occur by the flow of sap from above. A still more remarkable case than the one above cited, was related by a correspondent of THE LONDON GARDEN. He states that he procured scions of a diseased Horse Chesnut with yellow leaves, and worked them upon strong, healthy young trees. Some time thereafter, upon examining the stocks where the scions had failed, young shoots were found down the body, bearing the identical yellow-hued foliage; and yet, where the buds originally inserted had "taken," they produced perfectly healthy green leaves. This disease, for I hold that all variegation is in some manner unhealthy, had evidently been communicated from the bud or scion to the stock before the death of the former, and for a short time, during its vain struggle for existence, contaminated the parts below. The Scientific Committee of the Royal Horticultural Society of England, also records a like case with a yellow-leaved Laburnum. After the inserted bud had died, variegated shoots were noticed issuing from the stock, both below and above the inserted point. And Dr. Masters

has stated that an *Abutilon* had thrown out variegated shoots after grafting with a variegated variety, but ceased to do so after the inserted graft died. But, in some instances the stock exerts a marked influence upon the scion, thus showing the co-operative system in use between them. An instance is mentioned of a couple of Muscat Vines worked on the Black Hamburg, in the same house with a Muscat on its own roots. Those worked on the Hamburg start fully five or six days in advance of the one on its own roots, although they are nearly a fortnight behind the Hamburgs they are worked on. It is a curious fact that there has never been seen any difference in the ripening season, nor any effect on the fruit. As we stated in the commencement, certain marked peculiarities will sooner or later always make themselves known; sometimes it will be one thing, and again another and totally different feature assumes the superiority. The governing cause, involved in mystery, as it is, to a certain extent, affords us a clue by means of which we may study a very useful lesson in plant life. We know that all vegetable growth arises from a cell, and what are termed young shoots, leaves, blossoms, &c., are, in fact, but an accumulation of cells, which, in time develop woody fibre and other organs. The propagator of new varieties knows that a single bud, or a section of a young branch, may be inserted in a different tree, and these will unite and produce fruits and flowers similar to the kind from which said bud or graft was taken. Now, let us inquire into the changes that occur during this growing process, or, as horticulturists term it, "taking." Between the wood and bark is where active growth takes place, and the layer of young cells found here is known as the Cambium layer. All growth, of whatever nature, is by cells, the origin of which is, however, at present unknown. But this cell-growth is accomplished by small protuberances, making their appearances on the walls of the older cells, and these rapidly increase, and again, in turn, assist in the formation of others, and this is carried on so long as growth takes place. Without going into a long dissertation upon the subject of cell-growth, which would form a long essay in itself, I will merely state that the question has been asked in relation to a budded tree—Can the cells at the point of union, be partly of one variety and a part belong to another? My theory is, that a cell, singly, is entirely a component part of the variety from which it originates, either from the scion or stock, and is invested with all the powers and principles inherent in that part. A single cell cannot be of two varieties, but a collection of cells, as, for instance, the cellular tissue, may be formed partly of both. The vascular or fibrous tissue is governed by the same laws, each separate, but the little bundles of woody tissue uniting by their outside covering or walls, thus form a compact mass of wood, and the bud or graft has taken, which ultimately forms the future tree. A bud is, in fact, an embryo tree. It contains within its protective covering all the elements of tree growth, with all the organs of vegetation and reproduction intact. Therefore, when a bud is inserted beneath the bark of another plant, the cellular growth at once takes place on both sides, these unite by their outside walls, and the so-called sap commences to circulate in the inter-cellular passages from one to the other. It is, therefore, no wonder that certain peculiarities embraced in the root may be found developing in the scion or top, and *vice versa*. That the scion is enabled to re-produce its kind, is due to the fact that its young growth is merely an increase of cells already formed, and the variations alluded to at the commencement of this paper are the result of constant currents of sap flowing between the two remote portions of the tree, and at the same time imbuing the one with certain marked characters, contained previously in the other.

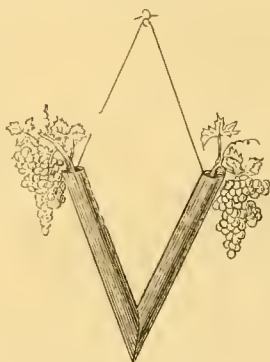
Thus, in a somewhat hurried, and, I fear, very imperfect manner, I have alluded to the influence of the stock upon the scion, and *vice versa*. This interesting subject is by no means all theory, as many suppose, but is the result, for the most part, of close examination by means of the powerful lens. Future investigation will, undoubtedly, reveal many novel features which we now know not of, and, to accomplish this fully, the patient student of horticulture is asked to join the botanist in the pleasant task. But there is another and more popular aspect to this subject—the relative advantages of certain stocks for particular species of plants. Under this heading, we may take for example the Plum worked on the Peach. Prejudice and distrust, on the part of many cultivators, have done this operation great injustice. By the owner of a heavy soil, where the Plum root thrives luxuriantly, Peaches should be planted with caution; but, on the other hand, in the great Peach districts, with a light mellow soil, the Peach root will succeed far better than the Plum. Peaches always make a large number of strong fibrous roots, and return to the top a vast amount of nutrition. The junction in certain varieties of Plum on Peach roots is perfect, and the tree is long-lived and healthy. The testimony of some of our most noted pomologists goes to show that the practice is correct, and a careful examination plainly indicates that the theory is faultless as well.

* Read by Josiah Hoopes to the American Pomological Society.

The subject of dwarfing fruit-trees is not properly understood. The Pear worked on Quince roots certainly dwarfs the tree to a certain extent, and for a few years, but is the process caused by some inherent property contained in the Quince? We think not. Once allow the Pear to throw out a few roots above the point of junction, and the tree becomes a standard. The abundance of sap or nourishment gathered up by the roots and forwarded to the top, causes in most cases a larger and finer growth of fruit, thus showing that the Quince is adapted to these kinds; but take an uncongenial variety, and mark the result. The fruit is often in such cases worthless. Years ago we were told that budding Cherries on the Mahaleb stock would cause the trees to become dwarf. Little did these propagators know that when they annually pruned their trees, this was what dwarfed them, and not the root. The junction in this case is always perfect, and it is a well-known scientific fact that excessive pruning causes debility in a plant, and that, when vitality is checked, the tree becomes dwarfed, as a matter of course. Excessive growth and productiveness seem to be generally antagonistic. A dwarf tree, after the first vigorous growth is over, will, if healthy, produce good crops and mature a reasonable amount of new wood. Some certain varieties of Pears, as, for instance, the Bartlett, never unite properly on the Quince stock—the cellular tissue of each never seems to make a perfect union. Very many trees that we have examined under a strong lens reveal a marked line between the cell-growth of the two, and not, as is the case with other kinds, a lengthening of both cell-growths, one up, and the other down, so that it is very difficult to determine where the exact point of insertion really is. There are causes, over which we have no control, that debar us from dwarfing some varieties, but science has not yet solved the mystery.

THE ASHTON COURT GRAPE PRESERVER.

THE accompanying is an illustration of a useful way of keeping Grapes in water after they are cut from the Vine. Any plumber can make the tins for 6d. each, exclusive of the copper wire by which they are suspended. The Grapes keep well in these preservers hung up in a Vinery; but what I should really like to have would be a small house so situated that by turning a valve one could have heat when required, such house to be properly ventilated; it could be used in the summer months for young Vines in pots, Cucumbers or Melons. Such a place could be kept perfectly free from dust or damp.—WILLIAM DODDS.



Fruit Culture in Nebraska.—At the annual exhibition of the American Pomological Association, held in 1873, at Boston, Mass., the first premium for fruits was awarded to Nebraska. This was the second occasion on which this honour had fallen to that State, a similar premium having been awarded at the Richmond, Virginia, exhibition of the society, in 1871. The Burlington and Missonri River Railroad Company, which owns a large tract of land in Nebraska, exhibited, at the 1873 American Institute Fair, at New York, a large variety of the fruits of the country, and has received three diplomas from the Institute for fruits and other kinds of produce. The same company, as our readers will remember, also exhibited a beautiful collection of fruits at the late Smithfield Club Show.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Apples for Northumberland.—Will any of your readers tell me from experience what first-class dessert and kitchen Apples I may plant with confidence in this part of the country? They must thrive as standards. I am about forming what I hope will prove a good orchard.—J. H., *Northumberland*.

Pears by the Sea.—Passing by the shore from Newhaven to Eastbourne the other day, and not expecting the least interest in the way of gardening along that exposed garden-less and tree-less walk, we were surprised to see some noble Pear trees trained against the side of the large tide mills near Newhaven. They are as fine examples of training as we have ever seen, and run from 20 to 30 feet high. They have borne many good crops. Some years ago, a gutter was put over them to prevent the water falling from the roof on the flowers. Since this has been done the crops have never been nearly so good. The roots having only a restricted road-way to feed in, the trees suffered from want of the roof-water. The fact is instructive.—R.

SOILS, FERTILISERS, &c.

THE DIFFERENT MODES OF PREPARING SEWAGE MANURE.

OUR readers will, no doubt, be interested by the following excellent summary of information relative to processes for the utilisation of town sewage. It is from one of the able articles included in the "Companion to the British Almanac." Dirt was defined by Lord Palmerston to be matter in the wrong place. The sewage filth, which in our large cities is one of the most dangerous enemies of public health, a constant source of annoyance and fear, would in its proper place be a valuable fertiliser of the soil, and aid in increasing the quantity and quality of the fruits of the earth for the food of man. Amidst the contending claims of the numerous sewage systems there is perhaps some danger of the public growing weary of the subject, and regarding it as a matter for the judgment of experts alone, and without any interest for anyone else. Such a result would be greatly to be deplored. The nation has a very vital interest in the sewage problem, and a just appreciation of this fact must precede any successful attempt towards its solution. The problem is, first, how to dispose of sewage in such a manner as to be harmless in its effects on public health; and, secondly, how to realise the vast potential wealth which is now thrown into the sewers. Our rivers are polluted to an almost incredible extent. The Thames receives the sewage of 880,000 persons before it comes into the hands of the water companies. "This water contains a larger amount of impurity derived from faecal matter than filtered sewage." The influence of this matter may be clearly traced in the epidemics of typhoid fever, and there can be no reason to doubt that the double contamination of air and water has a most deleterious effect on public health. But this matter, so offensive and detrimental when misapplied, has a very high potential value. We will now briefly mention the plans proposed for getting rid of this noxious waste, and utilising its valuable properties. For the removal of the excreta of the human body, and the refuse of the household, there are two essentially different plans, each having violent partisans. Whether the system should be based on earth or water is the primary contention.

Dry Earth System.—Experience has shown that earth carefully dried until it has become a powder absorbs and renders inodorous offensive substances, if applied in sufficient quantities to absorb all the fluid matter. The dry ash of hard coal or anthracite may be used instead of earth. This plan is impracticable in large and densely populated cities and towns. 4 or 5 lbs. of dry earth would be required daily for each individual. A city of 100,000 people will involve bringing in 250 tons daily from the surrounding country, and distributing it to, perhaps, 15,000 different houses. In the country, and in many establishments situated where there is plenty of land from which to take the earth, and to which the manure might be returned, the system could be advantageously adopted.

Water Carriage System.—All towns are obliged to have sewers and drains to carry off the surface-water falling as rain, and to drain the soil of its too abundant moisture. The houses are connected with the sewers by water-closets, &c., and the sewer gases seek a passage by these channels into the interior of the houses. Sewer air is not fetid, nor pungent, nor ammoniacal; it has no marked characteristic of its own. If it were foul-smelling, its presence would excite greater attention than it now receives. When it escapes from the sewer into the dwelling, it carries with it a virulent poison, and the air is filled with the seeds of disease. A storm of rain, or even a change of temperature, may cause it to rise through any unlucky leak and quickly spread throughout the dwelling. It has been proposed to have a continuation of the soil pipe carried up the roof, and so subject the contents of the drains to the purifying influence of currents of air. The water-carriage system being that for the most part in use, we now turn to the proposals for the utilisation of sewage.

The Lime Process.—In this, the sewage is mixed with cream of milk or cream of lime and violently agitated. When allowed to subside, highly putrescent mud is precipitated, while the liquor flows off in a tolerably clear condition. Drying the mud is a very offensive operation and much of its valuable constituents escapes. The manure has sold for one-third the money it costs.

The Phosphate Process is based on the fact that certain mineral phosphates, when freshly precipitated, eagerly combine with the organic matter in the sewage. Fetid sewage may be deprived of odour and colour if they are agitated in it. Phosphate of magnesia combines with the ammonia contained in the sewage, and precipitates it as double phosphate of ammonia and magnesia. The amount of ammonia is very small, and the plan does not appear to be capable of being worked profitably.

Morfit's Process replaces the natural phosphate of alumina by

a new artificial material, the "mother water," as produced by Dr. Morfit's process for obtaining pure phosphates of lime by precipitation from hydrochloric solutions of mineral phosphates of lime. The result is, in the opinion of the inventor, a valuable special manure for clay soils.

Blyth's Process is an attempt to obtain the ammonia contained in the sewage, and consists in treating it with super-phosphate of lime and a salt of magnesia. Very little success appears to have attended this plan.

In Holden's Process, the sewage is mixed with sulphate of iron, lime, and coal-dust. It yields only three per cent. phosphoric acid, '004 per cent. ammonia, and 0.555 per cent. of organic nitrogen. As a manure, it has, therefore, little value.

The A B C Process is a plan of precipitating by sulphate of alumina the valuable constituents of sewage, and purifying it with charcoal and clay. Its name is derived from the initial letters of the principal constituents employed, alum, blood, clay, and charcoal. Alumina, when in contact with sewage, is separated, and each particle seizes hold of, and drags down with it, a corresponding particle of nitrogenous impurity. All blood is charged with albumen, which coagulates in contact with alum. The treatment with blood precipitates a light hydrate of alumina which ultimately settles, leaving a clear liquid above it, although a slight agitation causes it to float up again. Clay finely ground with water forms a creamy emulsion which takes days to settle, but, in contact with sulphate of alumina, coagulates like albumen. It will be seen that there are three precipitations which occur simultaneously, and result in a dense mass which settles at the bottom of the tank. The charcoal is intended to correct whatever impurities may still remain. It is claimed for this system that it deodorises and disinfects sewage, leaves the effluent water fit for drinking purposes, and produces, at a cost of £2 per ton, a "native guano," having considerable manurial value, and selling at £3 10s. per ton. The reports as to this process are very contradictory. One authority tells us that the effluent water contains as much putrescent matter injurious to health as the sewage itself, whilst another tells us that fish have been kept alive in it!

Irrigation.—Perhaps the most important test that the system of sewage irrigation has yet received has been at Merthyr Tydfil, where Mr. Bailey Denton and Dr. Frankland conducted experiments under the authority of the Court of Chancery. Proceedings had been taken against the town authorities, for allowing sewage to enter the river Taff, and the Board of Health had determined to experiment on 393 acres of land, but, not having been expeditious enough, the gentlemen named were sent armed with full powers. The plan they adopted is thus described:—"About 20 acres of land, immediately adjoining the road on which the tanks are placed, have been arranged into filtering acres or beds on a plan devised by Mr. J. Bailey Denton. The land is a loamy soil, 18 inches thick, overlying a bed of gravel. The whole of these 20 acres has been under-drained to a depth of from 5 to 7 feet. The lateral drains are placed at regular distances from each other, and run towards the main or effluent drain. This is everywhere 6 feet deep. The surface of the land is formed into beds; these have been made to slope towards the main drain by a fall of 1 in 150. The surface is ploughed in ridges; on these, vegetables are planted or seeds sown; the line of the ridged furrow is in the direction of the under drain. Along the raised margin of each bed in each area delivering carriers are placed, one edge being slightly depressed. The strained sewage passes from the conduits into the delivering carriers, and, as it overflows the depressed edges, runs gently into and along the furrows down to the lowest and most distant parts of the plot. The sewage continues to be so delivered for six hours; then an interval of rest of eighteen hours takes place, and again the land is thoroughly charged with the fertilising stream. The water percolates through the 6 feet of earth, and reaches the lateral drains, which convey it to the main effluent drain." The result is that the water is purer than the Thames water drunk in London, and is used by the workmen on the sewage farm. The ridges have yielded large crops of kitchen vegetables, sufficient to compensate for the total outlay, whilst portions devoted to Italian Grass gave a profit of £24 per acre, and a plot of Onions realised £61 per acre. These results appear to be highly satisfactory. What would Dickens have said to the spectacle of the Court of Chancery stepping in to repair the delay of a Board of Health?

Smoke Drainage.—In connection with these sewage schemes, we may notice a suggestion made by Mr. Peter Spence, F.C.S., who advocates carrying the smoke of house fires, &c., through the drains, with the twofold object of purifying the air and sewage. Mr. Spence estimates that, in Manchester alone, 20,000 tons of sulphate of ammonia, which is now thrown into the atmosphere, would be deposited in the smoke-drain.

THE HOUSEHOLD.

EXTRACT OF APPLES.

New processes of utilising Apples have been put in operation in Ohio which place its culture upon an entirely new basis. One process is that of making Apple-jelly, and another that of making "Apple-butter." The jelly is a condensed product, requiring a large quantity of Apples for a corresponding small amount of jelly, and it must, of consequence, be dear, and perhaps it is neither as profitable nor as popular an industry as the other, which uses the whole of the Apples with little condensation. Apple-butter differs from the Apple-sauce of New England only in the manufacture. Apple-sauce is made, or it used to be made, by boiling down cider, that of sweet Apples usually preferred, and of adding pared and quartered Apples when the whole was boiled just enough to make the Apples soft, but not enough to break down the structure. In making Apple-butter the boiling is continued much longer, and the whole mass is thoroughly mixed together by constantly stirring it, and the more thoroughly this process is performed the better is the quality, particularly in regard to keeping. Both preparations are kept in jars, and often in barrels made for the purpose. The chief defect of Apple-sauce is, that when warm weather comes in the spring it is apt to ferment and become sour, when it is necessary to re-boil it. Apple-butter seldom ferments, and, if kept in a cool place, it remains good for years. The commercial Apple-butter factories provide first a cider-mill of improved structure and copper boilers, with tanks for storage and additional treatment, all of sufficient capacity to work up 1,000 barrels of Apples a day. The product is packed in barrels, when it is ready for shipment to any part of the world, and, if properly made, it will keep as well as flour, pork, or molasses, and it is as much of a cash article as either.—*New York Tribune.*

Keeping Apples.—At the West Grove Farmers' Club, T. M. Harvey and Dr. Bush both stated that they had been very successful in keeping Apples packed in barrels with dry forest leaves, placing them in apartments with a temperature just above freezing. Others had succeeded by packing them in sawdust, dry tan, and plaster of Paris. It will be observed that all these modes not only protect the fruit from freezing when any cold weather occurs, but prevent the active currents of air, for it is not only important to keep the fruit cool, but to preserve a perfectly uniform temperature. We have found that merely wrapping the specimens in tissue paper, when kept on shelves, preserved them longer than when exposed, for the same reason—and hence also the advantage of heading up in barrels so long as fermentation and the bad effects of confined air are prevented by a cool temperature and not confining them too long.—*Cultivator.*

Teas of Home Growth.—Somebody, professing to speak from long experience, avers that the leaves of the Raspberry, if properly treated, make finer tea than any that finds its way to Mincing Lane. The French peasants make an aromatic drink from the leaves of the Black Currant tree, and believe it to be a specific for indigestion. Thanks to M. Raspail, they have also learned to appreciate the flavour, aroma, and virtue of Borage tea. Our dietetic philosopher and friend, Fin Bec, would like to do in England what M. Raspail did in France, but, knowing the inveterate suspicion the poorer classes at home have of anything to which they are unaccustomed, especially if it costs little, discreetly declines making the experiment himself. "Let any social doctor," says he, "who may be anxious to test the pliability of the English agricultural labourer as a pupil, accost him with the following proposition: 'My good man, I have, I assure you, from the bottom of my heart, the liveliest interest in your welfare. Now, the tea you drink is detestable, adulterated, and very dear stuff. It does you no good; now take my advice—grow Borage, which will cost you nothing, and drink Borage tea. It helps digestion, is a sudorific, has a delightful aroma, and will have no bad effect on your nerves, or the nerves of your wife.' I am lost in conjectures as to the fate that would befall the doctor. He might be bonneted, elbowed into a Thorn hedge, reminded that the horse-pond was near, or recommended to confine his attentions to his own teacup. But the unlikeliest result of all would be thanks for his suggestion. No, the unlikeliest would be the trial of it."—*Chambers's Journal.*

Apple Marmalade.—Peel, core, and boil the Apples—Spitzenbergs are the best—with only sufficient water to keep them from burning; beat them to a pulp; to every pound allow three-quarters of a pound of lump sugar; dip the lumps into water, put these into a saucepan and boil until the syrup is thick and can be well skimmed; add this syrup to the Apple with half a tea-spoonful of minced Lemon peel to each pound, and stir over a quick fire till the Apple ceases to stick to the bottom of the pan. Dip jelly moulds into water and lay in the bottoms—as they are inverted—a few strips of Citron and some blanched Almonds, then pour in the marmalade, and when cold it will turn out easily.

THE ARBORETUM.

AN ANCIENT PLANE-TREE.

OUR illustration represents the present state of an old historical Plane-tree standing in the Temple Gardens. The Thames formerly flowed close to its roots, and it is now pointed out as marking the site of the old river wall, successive embankments having now shut out the river 50 or 60 yards further to the south. Apart from its interest as a landmark, both Goldsmith and Johnson are reputed to have spent many an hour in "sweet converse" beneath its shade; nor is this improbable, as it has evidently been a stately tree in its time. When the river wall was removed further south, the ground around it was raised to a height of 15 feet, and, probably, this hastened its death by depriving its roots of their due amount of aëration. It has been dead since 1835, and shows little of its former greatness. The branches are rotten and broken, and in a few years' time, if not better protected than it is, it will be among the things of the past. A neat label, giving a short account of its history, would be appreciated by visitors to the Temple Gardens, many of whom are, in all probability, quite unaware of its existence or of its historical interest.

The Yardley Oak.

—The most complete account of Cowper's Oak (see p. 22) will be found in London's "Arboretum," Vol. III., p. 1,765, 1838, at which time he had it measured. He gives the girth, at 1 foot above the ground, as 30 feet 6 inches. The stem then leant so much to the south as almost to admit of a person walking up it with very little aid from the hands. It had three huge branches wholly devoid of bark, and had formerly been much injured by persons carrying away small blocks or slices of the wood as relics, or to manufacture snuff-boxes, &c., from. Cowper's Oak was called Judith, from an old legend that it had been planted by the Conqueror's niece Judith, Countess of Northumberland. She held eighty-eight manors in Northamptonshire, including a portion of Yardley. There is a large engraving of it in Hayley's "Cowper," Vol. III., 1806, supplement. The two Oaks figured by Strutt, and known as Gog and Magog, are quite distinct from "Cowper's Oak." —EDWARD SOLLV, in *Notes and Queries*. [The title to the engraving of this Oak is "Judith or Cowper's Oak, a portrait from Nature, drawn by Mrs. Meen, 1801, engraved by Caroline Watson, engraver to her Majesty, 1805."]

Destruction of Seedling Ash.—Mr. Alexander Buchan read a paper the other day before the Botanical Society of Edinburgh "On the destruction by frost of seedling Ash trees, in Mr. Robertson's Nursery Ground, near Fettes College, on the 7th April, 1873." At the outset Mr. Buchan explained that, as a precaution against frost, Mr. Robertson spread an old fishing net over a plot of young Ash seedlings, which had all appeared above ground within the previous ten days. He entered into minute details as to the manner in which Mr. Robertson laid out the net, and went on to mention that the loss of young plants was considerable—the extent of it being represented by the fact that only about 400 plants per square yard were now growing in those parts in which the destruction of the seedlings took place, whereas elsewhere in the plot the number was 2,000 to the

square yard. The explanation of the facts adduced by Mr. Buchan was thus stated:—"The steady blowing light wind was sufficient to disturb the air cooled by contact with the ground, and mix it with the stratum of air lying immediately over it, in all places where the wind was felt. Over the beds, unprotected by the net, the wind passed freely and unchecked; and there, consequently, the temperature did not fall lower than was just sufficient to brown, without destroying, the young seedlings. But to the beds protected by the net, the wind had no access, owing to the intervention of the net, and there, consequently, the air strata not mixing, the temperature fell so much lower than over the beds adjoining as to destroy the seedlings, which happened at the time to be just at that stage of their growth when they are most susceptible of injury. From the illustrations which he gave, Mr. Buchan stated that it would be evident that the air enclosed under the net which was spread over the Ash seedlings was practically still, and the cold produced by radiation was thus allowed to accumulate close to the surface over the seedling plants. Thus, then, the destruction of the young Ash plants was due to the net being of too flimsy a texture to offer a sufficient obstruction to terrestrial radiation, whilst at the same time it afforded a complete obstruction to the winds, and thus prevented a circulation of air around the young plants; the destruction, he it observed, being most complete on the borders of the trenches in which the coldest air settled, and over which the stratum of air imprisoned under the net was less in thickness."

Evergreen Berberies.—I do not find in your interesting descriptive list of Berberies (see p. 31), B. Bealei mentioned. I have had one under that name for many years, but it may be a synonym of another variety. It is much like B. japonica in character, and flowers as freely every spring, but being, until now, under the drip of a large Lambert's Cypress, it has not fruited. I may mention that, in warm, dry summers, my plants of B. aristata are thickly covered with purple fruit, with as fine a bloom as that of a Sloe, but, this year, like many others, owing to continual dripping, and absence of sun, the long racemes of berries are a shabby red and unripe looking colour. I may add, that I have Primroses, in some numbers, in flower on the banks here (in Cornwall); also

some Narcissi in flower, and only a few days ago I cut a beautiful Devonensis Rose, and in a few days I hope to gather a bud or two of the Tea Rose Goubault.—THE COLONEL.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Prunus myrobalana.—Can any of your readers inform me if this tree will grow from cuttings? If so, what is the proper time to take them and what treatment should they receive?—J. M.

Mistletoe on the Acacia.—A large globular plant of Mistletoe, high up on the tree, may be seen in the garden of the vicarage, Godnestone Kent.—JOHN MARTIN.

The Mistletoe may be seen growing luxuriantly on the Acacia in several places in the neighbourhood of Bristol, among which may be mentioned Blaize Castle, and Holmwood, Westbury-on-Trym. It is, however, somewhat remarkable that it does not, so far as I am aware, grow on any of the Coniferae in this country, whereas in the neighbourhood of Gabas, in the Pyrenees, many of the Pine trees (*Pinus pyrenaica*) are literally covered with it.—ALFRED SHIPLEY, *Westbury-on-Trym, near Bristol*.

London Plane-Trees.—Are the Plane-trees which do so well in London squares *Platanus orientalis* or *P. occidentalis*? Some of the young trees sent me by nurserymen as the Plane of the London squares, turn out to be some sort of Maple.—W. Y. [All the large Plane-trees in the London squares are *Platanus occidentalis*, or the American Plane. In Scotland and the north of England, *Acer Pseudo-Platanus* or Sycamore is known by the name of Plane-tree.]



Old Plane-tree in the Temple Gardens.

THE KITCHEN GARDEN.

CONDITION OF SUCCESS IN THE GREAT POTATO TRIAL.

WITH reference to the great Potato trial in America, which was reported in *THE GARDEN* some time ago, some readers may desire to know the causes of such marked success, and the following trustworthy document explains it. This report is the production of Messrs. Thurber, Hexamer, and Quinn, three of the most able and experienced of American horticulturists. It should be borne in mind that the prizes were offered for the largest crop raised from one pound of seed, and that a good many competitors grew from 300 to 600 lbs. of Potatoes from this quantity of seed. The committee then condense the leading features of the modes and conditions under which these large crops were produced, justly accounting them of great value to all Potato growers.

Localities.—The largest yield—609 pounds from one of seed—comes from the Far West; but, in proportion to the number of the largest products, a much smaller proportion comes from the Western States than from the east—the very wet summer there, and the ravages of the beetle having, no doubt, caused this deficiency. The geographical distribution of the largest yields gives, from New York, 24 per cent.; Pennsylvania, 16; Vermont, 10; Ohio, 8; Massachusetts, 8; Minnesota, 6; Wisconsin, 5; New Jersey, 4; New Hampshire, 3; Indiana, 3; California, 2; and 11 per cent. from as many different States and territories.

Soils.—The largest product, that of Mr. Salter, was grown "on a very rich sandy loam, rich in decayed vegetable matter to the depth of between 2 and 3 feet, and lying upon a compact formation known as hardpan, which has never been underdrained." Mr. A. Robinson's soil likewise was "a sandy loam, clay sub-soil, where he broke up and raised Potatoes last year." Mr. F. A. Smith planted his Potatoes "in gravel soil with yellow clay sub-soil." Most crops, however, were raised on deep alluvial lands underlaid with gravel; others on light loam with clay or gravelly sub-soil, and in a few cases on heavy clay, highly manured. In but very few instances was the land artificially underdrained, which seems to be a noteworthy fact, as most writers consider drained soil indispensable for the production of good crops.

Manures.—Of fertilisers and mixtures an almost endless variety was used, but the one substance almost invariably applied was wood-ashes. There seems to be no doubt left that ashes are the special manure for Potatoes, and that even very large quantities of them occasioned no injurious effects. In a few cases, as much as one pint of ashes was applied to each hill as top-dressing, and in one instance the sets were actually planted on, and covered with, ashes. Plaster, lime, and salt were also extensively employed, and with great advantage. Strong nitrogenous manures have generally been considered as detrimental to the Potato, but here we find that many successful growers have used large quantities of blood, fish, and Peruvian guano, and hen-manure; also barn-yard manure, at the rate of fifty loads per acre, to the greatest advantage and without producing diseased Potatoes. Whether older and less vigorous varieties would have withstood disease equally well under such a treatment seems, however, somewhat doubtful.

Planting.—The time of planting was, in nearly all cases, during the month of May, and more than one-half of the competitors seem to have considered the 15th of May as the lucky date. In no case were larger sets than of one eye used, and in a majority of instances these were again divided into smaller pieces, so as to give from fifty to one hundred sets from one pound of seed. There appeared to be no difference in the yield between hills with whole eyes and sections of eyes. The hills were invariably placed a considerable distance apart, rarely less than 3 feet each way, and oftener further. As a rule, but one set was planted in a hill, and covered about 4 inches deep.

Cultivation.—It will be hardly necessary to state that, in many cases, the cultivation and care these growing Potatoes received was unremitting and indefatigable. In no case were weeds to be seen in the patch; some of the plantations received semi-weekly hoeings, and all were kept scrupulously clean, and the soil loose and mellow; yet many large crops were grown with but ordinary care. Mr. J. I. Salter states "that the cultivation, manuring, &c., was the same he has given to his general crop of Potatoes for the last five years, and in no respect had there been extra care and labour bestowed." Mr. H. C. Pearson certifies "that these Potatoes were grown with the most ordinary farm culture, being hoed only twice, and receiving no extra treatment in any respect." Nearly all growers adopted the hilling system, and in only two cases were large crops obtained by level culture.

Yield.—Although the Early Vermont gave the largest crop from

one pound of seed, the average productiveness of Compton's Surprise is shown to have been greater than that of the Early Vermont. In explanation of this, Mr. Salter says:—"The Compton's Surprise will, and did with me, with the same culture and soil, yield from one-third to double the amount of the Early Vermont; still, I obtained a much greater yield of the latter than of the former from one pound of seed. The reasons with me are many. In the first place, the number of eyes in the Early Vermont was nearly double that of the Surprise originally, and, in digging, the number was still further reduced by an ugly gash in one of the Potatoes, destroying four eyes. Then, again, I lost five hills by the extreme wet which followed the planting of the Surprise; and then the Vermont, being a very early Potato, matured rapidly, and I was enabled to keep the Colorado beetle in check until its ravages were comparatively harmless on it; while the Surprise, being of slower growth, after the Early Vermont had ripened, required constant attention to prevent their ravages. This time I could not spare, and was forced to let them have it their own way until it was too late; then came an early frost, Sept. 7, which killed the vines of the Surprise, while the Vermont had been out of harm's way from the middle of August." Several reports contain accurate statistics of the yield of different varieties, the result of careful experiments. Taking the yield of Compton's Surprise as 100, the comparative yields average as follows:—Compton's Surprise, 100; Early Vermont, 78; Harrison, 75; Peerless, 72; Late Rose, 70; Early Rose, 62; Campbell's Late Rose, 56; King of the Earlies, 40; Early Goodrich, 35.

Compton's Surprise and the Early Vermont.—The committee conclude, from all the foregoing, that few new varieties have ever before been subjected to so manifold and varied a trial as these two, concerning which the following estimate is made:—"Compton's Surprise has received the unanimous verdict for the most prolific Potato cultivated at present. Yields of from 12 to 20 lbs. per hill are reported by the hundreds, and in one instance 28½ lbs. were dug from one hill. As a rule, the most prolific varieties are not of the best eating quality, but to this Compton's Surprise is an exception. Thousands have testified that they never ate a better Potato. Its uniform mealiness of grain, combined with the purest flavour, and its snowy whiteness of flesh, which is not in the least affected by its blue skin, cannot fail to make it highly valued as a family Potato. This variety shows a peculiar tendency to produce a 'surface crop' not found in other kinds. Its rampant growing vines lying on the ground will frequently take root, and establish a new centre of production. Subterranean branches will also likewise grow above the surface, and form self-supporting plants which produce an additional crop of tubers. The Early Vermont has, as proved by the numerous reports before us, more than sustained its previous reputation. Nearly all competitors declare it from one to two weeks earlier than the Early Rose, and many even more. Its uniform and large size is recognised by every one." Mr. McLeod says: "There are more than 100 in the amount I raised that would weigh from 1 to 2 lbs. each," and Mr. Salter raised one tuber weighing 3 lbs. 12 oz. Its superior cooking and eating qualities are unanimously commended, as well as its compact growth in the hill and its freedom from disease; and with the thousands of cultivators who have grown it alongside of the Early Rose, there seems to be no doubt left that in quality, hardiness, earliness, and yield, it far surpasses that celebrated variety.

Cropping a Garden.—I have a large garden, which I have just changed from a wilderness of noxious weeds to a clean well-picked trenched ground. I have it for two-and-a-half years, so do not want to go to expense beyond what will remunerate my own time. I have little knowledge of gardening. Can any of your correspondents kindly give me a few directions about stocking my garden? I have had a fine set of Raspberries set, and well manured. I have just planted some Seakale, too late, I imagine, for use this season. I sowed early Peas and Mazagan Beans; how far apart ought the latter to be between seed and seed and each row? I re-planted some Globe Artichokes the other day. I was told it would answer to do so. Can I do anything more in the vegetable way? I have also planted Potatoes, Onions, and Leeks. How deep ought they to be covered? and how far apart, in what sized beds—3 feet? I intend sowing and planting the following in their proper time, viz., Cabbage, French Beans, Scarlet Runners, Cauliflowers, Beet, Salad, Celery, herbs, Spinach, Parsley—in a bed or in a border?—C. J. LONG.

Bones as Manure.—It is found cheaper to dissolve or grind bones than to quarry limestone, crush it and carry it to the land as a fertiliser; hence the enormous commerce in bones, of which we often import 100,000 tons per annum, valued at £660,000, whilst those collected at home are computed at nearly as much more. Bones of almost all animals are now imported as articles of commerce; whether wild or domesticated animals, they are made to yield parts of their skeletons for some useful purpose; and we import the bones of the giraffe, elephant, horse, cattle, and whale.

THE GARDENS OF ENGLAND.

ESLINGTON PARK.

THIS, the seat of Lord Ravensworth, like many charming retreats in the North of England, lies at a distance from any of the main thoroughfares to the North, and, nestling under the skirts of the Cheviots, is little known to tourists. It is approached through the lovely vale of Whittingham, which can hardly be surpassed for picturesque and natural beauty; about a mile beyond the village that has given its name to the vale, one enters the park, and the first object that attracts attention are its noble trees, conspicuous amongst which, and towering aloft like giants, are various Silver Firs, one of them being about 130 feet in height, and measuring at 5 feet from the ground 15 feet 8 inches round the bole. Proceeding westward along the drive, an opening on the right enables one to get a glimpse of the hall standing upon the left bank of the Aln, which is crossed by a tastefully designed iron bridge of recent construction. It is a plain building in the English style, and in fine keeping with the situation and surrounding scenery. The Aln, which is only a small stream here, and which threads its way round the bottom of a green terrace a few yards distant from the house, formed at one time a lake, but, owing to damp arising from it so near the house, it was drained off, and the little stream now issuing from between the greenest of banks falls over a weir at the farther end of the flower garden. The most attractive feature of this place, however, is its flower-garden, which is both compact and artistic in its arrangement; it occupies an oblong space equal in breadth to the south-eastern front of the building; a terrace, crowned with beautiful Evergreens, runs parallel to it on the right, and divides it from the stream, and along the left side runs another terrace covered with flowering shrubs, while on the top is a broad promenade. The flower-beds, which are upon the grass, are of considerable size, and very effective in autumn; foliage-plants, too, of the hardier kinds are used extensively in connection with flowering subjects; the Golden Thyme acquires a tint here that deepens as the autumn advances, and is really lovely. It seems to prove, in fact, that soil and situation have much to do in bringing out the lovely tints of this charming plant; a remark which holds good with regard to many other plants here that display a depth of colour and profusion of bloom not often seen in the warmer and lighter soils of our southern counties. A shady walk leads from the flower to the kitchen garden, the latter being somewhat distant from the former, and the intervening space, which is considerable, is laid out in a way that is both pleasing and natural. Some of our earliest imported varieties of *Pinus* are growing here with a vigour and freshness that show them to have found a congenial home, and not the least interesting thing about them is, I believe, that they were all planted by the venerable gardener, Mr. Oliver, who has been head gardener here for the long space of forty-nine years. We were fortunate in seeing a fine *Yucca gloriosa* in full bloom growing upon the Grass; on the right hand side of the door opening into the kitchen garden, stands a lean-to greenhouse, in which were some really fine pots of *Liliums* of various kinds. The garden wall here forms the boundary to the pleasure-ground in this direction; it is covered with fruit-trees, but the border along the base of it is filled with choice bedding material, laid out with great taste. We also observed some fine coloured black Grapes in a small house placed against this wall. On entering the kitchen garden, the first thing that attracted attention was the luxuriance and profusion of vegetables within it. Mr. Oliver seems to have carried this branch of his profession to the highest perfection, and his system of training and pruning fruit bushes deserves to be more generally adopted than it is; by careful and constant summer pinching they are kept low, open, and regular in the arrangement of the branches; by this means they acquire a robustness of habit, very different from the long scrambling bushes, too often seen, sometimes even in the best of gardens; dwarf fruit-trees are also treated here upon this principle, and with the same result. Like many old gardeners, Mr. Oliver's forte seems to lie in the frame-ground. He grows his Melons principally upon dung-beds; there are not many kinds of Melons or Cucumbers that he has not had through his hands, and he can tell you their merits and demerits better than any man with whom I am acquainted; the

same may be said of the different Celerics that have been in the market. A large square in the kitchen garden is devoted to the growth of Dahlias. As we wend our way through avenues of Hollyhocks, Gladioli, Stocks, and Asters, the fact is forced upon us, that florists' flowers are not only grown here, but well grown. Until very recently, no fruit was grown under glass here—Ravensworth, another seat of this family, having one of the best fruit gardens in the county—now, however, two houses occupied with Grapes here, furnish proof that this branch of gardening receives due attention. A combination of natural objects, assisted by art, has made Eslington one of those charming places that one leaves with reluctance. The fine old house, partly covered with Creepers of different tints, the Aln murmuring past, the deer browsing up to the entrance, the park abounding in fine old trees, each in the varied colours of autumn, all make up a picture surely worth painting by either pen or pencil. J. T.

GLEN EYRE, BASSETT, SOUTHAMPTON.

THIS is one of the most unique and charming spots in the county of Hants, and, although quite a modern place, yet so luxuriant has been the growth of the trees and shrubs by which it is encompassed, that it is now well wooded and secluded. The house is situated at the head of a pleasant dell looking eastward, and commanding charming views of the surrounding country. Immediately in front of it is a series of terrace-gardens, the banks of which are clothed with a rich verdure of evergreen shrubs, among which *Pernettyas* and *Berberis Darwinii* luxuriate, and the flower-beds are filled with diverse-coloured bulbous flowers, and edged or carpeted with hardy flowering plants in so tasteful a fashion that the floral bedding display will, early in April, form a most beautiful picture; when to this, too, are added the blooms of all kinds of flowering trees and shrubs, varied and pleasant walks, and a constant succession of gardenesque effects, one is compelled to acknowledge that Glen Eyre is emphatically a place worthy of the taste and wealth of its excellent owner—Mrs. Eyre Crabbe. In the gardens at Glen Eyre, *Camellias* thrive apace in the open ground, and, of the old double striped variety, there is probably one of the largest of outdoor unprotected *Camellias* in the kingdom; it is in the highest state of health, and about 9 feet in height and 10 feet through. In all directions, where the *Camellia* is planted out, it thrives well, and, indeed, it is one of our hardiest and most beautiful of border shrubs. Except a small patch of croquet lawn, there is scarcely a rod of level Grass plat in the place. So steep are the inclines, that levels are only obtained by a series of terraces, and, on the Grassy sides of the slopes, superb specimens of *Conifers* are growing; of these there may be larger trees of the various kinds throughout the country, but certainly none handsomer or more compact in growth than are those growing on the Glen Eyre slopes. Of *Wellingtonia* there is a splendid tree, with a trunk some 2 feet in diameter, having a grip of the soil like some vegetable giant, and of *Picea Nordmanniana* there is also a superb specimen. In one nook has been constructed a large interesting hardy Fernery, planted with fine and rare kinds; it lies low, and is overhung with trees, and, being sheltered on all sides with shrubs, the Ferns thrive admirably in it. This is as it should be, for it is contrary to nature to construct a Fernery where the winds can rack the vegetation, or the hot sun scorch it. At the extremity of the pleasure-grounds stands the cottage of Mr. Stewart, the gardener, with its broad front of red brick, its old-fashioned porch, and its warm covering of thatch, literally covered with Ivy and climbing Roses. The glass houses are richly filled with all sorts of Orchids, Ferns, flowering and fine-foliaged stove-plants, hard-wooded flowering plants of kinds innumerable, and a large mass of bedding plants. One of the best private collections of *Primulas* in the country is grown here, including the double sorts with self and flaked flowers. The double forms are exceedingly tender, and very difficult to propagate, hence the reason why good double forms are so scarce. In the conservatory just now are some fine specimens of *Solanum Pseudo-Capsicum*, about 3 feet in height and as much through, covered with their bright scarlet berries. A. D.

THE WATER SHIELD.

IN the many interesting collections of aquatic plants we have seen in the botanical and private gardens of this country we do not remember to have met with this curious and hardy North American plant. Its oval leaves are centrally attached to the foot-stalks, and are always noticeable and rather pretty as they float upon the water. They have their use as forming a shade and covert for fish, as anglers are well aware. The flowers are of a dull purple, and come to the surface to perfect themselves, but make little show. This aquatic plant has a remarkably wide distribution, it being found not only in North America, including the north-west coast, but in Japan, Australia, and India. Our figure, from the *American Agriculturist*, gives but a feeble notion of the plant.

THE AMATEUR'S GARDEN.*

COOL-HOUSE ORCHIDS AND FERNS.

YOUR article on Orchids, in THE GARDEN of December 20th, signed "J.," exactly suits my wants. I have a small greenhouse, 15 feet by 10 feet, now occupied with a few Heaths, Chrysanthemums, and other little flowers, which look pretty enough; but a collection of Orchids and Ferns, such as you describe, must be far preferable. It is heated by a flue under the floor, with iron grates to admit the heat; has a west aspect; three sides glass, and stone wall at the back, and is about 6 feet high in front and about 10 or 12 at the back. In such a house, will you kindly suggest how to make a rockery, what soil to put in amongst the stones (as I am as fond of Ferns almost as Orchids), and where I can obtain some plants of suitable kinds of each at a small cost? I see you give the names of some Orchids, will you please tell me which are the best for one to begin with, and also give me the names of some half-hardy exotic Ferns? In fact, I have little knowledge about such plants, but I am very anxious to have some, so any hints you may give me will be most thankfully accepted.

Derby.

R. H.

[Upon submitting your letter to our correspondent, "J.," he has favoured us with the following reply:—As your house is heated by means of a flue, I imagine the atmosphere in it must be somewhat unsuited to the requirements of such moisture-loving plants as Ferns and Orchids; still, if you really like these plants better than any others, do not let that deter you from attempting their culture. A rockery will do much towards keeping the atmosphere humid, and a few flat pans of zinc or earthenware kept constantly full of water and placed on the flue itself will do the rest. As your back wall is 10 feet high, your rockery need not much exceed half that height, and should be formed of large rocks or boulders, these being the best, and, no doubt, plentiful in your locality. Arrange them as artistically as possible, taking care to leave holes or pockets for your plants, and fill up the interstices with smaller stones and good fresh soil as the work proceeds. If you can obtain Moss-covered boulders so much the better, as these look prettier than the bare stones, and their surface is more suitable for the roots of the Ferns and

* This department is written exclusively by amateurs distinguished for skill in various branches of gardening.

Selaginellas. In arranging the stones, place them so that the water will drain inwards and not run off in front as is frequently the case. The soil best suited for Ferns is half loam and half peat, with the addition of some coarse well-washed river or road sand. The ordinary white sand commonly used is too fine for the purpose. Do not sift your compost, but break it up roughly into lumps, and fill in the pockets or interstices at the top of the rockery with this before planting, while the stones and rough soil below will act as drainage for Ferns; indeed, all plants, although they like moisture, soon succumb if there is any stagnant dampness at the roots. Having finished the rockery, proceed to plant it, the present being an excellent season for the operation. Many of the North American and Japanese Ferns do well in a moderate temperature, as also do our own species, and their, in many cases, beautifully crested or tasseled varieties. The following are nearly hardy, and will suit your purpose: *Osmunda cinnamomea*, *O. regalis*, *Lastræa atrata*, *Polypodium cambricum*, *P. appendiculatum*, *Athyrium Filix-femina*, and its many fine forms, *Scolopendrium vulgare* and its fine wavy or crested varieties, *Cyrtomium falcatum*, *C. caryotideum*, *Onoclea sensibilis*,

Nephrodium molle, *Polystichum mucronatum*, *P. Lonchitis*, *Lomaria chilensis*, and the Killarney Fern, *Trichomanes radicans*. The British Maiden-hair, *Adiantum Capillus-Veneris*, also does well in a moderate temperature. The names of other species and varieties equally suitable may be readily found in any trade list of Ferns, and I should think there are nurserymen in your neighbourhood who could supply plants of the above, or others, at a reasonable rate. The back wall of your house, if bare, should be covered with fresh vegetation, as this assists in keeping the air moist, as well as adding much to the appearance of any structure. The pretty little *Ficus (repens) stipulata* grows very freely and clings to the barest of walls without any support, especially if they are moistened once or twice a-day with the syringe; and common Ivy also grows well, and always has a fresh and cheerful appearance. The rocks can be planted with *Selaginella denticulata* or *S. hortensis*, and this will soon form a fresh

The Water Shield (*Brasenia peltata*).

green carpet to the gently arching Fern-fronds above. *Tradescantia zebrina* or *T. viridis* may also be used for the last-named purpose, and these form a nice fresh background for pots of Hyacinths, Crocuses, or other spring-flowers that do not require much heat and yet come fresher and more beautiful when protected in a cool house. The Orchids should be placed on a stage or bench in the front of the house, as they are then near the light and more convenient for watering and other cultural details. These benches may be made either of wood or slate, the latter being preferable; and, if covered with about half an inch of small Cannel coal, Derbyshire spar, or fine gravel, so much the better for the plants, as the stages will then absorb sufficient water to keep them continually moist. Begin with the commoner free-growing kinds first, and, if these succeed (as they will, if real interest is taken in them), others and rarer kinds can be added afterwards. The following are best for a beginner, or any others mentioned in our list, see p. 512, Vol. IV.:—*Odontoglossum grande*, *O. biconense*, *O. Uro-Skinneri*, *O. Alexandræ*, *Phajus grandifolia*, *Calanthe vestita*, *Dendrobium nobile*.—J., *Whalley Range*.]

WORK FOR THE WEEK.

PRIVATE GARDENS.

Pines.—Many plants will now have started, some are starting, and others showing fruit, therefore great care and attention will be required in every stage of Pine-apple culture for the next six weeks, to be successful with the plants when in blossom, and with fruit that is up, in order to prevent any kind of abortion in the pips or the uneven swelling so easily produced at this season. There must be no check to, or attempt to drive or hurry on, those fruits that are in any stage of swelling. Nothing but time, patience, and persevering attention will succeed in kindly starting, blooming, and swelling Pines to perfection in the short and dark days of winter, and we must allow from two to four weeks longer for winter fruit, according to variety, to swell, than those that will start into fruit in February and March. If hurriedly forced, they will push up weak, long stalks, productive of weak and irregular blossoms and abortive and small fruit (with some pips swelled imperfectly), light in weight, black inside, and bearing overgrown crowns. From 65° to 70° should be maintained in the pits, with a genial humidity during night, according to the light and sun by day; the interior atmosphere and humidity being in proportion to the sun and light. For all growing succession-plants, maintain a kindly bottom and inside atmospheric heat, advancing it as the days lengthen, and light increases. Pot on plants in every stage that require it, never allowing their progress to be arrested for want of pot-room at any season of the year.

Vines.—Those started in December will now be breaking, and they should have air on all favourable opportunities; but the giving air to Vines during severe frosts in January and February requires much attention, especially if the weather is windy. A temperature of 60° during the night, and a rise to 75° in the day, when the Vines are in bloom, will keep all safe. Peel the rough bark off Vines lately pruned, and dress them with some strong composition, to keep mildew and insects in check. The following mixture is very efficient for the purpose, namely, 4 ounces of soft-soap and 6 ounces of sulphur to a gallon of water, and as much quicklime and clay as will bring the mixture to the consistency of thick paint. The water must be hot, so as to melt the soap; the other ingredients should be stirred in, and the mixture used when cold. When it is used for Peach or Nectarine trees, more water and clay must be added to it, as the young bark and flower-buds of these trees are liable to injury when it is used too strong. Home-made brushes of bast matting, tied on short pieces of stick, are quite good enough for painting the mixture on the trees, and, to make safe, every crevice must be filled up; and when the first coat is dried, a second application should be made on places missed in the first dressing. If the Vineries are heated by pipes with troughs in them, all the sulphur and lime of last year's dressing should be scraped or washed off, for fear of rusting the tender berries after the Vines are out of bloom. When the Vines are forced early, the outside border should be protected by some slightly fermenting materials, such as litter, or tree-leaves, and covered on the top with wooden shutters, tiles, tarpaulin, or glass sashes. Maintain a temperature of 65° at night in mild weather in houses where the fruit is set, ventilate moderately and principally in the earlier part of the day, and do not fire strongly in cold weather. Ventilate freely, but avoid cold currents in houses where the Grapes are in bloom. Thin the bunches when they have well set, leaving one on each lateral, and also the berries. Muscats require a higher temperature for setting them than Hamburgs do. Water the inside borders freely with tepid water, and mulch them with a thin layer of short manure. Stop the young shoots at two joints beyond the fruit, and rub off all superfluous shoots. Start succession houses, beginning with a night temperature of 45° or 50°, and syringe the rods daily until their bunches are formed; then desist, and maintain sufficient atmospheric moisture by spilling water on the floors and using evaporating troughs. In late houses, where the Grapes are uncut, use a little fire-heat and ventilation at the same time, to preserve a dry atmosphere at about 45° and prevent mouldiness, which is very prevalent in dull and damp winters. Examine the hanging bunches weekly, and remove from them every mouldy berry, otherwise the disease will soon spread extensively. Prune and dress late Vines as soon as the fruit is cut from them, and swing the rods to cause them to break evenly at starting time.

Peaches and Nectarines.—Be cautious in the application of fire-heat in orchard-houses other than where the trees are in bloom, especially in dull weather. Where the trees are in flower, however, the night temperature may be kept at 55°, and throughout the day it may be raised, with sun-heat, to 65° or 70°; but, at this stage, a free circulation of air amongst the plants is of the utmost importance. Assist the setting of the crop by dispersing the pollen with a camel-hair brush, a feather, or by shaking the trees a little. Cease

syringing the trees from the time they begin to expand till the fruit has set; but, at the same time, continue to maintain a little moisture in the atmosphere, by sprinkling the floors daily with water. Disbud sparingly at first, removing only evidently superfluous growths. In starting Peaches and Nectarines, begin with a low temperature, say 40° at night; syringe with tepid water, and keep up a moist atmosphere by sprinkling the floors with water. See, also, that the borders are thoroughly damp to the bottom; and, in order to accomplish this, they must be well soaked before forcing begins. Prune the trees in the later houses, paint them with a prepared mixture, tie them up to the trellises, and freely ventilate the houses night and day. If the borders require renovating, they should be attended to in that respect whilst the trees are in a dormant condition, removing most of the old surface-soil, and replacing it with good fresh turfy calcareous loam.

Figs.—See that the borders in which the trees are growing are thoroughly moistened to the bottom, and begin forcing with a temperature of 50° at night, syringing the trees freely with tepid water, and maintaining a moist atmosphere. As the trees begin to grow, gradually increase the temperature, and rigidly attend to stopping the shoots at the third or fourth joint by squeezing the points. For starting pot Figs, no heat is so genial as that contributed by fermenting manure, and for this purpose a bed of manure inside the pits, and in which the pots could be plunged so as to have a bottom-heat of 75° or 80°, is of material benefit to the plants. Attend to re-potting plants requiring shifting, and mulch over the surface of the soil in the pots with horse-droppings, or other short and rich manure.

Cherries.—When Cherries are forced early, the temperature must be kept low, never allowing it to rise above 50° at night, until the fruit is set. When they are in flower, the temperature may be raised a little, and a little fire-heat and ventilation given at the same time.

Strawberries.—For early forcing, plants with good pump crowns ought to be selected; and those potted in rather small pots, with good matted roots, always set their fruit the best. Introduce them, according to demand, space, and convenience for forcing them, into a pit, Peach-house, or Vinery, having at first a temperature of 45° to 50° at night, and keep them on shelves near the glass. If in a pit, a little bottom-heat, about 60°, tends to produce abundance of roots. When they are in bloom, and when the fruit is set, increase the temperature about 10°, and always keep them in airy positions, and well attended to as regards watering.

Melons.—Sow some early Melons in small pots plunged in the Cucumber-house; the Scarlet Gem and Egyptian Green-flesh are good flavoured and early sorts, and may be successfully grown in boxes in a Pine-stove. Prepare beds or pits for their reception, and plant them out before they get pot-bound. Should fermenting material be the heating agency, see that it has been well turned and sweetened, and that it is uniformly moist and not heating too violently.

Cucumbers.—At this time, Cucumber plants are frequently infested by thrips and red spider, so that repeated fumigations must be resorted to, as well as syringings, to keep them down. A sowing of both Cucumber and Melon seed ought now to be made for succession crops. Maintain a night temperature of about 70° in bearing pits, and rather than use too much fire-heat in cold nights, cover the glass, if practicable, with mats. Avoid over-cropping, and keep up a healthy supply of wood and leaves, which thin a little to prevent over-crowding. Ventilate in fine weather sufficiently to dry the leaves once a day, and water moderately with tepid water.

VEGETABLE FORCING.

Asparagus.—Continue to cut all shoots as they attain a length of about 6 or 8 inches, and, if the soil gets dry, gently sprinkle it with tepid water. If necessary, make up another bed for succession. These beds may be formed of dung or leaves above the ground, or treuches may be cast out about 2½ feet deep, and as wide as the frames, and filled with the fermenting materials, the frame being set on a level with the ground, and a lining of hot dung built all round it. A few inches deep of light soil should then be placed inside to plant the roots in. Cover over the roots sparingly with light mould, and keep all pretty close until the Asparagus begins to grow, when a little ventilation greatly improves the quality of the "grass." Those who prefer blanched Asparagus should darken the frames by a covering of mats or litter, but in all cases be particular that neither the bottom nor top-heat rises above 70°, whilst 5° or 10° less is much more conducive to the well-being of the plants.

Carrots.—Sow some of the early Horn on a slight hot-bed, together with Lettuces, and keep those previously sown dry and clean.

Celery.—Sow a small quantity of some good, solid-stalked, early

sort, in a pan of light rich earth, in a hot-bed or pit, for the earliest crop.

Chicory and Dandelion.—Introduce roots of these into the Mushroom-house, arches under Cucumber-beds, under boxes in Vineries, Pine-stoves, or, in fact, any place where they may be kept dark and in a temperature of about 60°.

Endive.—Lift some plants of these with good balls and plant them in frames, where, as soon as they have grown enough, cover them with pots or boxes to blanch. A few seeds may be sown in the event of very early Endive being required.

French Beans.—Make successional sowings of these in pots half filled with rich loamy soil, and grow them in front shelves in the forcing houses, or in pits built expressly for them. Earth them up before they begin to flower, and syringe them regularly to keep red spider in check. Newington Wonder, Syon House, Fulmer's Forcing, and Osborn's, are good sorts for forcing.

Lettuces.—Young plants of these in frames should have the sashes tilted at back and front, in favourable weather, if wet; but if dry, they should be removed entirely throughout the day, and replaced at night. Tie up a few old plants of the Brown Cos, as required.

Mint, Pennyroyal, and Tarragon.—Plant some roots of these in boxes or pots, using light soil, and introduce them into some heated house or pit. A portion of a hot-bed may be devoted to them.

Mushrooms.—Maintain an atmospheric temperature of 55° or 60°, and gently charge it with humidity; the beds may rise 5° above the heat of the house. Attend to the prevention of draughts in the houses, as they are productive of severe checks to the crop. Obtain some fresh horse-droppings, as free from strawy litter as possible, for the succession beds. It is a good plan to turn and prepare this material in winter on the floor of the Mushroom-house, a practice that produces, by gentle fermentation, just the natural, gentle ammonia-charged atmosphere, in which the Mushroom luxuriates.

Mustard and Cress.—Sow these, in boxes or patches, in moderate heat, weekly or fortnightly, as required.

Onions.—Sow some of the Tripoli variety in a slightly heated frame, for drawing whilst young, for salading, or for transplanting.

Potatoes.—Plant some of the Early Ashleaf sort in gently-heated frames, and sow some Radishes on the surface of the soil. Ventilate on favourable occasions, and do not over-water.

Rhubarb and Seakale.—Lift some roots every three weeks, and introduce them into the Mushroom-house, or other heated structure. Some crowns may also be covered, where they are growing, with pots, over which place some litter or leaves. To blanch it, the Seakale should always be kept dark.

Tomatoes.—Sow a few seeds of these, if early plants are required.

ARCHITECTS VERSUS LANDSCAPE GARDENERS.

I beg to thank Mr. Niven (see p. 25) for his timely and excellent reply to "Civis" (see p. 21), whose strictures on landscape gardeners show in what light they are held by architects. Admitting, as "Civis" has stated, that some landscape gardeners, like many architects, do trespass upon the domain of their professional rivals in creative art, is that any proof that either or both are wrong? I trow not. In the battle of life every man does the best he can for himself, and whether the percentage-paid architect, or the premium-paid landscape gardener, is the most worthy of the confidence of employers, is for the latter to decide. Taking the three heads, heating, ventilation, and sanitary arrangements, architects, if not ill-informed, are certainly very unfortunate in their practice; for, to meet with a place which is in any way perfect in these respects, is the exception rather than the rule. Go again to farm buildings. Gentlemen, whose whole lives have been devoted to rural occupations, must, as a rule, be better informed than those who have necessarily nothing but a theoretical knowledge in such matters. In fact, if the architect insists upon drawing a hard and fast line of demarcation, I see nothing for it but that he must confine himself to the mansion and its surroundings, and that the landscape gardener must be content with outdoor ornamentation. I grant that the architect should have a voice in the formation of terrace gardens, the landscape gardener watching that he does not convert them, as is customary with some, into stone-yards; but, beyond that the architect has no right to go. "Civis," however, would doubtless grasp at every part of an estate, and would, no doubt, feel himself quite competent to furnish designs for plant and fruit houses, though he might be ignorant of the names, habits, or peculiarities of the plants

intended to occupy them. Of course, architects, in their own estimation, are well up in such matters; but, judged from a practical point of view, hot-houses and architectural conservatories are found unsuitable for the purposes intended; and it is the same with farm homestead arrangements. Therefore, how practical men do wrong in accepting employment which they understand, I cannot imagine. Indeed, we gardeners, in matters of taste, can hold our own; and, though we do not wish to inaugurate an aggressive warfare, we are prepared to defend our position if assailed. Among the original architectural thinkers of the last half-century, the late J. C. Loudon cannot pass without remark; while the bold conception of Paxton, in the exhibition building of 1851, shook both architecture and engineering to its centre, and has been the land-mark of progress ever since. Go we then to Neutmore, Baron Rothschild's beautiful residence in Buckinghamshire; to the château of another of the Rothschilds, near Paris; to his bijou and exquisitely-finished villa in the garden at Chatsworth; to the model village at Edeusor; and to scores of improvements upon the Duke of Devonshire's property in all parts of the country, and we have proof that a man may have originality of conception in a line of life to which he was not brought up, and develop it so as to command the admiration of the world. This Sir Joseph Paxton did; and scores of others, with the same appliances, could do the same; but some men strive hard for a niche in the temple of fame, while others have greatness thrust upon them. Therefore, let not "Civis" and others imagine that they are unrivalled. The leading landscape and horticultural architects are in a position to hold their own, even against architects themselves; and there are not a few of the latter, who make it a rule, wherever they go, to open a feud with the landscape gardener, if not with the ordinary gardeur employed on the place. X. P. Y.

THE NEW SUBSTITUTE FOR COAL.

WE (*Galignani*) stated a short time ago that a Belgian peasant had made the extraordinary discovery that earth, coal, and soda, mixed together, would burn as well and better than any other combustible, and the fact has since been proved beyond a doubt. The way in which he found this out is curious:—He had been scraping the floor of his cellar with a shovel, in order to bring all the pieces of coal lying about into a heap, which, mixed as it was with earth and other impurities, he put into his stove. To his astonishment, he found that this accidental compound burnt better instead of worse than he expected, and emitted much greater heat. Being an intelligent man, he endeavoured to discover the cause, and discovered that a good deal of soda, probably the remnant of the last wash, lay about the floor of the cellar, and that some of it must have got into his heap. He then made a few experiments, and at length improved his compound sufficiently to render it practical. The publicity given in Belgium to this discovery caused trials to be made everywhere, and it has now been ascertained that three parts of earth and one of coal-dust, watered with a concentrated solution of soda, will burn well and emit great heat. Many Parisian papers talked of it, but only one—the *Moniteur*—went so far as to make the experiment at its printing office. A certain quantity of friable and slightly sandy earth was mixed with the quantum of coal-dust prescribed; the two ingredients were well incorporated with each other, and then made into a paste with the solution above mentioned. The fire-place of one of the boilers had been previously lighted with coal, and the fire was kept up with shovelful of the mixture. The latter, in a few seconds, was transferred into a dry brown crust, which soon afterwards became red-hot, and then burnt brightly, but without being very rapidly consumed. The fact of the combustion is, therefore, well ascertained; but before the system can be universally adopted, there are some important points to be considered, such as the calorific power of the mixture compared to that of pure coal, its price, and, above all, a remedy for the great drawback attaching to it—its fouling the fire-grate considerably.

Lightning Rods.—The *Journal of the Franklin Institute* has published a series of articles by Mr. John M. Mott on lightning. The writer comes to the following among other conclusions:—"Lightning rods, as usually erected, do not afford much protection." "The conducting power of lightning rods is proportional to their solid contents, and not to their surfaces." "Insulators are of no use in any case." "The rod must be attached directly to the building, the closer the better." "Sharp points for the upper terminations of rods are necessary; rods are of but little value without them."

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE LION'S TAIL.

(*LEONOTIS LEONURUS.*)

THIS is one of the representatives of the Labiate family, from the Cape of Good Hope, and one that is rarely met with in cultivation, much rarer, indeed, than its peculiar merits deserve. Its introduction into Britain dates back for considerably over a century, and in some of our old works it is alluded to as a subject of pretty general cultivation; in fact, it is one of our old friends that ought not to be lost sight of. What, then, are its special claims? and what are the reasons why it has passed into this state of neglect? As to claims: when I say that its flowers and flower-buds, including the smaller bracts, are of an intense orange scarlet, and that these, in a well-grown plant, rise tier above tier, interspersed here and there with a sprinkling of narrow leaves, to a height of 2 feet or more, it will be obvious that its colour alone is a strong recommendation in its favour, added to which, it possesses a nice branching habit of growth, the lower part of the plant being clothed with leaves of an exceedingly delicate tint of green, and, like many of the Labiate group, the whole plant yields an agreeable aromatic odour. Why, then, seeing that it has such claims, is it rarely met with in the gardens of this country? So rarely, indeed, that few of the present generation of gardeners are aware of its existence. In replying to this inquiry we must study its peculiar constitutional characteristics, and in these, if I mistake not, we will obtain a solution of the mystery. As has just been stated, the Lion's Tail is a Cape plant, or rather, is indigenous to a district some 150 miles north of the Cape, consequently, it is not sufficiently hardy to stand our climate during the winter, even supplemented by the protection of a cold frame; possibly this statement should be modified as to the extreme south of England, but of its growth in such localities I have had no experience. We must, I think, look upon this plant as essentially a tender greenhouse-loving plant during winter, in fact, one that should be favoured with a similar treatment to what the great majority of our tender bedding-plants require. As the beauty of the *Leonotis* chiefly rests in its brilliant flowers, rendered all the more beautiful by their abundant production, I must say a word or two on the circumstances most conducive to the attainment of this result. With our ordinary bedding-plants, cuttings struck in autumn and potted off in spring are eligible for flower-garden decoration the following summer, but to this rule the Lion's Tail forms quite an exception. Under such treatment the result would be an abundant growth, culminating late in autumn into a vigorous character, and exactly in proportion to its vigour, the more susceptible of injury from early autumnal frosts would it be, but not a single flower, nor even the sign of one, would make its appearance. How, then, is the all-important result to be attained? Merely by giving the plants

a preliminary growth for a twelve-month in 7 or 8-inch pots, under exactly similar treatment as regards liquid-manure and exposure as we give to our *Chrysanthemums*; then wintering them in the greenhouse in a comparatively dry and quiescent condition, exciting them to make a moderately free growth in the spring, gradually hardening them off, and ultimately planting them out in the middle of May. In this operation judgment is necessary, as, if the soil in which they are to be planted is of a heavy character, it will be better to plunge than to plant; but, if of a light sandy nature, plant out; but do not, under any circumstances, disturb the pot-bound ball of roots; leave the rest to a bright summer's sunshine, and I will warrant the result will far more than counterbalance the extra trouble in obtaining it. My first acquaintance with this plant was

made some twenty-five years ago at Kew, where an old plant, that had stood sponsor for a label (if I may use a somewhat left-handed expression) for a number of years, was consigned to my care, with a lot of other Cape and New Zealand plants, to utilise on a considerable extent of wall and wall-borders we had just then acquired; and the said old plant, after the somewhat rough surgical operation of cutting the potsherd portion of the ball off square with the spade, and planting it at the foot of the wall, was one of the most brilliant plants during the autumn, only rivalled by the now familiar *Tritoma Uvaria*, which then, and under similar circumstances, minus the surgical part just alluded to, for the first time obtained its true status in English gardens. The roots of the latter were amenable to some reasonable disentanglement, which resulted in a vigorous growth, and an equally vigorous floral display, whereas those of the former were so matted together as to defy separation, and, in my opinion, to this very fact we were indebted for the satisfactory result; hence, my advice as to the non-disturbance of the ball in the process of planting out. Why the term "Lion's Ear," as indicated by its generic title of *Leonotis*, or "Lion's Tail," as its specific title *Leonurus* would imply, has been given to this plant, was, I well remember at the somewhat remote time I speak of, a mystery to me, and, I must admit, it is so still. The genus is closely allied to *Phlomis*, to which it was originally referred by old botanists. Cuttings strike freely in spring, in a slight bottom-heat, by merely removing the young shoots from a growing plant, much more so than they do in the



The Lion's Tail.

autumn, and will be found to answer all purposes for the mode of culture I have already described. The subject of our notice is common in most Continental gardens, where its flower-producing properties are naturally developed, whereas, in our moist climate, we must have resort to such artificial means as experience and practice may dictate.

Botanic Gardens, Hull.

JAS. C. NIVEN.

[This very fine plant deserves to be more frequently grown in our gardens. In warm light soils, in the southern parts of the country, we have observed it thrive well, grown as Mr. Niven advises; and, in districts where it would not bloom out of doors, it is well worthy of a place as a cool greenhouse plant. About Paris, established plants placed out for the summer flower profusely. Wherever it can be grown well in the open air, it would form a valuable plant for association with the finer bedding and sub-tropical plants.]

NOTES OF THE WEEK.

— MESSRS. BARR & SUGDEN have received, from India, a large consignment of the very fine *Lilium Wallichianum*, which is the best of the longiflorum section, and is very rare in this country.

— THE famous collection of plants, long grown by our able correspondent, Mr. Baines, formerly at Bowden and now at Southgate, is to be sold by auction at Stevens's in April.

— Two or three species of *Ferula*, on account of their freshly-tinted and fine feathery foliage, are still interesting objects in the herbaceous grounds at Kew.

— MR. WILLIAM BULL has a fine golden-flowered *Odontoglossum*, in the way of *O. triumphans*, now in blossom. It bears great, branched, many-flowered spikes, fully a yard long, the blossoms being from 2 to 3 inches across, and very striking in appearance.

— WE have received from Mr. G. F. Wilson, F.R.S., a pamphlet, "The Royal Horticultural Society; as it is and as it might be." This is published by Mr. T. S. Gilbert, of Moorgate Street. We shall allude to it at greater length next week. We may, however, state at once that it embodies the views, as regards the future of the Society, for which Mr. Wilson has lately so ably contended.

— THE Count d'Esterno advocates the destruction of woodpeckers on the ground that they injure trees, by boring after insects, more than the insects themselves do. In this opinion he is opposed by Dr. Turrel. M. Carrière seems perplexed by the disagreement of such high authorities, and asks the question whether it has been plainly proved that woodpeckers never bore into trees which contain no insects. Our own conviction is that the instinct of the woodpecker in its search for food does not mislead it into the useless labour of boring into sound trees.

— THE Count de Lambertye has recently published an interesting brochure of 128 pages, the subject of which is the history of the Strawberry from the sixteenth century down to the present time. The Count has evidently entered into his work *con amore*, and has aptly divided his pages into three sections, the first containing a general account of the genus, with descriptions of some of the most important varieties. The second part is occupied with historical notes on the different modes of culture which have been employed from the year 1570 down to 1873; while the concluding pages are devoted to an exhaustive account of the most approved methods of Strawberry culture, as at present practised in France. The work is published, at a franc, by A. Goin, 62, Rue des Ecoles, Paris.

— A GENERAL meeting of the Linnean Society of London was held on Thursday evening, Jan. 15, in the new Government rooms, at Burlington House, when certain very important alterations in the bye-laws, recently made by a majority of the council of the society were discussed. These consisted of a repeal of those bye-laws which prevent fellows from holding any paid offices in the society, and provide for the election of the paid librarian (who, of course, is not a fellow) by the society at large, and of a proposal to place all appointments to salaried posts entirely in the hands of the council. Unfortunately, no special notice of these proposed changes had been sent to the fellows, or, as they are distasteful to many, there would have been a larger gathering than the sixty-six who voted upon the question. A majority of two-thirds is required to pass alterations in the bye-laws, and this number exactly, forty-four, voted for the council's alterations. The result is, that by the barest possible majority changes have been made in the constitution of the society which, in the opinion of many of its fellows, must very seriously lower its hitherto high character, and will place undue and excessive power in the hands of the council.

— AT a meeting of the Royal Horticultural Society, which took place on Wednesday last, two dozen beautiful potsfuls of Lily of the Valley were shown by Messrs Standish & Co., of Ascot. There were also a few red and white-flowered Chinese Primulas of a good "strain" from Messrs. Dobson & Son, of Isleworth; a *Cineraria*, with large showy violet-purple flowers, from G. F. Wilson, Esq.; *Odontoglossum angustatum* from Mr. W. Denning; and a specimen of *Cypripedium Roezlii*, to which a first-class certificate was awarded, from Messrs. Veitch & Sons; from Mr. R. Dean, Ealing, came some plants of White Swan bedding Viola, and also, a few Primroses, beautifully bloomed, including Rosy Morn, Yellow Queen, and Violet Gem; Mr. Wm. Paul, Waltham Cross, exhibited some very fine cut flowers of Camellias; and Mr. Bennet, of Hatfield, furnished some very fine Early Prolific Tomatoes, ripe Gnavaas, and the edible fruits of the *Tacsonia Van Volxemii*; Messrs. Masters & Kinmont, Canterbury, sent a dish of pretty little seedling Apples, named Duchess of Edinburgh, a cross between Court of Wick and King of the Pippins; and from Mr. Wm. Hooley, Toddington, Beds., came another handsome seedling Apple; Mr. R. Dean, exhibited a dish of Brownell's Vermont Beauty Potatoes, a red-coloured, large, flatfish variety, and Extra Early Ver-

mont, a white sort, said to be a fortnight earlier than the American Rose.

— HARDY Cyclamens are finely in flower in the neighbourhood of London. In Mr. Wilson's garden, at Weybridge Heath, C. Commernum, and C. Atkinsii are now beautifully in bloom.

— A MEETING was held at Bath the other day, under the presidency of the Mayor, to consider the project of a winter garden for that city. All present were unanimous in favour of its erection according to plans then shown, and advised that subscriptions should be solicited for that purpose.

— MESSRS. HOOPER, of the Central Row, Covent Garden, who pay much attention to dried Grasses and everlasting flowers, have sent us a specimen of some ornamental Grasses prepared in a new way. Instead of being dyed, as now so common, they are slightly bleached, as described by M. Wermig in our columns (see p. 419, Vol. IV.). This gives them a charmingly silvery appearance. They are the best things we have seen in the way of ornamental Grasses in the market.

— WE observe a discussion in the *Irish Farmers' Gazette* on the respective merits of the eastern and western Planes as trees for town planting. We regret to learn that the former species has been selected for planting in Sackville Street. The Planes in the London parks and squares, as well as those planted along the Thames Embankment, are all varieties of the western Plane (*Platanus occidentalis*). This we have on the authority of Mr. Gordon, who certainly knows more about the trees in question than the now old authorities, who once condemned the western Plane for London planting.

— THE second part of the "Flora of British India," which is being prepared at Kew, under the supervision of Dr. Hooker, is, we understand, ready for publication. This important undertaking is likely to occupy the attention of the botanists engaged upon it for some years to come. It involves the critical examination and description of the whole of the flowering plants of our Indian possessions, numbering some thirteen to fourteen thousand distinct species. The new instalment continues the Polygalaceæ, and proceeds as far as the Geraniaceæ.

— THAT doctors differ is well illustrated by a little discussion now going on in *Nature* between two gentleman well-known in the gardening and botanical world. Mr. Berkeley says—"In *Nature*, vol. ix., p. 161, it is stated by Mr. Worthington G. Smith that the bodies referred to by Dr. Montague to *Artotrogus* are possibly no other than *Volutella ciliata*. Nothing can be more common on decaying Potatoes than *V. ciliata*, but I can state most positively that Montague's Fungus, whatever its nature may really be, had nothing to do with *V. ciliata*. A reference to the figures in the *Journal of the Horticultural Society* (vol. i., tab. 4, figs. 27, 28, 29), and the characters of *Artotrogus*, apart from the specimens submitted to myself, and the occurrence within the cellular tissue, ought to be quite sufficient."

— MR. DOUBLEDAY, of Epping, reminds us that in the list of mild winters given last week (see p. 50), mention is made of the winter of 1846-47, which was a very severe one. December, he says, was very cold. On the 14th, the thermometer, 4 feet above the ground, indicated 15° of frost at 8 o'clock a.m., on the 15th, 17°; on the 18th and 31st, 19°; and there were only five or six days on which the temperature was above the freezing point at 8 o'clock a.m. January and February were also very cold. On the 10th of February the temperature on the ground was 7½°. The date, he suspects, is a misprint for 1845-46, which was a very mild winter. In January, 1846, the thermometer was only twice below the freezing point at 8 o'clock a.m., and four times in February. On the 24th, the maximum in the shade was 58°. Mr. Doubleday adds that he gathered some ripe British Queen Strawberries from the open ground the last week in May, 1846.

— MR. EASTLAKE has (says the *Pall Mall Gazette*) very opportunely called attention to the fact that the chapel of the old town-house of the Bishops of Ely—the house in Holborn, the Strawberries in whose gardens Shakespeare has made famous—is about to be sold by auction. For some time past it has been used as a Welsh church; why the Britons have to give up their right in it is not explained. Though the chapel alone of the ancient house is left, it is, like Northumberland House, also soon to vanish—a trace of a past state of things. It is a trace of the days when the suburb between the cities of London and Westminster was largely filled up by the houses and gardens of earls, bishops, and other great men, who, then as now, needed a dwelling-place when they came to attend Courts and Parliaments. The Bishop of Ely's house in Holborn, with its gardens and fields, in the days of its grandeur, covered twenty acres. The estate was first given to the see by William de Luda, bishop from 1290 to 1297. John Hotham, bishop from 1316 to 1336, famous for rebuilding the presbytery of his cathedral after the fall of the great tower, gave his convent of Ely a "fair Vineyard in Holborn, a suburb of London."

THE FRUIT GARDEN.

GRAPE-GROWING AT MESSRS. LANES'.

OUT of the Berkhempsstead Nurseries have come, of late years, some of the best collections of Grapes exhibited at our metropolitan and provincial shows. Through cultural-skill, good and substantial soil, and abundance of water, the Vines under Messrs. Lanes' care grow strongly and bear freely, producing both heavy crops and large bunches. Their principal Vinery is a spacious span-roofed structure, 135 feet long and 25 feet wide, glazed with large panes, and heated with two rows of 4-inch hot-water pipes, that surround the house inside. It is built on the side of a gentle slope; the Vines are planted on the sunny side only, and are trained under the span, down to the upright sashes on the other side. It is now twenty years since this structure was erected in the form of a span-roofed glazed shed, open at the sides, and supported on wooden posts, for the purpose of protecting fruit-trees in pots, choice Conifers, Roses, and a few other plants, in winter. At that time there was no intention of converting it into a Vinery; it was, however, thought expedient to plant Vines against the posts and to train them inside, so that they might afford shade in summer, and, perhaps, a few Grapes for Messrs. Lanes' table. No border, in the ordinary sense of the term, was made, but, at planting-time, a little mound of prepared soil, consisting of chopped turfy loam from the common and decayed manure, was got together for each Vine, and, after a year or two, the interval between the mounds was filled with a similarly prepared compost. The Vines, after being planted, made such excellent progress that it was thought the house would be improved if the upright sides were glazed, and if it was made entirely a Vinery; accordingly it was enclosed, and the result is one of the most fruitful Vineries in the country. The Vines were originally planted about 3 feet apart, but it was subsequently found necessary to thin out a few of them in order to give those left more room; therefore, they now stand at distances of from 3 to 6 feet apart. They are all pruned on the close-spurred principle, each Vine being confined to a single rod; yet, notwithstanding the severe pruning to which they are annually subjected, they are in the best of health and vigour, and have formed trunks from $2\frac{1}{2}$ to $3\frac{1}{2}$ inches in diameter. A great many varieties are grown in this house, and amongst them the following are the most noteworthy, viz.:—Black Hamburgh, Foster's Seedling, and Royal Ascot; these three ripening earliest, the last being a very early kind, and one which has small bunches of beautifully coloured and well-bloomed berries. The Buckland Sweetwater and Muscat Hamburgh succeed these, the remaining kinds being West's St. Peter's, Trebbiano, Madresfield Court, Pope's Hamburgh, Frankenthal, Mill Hill Hamburgh (which produces berries of very large size, the surface of which has the appearance of being hammered), Lady Downes, Barbarossa (a gross grower and great

bearer, producing very large bunches), Mrs. Pince, Golden Champion, Alicante, Gros Colman, and several others. This Vinery is also used as a trial-place for all new sorts of Grape Vines, which are inarched on the side-shoots that rise from near the root. Should the variety prove good, it is retained; but, if it turns out inferior, after a fair trial, it is removed and discarded. Here the Muscat Hamburgh is held in high estimation. In one instance it is grown on its own roots; and, in other cases, it has been grafted on the Trentham Black and Morocco; but none of these stocks seems to have any influence over the scion—all grow equally well, and set and ripen heavy crops of fruit, each cluster weighing from 1 to 4 lb. Neither the Golden Champion nor the Madresfield Court Grapes do well at Berkhempsstead, the berries of the former invariably spotting, and those of the latter cracking and becoming mouldy before they are ripe. Messrs. Lane, however, consider these two sorts to be excellent under special cultivation and care. In this Vinery Peach-trees are wintered; Figs and Vines in pots are plunged in sawdust. Another span-roofed house of the same description, and running up and down hill like the last, but situated farther up the slope, is also devoted to Grape culture, and is divided into three compartments, each 45 feet long. The compartment farthest up the hill is filled with late-fruited Vines, such as Alicante, Lady Downes, Mrs. Pince, Trebbiano, and two plants of Black Hamburgh. The second division contains Hamburghs only, and the third includes the Muscat of Alexandria and Bowood Muscat; it is from this latter division that the fine bunch of Muscat of Alexandria Grapes, of which we give an illustration, was cut. The divisions are in the form of terraces, one a little higher than the other, and are ventilated on a simple and effective principle. The whole of the side-sashes of each compartment are opened on the lever-and-rod system at the same time; but, in the event of all not being required open at the same time, those wanted to be kept shut may be unfastened from the rod by merely unhooking the little chain that binds them to it. Top ventilation is furnished



Fine Bunch of Muscat of Alexandria Grapes.

on the same principle, but, in this case, the ventilators are only in every alternate sash, and a rope is used to open and shut them instead of an iron rod. The rain-water from the roof is collected in cement-lined sunk tanks in the several compartments, but, when rain-water fails, ordinary water is pumped into them. Water here is plentiful, there being many hill-side springs, one of which runs continually summer and winter, close to the Vineries, and it never varies in temperature beyond a degree or so, the usual temperature being 51° or 52° . By digging into the ground to a depth of about 2 or 3 feet, in any part of the home nursery, water is sure to be reached, and to this is attributed, to some extent, the excellence of the Berkhempsstead Grapes. At the lower ends of both the ranges of Vineries to which we have just adverted, the Vines produce by far the finest Grapes and the heaviest bunches, a circumstance attributable to the additional

light afforded by the gable ends of the house, and to the enlarged supply of water that must necessarily percolate down hill to that portion of the border. As regards the formation of Vine borders, Messrs. Lane consider that sometimes needless attention is paid to that matter. They are of opinion, however, that all borders should be on a well-drained sub-stratum, and that they should be composed at first of some substantial open soil for a space of 8 or 10 feet wide. The Vine roots in their large Vinery extend far out into the nursery; but, in the last-erected range, the Vines in which are only six years old, a 4-foot wide inside-border has been made, and to this, and a narrow outside border, their roots are confined, for the convenience of early forcing. When they require more nourishment, it will be given in the shape of additions to the outside border. The soil used both for borders and also for Vines in pots, is the surface turves off Berkhemstead Common, which consist of a strong, very fibrous, yellow loam, not too tenacious, chopped roughly and mixed with some well-decayed manure. That Vines may be successfully grown for a long time in a comparatively small bulk of soil, is exemplified here in a little span-roofed house, which is now being entirely cleared out, to make room for growing pot Vines, for which there is always a great demand. Along both sides of this house, next the walls, were built brick pits, 3 feet deep and 20 inches wide, somewhat similar to what we occasionally see Melons grown in. A foot deep, beyond the measurement of the box-like pits just spoken of, had been filled with brickbats, over which the rest of the space was filled with the already mentioned soil. A Vine was then planted to every 4-foot-wide sash ten years ago, and ever since has borne good crops of well-coloured fruit. Pot Vines were formerly grown in this house, but as the swelling and ripening fruit required a drier atmosphere than that for young Vines, the latter had to be removed. Of pot Vines there are over 2,000 saleable plants grown here every season, besides a large number for permanent transplantation, as well as some fruiting specimen plants. The latter are mostly all grown in No. 1 pots, which is the largest size; they consist of Foster's Seedling, Black Hambrugh, and Alicante, which are considered to be the best sorts for pot culture. The Madresfield Court Grape, too, was tried here last year, as a pot Vine, and was found to succeed. In the growth of pot Vines the main point of success consists in the early and thorough ripening of the wood. When the specimens here are started into growth, the rods are trained along the rafters of the houses like those of permanent Vines, and treated accordingly. When the Grapes are ripe, the rods are trained around a trellis fixed to the pots, or some strong stakes are inserted in the soil in the pots. In this way each Vine will produce from two to four dozen bunches of fruit, averaging nearly $\frac{3}{4}$ lb.

The Nurseries.

These nurseries, which consist of upwards of a hundred acres, have long been famous for Grapes, Roses, Azaleas, Rhododendrons, Ivies, Conifers, fruit trees, and other plants equally interesting. In that portion of them which lies high, on the breezy Berkhemstead Common, Cypressess and other Conifers grow with wonderful luxuriance, and even such peat-loving plants as Rhododendrons bloom beautifully here, and succeed satisfactorily where not a particle of peat exists. This is greatly in their favour, for when they are moved to sheltered places, where they can have a little peat, they take to their new situations at once, thus obviating all risk of failure. The Rhododendrons, of which some 5,000 to 10,000 are raised in these nurseries every year, are now as thickly set with flower-buds as they possibly can be, and the wood being hard and solid, even the finest hybrids winter safely. Laurels are grown here by the acre in the form of bushes and standards, but preference is given to the variety called *canadensis*, as it grows into a dense pyramidal form, finishes growing and ripens its wood early, whereas the common Bay, which it most resembles, continues to grow late in the season. Wellingtonias, too, are grown here in thousands, and pretty little plants they are, densely furnished with branches to the very ground, and averaging in height from a few inches to 8 feet; after they attain a height of 4 feet many of them become laden with cones. We noticed a large bed containing a great variety of

seedling variegated Yews, raised from one batch of seed, and embracing the habits of the English, Irish, and intervening types, the variegation being mostly golden. Amongst Pinuses *P. Nordmanniana* is the most remarkable; indeed, we never remember having seen so many of these fine trees growing together at one place; there are literally thousands of them, varying from a foot to 11 feet in height. *Cupressus Lawsoniana* may also be counted by thousands, of all sizes, the largest being symmetrical well-furnished specimens. Of *Thujaopsis dolabrata* we observed a large plantation raised from seeds saved in these nurseries, but, perhaps, the most attractive plant in the ground was *Cryptomeria elegans*, of which there is a large quarter containing young trees from 1 to over 4 feet in height. These beautiful little Conifers assume a bronzy hue in winter, but regain their fresh green appearance in spring, and, than these, few plants are better adapted for centres to flower beds. Amongst other Coniferous plants those of *Araucaria imbricata* were the most remarkable. Of these there are thousands, varying from young seedlings to plants 12 feet in height, all densely furnished with branches to the very ground. These consist chiefly of a strong dense-growing variety of this tree, many of which have borne and some are now bearing cones. Two of these *Araucarias*, each about 8 feet high, ripened seeds last year. These were saved, and sown in boxes of light soil, set in cold frames, and, notwithstanding their number being much reduced by mice—who are particularly fond of *Araucaria* seeds, 200 of them were left untouched, and these have produced as many healthy young plants. Ivies are largely grown here in pots, some as specimens, others in every stage between that and the cutting form. The specimens of them are trained on sharply attenuated pyramidal trellises, and are chiefly grown for purposes of exhibition, for which *Caenwoodiana*, *maculata*, *albo-lutescens*, *canariensis latifolia maculata*, *argentea rubra*, *gold-blotched*, *himalaica*, *argentea*, *rhomboides obovata*, *digitata*, and the Irish Ivy, are the best suited. For house decoration, nothing is more useful or ornamental than Ivies, especially in winter, and in order to meet the demand for them, several ranges of pits are filled with small plants of them in 60-sized pots; therefore, when a window-box is to be filled, or a suspended basket to be made up, a few of these young plants are turned out of their pots, planted as required, and their shoots, that formerly were stiffly tied to stakes, are unfastened and permitted to hang down in elegant festoons over the sides of the boxes. Frost scarcely hurts even the finest of them, and during the dullest winter months they are almost as bright as in summer. All strong-growing sorts, for covering walls, are kept in pots in the open ground, and one of the finest of all Ivies for that purpose is *Hedera Rægueriana* or the Irish Ivy (*H. hibernica*.)

CULTURE OF THE RASPBERRY.

The Raspberry delights in a deep, rich, moist soil; still it may be profitably grown in any good ordinary land, if deeply cultivated and well manured. Under good cultivation, the Raspberry is capable of yielding a better result than is generally attained. It is too often the practice to allow it to remain too long on one plot of ground; thus not only causing a deterioration in both the quantity and quality of the fruit, but also curtailing the space at command for the necessary rotation of other crops. I have never found it advisable to allow Raspberries to occupy the same ground longer than five or six years, and the new plantation should always be made one year before the old one is destroyed, in order to avoid any falling off in the supply. Raspberries are planted at various distances apart, but the most profitable plan to adopt, especially in inferior soils, is to plant in rows from 6 to 8 feet apart (I prefer the latter distance), and 1 foot apart in the rows; this gives both roots and branches more room for development, and the soil is not so soon exhausted as when the canes are bundled together in the old-fashioned way. The spaces between the rows can be cropped with low-growing vegetables—such as Turnips, Spinach, Cauliflowers, Lettuce, &c.—and in hot weather the Raspberry-caness furnish a grateful shade, beneficial to such crops, and in a measure prevent their holting prematurely. Whenever it is desirable to make a new plantation, let the ground be trenched at least

two feet deep, and at the same time well manured, burying the manure at least a foot deep, as the surface can easily be enriched by the necessary annual top-dressings. Raspberries may be planted any time up to February, but autumn planting is best. In planting, first mark out the rows at the required distance from each other with the line and spade; then begin at one end of the first row by opening a hole for the first plant, laying the soil taken out ready to finish off the second row coming back. Any handy spadesman will work backwards along the mark previously made, expeditiously planting the canes at equal distances in a straight line as he proceeds. I like this plan better than opening a trench with a straight face to plant against, as the roots can be placed in a more natural position; and, as the soil has only to be moved once, the work is more expeditiously performed. The roots should not be exposed to the drying influence of the atmosphere longer than is absolutely necessary, and care should be taken that the buds or eyes at the base of the canes are not injured, as upon their free and vigorous growth depends the future crop. After all the rows are planted, cut down the canes to within 6 inches of the ground, and lay a mulch of half-decayed manure, about 9 inches wide, on each side of the rows. There will be no fruit the first season, therefore no stakes nor any kind of training will be required; and, as I have before stated, the ground may be cropped with low-growing vegetables—always watching, however, that the growth of the young canes is not impeded in any way by any overhanging or rampant-growing crop. All weak canes should be thinned, or cut away, as the growth progresses during summer, and the following winter they should receive their final thinning to about 8 or 9 inches apart. At this time some provision must be made for supporting and training, to prevent the fruit from receiving injury by winds. The following is the plan we adopt:—Stout stakes are procured, and are pointed round at the lower ends (not angular), and the ends afterwards charred in the fire to preserve them. They are then driven in at 10 feet intervals in a straight line along each row, and the tops sawed off at 4 feet from the ground; this will be high enough for most kinds of Raspberries; but if the canes are very strong they may be left 6 inches higher, as Raspberries usually bear best at the ends if the wood is well matured. Drive a nail in the top of each stake, and stretch a galvanised wire along the top, giving it a twist round each nail to tighten it, and secure it firmly at each end. Another wire may also be run in the same manner about 2 feet from the ground. When the canes are neatly tied to the wire with small twigs of the Golden Willow, the whole quarter will have a neat and dressy appearance. Raspberries should always have a good top-dressing of old hot-bed manure every autumn, but not to be dug in deeply close up to the roots; and in summer—in dry, hot weather—they should be mulched with Grass, litter, or something similar, as a precaution against the effects of drought. With proper means and space there is no difficulty in having a constant supply of Raspberries in succession from July till October, or, if the autumn is mild, till November; and this, too, may be accomplished without growing many kinds—one or two good old kinds, such as the red Antwerp and Barnet, Cox's Honey, or some other good yellow, and Rivers's large-fruited monthly for autumn bearing. If early in May, the young bearing shoots of a portion of the Antwerp or Barnet are cut off; a second growth will be produced that will bear a good late crop, and succeed those of the same kinds that have not been cut back, and produce fruit of better quality than the usual autumn-bearing kinds; and I need not say how desirable it is to have a supply of fresh Raspberries through the summer and autumn months. The autumn-bearing sorts should be cut close down every winter, and all the weakly growths well thinned out during spring and early summer; they will then bear well in September and October, and I have, in some seasons in Norfolk, gathered fruit partly through November. Raspberries are usually propagated by suckers or offsets; they may also be increased by pegging down some of the strong shoots in March, and, treating them as layers, all the buds will push up canes and strike root. Raspberries are easily forced; and, when early fruit is desired, four or five strong canes each may be planted into as many 11-inch pots as there is room for. The potting should be done early in autumn; or, better

still, grow them in pots for one season, plunged in the open air. Forcing should not begin too early—not before the first week in February. E. HOBDAV.

Apples for Northumberland.—The following list of first-class kitchen and dessert Apples may be of use to your correspondent "J. H.," Northumberland (see p. 61). They are what I have selected from an orchard planted here about ten years ago, the situation being very exposed, the soil strong loam, with a red clay sub-soil, but well drained. Kitchen Apples—Lord Suffield, September and October, great and sure bearer; Cox's Pomona, October to December, fine colour and good bearer; Cellini, October and November, large and handsome, good bearer; New Hawthornden, October to January, great bearer; Duchess of Oldenburgh (Russian), sets well in frosty springs, and not so liable to the American blight as others; Blenheim Orange, good for kitchen or dessert, great bearer; Tower of Glammis, valuable as a sauce Apple, great bearer, November to February; Northern Greening, November to April, excellent keeper; Norfolk Beaufin, December to April, good bearer; Rymer, December to April, good sauce Apple; Dumelow's Seedling, or Normanton Wonder, the best sauce Apple, keeps till April; Sturmer Pippin, keeps till June or July, great bearer. Dessert Apples—Irish Peach, the best, very early Apple, July to August; Kerzy Pippin, August to September, good bearer; Red Astrachan, July to August, good bearer; Margil, fine flavour, like Ribston Pippin, great bearer, September to October; Cox's Orange Pippin, fine flavour, October to November; King of the Pippins, great bearer, October to November; Golden Reinette, great bearer, October to November; Sykehouse Russet, good bearer, January to March; Lamb Abbey Pearmain, good keeper and bearer, January to March; Keddleston Pippin, fine flavour, January to March; Lord Burleigh, fine flavour, April to June; Sturmer Pippin, for keeping the latest, April to July.—WILLIAM TILLERY.

Wintering Vines in China.—In the north of China, on the approach of winter, the Vines are taken down from the trellis-work to which during summer and autumn they had been attached; long pits of from 2 to 3 feet in depth being dug, the stems and branches are first trimmed, then laid longitudinally in them, and the whole covered up with soil. Thus they remain protected from the severe cold of winter until the following spring, when they are once again brought to light, are ranged upon the framework newly erected for them, and otherwise prepared for bearing their luscious fruit, several varieties of which are cultivated for the table, but as yet none for the purpose of yielding wine. During the latter part of 1860 and the greater part of 1861, it was my daily habit to take my walks and rides in the vicinity of Tientsin, in order to observe the botany and natural history of the locality; in the latter half of March I have seen the process of disinterring the Vines, and arranging them for bearing, as the temperature of spring increased; and it did so very rapidly; tendrils, that but a few days before appeared like so many dry and sapless twigs, sent forth their buds; a few days more the buds had developed into leaves, and, ere a month was past, the rich green foliage was such as to yield refreshing shade from the heat, which, by the latter end of spring, had become unpleasant during the three hours after mid-day.—G. A. GORDON.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Pear-trees in Bloom.—Owing to the mildness of the season, I have Pear-trees nearly in full bloom, and, in order to try an experiment, I have potted and placed them in the orchard-house with my Peaches and Nectarines. Common China Roses are also thickly in blossom in this neighbourhood.—F. COVIL.

Blackberries.—Can any of your readers tell me how it is that the Blackberry is not among our cultivated fruits? If it were improveable in anything like the same proportion as the wild Raspberry or Gooseberry, to say nothing of the Strawberry, it would well repay the care bestowed on it, and the idea is so obvious that one would suppose there must be some insuperable difficulty in the way of carrying it out. Where can I get any information on the subject?—B. W. S.

New Early Plum.—The current number of the *Revue Horticole* contains a coloured plate and a description of a new early Plum, the Normande précoce, which ripens from the middle to the end of July. The tree is said to be of very vigorous growth, with long and thick branches. The fruit, which is usually produced in twos and threes, is of a light purple colour, large size, and first-rate quality. This variety is a seedling from Reinette précoce, raised about ten years since, and fruiting for the first time in 1871.

Apples Kept Two Years.—At an entertainment given to the members of the Massachusetts Board of Agriculture, at the house of Captain E. T. Miles, during the late meeting at Fitchburg, among other rare and choice fruits were several baskets of Roxbury Russets, of the crop of 1872, in a remarkable state of preservation, being sound and quite plump, and retaining a fair proportion of their original flavour. Captain Miles's foreman informed the editor of *The N. E. Farmer* that he considered it no wonderful feat to keep Apples in good condition two years. He keeps them in barrels in a cold cellar, has the barrels as nearly air-tight as possible, heads them up after they are entirely past all sweating stages, and does not look them over till wanted for use.

GARDEN DESTROYERS.

THRIPS.

These may be classed with the worst insects with which we have to contend, especially in the indoor department. They do not increase so fast as the aphides, yet in some cases, as when they attack Vines, they are more difficult to destroy. The black thrips are most destructive to Azaleas, Vines, and Ferns under glass, and to such things as Dahlias, Phloxes, and Verbenas out of doors. In some localities they attack late Peas in such numbers as to almost destroy the crops. The means required for their destruction vary with the different plants, and the conditions and situations in which the plants exist. Azaleas are more liable to their ravages than any other plants, and, unless means are taken to destroy them as soon as they make their appearance, they do irreparable mischief by destroying the vitality of the leaves, causing them to fall off prematurely, and correspondingly weakening the root power. They require a higher temperature than aphides to bring them into life; but, in the stove, the eggs hatch in about three weeks. Except in houses that are kept warm through the winter, the female deposits and seals over her last eggs late in the autumn, and dies, unable to withstand the cold. The small black varnish-like spots, most generally found on the backs of the leaves (and which are often mistaken for the excrement of the insects), are the sealed-up eggs, ready to come into life as soon as the plants are subjected to artificial heat, or naturally by the increase of solar heat in the spring. If this last batch of eggs is thoroughly destroyed in the autumn, the plants stand a reasonable chance of escaping their attacks the following summer. Fumigation, no matter how strong the application, is of no use for the destruction of the eggs; consequently, it becomes necessary to employ other means. The best method for small plants is dipping them in moderately strong tobacco-water, to which has been added 2 oz. to the gallon of Gishurst, which softens the tobacco-water, and counteracts the injurious effects that the oil which it sometimes contains has upon the leaves of plants. For large plants that cannot be dipped, it is necessary to lay them down on their sides and syringe them all over, turning the plants during the operation, so as to thoroughly wet every leaf on both its upper and under surface. Not a single leaf should be missed, or the chances are that the dressing will not be effectual. Allow the mixture to dry on, and it will destroy the vitality of the eggs effectually. In the operation of washing it is necessary to use a trough, over which to lay the plants whilst being syringed, otherwise serious waste will occur. Every garden where plants are grown ought to be provided with a trough of this description; it should be made of strong galvanised iron, 6 feet square and 10 inches deep, strengthened in the rim and across the bottom with stout iron wire. After syringing, allow the plants to lie on their sides until the liquid is quite dry upon them, as it is not desirable that it should run down in any considerable quantity amongst the roots. Plants that have been much affected with the insect should be washed in this manner twice, at an interval of a fortnight, in the autumn; and, if it is thoroughly well done, very few will be attacked with the insects the following summer, unless some affected plant is introduced amongst them. During the growing season, the plants should be frequently examined, and, as soon as any of the thrips are discovered, they should be at once washed with the mixture, not allowing them time to spread. Thrips may be destroyed by tobacco-smoke, but I do not approve of fumigating Azaleas, as I never saw a sufficiently strong application of the smoke to kill the insects without injuring the leaves, causing them to fall off prematurely; consequently it is much safer to destroy them by the application of tobacco-water. In the stove, Ixoras, Dipladenias, Francisceas, Crotons, with numbers of other plants, are subject to their attacks. I find the best remedy is to wash the affected plants with "Fowler's Insecticide," used 4oz. to the gallon, dipping and syringing the plants in a similar way to that described for the Azaleas. Where these insects get amongst Vines, they do serious mischief. After the crop is cut, the living insects can be killed by repeated smokings; not so their eggs, which are deposited thickly on the young wood ready to come to life when there is sufficient heat to hatch them. The usual winter

dressing of sulphur, clay, and soft-soap, thoroughly applied, is sufficient to destroy them; but if they attack the Vines early in the season, or before the crop is cut, fumigation will not answer, for the Grapes will taste of the smoke to an extent that will spoil them. Sulphur mixed with clay and a little fresh lime, applied to the pipes in the same way as for red spider, will kill the mature insects, and the application must be repeated three times at intervals of eight-teen or twenty days, so as to kill the young brood as they are hatched, before they have had time to breed. When they make their appearance upon Cucumbers or Melons grown in houses or moderately large pits, the best plan is to fumigate repeatedly, but not too severely, or the plants will be so far injured as to make them useless; and, even in houses of this description, if they get established upon the plants in winter or early spring, the plants are rarely able to withstand sufficient smoke to kill the insects. Careful syringing with tobacco-water, using a very fine Rose, is the best and safest remedy; but, for these plants, there must be no Gishurst added to the tobacco-water, or it will kill all the points of the young shoots. When they make their appearance on these plants, in small pits or garden frames, they may be destroyed if taken in time by sponging the under-side of the leaves with tobacco-water. Dahlias, Phloxes, &c., are very subject to them in some localities; nothing here can be done but frequent use of syringe or garden-engine, as they cannot bear repeated immersion in water. In the greenhouse, Fuchsias, Cytisus, Statice, Hydrangeas, Camellias, Vallotas, Cyclamens, and Cinerarias, are a few of the plants which they attack; here fumigation, repeated until they are destroyed, is the best remedy. In some localities, generally in dry situations, they are very destructive out-of-doors. About July, in a dry season, they generally make their appearance upon Peas, scores of the insects getting into every flower as soon as it is open, and causing a malformation of the young pods, so that they frequently do not contain more than one or two Peas. A liberal use of the garden-engine two or three times a week will keep them in check, so as to prevent their doing serious harm.

The small yellow thrips is a more difficult insect to deal with than the black one. The plants they attack are somewhat different, and not so numerous. Fumigation of this insect is almost useless, from its habit of establishing itself down in the bottom of the young leaves as they unfold. Here there appears to be sufficient stagnant air to supply their breathing until the fumes escape from the house without injuring them in the least. In the stove, Allamandas, Crotons, Francisceas, and winter Cucumbers, suffer much from their attacks; for the latter, careful and repeated use of clean tepid water, applied with a fine-rose syringe all over the plants, but more especially the under surface of the leaves, is the best remedy. Allamandas, Crotons, or any plants of similar description should be regularly well syringed with clean water, and an occasional washing with a weak solution of Fowler's Insecticide at 2 oz. or 3 oz. to the gallon. But it is to Orchids that this insect does the most mischief. Amongst East Indian species, such as *Phalenopsis*, *Saccolabiums*, *Aërides*, and *Vandas* (getting down into the heart of the plants, disfiguring the young unfolding leaves, and, if left unchecked, entirely destroying them), *Cattleyas*, *Dendrobiums*, *Oncidiums*, *Odontoglossums*—in fact, on almost any species of Orchid—they appear to be at home. Fumigation here would be of little avail, even if all Orchids would bear it. All insecticides with which I am acquainted do harm to the plants. I have seen soft fleshy-leaved plants like *Phalenopsis* killed outright by the use of Gishurst and similar compounds; consequently, they should never be used. I have seen tobacco or ordinary snuff blown into the crown of the plants; this partially destroys the thrips, but it is objectionable; if water gets along with it into the hearts of the plants it frequently rots them. By the continued use of a very small bit of sponge tied on the point of a stick, so that it can be got down into the young unfolding leaves, or a small camel's-hair brush just dampened with clean water, they may be kept under; but it is a slow process, and, unless where there are few plants, it is scarcely possible by this means to completely eradicate them. Continued application of clean tepid water, syringed over-head every other day during the growing season will soon completely destroy them. Care must be taken that

the water gets right into the crown of the plants, otherwise it will not be effectual. Some growers object to this syringing overhead, alleging that it frequently rots the young growth. Such will be the case where Orchids are grown on the coddling system, with too much heat, too much atmospheric moisture, too much shade, too far from the glass, insufficient air, not enough rest in the winter; and these are the conditions under which the greatest number of Orchids in the country exist, entailing four-fifths of that fatal disease, the spot, and rendering these naturally strong-constituted plants unable to withstand that necessary, as well as most natural, way of applying water overhead. Winter Cucumbers are frequently attacked by these insects; here they are more difficult to deal with, as at this season the plants do not well bear the amount of syringing overhead required to keep the insects down. A syringe with a very fine rose should be used, so as to wet the whole surface of the plants with as small a quantity of water as possible. They are sometimes troublesome on Peaches and Nectarines under glass, as well as on open walls; this generally happens where an insufficiency of water has been used overhead. Here they do the most mischief in the last stages of ripening, congregating by hundreds upon the ripe fruit, and much damaging its appearance. Nothing can be done here except to use the syringe or garden-engine, and too much water overhead at this time injures the flavour of the fruit. The best practice is prevention by a liberal use of the syringe or engine all through the early stages of growth. This insect is a continual source of annoyance through the summer to the Auricula-grower, seriously injuring the young leaves as they unfold, and, if left undisturbed, will quickly destroy the plants. I once had charge of a collection of these plants, and soon found that the time required to catch the insects singly by the old method of employing a flat-pointed stick, wetting the point so as to cause them to adhere to it, and then crushing them by hand, was more than could be spared; so I tried fumigation, and found that the plants would stand it, applied sufficiently strong to kill the insects, matting the frames well up to retain the smoke.



Ricinus sanguineus.

T. BAINES.

NOTES AND QUESTIONS ON GARDEN DESTROYERS.

Destroying Snails.—Snails may be enticed to harbour in and feed on bran, if placed in handfuls where they are numerous. Every morning the places should be examined and the snails destroyed. Quick-lime, if dusted on the rows of early Peas, and other early vegetables, in spring, when the dew is on them, is a certain cure for snails, if persevered in.—W.

Wire-worms.—These are found in the greatest quantities in fresh new loam, just brought from the fields, and such soil, when used for valuable plants, should be carefully examined, and the wire-worms crushed; their brownish-red bodies are easily seen. Slices of Potatoes or Lettuce stems will likewise entice them where they are numerous. The slices should be placed under ground, and then frequently examined. This year I saved a bed of seedling Gladioluses that were planted in some new loam, which I found afterwards swarmed with wire-worms, by placing slices of Potatoes and Lettuce stalks in the ground, after I found that some of the plants were flagging. By this means I saved the rest from being attacked so much afterwards.—W. TILLERY.

THE FLOWER GARDEN.

CASTOR-OIL PLANTS.

THESE very ornamental foliage-plants are said by M. Mueller (who has studied the genus very attentively) to belong to a single species, *Ricinus communis*, of which he considers all the kinds in cultivation to be mere varieties. In his monograph on the Euphorbiaceæ, M. Mueller states that, up to the year 1866, he had established sixteen leading varieties and twenty sub-varieties of *Ricinus*. Like the Cannas, these plants manifest a remarkable tendency to natural hybridisation, and M. André states that, in raising them from seed, so many varieties are produced that in two generations it is difficult to find a seedling resembling the original type.

The following are descriptions of the type and twenty of the principal varieties grown by M. André:—

RICINUS COMMUNIS.—A native of the East Indies, but growing freely in the open air in this country in the summer months. Planted out in some of the London parks, it attains a height of nearly 12 feet, and produces leaves nearly 3 feet across. The stem is jointed, of a purplish-red colour, covered with a glaucous bloom. The leaves are palmate, deeply divided into five, seven, or nine oval-lance-shaped segments, which are unequally toothed at the margin. The flowers are borne in spikes, but are insignificant in appearance, as the corolla is wanting. The fruit is a tolerably large three-celled capsule, covered on the outside with prickles, like the fruit of the Horse Chestnut. Each cell contains one seed about the size and shape of a French Bean. From these seeds the castor-oil of commerce is extracted; the seeds being first boiled, and afterwards submitted to pressure in a hydraulic press. This plant is largely grown in Algeria, where it often attains a height of from 22 to 26 feet.

Varieties.

1. **R. PURPUREUS MONSTROSUS.**—Grows about 10½ feet high. Stem, simple, as thick as a man's arm, of a deep reddish-brown colour suffused with rose, as are also the long and stout leaf-stalks; leaves, large, deeply lobed, of a deep green colour, with bright red nerves or veins; flower-spikes, very large, pyramidal in shape; flower-stalks, red; capsules, large, deep green, with reddish prickles. A magnificent plant.
2. **R. AFRICANUS ALBIDUS.**—Grows about 8 feet high; moderately vigorous. Entire plant of a pale yellowish glaucous green colour. Stem and leaf-stalks of a hoary yellowish colour, tinged with very deep green; leaves, small, of a lively green colour, with yellow nerves or veins; flower-spikes, small, hoary or frosted green; capsules of medium size, with pale yellow prickles.
3. **R. BORBONIENSIS RUBICOLAUS.**—A very strong-growing variety, about 8 feet high. Stem, violet-green at the base, hoary purplish-violet at the top; leaves, large, flat, not much divided, deep green, centre starred with rose-colour; nerves or

veins, rose-colour; leaf-stalks, long and slender; flower-spikes, of medium size, on rose-coloured stalks, marbled with green. Capsules, large, of a deep green colour, with a bluish iridescence.

4. *R. ELEGANTISSIMUS*.—Grows about $5\frac{1}{2}$ feet high. Stem, slender, with long internodes or joints, of a reddish-purple colour; leaf-stalks of the same colour, long, slender, erect; leaves, deeply cut, of a lively green colour, with bright rosy veins or nerves. Capsules of a uniform ashy-green tinge.

5. *R. BORBONIENSIS*.—A variety with very few branches, growing nearly 10 feet high; stem, very stout; leaf-stalks, long, stout, much swollen at the base, streaked (as is also the stem) with fine red and green longitudinal lines; both covered thickly with a bluish rose-coloured bloom; leaves, very large, of elegant shape, divided to the middle, standing far apart, and of a fine green colour; flower-spikes, short; capsules, large, of a bluish-green colour, with stout prickles. A very handsome variety.

6. *R. COMPACTUS*.—A very branching plant, about 8 feet high; stem and leaf-stalks of a deep reddish-purple colour, like those of No. 1; leaf-stalks, long and slender; leaves, very deeply cut, and margined with very large unequal teeth; veins or nerves of a lively rose-colour; flower-spikes, long, dense, and erect; capsules, of medium size, blackish green, with stout prickles.

7. *R. AFRICANUS HYBRIDUS*.—A vigorous-growing plant, nearly 10 feet high; stem, thick, with long joints or internodes, of a deep violet-purple colour; leaves, broad, of a deep brilliant green colour, with bluish reflections, and bright red veins or nerves; capsules, of medium size, deep green, on long stalks, and with long yellow-pointed prickles, standing far apart.

8. *R. SANGUINEUS GLAUCUS*.—A short-branched plant, about 6 feet high; stem, of a light violet-purple colour; leaves, firm, with short ill-defined lobes, of a dull deep green, tinged with reddish; veins or nerves, forming a central red star; leaf-stalks, slender, streaked with purple and green, and covered with an ash-coloured bloom (as is also the stem); flower-spikes, short; capsules, large, white and red, with strong twisted prickles of a delicate rose-colour.

9. *R. SANGUINEUS MINOR*.—A plant of small or medium-sized dimensions, about 6 feet high; stem, of a very deep reddish-purple colour; leaf-stalks, of a lighter shade; leaves, deeply lobed, and edged with broad teeth, of a handsome deep green, shaded with violet when young, nerves or veins, very prominent, and of a deep crimson colour; flower-spikes, short; capsules, purplish-green; points of the prickles, deep red.

10. *R. NANUS MICROSPERMUS*.—A branching plant, about $6\frac{1}{2}$ feet high; stem, stout, of a deep purple streaked with rose-colour; leaf-stalks, long and stout; leaves, large and handsome, with very broad large-toothed lobes, orbicular in outline, and resembling those of *R. viridis*; nerves or veins, prominent, rose-coloured, well-marked, and radiating regularly; flower-spikes, large; capsules, numerous, closely set, of a very deep green colour, relieved with bluish and purple tints; prickles, short, green.

11. *R. AFRICANUS*.—A plant of weak growth, and of branching and bushy habit, about $6\frac{1}{2}$ feet high, with a prevailing tint of glaucous green or ashy-yellow, owing to the presence of an abundant light-coloured bloom on the branches and stem; flower-stalks, long and slender; leaves, small, not deeply cut, of an ashy-green colour, with pale yellow nerves or veins; flower-spikes, short, numerous, unequal in size; capsules, of medium size, drooping, of a uniform glaucous-green colour. (I suspect this to be no other than *R. africanus viridis*, and not the true *africanus*, which is the same as the *R. major*, or Giant Ricinus, of the gardens.)

12. *R. (SPECIES FROM THE PHILIPPINE ISLANDS?)*.—A plant of an entirely yellowish-green aspect, something like the preceding variety, but less glaucous, and growing about $6\frac{1}{2}$ feet high; leaf-stalks, long, slender, and of a marbled-green colour; leaves, with broad undulated finely-toothed lobes; and yellow nerves or veins; flower-spikes, stout, short, and compact; capsules, large, of a uniform ashy or glaucous green, on short stalks; prickles, short and green.

13. *R. SANGUINOLENTUS*.—This is, undoubtedly, the handsomest of the whole collection, as regards colour; grows $6\frac{1}{2}$ feet, or more, high; stem, simple, of a very deep reddish-purple,

with a shining surface; leaf-stalks, long and stout, of the same colour, mixed with green, somewhat erect, and close together; leaves, very large, neatly cut (the lobes not extending to the middle, and of a lance-shaped acute form), of a general reddish-purple and violet colour, with metallic reflections, like those on the neck-feathers of some pigeons; nerves or veins, very prominent, of a bright blood-red colour, which remains when the leaves become old and change their colour to a deep green, with purple reflections; flower-spikes, large, pyramidal, dense; capsules, large, blood-red, with long deep-red prickles. This variety ripens its fruit very slowly.

14. *R. GUIANENSIS*.—A branching variety, of moderately vigorous growth, about $6\frac{1}{2}$ feet high; stem, of a mingled reddish and light violet-green colour, covered with an abundant whitish ash-coloured bloom; leaf-stalks, slightly reflexed; leaves, large, well-formed, deeply and elegantly cut into pointed lobes, of a deep glistening green colour, with red veins or nerves; flower-spikes, thinly set with flowers; capsules, large, of a pale ashy-green colour; prickles, rose-coloured.

15. *R. MACROPHYLLUS ATROPURPUREUS*.—This variety resembles the preceding, but is more vigorous in growth, and has a more erect habit; grows about $5\frac{1}{2}$ feet high; leaves, broad, handsome, deep green, with a large central star of red nerves or veins; capsules, like those of the preceding kind.

16. *R. MACROCARPUS*.—About $5\frac{1}{2}$ feet high; stem, green, streaked and marbled with rose-colour, slightly glaucous; flower-stalks, slender, deflected, then recurved and standing erect; leaves, very large, orbicular in outline, with very broad short lobes, of a uniform brilliant green colour, with stout bright yellow nerves or veins; flower-spikes, depressed; capsules, bluish-green, on short stalks; prickles, short and thick, of a pale green colour.

17. *R. INSIGNIS SPECTABILIS*.—This plant hardly bears out the promise of its high-sounding title. It is very like the preceding variety, but smaller and more glaucous; the leaves are deeply toothed; the nerves are of a paler hue; the capsules have a bluer tinge; and the prickles are curved and longer.

18. *R. SANGUINEUS TRICOLOR*.—The specific name of this variety is also not well applied. It grows about $6\frac{1}{2}$ feet high; stem, simple, stout, of a deep blood-red colour, and handsome appearance; leaf-stalks, long, growing at right angles to the stem; leaves, neatly cut into lance-shaped pointed lobes; nerves or veins, broad and equal, of a delicate rose-colour; flower-spikes, pyramidal, dense; capsules, of a blood-red colour.

19. *R. PURPUREUS MAJOR*.—Grows about $6\frac{1}{2}$ feet high; stem and leaf-stalks, deep reddish-purple. In habit and foliage this variety resembles the preceding one, but the leaves are broader, and the nerves or veins are of a lively red colour; flower-spikes, of medium size; capsules, large, green, with reddish prickles.

20. *R. PURPUREUS*.—A vigorous-growing variety, about $6\frac{1}{2}$ feet high; stem, stout, of a violet-red colour, covered with a hoary bloom; leaf-stalks, slender, marbled with rose-colour, white, and green; leaves, neatly cut into lance-shaped pointed lobes, of a brilliant green colour; nerves or veins, rose-coloured, not prominent; flower-spikes, short, bluish-green; prickles, short, with rose-coloured points.

Of the foregoing varieties, Nos. 1, 3, 5, 10, and 13 should be selected by those who prefer cultivating a few fine sorts to the possession of a large indiscriminate collection.

RARE LILIES.

For years past, Japan has been pouring in upon us her horticultural treasures in many forms, but notably so in the abundance of her rare and beautiful Lilies, giving to this family a first-class place amongst decorative plants, and bidding fair to revive that enthusiastic spirit amongst amateurs which our modern style of gardening has much tended to extinguish. North America, especially California, promises to run Japan close in the race of Lily introductions, and to show that her mineral wealth is but one of her excellencies; for, while she has been fertile in the precious metals, she has been developing a superb flora, and her recently-found Lilies are amongst the most magnificent in cultivation. At the head of the list conspicuously stands *L. Humboldtii*, the grandest of all Lilies, and one that, from its constitution, bids fair to make a

permanent residence amongst us. India, in its temperate regions, has a Lily flora second to none in beauty, statelyness, and fragrance. Our knowledge of the species is, however, limited. From time to time one or other has been introduced, but *Giganteum* alone remains; the others have been lost, it is supposed, from over-coddling, treating them as stove plants, whereas they come from regions where the frost in winter is severe, though the temperature in summer is high; but this may be said of the native habitats of almost all our Lilies which lay pretensions to the title of beautiful; for example, the Caucasus, North America, Japan, and Southern Europe; these are the places from which our Lilies mostly come, and, while I cannot precisely imitate soil, situation, and climate, I can do much to adapt them; and it is with this object I have prepared this article, some important notes having come to me from an Indian correspondent, accompanied by the two rare Lilies, *Wallichianum* and *polyphyllum*.

"*L. WALLICHIANUM*," says Baker in his "Synopsis," "stem reaching 4 to 6 feet high, half an inch thick at the base; leaves, thirty to forty, always narrow, linear, ascending, the lower reaching 8 to 9 inches long, 3 to 6 lines broad below the middle, narrowed very gradually to an acuminate point; flowers, two to three, ascending or horizontal; perianth, 7 to 9 inches long; the neck of the funnel, 3 to 3½ inches long." This might fairly be placed as a species of full rank; for in the height of its stem, size and fragrance of the flowers: it is the prince of the Longiflorum series.

"*L. POLYPHYLLUM*."—Stem, 2 to 3 feet high, moderately stout, glabrous, terete; leaves, all scattered, thirty to forty to a stem at the flowering time, much ascending, linear, lanceolate, the lower ones 4 to 5 inches long, 6 to 8 lines broad above the middle, narrowed gradually to the base and an acute point, similar to those of the *Martagon*, and much thinner than those of *Carniolicum* in texture; the veins, fine and anastomosing, both sides glabrous, the edge not at all scabrous or ciliated, the upper ones ceasing several inches below the inflorescence; flowers, four to six in wild specimens, on a lax raceme; perianth, 18 to 21 lines deep, reflexed from below the middle when expanded, drooping, as in the other *Martagons*. It has never been in cultivation; colour of the flowers unknown." My Indian correspondent from Mussoorie writes of *L. Wallichianum* thus:—"Flowers in August, but more usually in September. It is a hardy plant, and here defies both heat and cold. I find it growing, at an elevation of 5,500 feet, on the open grassy hills, with a slope often of 45°, not under forest shelter, but in the open tracks; the soil full of bits of limestone pebbles, and the matrix composed of lime, clay, and vegetable mould. From the great slope of the hill, it is thoroughly free from surplus water, the temperature of the summer sun being from 120° to 130°. From June to the end of September it grows in a perfect deluge, and often enshrouded in mist for days together, that being our rainy season. From September to December it gradually dies down in a fine warm temperature by day, with hoar-frost at night in November. Little rain falls during these months. Sometimes there is but little snow in winter, say 3 to 4 inches, with hard frost; at other times, the snow lies over them 2 feet in depth, but this is unusual. The bulbs lie at a depth of 6 to 9 inches, and are uninjured. The plant seldom or never produces seed, but is propagated by suckers or by bulblets from some part of a long root, so that the flowering plants are surrounded by numerous young ones of various ages." Another correspondent writes:—"Wallichianum is certainly a magnificent Lily. I have seen it in the Himalayas 8 feet high."

Of *L. polyphyllum*, my Indian correspondent says:—"It is one of the Turk's-cap group; grows in good tolerably moist vegetable mould, on a slope in thick shrubbery; and flowers here in June, at an elevation of 6,500 feet." And he adds:—"I have sent you an *Amaryllis*, now for the first time procured. I have not seen the flower; but the lad who found it says it throws up a smooth stalk, bearing Blue-bell-shaped flowers, disposed on alternate sides like *L. giganteum* and *L. roseum*. It was found on the margin of a stream, at about 5,000 feet of elevation, at the bottom of a deep wide valley. This is the first *Amaryllis* I have yet found on these hills."

PETER BARR.

BEDDING CALCEOLARIAS.

WE cannot as yet dispense with the *Calceolaria* as a bedding plant so long as the present system of massing in colours continues, and especially is this true of the yellow bedding varieties; for, notwithstanding that several yellow-flowering plants have been suggested as substitutes, such as the Pansy, *Tagetes signata pumila*, dwarf *Nasturtiums*, dwarf *Marigolds*, &c., yet there is not much probability of their becoming so generally employed as the *Calceolaria*. The bedding *Calceolarias* have fallen into much disrepute with flower gardeners of late, owing to their fatal tendency to show the possession of disease. Whether this is an epidemic like the Potato disease, or whether it is owing to mismanagement, has not been clearly demonstrated. Certain it is that in cases where particular attention has been turned to the treatment of bedding *Calceolarias* during the winter, the ravages of the so-called disease have been much lessened; in some instances it has been stamped out altogether. Roughly stated, the common treatment is as follows:—Cuttings are taken off at the end of July or during August and put into store pots, in which they root. They are frequently neglected at this stage, and become dry, scrubby, and infested with greenfly. In the spring, the cuttings are potted off singly into small 60-pots and pushed on into growth, and then allowed to become pot-bound, and to suffer from want of water. Then in May or June, they are turned out of the pots with their hard balls of roots into the open ground in a somewhat unhealthy state through neglect, and the result is the certain loss of many of the plants. A mysterious disease, inexplicable in cause and action, is credited with the destruction, and it is concluded the bedding *Calceolaria* cannot be grown. The plants are kept in a hot dry atmosphere for a great part of the winter. They suffer from confinement at the roots at the time when they should have the fullest liberty to develop themselves; the plants become weakened and scrubby when they should be strong and robust; and what wonder is it that they succumb to hostile influences? A much more sensible and safer course is to take the cuttings at the usual season of the year, and dip them for a few minutes in a solution made of 3 oz. of Gishurst's compound, dissolved in a gallon of soft water, and allowed to stand for twenty-four hours before being used; then the cuttings should be dried in the sun, and pricked out into shallow boxes, or in a bed in a cold frame. The siftings of the refuse of the potting truck can be turned to good account in this way. There is nothing like a bed in a cold frame, and here the cuttings speedily root. After being kept close for a few days, air should be given on all suitable occasions; but, if hard frost sets in, some protecting material should be thrown over the frame. In February or early in March, cut a trench across an unused part of the kitchen garden 3 feet in width by 18 inches in depth, and fill it with about 6 inches of any light soil, such as the refuse of the potting truck; and, about the middle of March, plant out the rooted cuttings of *Calceolaria* in lines about 6 inches apart each way. When the trench is filled, bend over it some stout sticks to form a rough framework on which mats can be laid to give shelter when necessary. On all occasions air should be given, and water when needed. Plants treated in this way will be certain to do well when transferred to the flower-beds; and very seldom indeed is it that any loss takes place. The great thing is not to put out plants that have had their roots confined in pots during the winter till they have become little better than a dried half-decayed ball. Plants lifted from the trench, as directed above, at once lay hold of the soil; for, the roots, having been perfectly free and unconfined, are in the highest stage of development. Perhaps there is no flower garden where more *Calceolarias* are bedded out and flourish better when planted than at Hatfield House, the Hertfordshire seat of the Marquis of Salisbury. The plants are treated in the manner just indicated. The growth is luxuriant, the bloom most profuse; and yet the Hatfield Terrace flower-gardens are as much exposed to the action of the sun as gardens can well be. Plant out, if possible, when a shower is imminent; it settles the soil nicely about the roots, and root-growth is made at once. The fine old *aurea floribunda* still holds its own as a good dwarf yellow bedding *Calceolaria*, compact in habit, and free and continuous in bloom. *Golden Gem* is a newer variety, and is considered to be the best of all the yellow *Calceolarias* in use, even more hardy and compact in growth than *aurea floribunda*, of a deeper yellow hue, and less affected by weather. Some beds and lines of this variety formed a leading feature in the effective flower garden at Auckland Castle, the residence of the Bishop of Durham, during the past summer. The old *amplexicaulis* is still much grown for its clear pale straw-yellow colour and general effectiveness. A new dwarf sulphur-yellow bedding variety, named *Princess Louise*, is highly spoken of by many growers. Another, named *elegans*, has clear golden-yellow flowers, and it does well. Of amber-coloured flowers, *Beauty of Herts* stands pre-eminent; it has a fine dwarf, robust, free-branching habit, and blooms profusely.

This is largely grown at Hatfield. The old Prince of Orange and Princess Alexandra, having striking orange-buff flowers, also come into the group. Then, of red and crimson flowers we have Bijou, beautiful brilliant crimson; Crimson Dwarf, dense compact habit, very free and profuse of bloom; and Victor Emmanuel, reddish-scarlet, distinctly spotted with crimson, makes a fine bedder also.

R. D.

MR. ATKINS'S PLANT-COLLECTORS' BOXES.

THE favourable allusion made by our correspondent, Mr. Elwes (see p. 53), to the kind of boxes used by Mr. Atkins, of Painswick, when collecting plants, induced us to write to that gentleman for further information respecting them, and he has kindly furnished us with the following reply:—"My collecting boxes or trays are very simple, but effective. I have for many years used them when far from home, on the Alps and other localities, and, by taking every opportunity of removing the lids to expose the plants to light and air, with an occasional sprinkling with water all over the plants, especially in the evening, I have travelled with them for many weeks, and found my plants at the end of the journey in the best of health, and grown together into one mass, so as to require a knife to separate them. I use shallow boxes or trays; a convenient size I have found to be about 18 to 20 inches long by 13 to 14 inches wide, and 3 inches deep in the clear (inside measure), but, of course, the size and depth must be somewhat guided by the description of plants they are intended for. The above I have found ample for such as Gentians, Soldanellas, Myosotis, Androsaces, Saxifrages, and such like. If too large, they are cumbersome to move about, and more apt to get damaged in transit. Let them be well made of seasoned $\frac{3}{4}$ deal, or they will be apt to warp and give way with the damp from the plants. On the four corners of each tray, or box, nail a block of wood about $\frac{3}{4}$ inch in depth, on which the loose lid will rest, thus allowing that space all round for the entrance of air to the plants. These, as collected, with sods of earth to the roots, should, from time to time, on return from each excursion, be firmly pressed, with their balls of earth, close together into the box, the top of the plants being nearly, or quite, level with the sides of the box or tray. If more than one be required, they should be all made of the same size, so that when placed one on the other, the bottom of the one above would form a top, or lid, for the one underneath, and, by being provided with two or three stout leather straps, they are very readily fixed together, and opened when at one's quarters (or when passing Custom-houses), with very little trouble or disturbance. When small plants are placed in one of these boxes, a slight division, or a rod, run down the middle of the box longitudinally, is of advantage in preventing their shifting, or being displaced by being thrown about in transit. The new additions of plants, when placed in the box, should have a moderate watering to more effectually unite them with those previously placed therein; and then, in an hour or two, by tipping the box on one edge, you may effectually drain them to prevent soddening. Drain-holes in the bottom of the boxes being objectionable for packing with other baggage, the vacant space in each box is best filled with tightly-pressed Sphagnum, or Moss, until required. I never found any difficulty in getting additional trays made in any of the Swiss villages, neatly, and also cheaply.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Winter Flowers.—Crocus *Imperati*, fawn-colour, striped with black, inside of petals violet, in 1873 and 1874 was in flower January 4 and 11 respectively. *Eranthis hyemalis*, bright yellow, was in flower January 11. *Colchicum autumnale album plenum*, casual blooms on January 11. This has been flowering, off and on, over two months in my trial ground.—P. BARR.

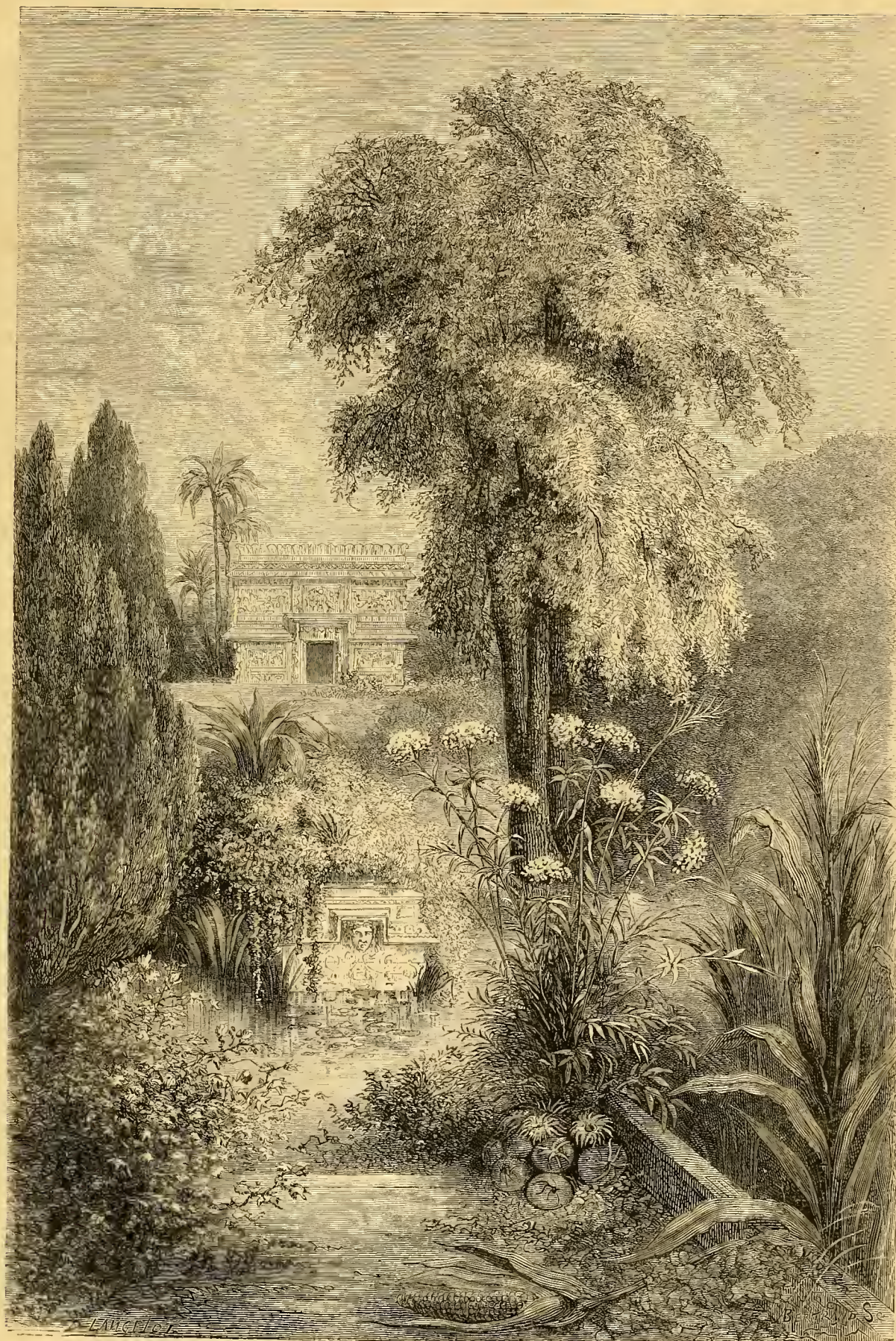
Ivy-leaved Geraniums for Rose Stems.—Mr. Dean tells, in the *Florist*, of a graceful way of training these plants up the stems of Rose-bushes. I saw a country flower garden not long since with its inevitable lines of Standard Roses planted in the turf by the sides of the gravel walk, but with a small circular bed at the base of each. In these beds had been planted various-coloured Ivy-leaved Pelargoniums, which were trained up the stems of the Roses, and so furnished them with pillars of leaves and flowers. The association of the Ivy-leaved Pelargonium with the Roses in this fashion quite hid the naked stems from view; and I failed to perceive that the Roses suffered in any way from the companionship of the Pelargoniums, as the heads were of vigorous growth and blooming freely. This combination is worked out every year without inflicting any perceptible injury to the Roses.

The Species of Tulips.—I send a few notes taken from Tchihatcheff's "*Asie Mineure*," vol. ii., to supplement Dr. Regel's paper on Tulips, published in THE GARDEN last week (see p. 48). Tulipa *armena* grows at an elevation of 6,000 feet; T. *montana* found in the Troad, Mysia, at Erzeroum, and on Mount Ararat, at elevations of from 6,000 to 9,000 feet; T. *Gesneriana*, found in Armenia at from 9,000 to 7,000 feet; T. *Julia*, also found in Armenia; T. *undulatifolia* is found in rich pastures near the top of Mount Tahtaln, near Smyrna; T. *Sibthorpiana* is found at Makri, on the Lycian coast, and at Porto Cavaliers. Two species not noticed by Dr. Regel, are also mentioned, namely, Tulipa *pulchella*, found by Kotschy, in the Cilician Bulgardagh, at an elevation of 6,000 to 7,000 feet (Ky. Reise in Cilic. Taur. p. 379), and Tulipa *Thirkiana*, C. Koch. (T. *tricolor*, C. Koch. in Linn. xix., non Lideb.) [*sic*, in Tchihatcheff], found near Broussa.—H. J. ELWES.

BOLD VARIETY IN GARDEN SCENERY.

THERE are two ways of obtaining good effects in planting, as in painting, the one being gained by a judicious combination of forms and colours, the other by skilful contrast. Both these plans have their advantages when put into practice, and we not unfrequently see them blended together in happy union, for, it must be remembered that we can contrast forms while we harmonise colours, and *vice versa*; in many cases, indeed, it is best to do so. To plant well, we must have the height, form, and colour-changes of every tree or plant employed in our mind's eye; then some definite result can be worked out from the beginning. Every one interested in planting for landscape effect should pay particular attention to the kind of forms they employ for that purpose, if they would be successful. The columnar Lombardy Poplar, the spreading Oak, the round-topped Ash, the silvery-stemmed drooping Birch, the massive cone-shaped Limes and Chestnuts, or the straight tapering Larch or Firs all assist us, if their forms are judiciously combined with those of trees of a different contour. These may be taken as types, as far as form is concerned, but we must also consider colour, either in harmony or by way of contrast. Here we may have either a soft blending of greens, such as is afforded by Acacias, Limes, Elms, Chestnuts, and sombre Conifers; or contrasts, such as those afforded by silvery Willows, Negundos, purple-leaved Beeches, and golden-foliaged Yews, Maples, or the crimson autumnal foliage of the Oaks and Vines. Our illustration shows the good effects which result from striking contrasts in the way of ornamental planting. The noble round-headed tree in the centre of the annexed illustration is in itself a study, apart from the pleasing types of vegetation with which it is surrounded. The whole picture, in short, teaches us a valuable lesson as regards the grand effects we may produce by boldly varying the garden-landscape, instead of following the nearly universal plan of planting in solid clumps and formal masses. We frequently see planting, in which all the tall and striking subjects are so surrounded by others that their individuality is lost. Mr. Marnock, whom, in matters of taste in landscape gardening, we may now consider our best authority, usually follows a different plan from the common one; instead of placing trees of bold or peculiar habit in the centre of clumps, groups, or masses, he usually plants them on their outer and most prominent edge, or point. Good examples of this may be seen at Montague House, and many other gardens designed by him. In due time, these trees, instead of forming an almost unnoticed unit, in a more or less formal mass, stand forth boldly. But, even if we did not possess these peculiar and striking forms of trees, weeping or otherwise, our commonest round-headed forms would well repay us for the fullest attention we could bestow on their effective grouping. The Horse Chestnut groves at Versailles are monotonous in their serried level ranks as so much groundsel, but a well-developed tree is one of the finest objects in the vegetable kingdom. So it is of a number of other inhabitants of our gardens. It is, indeed, odd to think that, notwithstanding the number of fine plants and trees in our gardens, we should be so successful in producing the eternal monotony of form that is everywhere seen. As to variety of forms, we can probably grow a greater number at present in the open air than any other country. In tropical and sub-tropical kinds, we can never be so rich in them as warmer countries may become; but, recently, we have developed this type to a large extent; and in deciduous, evergreen, and Coniferous trees and shrubs—all classes strikingly diverse in form—our collections are the fullest ever made. We have a good many Yuccas as hardy as our native shrubs; we have the hardy Palms; we have a host of Cannas with noble foliage, and various other types developed in the sub-tropical garden; we have a goodly number of hardy trees, like the Ailantus and Paulownia, of which, when young, the foliage is large and striking; in fact, we have all that the most fastidious could desire. One type shown well in the illustration is the Umbelliferous—a form rarely seen in garden scenery, except as represented by the coarse and not fragrant Cow-Parsnips. We know of no plants which are likely to be more useful to the garden-artist than the Giant Fennels and their allies, now too much confined to good botanical collections.

F. W. B.



VARIOUS TYPES OF TREE AND PLANT FORM.

SOILS, FERTILISERS, &c.

PROPER TREATMENT OF YARD MANURE.

Few subjects are of more importance to the gardener, or have led to the expression of more opposing views from different writers, both practical and scientific. One class recommend vehemently that manure should be thoroughly rotted in the yard before putting it out on the land, and support their position by arguing that manure is not food for the plant until it is decomposed; also that, when manure is rotted, it requires less labour to haul and spread it, in consequence of the great diminution in its bulk. This latter argument can only count on the supposition that, although the bulk be so greatly diminished, the virtue of the manure all remains, which is most certainly a mistake. Another party advocate putting out the manure while quite fresh or "green," and immediately spreading it on the land. Advocates of both measures point triumphantly to results as conclusive evidence that they are right. It is not to be denied, of course, that a marked effect will follow either course alluded to, especially if sufficient manure be applied; and yet both of these plans are greatly wrong, though partly right. It is quite true that manure is not food for the plant until it is decomposed or "rotted." But, the fatal objection to rotting in the yard is that, by so doing, we lose, say one half, of a valuable commodity. On the other hand, it is true that putting out green manure puts all the constituent elements on the land; yet the following grave objections exist against the plan:—1. It does not increase the manure. 2. It does not improve the quality. 3. It seeds the land with weeds. 4. It does not save labour or time, and may cut the ground up objectionably. But, can a process be suggested which possesses all these advantages without the drawbacks? Yes, I am confident that the following process will meet all objections, and will also increase the bulk of manure; will improve the quality; will kill the weed seeds, without increasing the labour, and will throw much of that work into seasons of the year which are not so precious as that in which yards are usually emptied. The process is as follows:—On the ground where it is desired to have the manure, select an elevated position, and, with the aid of the plough and shovel, make a long, shallow trench, say 6 or 7 inches deep and 2 or 3 feet wide; throw the earth out on the upper side of the trench. This trench may be made at any time, but one must always be prepared just before winter, say in the early part of November. Next, in cleaning the stables, always shovel immediately into the cart or waggon and haul at once to the trench, where it may be dropped in a manner most convenient for covering. Then cover the manure as soon as possible with earth taken from either side of the trench, until the manure is covered with twice its bulk of earth. The drier the earth and the more pulverised the better. Let the earth cover all the manure as effectually as possible, to arrest the gases arising from the decomposing manure. In this state it may stand as long as desired without loss, if the weeds are not allowed to grow on top of it. A month before using it should be examined, and, if not thoroughly rotted, the heap should be lightened up and stirred, to admit air and moisture. When ready for use, the manure has almost disappeared, and the earth having absorbed all the gases evolved in the act of decomposition, has become manure. But, inasmuch as we doubled the bulk of earth to the manure, we have twice as much manure as we had, and moreover we have two loads on the high part of the field for the hauling of one, thus lessening greatly the labour of drawing to the field. Hence it follows that this process pays best where you have to haul farthest and highest; the spreading, being down hill, is easier. The main principle of this process is the well-known quality which earth possesses of "fixing" or holding and retaining gases, a quality now applied beneficially in earth closets, &c. The earth retains these gases, which are the vital fertilising properties, until the plant root comes in contact with it. This fertilising earth is very durable, as "nothing is lost," indeed, its effects have been plainly visible on the spot where it had been spread twenty-nine years before. By this process I conceive that every possible objection in the treatment of manure is obviated, every leak stopped, and every advantage gained. When the compost is thoroughly "cooked" or rotted, the weed seeds must be killed, and the manure is fit food for the plant. It is a manure fit for any or all crops. For ploughing under and top-dressing we have the high authority of Professor Johnston for saying that when a compost is made of more than one constituent, the mass is equal or superior to its best part. From this it would follow that the whole of the compost heap is at least as good as the best ingredient which came out of the stable, and that the quality of the whole is improved. The writer was induced to "work up" this subject many years ago—before earth closets had been heard of—by the great difficulty of procuring sufficient manure to improve his land.—*The Cultivator*.

THE INDOOR GARDEN.

THE FUCHSIA TRIAL AT CHISWICK.

THE following were considered to be the best Fuchsias at the trial of these plants which took place at Chiswick last year:—

ALPHA (G. Smith).—Habit, free and good, very free-flowering; bright carmine tube and sepals, the tubes short and slender, the sepals very broad and short; corolla of immense size, very double, clear violet; one of the very best.

AVALANCHE (G. Smith).—Habit, rather sparse and not very free; tubes, small; sepals, very short and broad for the size of the flower, light rosy-red; corolla, white, exceedingly double and large, and of fine form.

AVALANCHE (E. G. Henderson).—Habit, good and free; tube, slender; sepals, broad, deflexed, scarlet; corolla, deep, full, and even, dark violet-purple; a fine bold variety.

BLUE BEAUTY (Jervis).—Habit, good, compact, free-flowering; tube, short; sepals, broad and short, reflexed, light red; corolla, large, very double, clear purple.

CROWN PRINCE OF PRUSSIA (Veitch).—Habit, dwarf and free, and a free bloomer; flowers, large, the tube bulged, the sepals broad, scarlet; corolla, prominent, dark violet-purple, reddish at the base.

DELIGHT (Smith).—Habit, excellent, and a free bloomer, of first-class merit for decorative or exhibition purposes; tube and sepals, clear crimson, the latter sufficiently reflexed; corolla, very large, pure white, with a few rosy streaks near the base. A really good variety; the best of its class.

LA FAVORITE (Veitch).—Habit, first-class; tube and sepals, well proportioned, the latter reflexed, scarlet; corolla, large and of good substance, well expanded, light violet. A very free-flowering and good variety.

L'EMPEREUR (Cannell).—Habit, dwarf and floriferous; tube and sepals, scarlet; corolla, single, white.

LUSTRE (Downie & Co.).—Not of free habit; flowers, with blush recurved sepals, and deep-red compact corolla. Approved for its colour.

NOBLESSE (Veitch).—Habit, good and free; flowers, with bright crimson-scarlet tube and sepals, the former slender, the latter spreading; corolla, deep maroon. The darkest-coloured in the collection, and of first-class quality.

RHODERICK DEU (E. G. Henderson).—Habit, good; tube and sepals, bright scarlet, the latter well reflexed; corolla, expanded, lavender-blue.

SCHILLER.—Habit, somewhat loose; flowers, large; the tube and broad-spreading sepals, white-green at the tip; corolla, clear rosy-purple, with white feathers at the base.

STARLIGHT (G. Smith).—A fine variety, not sufficiently known. It has the same habit and the same free-flowering character as Lady Heytesbury, but the corolla is of a bright crimson-lake. It is really a first-class Fuchsia.

VICTOR (Bull).—Habit, strong and compact; very bright scarlet tube and sepals, the latter not much reflexed; corolla of immense size, but coarse and irregular, pale purple, changing to reddish-purple. Not a very desirable Fuchsia.

WAVE OF LIFE (Veitch).—Habit, compact and good; leaves, pale yellow at the points; tube and sepals, bright scarlet, broad and reflexed; corolla, prominent, intense violet, of good substance. A distinct and really good Fuchsia.

WEeping BEAUTY (Veitch).—Habit, dwarf, free, and good; flowers, medium-sized; tube, rather bulged; sepals, broadish; bright crimson-scarlet; corolla, moderately expanded, rich deep purple. A very fine Fuchsia.

WHITE PERFECTION (E. G. Henderson).—Habit, good, floriferous, and drooping; tube and sepals, long and narrow, blush-white; corolla large, lake-crimson and rose.

The following is a selection of good and distinct varieties made by Mr. W. Spinks, while foreman at Chiswick and in charge of the plants above described:—

SEpALS AND TUBE WHITE; COROLLA CONTRASTING.—Arabella, Lady Heytesbury, Starlight, free (all dissimilar). May Queen, late. Minnie Banks, distinct. Water Nymph, for colour.

SEpALS AND TUBE SCARLET; COROLLA WHITE.—Delight, large single and best. Conspicua, free good single. Puritani, for habit and free-flowering. Alexandrina, extra bright tube and sepals. Avalanche (double, very large), and Enchantress, (double, free-flowering), not of good habit.

SEpALS AND TUBE SCARLET; COROLLA DARK.—Killiecrankie, the most perfect form. Noblesse, the darkest. Weeping Beauty, dark and very fine. Wave of Life, distinct in foliage and good. Sedan, the best-formed red-purple. Monarch, very large and long, distinct. —THOS. MOORE, in the *Journal of the Royal Horticultural Society*.

CATTLEYA MOSSIE.

THIS is one of the most showy of all Orchids, and, as it is tolerably reasonable in price as compared with rarer, but less beautiful kinds, it ought to be cultivated as generally as the old *Dendrobium nobile*. It may be grown either in a warm greenhouse or plant-stove, and will grow best in a compost of fibrous Peat and living Sphagnum, to which add sufficient coarse well-washed sand to keep the whole fresh and porous. Drainage is an important point, and the pots must be at least half full of clean crocks, over which place a thin layer of Sphagnum Moss to keep the sand and peat from passing down, and so preventing the superfluous water from passing away freely. As shown in the illustration, the plant should be elevated above the rim of the pot, and, if the Sphagnum is induced to grow freely, so much the better. For exhibition purposes, or for cut flowers, this superb plant is very useful, good specimens bearing from fifty to sixty great broad-petalled flowers, of a deep, rich, rosy tint, the lips being suffused with golden-yellow in the throat, and streaked and veined with dark velvety crimson. This plant is found in almost innumerable varieties in its native habitats, each varying from the other in either size, colour, or markings. If half-a-dozen imported



Cattleya Mossie.

plants are obtained, it is a great chance if any two of them prove to be alike when they flower, and this fact excites an agreeable curiosity on the part of some amateurs to purchase only imported plants, or plants that have not yet flowered in this country. Some forms are very pale in colour, the sepals and petals being nearly white or pale lilac, while others are of the richest rose-colour, and the lip reminds one of a broad bit of crimson velvet. When in flower, it may be removed to a warm room for a week or two without any fear of injury, and, if the plant is of moderate size, it should be placed under a glass shade, which will not only protect the blooms from dust, but will also cause them to last in beauty much longer by protecting them from the dryness of the atmosphere of the apartment. This last precaution is specially necessary if the room is heated by gas. The plant flowers during the summer months, and generally lasts from two to four weeks in beauty.

F. W. B.

A BLUE PELARGONIUM (?).

"CAN you hybridise *Geranium pratense* with your Zonal varieties?" I asked Mr. Pearson, the famous Zonal Pelargonium-grower. "I think not; but my neighbour, Mr. Lowe, of Highfield House, thinks he can. We will go there and see for ourselves." So off we went next day, and saw Mr. Lowe's wonderful repository for all kinds of curiosities; saw his hybrid seedlings from *Lilium auratum*, which had not yet flowered; saw the yard filled with valuable Lilies, all to be or

being hybridised; and last, not least, his collection of seedling Ferns, which is perfectly wonderful. I believe there are here not less than 15,000 different varieties of English Ferns, nearly all raised from seed, many of them being varieties only in a connoisseur's eyes. There are Ferns lovely, Ferns ugly, Ferns like fairy dreams, and Ferns like grim nightmares; Ferns tall, crested, broad, narrow, long, short, curled, straight, twisted like Mosses, or split up into fronds as delicate as the Maiden-hair, and as unlike their normal form as anything can be. There are few horticultural sensations so great as the variety of Mr. Lowe's Ferns. He is certain that he has succeeded in raising crosses between different Ferns by sowing the spores mixed together, and some of the odd seedlings which he showed us seemed to confirm his statement. "My friend wants to see," said Mr. Pearson, "if you have hybridised the blue *Geranium* of the fields with the Zonal. Have you done so?" "Undoubtedly. Come and look." And we saw a great number of seedlings raised from the blue *Geranium* crossed with Madame Vaucher, a well-known white Zonal. Most of these in no way differed from the female parent, with one striking exception, which was a small plant with little leaves, almost like those of a show *Pelargonium*, and with flowers having the narrowest petals imaginable, which were of a bluish-pink tint. The whole plant resembled somewhat the old pink bedder, Lady Cullum, except that its petals were very much smaller than I have ever seen in any *Pelargonium*, seedling or otherwise. Of the seedlings raised from the Zonal for the female fertilised with the blue *G. pratense* there was a large frameful, nearly all of which showed more or less inclination to the deeply-cut leaf of the male parent. One plant in particular differed but little from *G. pratense*, and most of the flowers showed traces of blue; some, however, were red, a curious fact, as the female parent was again Madame Vaucher. Nearly all the flowers were very small, and generally extraordinarily narrow-petalled. In the end, both Mr. Pearson and myself came away convinced that these were true hybrids, for, as Mr. Pearson remarked, "there can be no other way of raising such extraordinary varieties." My reasons for wanting to know how Mr. Lowe's experiments had succeeded are these. I have been trying for three years, quite independently of any one else, to raise a cross between these two plants. My first year was quite unsuccessful. The year before last I crossed, as I fully believe, a Zonal, with a bluish tinge in it, named Lawrence Heywood, with *G. pratense*. Only four seeds ripened, which came up when I was away, as I generally am, and, I suppose, consequently damped off. So, last summer, I set to work again, and crossed several Zonals with *G. pratense*; every cross took, and I waited for the store of seeds to ripen, which they did with a vengeance; for one sad morning I found all my seeds had scattered themselves, and been irretrievably lost; luckily three were still discoverable; these I sowed, and, after six months' waiting, one seedling is putting in, or rather out, an appearance in a small saucer in my greenhouse. It has cotyledons similar to those of *G. pratense*, and promises soon to exhibit its first leaf. I am aware that many of our great horticulturists, Major Trevor Clarke for example, have said that there can be no true hybrid as I have described. I know little of botany; nevertheless, I believe, after my second experiment, that it could be done, and in this I am confirmed by Mr. Pearson, who is one of our best hybridisers. Whether we shall ever have a blue Zonal *Pelargonium* or not is another matter, and on which some of your readers can possibly throw some light.

Bingham, Notts.

FRANCIS MILES.

CLEMATISES IN POTS FOR EARLY FLOWERING.

THE Clematis has been produced of late in so many new, varied, and beautiful forms, that those having only a superficial knowledge of them find it very difficult indeed to make a selection. The various types have recently been grouped under several divisions or sections, but each of these contains so many varieties constantly receiving accessions of new ones, that the difficulty of selecting remains as great as ever. The Clematis deserves to be, and should be, as common in our gardens as the Rose, which may be taken as the typical popular flower. It is as hardy as the queen of flowers, and as easily managed. The main purpose of this paper is to show that the varieties of two of the sections of Clematises—viz., the patens type and the lanuginosa

type—are specially adapted for early flowering in pots; and there is no glass structure that will grow plants, however homely in design and rude in character, but can be made very gay by means of freely-bloomed Clematis in pots during the early summer months. In cold, late districts, where the vegetation is apt to suffer from the late spring frosts, it is scarcely safe to plant in the open air the early-flowering Clematises of the patens type, as they are very apt to be injured by frost. It has frequently happened that in late districts these early Clematises will develop their flowers, and then in one night a cutting frost will work them irretrievable injury. Granting that such an instance as this may be exceptional, yet it may frequently occur, and, therefore, it is wise to grow a few plants under shelter, especially of the newer and rarer varieties. Of the patens group, that is, those Clematises which flower from the old or ripened wood, the following can be recommended for their great beauty, distinctness, and decorative value; Albert Victor, deep lavender, with a pale bar along each sepal; Lady Londesborough, silver grey, with pale bar; Lord Londesborough, delicate mauve, with pale claret bar; Patens, delicate manvrelilac, very free and effective; Miss Bateman, white, with chocolate-red anthers—the best white Clematis in cultivation—Sophia plena, lilac-purple, double; and Standishii, light mauve. All the foregoing produce large finely-formed flowers, with considerable freedom, and, when cultivated under glass, the flowers are prolonged for a lengthened period, as they are preserved from the effects of wet and frosty weather, and from the ravages of the wind. The varieties of the patens section just enumerated will come into bloom before the varieties of the lanuginosa section, because the latter flower from the young growth of the same year, and are, in consequence, later. Of the lanuginosa group, which now includes some very fine and valuable varieties, the following should be grown—Aureliana, porcelain blue; Gem, deep lavender blue; lanuginosa, pale lavender; lanuginosa nivea, pure white; and Otto Fröbel, greyish-white, very large, and finely formed. According to the size of the plants should be the pots in which they are placed; but 24's for the small plants, and 12's for the large ones will be found amply sufficient. Let it always be borne in mind in planting the Clematis, whether in pots or in the open ground, that it develops a large number of strong succulent roots that are strong feeders, and require liberal nutriment from which to draw the needful supplies for the plant. These succulent roots go down to the bottom of the pot, and form a dense mass; therefore, it is absolutely necessary that some very rich soil be used at potting time. Equal quantities of good loam and thoroughly rotten manure will suit the Clematis well; and, when potting, plant nearly up to the rim of the pots, leaving room for water. The flowers are thrown out on shortish stems, producing two, or three, or more from the buds, which are put forth from the old or ripened wood; and, at the same time, there will come up from the base of the plant sturdy young shoots, which will form the flowering-wood of the following year. It will be necessary to provide some appliance to which the blooming wood can be tied out and the young growth trained. There is nothing like wire frames, of oval or rounded shape; but, failing these, a stout stake placed in the middle of the pot to support the plant, or some slighter stakes placed round the pot, will do equally well. The growing wood should be kept tied to the main stake, so as not to impede or hide the expanding flowers. In the case of lanuginosa and its varieties, the young growth should be trained so as to become equally distributed, and afford a good surface of flower. There must be no lack of water, for the Clematis likes and should have plenty of it, and especially manure-water when the plants are in bloom. As soon as the plants have done flowering, remove them from the house, and plunge them in a shady border up to the rims of the pots, or stand them away under a hedge where they can ripen their wood, and remain till they are wanted for re-potting in November and December, when the plants should be pruned. In the case of the patens section, cut away only the weak, straggling, or overcrowded branches. All the strong wood of the previous summer should be left, in so far as it has become thoroughly ripened, beyond which it may be cut away. In the case of the varieties of the lanuginosa section, but comparatively slight pruning is required. In Moore and Jackman's book on the Clematis, it is stated that "the type itself, and those varieties which come nearest to it in habit, indeed, die back almost sufficiently to render pruning unnecessary; but, in those instances where a mixture of wood has led to a more extended growth, it will be necessary to cut so as to remove the weakly and ill-ripened portions of the year-old wood. Under favourable conditions, the plants will make an annual growth of from 8 to 10 feet in length, and of this, the unripened extremities, together with the weak or superfluous shoots and the dead wood, are the only parts which ought to be removed." Lastly, during the time the Clematis is making its growth, give abundance of air on all suitable occasions, and syringe the plants freely in bright weather. R. D.

Cœlogyne cristata.—Mr. Tanton has stated (see p. 10) that *Cœlogyne cristata* is a native of Guatemala, and that it was introduced by Hartweg. I had always understood that it was discovered by Dr. Wallich, about 1832, in Nepal, and afterwards by Dr. Hooker, in Sikkim, growing on mossy rocks and trees, at an altitude of from 5,000 to 8,000 feet; consequently it comes from a very cool temperature, though exposed to a hot sun. Having been a long and considerable grower of this *Cœlogyne* I have been frequently asked from whence it was brought, and the invariable reply has been in accordance with the facts just stated. I was, therefore, astounded at Mr. Tanton's statement that it came from Guatemala. If he will refer to Warner and William's folio work on Orchids he will there find the authentic references, Lindley, Wallich, Hooker, and others. Mr. Gibson, if I am not mistaken, informed me, when he was at Chatsworth, that, during his three years' exploration of upper or northern India, he collected and brought over, amongst other priceless discoveries, a number of bulbs of this useful Orchid, which he himself had gathered in Nepal. If Mr. Tanton will consult his gazetteer he will find that Guatemala is not a province of, nor in, Mexico, but an independent republic of central America, lat. 13 to 18 N., climate hot and unhealthy in the valleys. Nepal and Sikkim are from 5,000 to 8,000 feet above the sea-level, lat. 26° to 30° N., climate, cool and moist.—RICHARD S. YATES, *Cheshire*.

Pitcher Plants.—From the peculiar habit of these plants they are exceedingly susceptible of injury from the slightest touch of the hand, a circumstance worth remembering by those who have them under their care. No Pitcher plant will long remain in a healthy state if the foliage be allowed to be frequently handled. The *Nepenthes distillatoria*, or common Pitcher plant, succeeds best in Moss chopped rather fine, mixed with white sand and a little peat; and it will be found of great assistance in promoting the vigour of the plant, if a little additional Moss be added to the surface from time to time, as the plant advances. The roots of the *Nepenthes* never run deep, whatever the compost may be in which they are planted, but invariably spread themselves over and about the surface of the Moss. They require to be kept moist, but, unless when the plants are growing very vigorously indeed, setting them in feeders of water is injurious to them. This plant is far from tender. In the Edinburgh garden a plant was exposed to 8° of frost; it was afterwards removed to the stove, without suffering any injury from the frost to which it had been exposed. It, however, usually succeeds best when kept in a heat ranging from 60° to 80° of Fahrenheit. It is not difficult to increase by cuttings.—J. H.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Lapageria rosea.—Will any of your correspondents who have had experience in a similar case tell me if it will answer to cut down a large plant of *Lapageria rosea*, on a trellis, which is getting rather naked at bottom? The plant in question grows strongly enough from the top, but has not pushed a shoot from the bottom for four or five years, though there are six or seven strong, long shoots buried in the soil curled round the inside of the tub.—G. W.

Green "flowered" Pelargonium.—A very singular *Pelargonium* was raised in 1870 by M. Pescatore, of Villafranca, and named by him *P. zonale lycopodioides*. Its peculiarity consists in the circumstance of all the flowers being transformed into dense longish tufts of narrow green bracts, presenting the appearance of the extremities of the branches or shoots of a *Lycopodium*. In foliage and other respects, the plant does not differ from an ordinary *Zonal Pelargonium*. This monstrosity is described, and well shown in a wood engraving, in the last number of the *Revue Horticole*.

Venus's Fly-trap.—No. 147 of the *Proceedings of the Royal Society* contains Professor Burdon Sanderson's note on the Electrical Phenomena exhibited by Venus's Fly-trap (*Dionaea*). The blade of the leaf is found to possess a current proceeding from base to apex, but what is very remarkable is that the stalk contains one which proceeds in the opposite direction. The result of snipping off successive portions of the stalk is to increase the effect upon a galvanometer of the current in the blade. When the blade is irritated, the blade-current appears to be diminished, at first momentarily (but afterwards to be slightly augmented); correspondingly the stalk-current appears to be intensified.—*Academy*.

Odontoglossum coronarium.—This fine Orchid first flowered in this country in Lord Londesborough's collection at Grimston Park, where it bore eighteen flowers on a spike, and shortly afterwards it bloomed in Mr. W. Bull's collection at Chelsea, where it bore between thirty and forty blooms on a spike. More recently, a plant of it has borne two flower-spikes in Mr. Wrigley's fine collection, at Bridge Hall, where the smallest spike bore twelve and the larger one twenty-four blooms. This last is the best bloomed specimen in this country of which we have any record. Mr. Wrigley has kindly sent us a photograph of his plant taken while in bloom, and which shows it to have been very effective, the noble spike of flowers standing perfectly perpendicular, well up above the foliage.

Packing Plants to Travel long Distances.—In packing plants for transmission to distant places, there is more danger from too much than from too little moisture. The best packing material is Sphagnum, or bog Moss, and this should be just so damp only as to be elastic to the touch. Plants packed in this, if not too damp, will remain for weeks uninjured; that is, if the plants are at rest. Another thing is to pack close. If sending by post, take a piece of strong brown paper; lay the just damp, not wet, Moss upon it; put the plants upon the Moss, and more Moss over the plants. Then begin at one end of the paper and roll up hard, secure with a string, and then put another paper over for directions. So, in packing in boxes, use the Moss just damp, and have the box full and crammed down hard, so that there can be no possibility of moving or shaking in transit.—DR. TURNER.

THE ARBORETUM.

HARDY TREES AND SHRUBS.

By GEORGE GORDON, A.L.S.

THE ATHENIAN MAPLE (ACER ATHENIENSE).

THIS kind forms a tree 30 feet high, with the main stem rising straight up and regularly furnished on all sides with rather stout, open, and somewhat ascending branches, covered with a smooth ash-coloured bark. It is said to be found in the neighbourhood of Athens, and was first introduced in 1849 from the nursery of M. Van Houtte, in Belgium. The leaves are palmately five-lobed, nearly square or very slightly cordate at the base, quite smooth on both surfaces, on very long and rather slender foot-stalks, light green above, pallid beneath, and just before they fall off in the autumn turn to a pale yellow or light brown colour. The lobes are ovate-pointed with angular recesses, the three outer ones being the largest and nearly equal in size, and, with the exception of a pair of short angular blunt semi-lobes on each, quite entire on the edges. The flowers are rather small and in loose racemes. The fruit or keys are rather large, with widely diverging wings. Length of the leaf, 8 inches, including the foot-stalk (which is from 4 to 5 inches long), and the breadth 5 inches.

THE REDWOOD.

(SEQUIOIA SEMPERVIRENS.)

MANY of our readers are familiar with young specimens of Sequoia or Taxodium sempervirens, the Redwood of California, but few have any idea of the enormous importance and great size of the tree. These facts may not be without importance to us, even from a commercial point of view, as the tree does very well in sea-shore districts in the southern parts of England and Ireland. The most notable fact about the tree is, that it is quite as great in stature as the "Big tree," or Wellingtonia. And, though not so large in the bole, it is nevertheless a large tree. One peculiarity of the tree is, that its wood may be made into planks without the aid of the saw—split, in fact, by means of wedges. One of the best recent additions to our knowledge of this tree is from the pen of Mr. Charles Nordhoff, who contributes a good deal of interesting matter about northern California to *Harper's Magazine*. In the coast counties of this region he finds the famous Redwood forests, "whose trees are unequalled in size, except by the gigantic Sequoias;" "and on this coast saw-mills and logging-camps, where the immense Redwood forests are reduced to useful lumber, with a prodigious waste of wood." The saw-mill country begins at the mouth of Russian River, and they are placed at the mouths of all these streams, and wherever a river-mouth offers the slightest shelter to vessels loading; for the Redwood forests line the coast up to, and beyond, Humboldt Bay. There are even mills which offer no lee to vessels loading; and here the adventurous schooner watches her opportunity, hauls under a perpendicular cliff, receives her lading in the shortest possible time, and her crew think themselves fortunate if they get safely off. It is in the logging camps that a stranger will be most interested on this coast; for there he will see and feel the bigness of the Redwoods. A man in Humboldt County got out of one tree lumber enough to make his house and barn, and to fence in 2 acres of ground. A schooner was filled with shingles made from a single tree. One tree in Mendocino, whose remains were shown to me, made a mile of railroad ties. Trees 14 feet in diameter have been frequently found and cut down; the saw-logs are often split apart

with wedges, because the entire mass is too large to float in the narrow and shallow streams, and I have even seen them blow a log apart with gunpowder. A tree 4 feet in diameter is called undersized in these woods; and so skilful are the wood-choppers that they can make the largest giant of the forest fall just where they want it, or, as they say, they "drive a stake with the tree." The choppers do not stand on the ground, but on stages raised to such a height as to enable the axe to strike in where the tree attains its fair and regular thickness; for the Redwood, like the Sequoia, swells at the base, near the ground. These trees prefer steep hill-sides, and grow in an extremely rough and broken country, and their great height makes it necessary to fell them carefully, lest they should, falling with such an enormous weight, break to pieces. This constantly happens, in spite of every precaution, and there is little doubt that in these forests and at the mills 2 feet of wood are wasted for every foot of lumber sent to market. To mark the direction line in which the tree is to fall, the choppers usually drive a stake into the ground 100 or 150 feet from the base of the tree, and it actually is common to make the tree fall upon this stake, so straight do these Redwoods stand, and so accurate is the skill of the cutters. To fell a tree 8 feet in diameter, is counted a day's work for a man. When such a tree begins to totter, it gives at first a

sharp crack; the cutter labours with his axe usually about fifteen minutes after this premonitory crack, when at last the huge mass begins to go over. Then you may hear one of the grandest sounds of the forest. The fall of a great Redwood is startling, like a prolonged thundercrash, and is really a terrible sound.

The Government has lately become very strict in preserving the timber on Congress land, which was formerly cut at random, and by anybody who chose. Government agents watch the loggers, and, if these are anywhere caught cutting timber on Congress land, their rafts are seized and sold. At present prices it pays to haul logs in the Redwood country, only about half a mile to water; all trees more distant than this from a river are not cut; but the rivers are in many places near each other, and the belt of timber left standing, though considerable, is not so great as one would think. Redwood lumber has one singular property—it shrinks endwise, so that where it is used for weather-boarding a house, one is apt to see the butts shrunk apart. I am told that across the grain it does not shrink per-



Leaf of the Athenian Maple.

ceptibly. Accidents are frequent in a logging-camp, and good surgeons are in demand in all the saw-mill ports, for there is much more occasion for surgery than for physic. Men are cut with axes, jammed by logs, and otherwise hurt, one of the most serious dangers arising from the fall of limbs torn from standing trees by a falling one. Often such a limb lodges or sticks in the high top of a tree until the wind blows it down, or the concussion of the wood-cutter's axe, cutting down the tree, loosens it. Falling from such a height as 200 feet or 250 feet, even a light branch is dangerous, and men sometimes have their brains dashed out by such a falling limb. When you leave the coast for the interior, you ride through mile after mile of Redwood forests. Unlike the Firs of Oregon and Puget Sound, this tree does not occupy the whole land. It rears its tall head from a jungle of Laurel, Madrone, Oak, and other trees; and I doubt if so many as fifty large Redwoods often stand upon a single acre. I was told that an average tree would turn out about 15,000 feet of lumber, and thus, even thirty such trees to the acre would yield nearly half a million feet.

The Beech Blight.—A Beech-tree here, on high ground looking over the "Downs," has, for the last two years, been covered with a snow-white down, extending from the trunk to some of the branches.

I see in your last number (112), a paragraph headed "A New Blight," which corresponds very much with the one which has attacked our tree. Beech-trees, as a rule, grow very well, and the one mentioned is the only one attacked, although there are more close by. I should feel much obliged if you would give me any hint as to the destruction of this blight. The tree in question has not shown any symptoms of decay.—J. H. MONIUS. [The snow-white downy secretion on his Beech trees which your correspondent ("J. H. Monius") has sent for examination, and which, as he suggests, is, no doubt, the so-called "New Blight" quoted in last number of THE GARDEN, as attacking the Beech trees, in Westphalia, is neither new nor (unhappily) rare, nor have we any difficulty in saying how it got there. It is the excretion with which a species of the Coccus family, named *Adelges fagi*, covers itself, sometimes in such quantity as to cause the stems of the trees to look as if whitewashed. Foresters are familiar with two other species of the same genus, which, like this, covers the stems of two other trees with a similar white excretion, the one the Silver Fir, and the other the Weymouth Pine. I remember, some twenty years ago, consulting the late Mr. Charles Macintosh, author of the "Book of the Garden," as to the best mode of dealing with one of these. It was that which attacks the Silver Fir, but it does not matter which species it was, for all have the same habits, and whatever is good or bad for one will be so for all. His advice was to cut down every tree that was attacked, or it would spread, and, if it once established itself, it would destroy all the Silvers round about. I unwisely, and too credulously, acted upon his advice, all the trees were carefully examined, and wherever one was found with the *Adelges* on it, down it went; fresh researches produced fresh victims, until I awoke to the conviction that if I went on at that rate I would have to cut down all my trees to preserve them; and, as if they were to go, it mattered little whether they were cut off by disease or the axe, I came to the conclusion that I had better let them die by the slower process of natural death, and, at least, enjoy their beauty so long as it lasted. Unhappily I had been rather long in coming to my senses, and the Silvers about the place had been reduced by the stamping-out process to a very few. Few as they are, however, there they still remain, and, to all appearance, not a whit the worse of the *Adelges*. It still sticks to them, but in smaller numbers, and the antidote seems to have followed the disease without any trouble on my part. The last time I looked at them I was not surprised, but interested, to see great numbers of the larvæ of the lady-bird (*Coccinella*) so like the bark of the tree that the eye could scarcely distinguish them until they moved, busy promenading about among the *Adelges* ponacing upon them and sucking the life blood out of hundreds, if not thousands, every day. The result of this would, no doubt, be to keep them in check, and the proof that they had done so was that the *Adelges* are in smaller numbers and the trees more healthy than they were for twenty years. Your correspondent will see that he has no reason to be very anxious about his trees, but I would recommend his rubbing the stems, where they are infested, with a coarse nail-brush made of cocoa-nut fibre (to be had for 3d.) He may wash them at the same time with Gishurst compound, or any other sulphur-soap, but the rough friction is the thing, and the object is to kill the insects by crushing them through rough-handling. They are soft and tender, and chiefly (although by no means entirely) congregated on the stems, which makes it easier to get at and rid of them.—ANDREW MURRAY.]

THE KITCHEN GARDEN.

CULTURE OF PARSLEY.

PARSLEY will grow in almost any kind of soil; nevertheless, there are few plants that will pay better for a little extra care and attention being bestowed upon them. The greatest mistake committed in regard to its culture is thick sowing and want of timely thinning. Give it room enough, and plenty of fine curled leaves will be the result. Even a really good curled Parsley, if grown too thickly, will, in a measure, lose its improved character. Let any one notice the difference between the development of a chance stray seedling where it has had plenty of room to grow, and the puny weakly growth of the thickly-sown unthinned bed, and the truth of this statement will be at once apparent. If there is likely to be any scarcity of Parsley during the spring months, a box of it may now be sown and placed in any warm house or frame near the glass, in due course to be hardened off and transplanted at the foot of a south wall, 6 inches apart; this will come in for early picking. In February, when the ground is in nice working condition, having been manured and deeply stirred, and exposed to the

mellowing influence of frost, a good large sowing should be made; at least, large in proportion to the demand, as it is always best to err on the right side. And, as Parsley is wanted daily, let it be sown in some spot that is easily accessible. Sow thinly in drills a foot apart, covering the seeds about half an inch deep. In heavy soils there is sometimes a difficulty in getting small seeds to vegetate quickly in ungenial seasons, and in such cases I have found a great advantage in covering seeds in drills, with half an inch of the sifted ashes from the bottoms of heaps, where fruit-tree and other prunings or cuttings and rubbish generally have been burned. When regulating the rubbish-yard it is easy to lay a heap of this kind of material on one side, and there is always a lot of cuttings and other matters in every garden, that are best smothered, if I may so term it; to burn all up to fine ashes is a wasteful method. Commence by making a fire with the sticks and other inflammable matters, and, when well established, gradually place on it Cabbage-stalks, weeds, &c., and, if the sub-soil is of a clayey nature, dry lumps of that may be piled up round and over the heap. Care must, however, be taken not to load it too heavily, or the draught will be stopped, and the fire put out. This not only makes a capital compost for covering seeds, but also for renovating an exhausted soil, or rendering a heavy one more workable. As soon as the young plants are up, run the Dutch hoe through them, and, when two inches high, thin them out to six inches apart, to be ultimately, early in July, thinned further to one foot apart, and the plants so thinned out ought to have all the large leaves cut off and be planted in a warm sheltered corner for late autumn and winter supply, where they may be easily covered up in bad weather. I have always found Parsley transplanted in July, after having most of the leaves cut off, stand the winter better. It is, however, not wise to depend altogether upon the outdoor supply. It is always best, in addition, to have some in reserve under glass, for very severe weather; it may be in pots or boxes, if a whole frame cannot be spared for it. A few roots lifted in September will come in very usefully during severe frost. Another small sowing should be made towards the end of July. This latter sowing will be found especially useful during the following summer, as it will not run to seed so soon as the earlier-sown crops.

E. HOBDAV.

Cauliflower and Broccoli.—These are always in demand, and, happily, either one or the other may be had in season the whole year round—i.e., where anything like proper attention is paid to succession-cropping. For all early crops of Cauliflowers to furnish the summer supply, the soil can scarcely be too rich or highly cultivated; but, for all late crops of Cauliflowers and all Broccoli crops, a great saving of labour with good results may be effected by proceeding as follows:—As the early Peas, Potatoes, &c., are cleared off, do not either dig or fork the ground, as the firmer it is the better. My system, if the weather is very dry, is to draw drills deeply, and to fill them with water until the ground is thoroughly soaked. Then plant immediately; give another good watering, and draw some dusty soil over the portion wetted, in order to prevent evaporation. The advantages of this plan over that of digging the ground first are, that the plants will be rooted and growing in much less time; scarcely any go blind, the growth will be sturdier, and better able to resist extremes of temperature, and the flower will keep far longer in a fit condition for table than in the case of plants treated otherwise, while the labour thus saved can be more profitably employed; and last, but not least, the best roots of choice fruit-trees growing near will not be disturbed.—JAMES GROOM, *Henham Gardens, Suffolk.*

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Seeds and Mice.—To keep seeds from the depredations of mice, mix some pieces of camphor-gum with the seeds. Camphor placed in drawers or trunks will prevent mice from doing them injury.—C.

Protecting Endive.—I have at this moment some hundreds of heads of this useful winter salad plant plunged under sheds and walls keeping admirably, by the simple process of plunging their roots in sawdust and ashes, with a slight sprinkling of powdered charcoal. The tops outside are covered with dry Fern, kept on the plants by small pieces of old rails.—Q.

Red Celery.—I have last year tried Major Clarke's Vanity, Leicester Red, Cole's and Wyatt's Red Celery, against my old friend Williams's Matchless, supplied by Messrs. Barr & Sugden, and find it still the best of them all. I shall this year, unless, perhaps, a row or two for trial, grow only Williams's Matchless.—R. GILBERT, *Burghley.*

THE AMATEUR'S GARDEN.*

HINTS ON HYBRIDISING.

NEW flowers produce an indescribable pleasure, and it is one which anyone with a garden, or even a few pot plants in a window or cool frame, may enjoy. In some parts of Lancashire and the north of England, Auriculas, Tulips, Pansies, Hollyhocks, and other hardy flowers are much grown by working men or artisans, and some of the finest show varieties of these flowers have originated in cottage gardens. Even the colliers in many of the midland districts grow enthusiastic when dilating on the properties of some new florists' flowers which they have raised, while the numerous skilled artisans in towns, such as Coventry or Nottingham, are well known as most excellent cultivators of nearly all kinds of hardy vegetables as well as florists' flowers. In the raising of new varieties, there are a few leading principles which must be borne in mind; for example, species or varieties of the same genus can only be crossed with each other with advantage; and, if possible, always make the best-habited plant the seed-bearing parent. A plant of bad general habit or weak constitution often bears a richly-coloured or finely-formed flower, and by crossing this with another variety, perhaps possessing poor flowers but a robust constitution, an improvement on both parents may be looked for among the seedlings. The operation of crossing, or, more properly speaking, fertilising, one flower with another, is simple enough, all that is required, as a rule, being two parent plants in such a condition as to enable the operator to convey the pollen of one flower, or

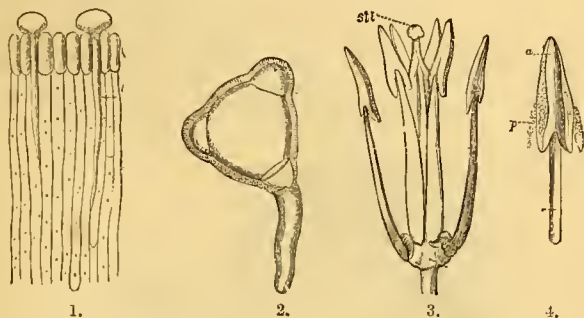


Fig. 1. Portion of the style and stigma magnified, showing pollen tubes forcing their way down the style. 2. Pollen grain magnified, emitting tube. 3. Stamens and stigma of Wallflower, magnified. 4. Magnified anther of same, showing the pollen grains at *p*.

variety, to the tip of the style or stigma of the other. This operation can be effected readily by means of a moist camel-hair brush or pencil. Some plants cannot be fertilised with pollen from their own flowers; but there are others that are much too susceptible of fertilisation, and this often puzzles amateurs, who imagine that they have crossed flowers with the pollen of another form, when the same have been fertilised with their own pollen days before, and, consequently, the result is disappointing. In order to prevent this, it is well to clip off the anthers or little cases that contain the pollen of the seed-bearing plant directly the flowers expand, taking care not to cut or bruise the stigma when so doing. For the latter process, a pair of small sharp-pointed scissors is the best. The action of the pollen on the stigma is very singular and interesting, and is well illustrated in our engravings. The pollen grains, soon after being placed on the glutinous apex of the style, throw out slender tubes, which pass down the loose cellular tissue of the style until they reach the embryo ovules, or seeds, contained in the ovary or seed-vessel below. Having reached these, and fertilised them by emitting the fluid contents of the pollen grain above, their use ceases, and they soon become dried up, together with the superfluous end of the style, while the young seeds, or such of them as have come in contact with the pollen tubes begin to swell and ripen. In some cases only one or two out of the twenty or thirty embryo seeds in each seed-vessel become fertilised and swell off, while the others come to nothing. A

very little practical experience will enable any one to fertilise and raise seedlings from their favourite flowers, while researches in this way may lead to valuable results. Comparatively few horticulturists have as yet devoted themselves to hybridisation, and yet the results obtained are very remarkable. We have only to look at the new Peas of Laxton or Dr. McLean, the Orchids of Dominy, or the many beautiful varieties of Cyclamen, Pelargonium, Gladioli, Asters, and other florists' flowers now common in our gardens, in order to fully recognise the beneficial results which are to be obtained by studying and working out this subject as far as means will permit. To be able to render a flower more beautiful, or to enhance the excellence, or ameliorate the flavour of a new fruit or vegetable, is something worth attempting, as such a result not only benefits its producer, but is the means of handing down to posterity a great and lasting good. J. W.

FERNS FOR A COOL HOUSE.

SURELY your Manchester correspondent (see p. 66) must have been led into some mistake when he recommends the hardy *Osmunda regalis*, *Filix-femina*, *Onoclea sensibilis*, *Polypodium cambricum*, *Scolopendrium vulgare*, or even the grand *Cyrtomium falcatum*, to be grown in a heat in which *Dendrobium nobile* can exist. I venture to add the names of a few Ferns that appear to me more worthy of culture in heat, all of which ought to thrive in the house described by "R. H.," viz., *Adiantum assimile*, *A. concinnum*, *A. concinnum latum*, *A. chilense*, *A. cuneatum*, *A. rubellum*, *A. pedatum*, *A. tenerum*, *A. trapeziforme*, *A. macrophyllum*, *Asplenium marinum*, *A. viviparum*, *Cheilanthes elegans*, *C. hirta*, *Lygodium scandens*, *Pteris tricolor*. Several of the hardier *Davallias* and some of the *Todeas* would also thrive, with many others whose names do not at the moment occur to me. W. C. M.

WORK FOR THE WEEK.

PRIVATE GARDENS.

Conservatories.—Arrange fine-leaved plants, such as greenhouse *Dracenas*, *Yuccas*, *Beaucarneas*, *Grevilleas*, *Tree-Ferns*, and other foliage and flowering ones together effectively and harmoniously. Remove plants done flowering, and introduce a fresh supply from the forcing pit. Give a little weak manure-water to *Cyclamens*. Keep late ones close to the glass in frames free from drip, and sow some seeds of *Cyclamens* in an intermediate house, if not previously done. Prick off October and November sowings into pots, or pans, filled with light soil, putting several plants in each, and allowing them to remain there until their leaves meet one another, when they should be potted singly into 60-sized pots. Sow also a few seeds of *East Lothian Stock*; keep autumn-potted Stocks in cold frames, and pot off a few of them singly. Pot any *Calceolarias* or *Cinerarias* that may require it, using a rich compost for them, and keep them rather close for a short time, but they should always be in cool houses or pits, and near the glass. Prune a few more pot *Roses*, and place them in a forcing house or early *Peach-house* to induce them to come into bloom. In early *Fig-houses*, or other fruit-houses, not too much shaded, many flowering plants may be brought into bloom, either for conservatory decorations or for cut flowers. *Rhododendrons*, *Roses*, *Callas*, *Tree-Carnations*, *Heliotropes*, *Mignonette*, *Lily of the Valley*, *Tulips*, *Hyacinths*, *Narcissi*, *Kalmias*, *Jasmines*, *Weigelas*, *Prunus sinensis*, *Lilacs*, *Ghent and Indian Azaleas*, *Camellias*, *Fuchsias*, *Hippastrums*, *Hæmanthus*, *Violets*, *Pelargoniums*, and several other plants might be brought to the flowering stage in early fruit-houses, and afterwards removed to the greenhouse. Such as are soft-wooded should be kept as near the glass as possible, and hard-wooded deciduous plants should be placed by themselves, so that they can be freely syringed. *Violets*, if planted out in frames on a bottom-heat, afford more flowers than under any other circumstances. Proceed with the staking and tying of specimen hard-wooded plants, such as *Boronias*, *Croweas*, &c. Keep Heaths in the freest ventilated portion of conservatories, water them moderately, and neatly stake them. Remove plants of *Solanum Capsicastrum* when the berries begin to drop, or shrivel, and save a few of the best berries for seed. Remove all damping or decaying leaves, and use every means at command for keeping down insects. The old plants, too, may be saved for next year's blooming, by placing them under the stages, or in frames, keeping them moderately dry for a time, then pruning them back pretty closely, and planting them outside in a rich border in May,

* This department is written exclusively by amateurs distinguished for skill in various branches of gardening.

when they are permitted to grow, flower, and form their berries, and are then lifted, potted, and introduced into the frames or greenhouses. A few of the earliest-rested plants of Fuchsias, and Lemon-scented Verbenas may be pruned a little, and started in a genial warm temperature; just give the others enough water to keep the soil from being dust-dry. A few plants of *Lilium auratum* may now be brought into an intermediate house to start; great care being taken in watering, until the shoots have emerged some inches from the soil.

Stoves.—*Allamandas*, *Bougainvilleas*, and *Clerodendrons* (climbing ones) should be cut back at once if not already done, and re-potted very firmly as soon as convenient, using good loamy soil, enriched with a little decayed manure, but not encouraged to make growth. Keep the soil pretty dry, even after potting, insert the principal stakes, and preserve the young growths from getting broken. Plants of *Poinsettias* and *Euphorbia jacquiniæflora* done blooming should be stored away on back shelves, under the stages, or in any other place where they can be kept dry in an intermediate house or the coolest end of the stove. *Aphelandras* done flowering may be treated in the same way, and those coming into bloom should have plenty of water, and a position near the glass. Do not allow any young plants to suffer from want of root room, but give them a shift as soon as they require it. Of stove bulbous plants at rest, start a few into growth, for early use, but it is too soon yet to start the general stock of these. A few *Amaryllises* should be introduced into a moist brisk temperature, to encourage them to bloom early. Attend to the eradication of all winter pests, and to the staking and tying up various sorts of plants.

Orchids.—From amongst these the warmest nooks in our conservatories are being supplied with their most showy flowers. *Oncidiums*, *Odontoglossums*, and *Cælogynes* are in great beauty, and these, together with *Phalenopsis*, furnish masses of white flowers, orange and crimson and allied colours being furnished by *Masdevallias*, *Adas*, *Sophrontis*, *Epidendrums*, *Barkerias*, &c., whilst *Cattleyas*, *Vandas*, *Saccolabiums*, *Lælias*, *Dendrobiums*, *Phajns*, *Restrepias*, &c., afford an immense variety of both colour and form. Prepare materials for a general potting next month and the succeeding one. Begin to pot, as soon as practicable, *Odontoglossums*, *Miltonias*, *Masdevallias*, &c., and those not requiring this at present should be top-dressed. Any bulbous *Calanthes*—those of the *vestita* section—not yet placed at rest, should be laid on their sides and kept dry. As soon as any appearance of growth presents itself in the earliest rested plants, re-pot them, and place them under growing conditions. Give the terrestrial *Calanthes* plenty of water when they require it, and if they are in vigorous condition a little weak manure-water will be very beneficial to them. *Dendrobium nobile* being now, as a rule, well set with flower-buds, may be forwarded by introducing some plants of them into a brisk temperature, and others may be retarded by keeping in rather a cool house or pit. Attend to the destruction of all kinds of insects, as their numbers can be more easily and conveniently reduced than later on in the season. Scale, green fly, thrips, ants, mealy bug, red spider, woodlice, and wire-worms require attention. Keep *Pleiones* in a nice growing state; any of the varieties that have not finished blooming should be re-potted as soon as their last flowers are past. Maintain a moderately moist atmosphere in all the Orchid houses, otherwise *Phalenopsis* and other long aerial-rooted species will suffer.

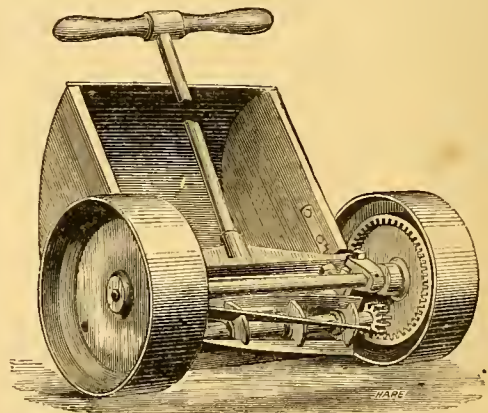
Hot-beds.—Prepare materials at once, consisting of cleanly-collected leaves, and rank, but well-moistened, stable litter, for the construction of these. In making a hot-bed, have a good wide foundation marked by inserting some strong stakes in the corners, for by these stakes the plumb, and height of the beds, too, can be determined. The foundation should consist of a layer of brush-wood, over which *Asparagns*, *Bean*, and *Pea haulm* should be placed, and fermenting material firmly built over that, being careful to make it firm by beating with the fork in preference to much trampling, and leaving sufficient space on either side of the frames for the convenience of linings. One made immediately of equal parts of stable litter and leaves will be found useful for starting a few early *Gloxinias*, *Caladiums*, *Achimenes*, and roots of *Lilium auratum*; also for cuttings of different kinds; and it will afterwards be useful for the raising of various kinds of seeds. Throw into a heap a mixture of two or three parts of leaves and one of litter, and turn it once or twice, applying some manure-water if dry; the material may also be used for another bed in February. Besides hot-beds necessary for bringing plants into flower, several are required for vegetable forcing, especially where there are few hot-water-heated structures. In April and the two following months, these beds will be useful for soft-wooded greenhouse plants, such as *Balsams*, *Cockscombs*, some annuals, and various odds and ends. In others, *Cucumbers*, *Chillies*, &c., may be grown; and those not required can be removed and used as manure, or turned for forming a compost for the potting bench. Their size must be in proportion to the amount and continuity of

heat they are required to produce. If for starting stove-plants on, they may be built as high as 5 feet, but if for growing *Potatoes*, *Carrots*, *Radishes*, and other vegetables, 3 feet will be found sufficient. They sink considerably after being built, and, when the heat begins to fail, the best way of recruiting it is by adding fresh linings around the frames.

Flower Garden.—In warm situations *Violets*, *Daisies*, *Pansies*, *Snowdrops*, *Wallflowers*, *Aubrietias*, and *Primulas* have been tempted to expand, and to these may be added the *Chimonanthus fragrans*, *Jasminum nudiflorum*, *Christmas Roses*, *Cydonia japonica*, *Arbutus*, *Winter Aconites*, *Berberis Darwinii* and *Aquifolium*, *Arabis*, and a few other miscellaneous plants. As a rule, however, flower-gardens are not over attractive at this time of the year; therefore the lawns should be kept clean and well rolled, the walks swept, and the shrubbery borders and similar surroundings attended to, especially as regards the removal of withered leaves. Prune, train, and tie up all plants growing against walls and pillars. If bulbous plants are so far forward as to be injured by frost, should it come, top-dress the beds with leaves, ashes, cocoa-nut fibre, or other material of that kind. Transplant trees and shrubs, repair and make walks, renovate rockeries, if necessary, re-lay turf, and energetically proceed with all operations that tend to forward spring work. Where flower-beds have to be altered in pattern, attention should be paid to them in that respect at once. *Ivies*, *Periwinkles*, and *St. John's Wort* may now be transplanted in shady borders and under trees. Keep the crowns of *Funkias*, *Cannas*, and *Dahlias* in the ground protected with leaves or litter, and examine occasionally such as are indoors, picking out all decaying portions, and rubbing over the incisions with powdered charcoal.

A NEW LAWN-MOWER.

UNDER the title of the "Royal Guinea Lawn-mower," Messrs. Green, of Leeds, have brought out a new lawn-



New Lawn-Mower.

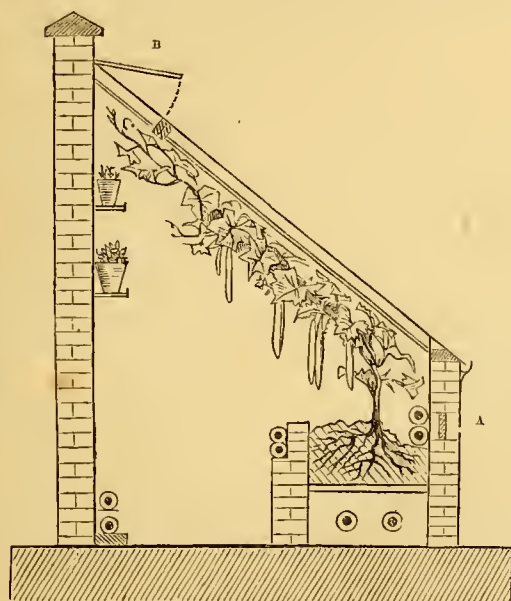
mower, of the appearance of which the annexed illustration gives a good idea. It is stated by Messrs. Green to possess the following advantages. 1. It consists of a smaller number of parts than any other lawn-mower; the frame-work is cast all in one piece, and, therefore, is not liable to be twisted, or by any means to get out of order. 2. The cutters are set in the cylinder, without wedging or wiring; and yet they are so firmly fixed that they cannot be shaken, or in any way become loose. 3. The fixings or caps of the cylinder are fitted together by two bolts and two screws only, and the cylinder itself can be adjusted or removed by the most inexperienced person in two or three minutes. 4. The motive-power is given by the travelling wheels, into which a pinion, fixed on the end of the cylinder shaft, is geared, giving revolving motion to the cutters; and it will cut either short, long, wet, or dry Grass, Peat, &c. 5. The Grass-box is fixed behind the cutters, so that the machine will cut Grass close up to trees, seats, walls, and underneath shrubs, without the box having to be removed. 6. It is eminently adapted for banks, slopes, flats, &c. 7. The handle of the machine will suit the height of the person using it at any angle. 8. From the fact that the royal guinea lawn-mower is of such simple construction, the manufacturers are enabled to offer it to the public at a price within the reach of everybody requiring a lawn-mower.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

WINTER AND SPRING CUCUMBER GROWING.

The accompanying section represents one of the best forms of house for growing Cucumbers or Melons during the winter and spring. It is 7 feet wide, 10 feet high at the back, and 4 feet at the front. A house of these dimensions gives an ample roof area, or training surface, for either Cucumbers or Melons. Three rows of pipes are shown in the plan, and this quantity, though it may appear large, will not be found too much in severe winters, for it takes a large amount of heating surface to keep up high temperatures at such times, without making the pipes hotter than they ought to be. Each row of pipes should be furnished with a stop valve, and in mild weather the front row may be turned off, as, being nearest to the plants, it is more likely to cause injury than the others, should the pipes get too hot at any time. The ventilation is effected as shown at A and B in the plan. The early Cucumber



Section of Cucumber-house.

and Melon-house here is built on the above plan, and is about 35 feet long. From this house we cut a large quantity of Melons in summer, and Cucumbers in winter. Indeed, I would not desire a better structure for such purposes.

Culture of Winter and Spring Cucumbers.

Though the house is used chiefly for early crops of Melons, the successive crops being grown in frames, still we keep the early plants going on all the summer, getting supplementary second and third crops of them; but by the middle of August, or the beginning of September, we get one division cleared and sow Cucumbers—perhaps a dozen good seeds, in a 6-inch pot, of Wilson's Prolific, the old Syon House, or others of that class. Long or large Cucumbers are very good for exhibition, but, for supplying an establishment, short fruits, which are produced in quantity, are in every way the best. Economy is an important object with winter crops, and I have long since discovered that moderate-sized Cucumbers go furthest in the pantry. The seed-pot is plunged in a bottom-heat of 75°; a higher temperature is not necessary, and an atmospheric temperature of 70° by night, and from 75° to 85° by day, according to the weather, is given from the time the plants are sown, till they are thrown out, when they are done. Sometimes, when our boilers are hard pushed, these figures cannot always be sustained, but we do not like to see the top-heat below 65°, even in the coldest nights, at least, not many nights in succession; nor the bottom-heat

below 10°. At the same time the above temperatures should not be exceeded; 85° top-heat should only be allowed on fine sunny days, rather than admit heavy draughts of cold air, but 80° is a good growing temperature, and our winter Cucumbers seldom experience a higher temperature all the winter, and for days together the thermometer is often not above 75°, while the bottom-heat generally ranges between 70° and 75°. I am quite certain that a lower or a higher bottom-heat than this is not attended with any good results. I am describing my own practice exactly, at least, as our Cucumbers have been growing and bearing freely all the winter, and I expect they will go on doing so till May or June. After the seedlings have made their rough leaves, they are potted off into 4-inch pots, burying the stems up to the leaves, and are watered thoroughly with tepid water and restored to their former quarters. While they are getting established in the pots, the bed is prepared for planting in the following manner. Bottom-heat being furnished from pipes, which are only covered with flags, as shown in the plan, a good thick sod is laid in the bottom of the bed (grassy side downward) and above this the soil, about 9 inches or 1 foot deep, which is about the depth of the pit. I am not fastidious about soil, seldom using anything but the refuse of the potting-bench, and such like, as Cucumbers will thrive well in any light rich soil if they get proper attention otherwise. Those who can afford the best materials should use light turfy loam chopped fine and mixed with leaf-mould or decayed hot-bed manure in equal quantities. No better compost than this could be employed. When the bed is ready and warmed to the proper temperature, and before the plants get pot-bound, they are turned carefully out of the pots and planted, 2 feet apart, along the centre of the bed and watered. The after treatment consists in carrying the leaders forward up the wires until the plants are about 3 feet high, when they are stopped. This causes them to send out side-shoots all along the stem, which are also stopped at the second or third joint. These shoots always show fruit, but only one or two are left on each plant at first, and more as the plants get older and stronger. The stopping of the shoots is continued at every second or third joint from the last pinch, and they are also thinned out freely when needful. Crowding of the wood and foliage should always be avoided. The object of planting 2 feet apart at first is only to secure a good crop of Cucumbers early by taking one or two fruits off each plant as soon as possible, but this space is too little ultimately for each plant, and, when it becomes necessary, every alternate plant is removed to give the others more room. Watering must be attended to regularly. The bed should be kept nice and moist, and, when water is given, it should be a thorough soaking till it runs out at the bottom of the bed. Syringing morning and afternoon must also be attended to, and air, more or less, should always be admitted, according to the weather. The roots should also be top-dressed every two or three weeks with a little fresh soil. If these simple directions are carried out, a supply of Cucumbers during winter and spring will not be found a difficult matter. The Cucumber is an easy plant to grow; unlike the Melon, the fruit is not wanted ripe, but only when half swelled, and the secret of the matter is, to keep the plants in a continually growing state.

Diseases.

Mildew not unfrequently attacks the Cucumber, but, when it does, it is generally the result of insufficient ventilation, and too low a temperature. When it does appear, dusting thinly, but evenly, with flowers of sulphur through a piece of muslin cloth is the only cure. Thrips are the most terrible of the insect enemies which attack the Cucumber. For these and also for greenfly, which is sometimes troublesome on the young growths, smoking with tobacco is usually resorted to; but the foliage of the Cucumber is so tender, especially when forced, that smoking, unless done very carefully, is a cure which is often worse than the disease, and one which I never use myself. For these pests, and also for red spider, I apply the "Antidote for Red Spider, Thrips, and Greenfly," by putting a little in the water with which the plants are syringed; and our Cucumbers, which have been subjected to an autumn and winter's hard firing, are at present as green in the foliage as when first planted.

J. SIMPSON.

Wortley.

NOTES OF THE WEEK.

— We understand that the works at Alexandra Park are progressing rapidly, and that the Palace will be opened early in June. The horticultural attractions will be even greater than before the fire took place.

— THE varieties of *Amaryllis* raised from *A. pardina* are likely to form the most useful race of all. They flower very freely, which is not the case with the older and better known forms; and, better still, they flower freely in winter and early spring. There are a good many of them now in flower at Messrs. Henderson's, Wellington Nurseries.

— WE learn that the following hardy plants are now in flower in the open air in Messrs. Backhouse's nursery at York:—*Crocus Sieberi*, *C. Aucheri*, *C. Imperati*, *Muscari pallens* (syn. *botryoides*), *Cyclamen Coum vernum*, *C. Atkinsii*, *Galanthus plicatus*, *Hepatica angulosa*, and its white variety.

— A NEW work by Mr. F. W. Burbidge on "Cool Orchids and How to Grow Them," is announced by Mr. Hardwicke, Piccadilly. It is illustrated by coloured plates and wood engravings, contains plain cultural directions, and is furnished with a copious list, in the shape of an index, of what are termed cool Orchids.

— It is not only the late kinds of Grapes that may be preserved by inserting the shoots in bottles of water, as we have so often described and advocated. The season of choice early Grapes may be much prolonged in the same manner. Mr. Bennett has now a collection of Grapes preserved in this way at Hatfield, and among them Sweetwater, slightly shrivelled now, but, in the opinion of many, improved, instead of deteriorated, in flavour. This is a noteworthy fact.

— THE Cockatoo flower of Madagascar, *Angraecum Ellisii*, is now showing a strong spike, in the collection of Mr. John Day, of Tottenham. We believe there are only two specimens of this beautiful Orchid in this country. The flowers are pure white, and sweetly scented, being borne on a spike 18 inches long. It has tails 6 inches in length, and the flowers, when seen sideways, resembles an Australian parrot, whence its popular name.

— It is said that Grape clusters can be preserved until Easter, as fresh and palatable as when cut, by gathering them in small quantities on clear dry days, removing any decayed berries, fuming them with benzine, and laying them (not in contact, however) between Maize-leaves, in drawers or trays, carefully closed against air and dust. This is an Italian method of preserving Grapes.

— THE fruiterers' shops in Covent Garden and other parts of London are now well supplied with white Almerian Grapes in fine condition. As regards quality, these cannot be compared with fruits of home growth, but they afford a treat to many who otherwise would never have an opportunity of tasting Grapes of any kind. These, and the red Grapes from Lisbon, are imported in boxes and barrels firmly packed in cork-dust, a light, dry, and spongy material well suited for the purpose.

— WE have received, from M. H. Ortgies, the programme of the International Horticultural Exhibition, which will be held at Bremen from the 13th to the 21st of next June. The subjects for exhibition are classed as follows:—Hardy plants; carpet-beds; groups of flowering plants, ornamental arrangements, and cool-house plants; hot-house plants; cut flowers, bouquets, &c.; fruit-trees; Grapes, fresh fruit, and vegetables; preserved fruit, wines, machines, and implements. These are sub-divided into 139 sections, for each of which will be given a silver medal and prizes in money to the total amount of 9,580 marks (about £480). Special prizes of gold medals, silver cups, &c., will also be given by the Emperor, the Empress, and several of the German nobility. Intending exhibitors are requested to write to the office of the International Horticultural Exhibition, at Bremen.

— At a recent meeting of the Metropolitan Board of Works, the chairman announced that he had received a letter from the solicitors of Mr. Albert Grant, enclosing one from that gentleman offering Leicester Square to the board, and through it to the public, as a free gift. Mr. Grant stated that Mr. Gibson had prepared plans for laying out the grounds. A fountain would be placed in the centre, the square would be railed in, and seats provided for 200 persons. At the four corners it was intended to place pedestals, on which would be set busts of Hogarth, Sir Joshua Reynolds, Dr. Johnson, and Sir Isaac Newton—all celebrated persons, whose history was identified with that of the square. Our only regret is that it is part of Mr. Grant's plan to place a fountain in the square, as a fountain, or any other object in the centre of such a piece of ground is sure to destroy any happy effects the designer may otherwise produce. The centre should be an open carpet of turf, like that of the prettiest squares in Paris. Besides the bad effect of placing such an object in the centre, a dripping

fountain in a small square in this dripping climate is a decided mistake. In a sun-burnt region the refreshing splash of water is more agreeable; but we have always noticed that, in the very hottest as well as coldest countries, the best effect in a square is obtained by having an open centre of turf.

— WE are informed that Alfred de Rothschild, Esq., has kindly consented to preside at the thirty-first anniversary festival of the Gardeners' Royal Benevolent Institution, to be held in the ensuing summer.

— GROWERS of winter flowers will now find a brilliant collection of Cyclamens and Chinese Primroses in the Wellington Nurseries, St. John's Wood. Both families are in charming variety, and both show considerable improvement in the way of novelties.

— WE observe that in this month's number of the *Bulletin d'Arboriculture*, the Hon. Marshall P. Wilder appears to be known on the Continent as *Le Maréchal* P. Wilder. He will, no doubt, be much flattered by the imputation of such high military rank.

— THE prettiest *Amaryllis* we remember to have seen is a new species now in flower in Mr. Wm. Bull's nursery at Chelsea. The divisions of the flower are pure white with two distinct carmine stripes in each. It is a most striking flower, is as yet unnamed, and comes from Peru.

— WE learn, from Mr. Anthony Waterer, that the Planes now being planted in Sackville Street, Dublin, are of the Western variety (*Platanus occidentalis*), supplied from the nurseries at Knap Hill. The important task of superintending the planting has been entrusted to Mr. Moore, the editor of the *Gardener's Record*.

— WE understand that there is a project on foot for the construction of an aquarium, winter-garden, Ferneries, and a recreation promenade, upon a large scale, at Margate. The work will be carried out by a limited liability company, the capital being £15,000; and it is expected that, in all probability, it will be commenced early in the spring. The aquarium itself is to be 250 feet by 100 feet.

— WE have just received from Herr Max Leichtlin a neatly printed list of select plants and shrubs now growing in his garden at Baden-Baden. Among them we notice *Galanthus Imperati*, *Talipa Greigi*, *Dianthus alpinus flore pleno*, a climbing species of *Linaria*, and many other rare and fine plants. Herr Max Leichtlin's collection of Lilies is, perhaps, the finest in the world, his list containing no fewer than 106 species and varieties of these plants.

— WE understand that a meeting of gardeners is to be held at 11, Eden Quay, Dublin, on Tuesday next, for the purpose of appointing a board of directors and a secretary for a new society, which is to be called "The Gardeners' Provident and Benevolent Society of Ireland," and is intended, by the subscriptions of its members and the donations of patrons of horticulture, to provide a fund for the support of gardeners in old age, in time of sickness, and when out of employment, and, in the event of death, to defray funeral expenses. There is also to be a loan fund attached to the society.

— THE great improvement admirably begun in Leicester Square, the most neglected spot in London, will, we hope, together with Mr. Albert Grant's example, tend to spread. Lincoln's-inn-Fields is a scandal in another way. The huge houses all round have become offices, and the small park which fills the centre of the vast square is almost a voiceless solitude. Surrounding it is one of the densest populations in the metropolis, and crowds of children play on the pavements and the stones, only casting longing eyes at the few children who, with their nursemaids, are occasionally to be seen taking the air on the green sward under the trees. No residential damage would accrue to the offices all round this vast area if it were thrown open to the public. A large and handsome play-ground might be made there without injury to any one, and with the greatest possible advantage to the hundreds of thousands of people who throng the close streets of central London, in the very midst of which this splendid breathing-place has been so long kept shut up.

— THERE were, in 1873, 216,000 allotments of land in Great Britain, of which 212,000 were in England, 1,700 in Wales, and 2,100 in Scotland. The practice of letting land in small allotments detached from cottages is not so common in Wales and Scotland as in England; and, even in England, allotments are comparatively few in the northern districts. The total extent of land let in garden allotments in Great Britain in 1873 was 59,631 acres, which shows almost exactly an average of one-quarter of an acre for each allotment; and the average for England is the same. The average size of allotments varies, however, in the different English counties. In twenty-four counties, in which there were altogether 122,000 allotments, the average size may be said to vary from one-eighth to one-quarter of an acre. In eighteen counties, in which there were altogether 120,000 allotments, the average size may be said to vary from one-quarter to one-half of an acre. One-eighth of an acre is the quantity of land usually considered as much as can be thoroughly cultivated by an employed labourer in his spare time.

THE GARDEN IN THE HOUSE.

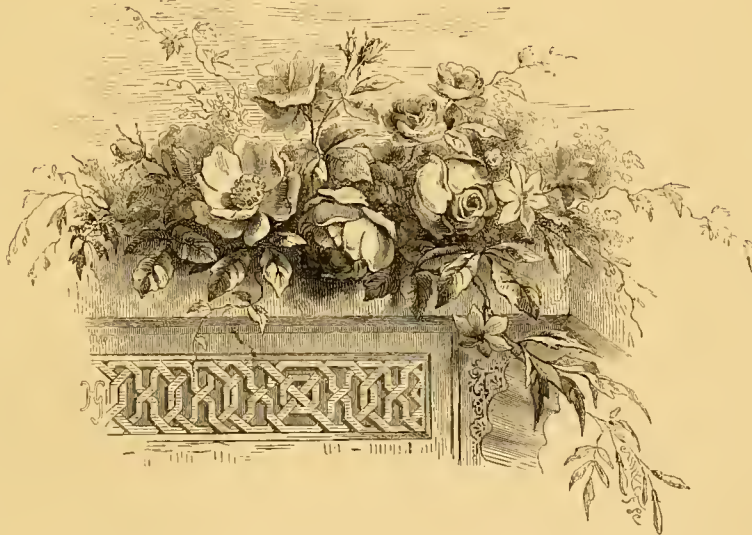
MANTEL-PIECE DECORATION.

THIS forms a very important arrangement in the decoration of the sitting-room, and one to which good attention should be given, as the vases on the mantel-shelf occupy a very prominent position, and, unless they form a good example of floral dressing, are better dispensed with altogether. Specimen glasses, with Everlastings, Rose-buds, Pelargonium blooms, or some other flowers, are seen on every chimney-piece, and, as a matter of course, seem invariably to have a one-sided arrangement, which faces towards the room, all that is reflected in the mirror being the back of the flower or leaf, in place of as good an arrangement as that exhibited in front, and which should be the case. The style of decoration which I shall now explain is for each end of the mantel-piece. The first thing to obtain is the stands in which the flowers are to be arranged, and these may be had of various shapes, but those best suited for this purpose are a pair of common zinc troughs, each about 10 or 12 inches long by 5 inches wide, and $3\frac{1}{2}$ inches deep; painted green on the outside and white in the inside. When about to be filled with flowers, they should be filled with sand to within half an inch of the top; the sand should be then damped, and planted over with common *Selaginella*. If too much water be put on the sand, the flower-stems will not remain firm or upright. It is a good plan to have two pairs of these zinc troughs—one pair in use in the drawing-room, and the other pair, with the *Selaginella* growing in them, in the greenhouse. By this means, as soon as the flowers in the pair in use have faded, that pair of troughs may be removed to the greenhouse, and the other pair introduced therefrom into the drawing-room, and arranged with fresh flowers. The care in the greenhouse will have quite revived the *Selaginella* in the first pair, which will again be quite fresh, and ready to take the place of the other pair when required, and so on. This will be found a good plan for many other kinds of floral decorations, as well as the above, where zinc troughs or trays are employed. Round the edges of the troughs, Fern-fronds should be used and arranged so as to droop over and hide the sides as much as possible. The best kind of Fern for this purpose is the Lady Fern, such as is sold at the florists' shops, in bundles; and, should the fronds be found too long, they can be cut as short as necessary, and the tip-ends used. After the Ferns have been rightly placed, the flowers should next be arranged, using rather large and bold-looking varieties, such as Roses, Lilies, Clematises, &c. These should be placed so as to stand out well, one from the other, avoiding any tendency to their having a crowded appearance. Branches of Fuchsias look very effective mixed through such flowers as those mentioned, and plenty of foliage must also be placed through them. When the flowers have been arranged according to fancy, the troughs should be placed on the mantel-piece, one at each end, and close to the margin of the ledge; then some long sprays of trailing plants should be inserted in the soil and allowed to droop down at each side. Sprays of *Lapageria rosea*, Clematis, Hops, Passion-flower, Tacsonias, and such like, are admirably suited for this purpose. The different kinds of Ivies, too, claim our atten-

tion for this purpose, being very light and graceful, and obtainable at all seasons of the year—a great point in their favour. Those who do not care for troughs of growing *Selaginella*, can use instead a pair of those pretty small china pots sold at the glass shops for standing on brackets and holding cut flowers. I do not mean those similar to what are sold for dropping pot-plants into, as the latter have always a hole at the bottom for drainage; but the pots I refer to are made on purpose to hold water in which to stand flowers, and in them very effective arrangements can be made, in the same way as that described for the troughs, but they can never be made to look as suitable in shape as in the latter, in which way the accompanying illustration is arranged. At nearly every season of the year we have flowers suitable for this style of decoration. In spring, we have Hyacinths, Tulips, Forget-me-nots, Snowdrops, Scillas, Lily of the Valley, Lilacs, &c. In summer, Roses, Pelargoniums, Fuchsias, Water Lilies, and Clematis. In autumn, Japanese Lilies, Roses, *Lapagerias*, and *Pancratium fragrans*. And, in winter, in the market, those who have no glass-houses of their own, can obtain Cape Heaths, *Chrysanthemums*, Arums, Poinsettias, and such like. All the above-mentioned flowers are well adapted for this style of decoration. Specimen-glasses with a few flowers and Ferns look very well on the mantel-piece if dressed all round, but

not to one face. A hand holding a vase in china is a pretty device for a few choice flowers, such as Orchids and Gloxinias; and, as a rule, richly-coloured flowers are best suited for opaque vases, their deep tints being shown to much better advantage on that kind of surface than on any other. A. HASSARD.

Upper Norwood.



Watering Window Flowers.—Most people are fond of growing a few flowers at their windows; but almost every one is puzzled as to the number of times they should be watered in a day. Suppose one purchases a few flowers—say scarlet Tom Thumb Geraniums, Petunias, Heliotropes, Fuchsias, and similar plants, one naturally inquires how often they should

be watered. The answer to this question will be “do not water them till they are dry,” or “till they require it.” The plants are sent home, placed in the window, or wherever they are intended to stand; and, although the drooping points of their branches soon indicate aridity at the roots, the balls of earth are not considered quite dry; therefore, amidst considerable alarm, there is some hope entertained that the safety of the plants will be best ensured by a scrupulous adherence to the directions. Another day is allowed to pass, and the soil at last is as dry as a crust. “Now,” soliloquizes the anxious cultivator, “I surely may water them.” The pots are accordingly charged with water, which the dryness of the soil does not permit to percolate till after some considerable time. The shoots do not regain their firmness, the leaves turn no fresher, and everything testifies, in the most unmistakable manner, that the remedial measure has been withheld till it is “too late.” Undoubtedly it is wrong to keep such plants as those mentioned continually soaking in water by means of saucers, but the soil in which plants grow should never be allowed to get quite dry. The safest condition for such plants is that of moisture, though in winter they require less water than in summer. Ferns, even the deciduous species, I keep moist. Such treatment I have found to ensure success, and if we look at the kinds we have growing in our own country, we find they are moister at the root in winter than in summer. Though the soil in which Ferns are grown, however, should always be kept damp, great attention should be paid to the state of the drainage—K.

GARDEN DESTROYERS.

SCALE ON PLANTS.

THE different species of scale insects that are to be contended with, in both in and out-door gardening, entail a serious amount of labour to keep them down, more especially the brown and white species that infest hot and green-houses. The brown species increases the fastest; but is much easier to kill than the white, which more commonly infests the greenhouse, or plants that are grown in a similar temperature. Brown scale is an insect that will live on many soft-wooded and a still greater number of hard-wooded plants. Even a poisonous family, such as the Euphorbiaceæ, are subject to them; but, on plants of this description, they do not increase so fast, and are so much smaller that they might be easily mistaken for a different species. In the stove, they require unremitted attention to keep them from doing serious mischief. Crotons and Allamandas are the only plants here which I have found exempt from their attacks. Ixoras, Dipladenias, Francisceas, Combretums, Rondeletias, Stephanotis, Euphorbias, Gardenias, Tabernæmontanas, and plants of similar description, possessing foliage sufficiently hard to withstand dressing with Stevenson's "Abyssinian Mixture," or Fowler's "Insecticide," at 4 oz. or 5 oz. to the gallon, should be washed with one or other of these mixtures as often as they require it—laying the plants down on their side over the trough. In the case of small plants, the use of sponge and brush may suffice; but, when the plants get large, it takes too much time to clear them in this way. These washings should be repeated as often as required, not allowing them to remain undisturbed until the plants are swarming with them, as is sometimes done; but it is in the autumn and winter, when the plants are at rest, that an effort should be made to get the insects destroyed as much as possible. Such plants as *Clerodendron Balfourianum* and *Bougainvilleas*, that when in full leaf and active growth will not bear the application of the mixture sufficiently strong to kill the insects, should receive two or three dressings whilst at rest during the winter: and any plants that are cut down, as *Clerodendron Kämpferi* or *C. fallax* generally are in the winter, should, before they break, receive a dressing of the insecticide, at 6 oz. to the gallon. With Palms, and other large-foliage plants that are attacked by these insects, the safest method is sponging the leaves with clean water, as an application of the insecticide sufficiently strong to kill the insects is almost certain to disfigure the foliage. The insect will live upon Pines, but is comparatively small on these plants, and does not increase so fast, neither does it get so far down into the heart of the plant or into the base of the leaves, as white scale, and it can be kept down by the use of the sponge. Most thin-leaved Orchids, such as *Lycaste Skinneri*, *Phajus*, *Peristerias*, *Houlletias*, *Anguloas*, &c., are subject to brown scale. From these they must be carefully removed with the sponge. On *Vandas*, *Saccolabiums*, and *Aërides*, they do serious harm if left undisturbed, although on these plants they do not get larger than the mussel scale on Apple or Pear trees; on these Orchids they occupy both the upper and under surface of the leaves, quickly turning them yellow, after which they are certain to fall off prematurely, seriously weakening and disfiguring the plants. Exotic Ferns are much infested by them. When the plants are quite at rest, some of the harder-fronded kinds may be washed with Abyssinian mixture; tender-leaved kinds, such as the *Adiantums*, must be cleaned with the sponge; also *Gleichenias*, which are very difficult to keep clean if once they get affected with these insects. Heaths, as well as most hard-wooded greenhouse plants, are subject to them, although here they do not increase so fast; yet, if left undisturbed, they do serious harm by clogging up the pores of the leaves by the sticky excrement they cover them with, to which all the dust which comes in contact adheres, causing the leaves to turn yellow and fall off. With small-leaved plants of this description little can be done with sponge or brush. Washing with Fowler's insecticide at 5 oz. to the gallon in water, when the plants are at rest, is the only remedy I have found effectual; it also removes the dirt from the shoots and leaves. With soft-wooded plants the best remedy is the use of sponge and soft brush, with clean water, as the plant will not bear the use of any insecticide strong enough to kill the insects. *Crinums*,

Vallotas, and *Amaryllis*, affected with it must also be treated with the sponge. With *Camellias*, the insect is mostly on the leaves; these plants will bear washing with the insecticide, 5 oz. to the gallon, as soon as they have done flowering, before they begin to grow; but it is dangerous to use the mixture when the buds are at all prominent, as it frequently causes them to drop. In the case of these and other pot plants, a good deal may be done in the way of preventing the spread of the different species of scale by careful isolation. If plants that are quite free from the insects are never allowed to touch or stand under any that are affected, they will not be attacked. The females being wingless, they cannot get from one plant to another unless the plants touch each other. A frequent source from which the different species of scale spread, is from roof climbers, that are infested, dropping them upon any plants placed under them. Where plants on the roofs of conservatories and other houses are infested with these insects, they should either be removed altogether, or taken down, cut back into the hard-wood, and thoroughly immersed in the washing-trough containing a sufficient quantity of the insecticide (6 oz. to the gallon) to cover the head of the plant, in which it may left for an hour; for brown scale, one dressing in this way will generally be found sufficient. Peaches, both under glass and on the open walls, are sometimes infested with brown scale. As soon as the leaves are off, go over every branch with a brush, and remove the insects, loosing the trees from the trellis or wall, and give them a thorough dressing with sulphur, soot, and clay, made to the consistency of thick paint, to which add 2 oz. of soft-soap to the quart of the above mixture. This should be done as soon as the leaves are off, as, if the flower-buds are too prominent before the dressing is applied, they are liable to drop off.

The White Scale.

White scale does not increase so fast as the brown, neither does it infest so many species of plants; but it is much harder to kill, requiring a stronger application of whatever insecticide is used than most plants will bear. It establishes itself more on the old wood, down at the extreme base of the leaves, under the flower-buds, or in any secure crevice in the plant where it is difficult to clean. It is not so often met with in hard-wooded stove plants; and, if a plant here happens to be infested with it, it should be placed so as not to touch any others, and should be repeatedly gone over with a sponge and stout brush, getting into every crevice in the bark right down to the collar as far as the soil, using "Abyssinian mixture," at from 6 to 8 oz. to the gallon, and brushing the mixture well in after removing every scale perceptible. If the plant can be cut back into the hard wood after it has completed its season's growth, all the better, as the old mature wood is more likely to withstand the application of the mixture at this strength. Orchids are very subject to it; on them there is no safe method except the sponge and brush, getting right down to the bottom of the leaves and to the base of the bulbs, for there is no portion of the plant, roots included, that is above the soil, but where the insect will establish itself. If it is allowed to remain undisturbed until it exists in large numbers in the bottom of the leaves of *Aërides*, *Saccolabiums*, *Vandas*, or *Cattleyas*, it turns them yellow, and they will fall off prematurely. Use the brush dry, and with care, so as not to scratch the leaves, or serious injury will be done; finish with the sponge and clean water. When this insect makes its appearance upon an Orchid, the plant requires to be gone over frequently and very carefully at short intervals, or there is not much chance of thoroughly eradicating the pest. Any insecticide that I have ever seen tried, sufficiently strong to destroy these insects, has either killed the plants outright, or seriously injured them. In the Orchid-house, infested plants should never be placed so as to touch such as are clean. I have never known the insect spread except by actual contact with plants affected. It is upon hard-wooded greenhouse plants, conservatory climbers, *Camellias*, and Heaths that they are most difficult to deal with, consequent upon the leaves and flower-buds of few plants being able to withstand the mixture in a strong enough state to kill the insects. Such things as *Acacias*, *Tacsonias*, *Mandevilla suaveolens*, *Bignonias*, *Hardenbergias*, *Lapagerias*, *Rhynchospermum jasminoides*, *Stau-tonias*, &c., may be cut back in the spring before any growth

commences, and dipped in "Abyssinian mixture," 8 or 10 oz. to the gallon, used at a temperature of 90°, in which allow them to remain for an hour; repeat the dressing in ten days, or at all events before the buds begin to break, or the mixture at this strength will destroy them; and if their first effort at growth after heading down is killed, it will most likely be death to the plant. Camellias are very subject to this insect; there is only one season of the year that it is safe to dress them with the mixture; that is, just when they have completed their growth and are setting their flower-buds. The mixture is ineffectual at less than 6 or 7 oz. to the gallon, and, if used after the plants have flowered, with their wood buds ready to burst, or afterwards while the leaves are tender, serious injury will follow. Just as the plants are setting their buds I have found the best time, as, if deferred until the buds get large, it will cause many to drop off. Previous to syringing with the mixture the whole of the plants should be gone over carefully with a tooth-brush, and as many of the insects as can be seen removed. In the case of very large plants, that cannot be laid down over the trough whilst being syringed, the best method is to apply the mixture with the brush, loosening all the insects as the work proceeds; allow the mixture to dry on, and give a second application in the course of a fortnight. Where Pines are affected with this insect, it gets down into the axils of the leaves, so far as to be almost out of the reach of anything that will either kill or remove it. The best thing that can be done is to burn all affected plants, for it costs more in labour to exterminate the insect than the plants are worth. There is a small black scale, white round the edge, sometimes met with on Orchids, as well as hard-wooded and other plants. Its habits are similar to those of the white scale, and it is equally difficult to kill, requiring to be dealt with in the same manner.

Scale on Fruit Trees.

Apple and Pear trees are subject to the attacks of mussel scale, which if left unmolested ultimately destroys them. The insect spreads slowly, and not without actual contact. Care should be taken in the selection of young trees that they are free from this insect. I have tried dressing with soft-soap and soot, "Gishurst" 8 oz. to the gallon, and numbers of other mixtures, but never found anything effectual except pure train oil. It is necessary to be careful in procuring this oil, as an article is sold under the name which is injurious to the trees. Train oil is, I believe, produced from the seal. Every portion of the trees must be thoroughly painted over with the oil, getting into every crevice. This should be done as soon as the leaves are off, for, if done late in the winter, the blossom-buds will suffer. I had a collection of some fifty trees dressed with the oil, and it was so far effectual as to not require repeating for a dozen years. The trees were over-vigorous, and the dressing checked their growth to something like what root-pruning would have done. They bore splendidly afterwards. It will at once be seen that a dressing of this description is only possible on trained trees of moderate size; with large orchard trees it would be out of the question, for unless the whole surface of the bark is touched with the oil the results will only be partial. Pears on walls require un-nailing, so as to get thoroughly to the back of the trees, brushing the oil in as for the Apples.

T. BAINES.

BLACKBIRDS AS GARDEN DESTROYERS.

UNLESS your correspondent, "Bad Shot," gets all his surrounding and suffering neighbours to join him in a systematic raid upon the blackbirds around, he will find that no individual effort will lessen their number. They are naturally a solitary bird, and breed by hundreds in the most unfrequented and lonely copses, and hedgerows, after the fruit season, return to their lonely haunts. When fishing in autumn, I have seen them by scores along the margin of reedy and unfrequented streams in this county. If it is any consolation to "Bad Shot" to know that he is not alone in his sufferings, I can assure him that I could "a tale unfold" that would make him thankful that his case is no worse. The protection of fruit from birds, in many places in this neighbourhood, is a thing of absolute necessity. This we can accomplish by a little expense and time; but large squares of autumn Peas are not easily protected, and, where this cannot be done, the crop is entirely eaten up by a little sharp-billed bird of the titmouse species. As soon as the pods are about half-filled, they begin their work of destruction, and never leave them until the Peas are cut

down by frost. The little birds referred to are never seen near gardens here during the summer months; but, like the blackbirds, they appear to be drawn to spots where their favourite food exists by a sort of instinct. There is one thing that experience has taught—namely, to cover all fruit before it is ripe. If blackbirds are prevented at the outset from getting a taste of it, they are not likely to cost the gardener so much trouble as they would otherwise do. They are voracious feeders, and it is not surprising to hear that they cleared your correspondent's Currant bushes in so short a space of time as he names. In autumn here, during severe weather, they often fell upon Apple-trees in, as it were, showers, and devoured great quantities of the fruit. They are, however, less destructive now that we grow our Apples upon dwarf trees. No doubt the cause of their rooting up your correspondent's beds is searching for worms, which are their natural food, and they never get tired in looking after it. Last year a neighbour discovered what was, for a time, an effectual scarecrow to blackbirds—namely, a stake, 7 feet long, stuck into the ground at an angle of about 45°; from a string tied to the end of it there was attached an old hat; the string was passed through the centre of the crown, and by this means the hat appeared above the bushes, as if it were placed upon the head of a person amongst them. Every breath of wind stirred it, and for a time it was effectual in scaring off the birds from the fruit.

J. T.

Shawdon, Alnwick.

HAVING suffered from blackbirds last year to a great extent I thinned their numbers in the following way, and I would advise "Bad Shot" (see p. 58) to try my method:—Take some small rat-traps and tie a small piece of Apple or Pear on the plate; the best way of fastening the baits on the plate is to take a large needle and thread and run it through the middle of the piece of Pear, or a Gooseberry, and than tie it round the plate. This prevents the birds from drawing the baits off when pecking at them; a bunch of Currants can be fastened on in the same way, by tying them round the middle of the plate. The traps may be placed on the surface of the ground, under the trees or bushes infested by the birds, and, if they get a little more wary by the beheadings going on, the traps may be sunk a little and covered over with mould. This is the most humane way of destroying blackbirds, for they are invariably caught in the traps by the neck, and killed instantly. In shooting at them, if not killed they are tortured by broken wings or legs, or fly off, with shots in them, to die a lingering death. Last year, in the kitchen-garden here, after all the late Gooseberry and Currant bushes had been netted up, the blackbirds turned their attention to some small standard trees of Doyenné d'Été Pears just ripening. Three of these steel rat-traps were set under one of the bushes baited with small pieces of the Pears, and seven blackbirds were caught in one day, and all by the necks. All through the autumn these traps were used and the blackbirds were considerably thinned, so, as I hope, to keep them under another year. The thrush is another great fruit eater, but it is worthy of its salt, being a great devourer of snails and slugs in the autumn and spring months; it is, likewise, not so daring as the blackbird, and is seldom caught in these steel traps like it. The blackbird will make its raids on all kinds of fruit, even getting under the nets, where a hole can be found, and the ripe Nectarines in the houses are not safe from it, when it finds the lights open.

WILLIAM TILLERY.

Welbeck.

Ants and Fruit Blossoms.—These little pests are often very troublesome and injurious to fruit when ripening in hothouses, and they sometimes do much injury to the blossoms of the earliest Peach and Nectarine trees in hunting for aphides and honey. I have used thick treacle spread on pieces of brown paper to catch them; they get entangled in the mass when sucking it, and their bodies may be swept off the edges at different times till the nest or nests are much thinned of them. They may likewise be poisoned by mixing half-an-ounce of arsenic in some brown sugar, but this is a dangerous remedy, and ought not to be tried unless in locked-up houses. The bodies of little dead birds, if placed in their runs, will entice them to feed on their flesh, when they may be destroyed in myriads by pouring boiling water over them when busy at their feast.—WM. TILLERY, Welbeck.

Earwigs.—These can best be trapped by putting Bean-stalks or small garden-pots, half-filled with Moss, on the top of short stakes. They are nocturnal in their feeding on flowers and fruit, and they retire into these traps in the day-time, when they may be cleared out and destroyed by blowing them into a pan of hot water.—T.

Blackbirds v. Fruit.—In reply to your correspondent, "Bad Shot," I would suggest that, if in the approaching breeding season he could procure a pair of young kites or hawks, and place them in his garden, looking after their wings from time to time, he would drive off the blackbirds, &c. Of course he must feed the kites. A relative of mine tried this plan with great success.—J. L. H. S.

THE FRUIT GARDEN.

GRAFTING FRUIT TREES.

(FRESH CUT *versus* RETARDED SCIONS.)

ABOUT the 22nd of October, 1872, I moved a young Apple tree into the place where I intended it to remain. From a dwarf bush it had been altered into an espalier, and had stood in its old place four years. Its name I know not, but its character resembles that of Cox's Pomona. It was in full leaf when moved to its new quarters, and several weeks elapsed before it shed all its leaves; and, although its removal was not effected without considerable mutilation, or, rather, shortening of the roots, the tree did not appear to suffer, the leaves only turning a little black before they finally fell from it. I took off one of the shoots its entire length, about 2 feet, and stuck it upright in the open ground, at a short distance from the tree; and I watched to see if there would be any difference in the appearance of the two as winter approached. Both, of course, received the same amount of sunshine and cold, and I thought, if the removal was a success, it would be seen in the more healthy state of the foliage on the tree, owing to the supply of nourishment afforded by the roots. The severed shoot, however, appeared to follow the example of its parent, and, by degrees, the leaves disappeared from it in like manner. This shoot remained in the same place till towards the end of March, 1873, when I selected two good Crab stocks; on one I grafted the middle portion of this shoot, on the other, a scion cut from the removed tree. Both scions were of about the same size; both made about the same amount of growth. I could see no difference between that which had been cut off at the time of grafting, and that which had stood up in the open border all the winter. About the same time, I grafted on a Quince stock a shoot taken from a *Beurré de l'Assomption*. It was given me by a neighbour, and its appearance, at the time I received it, was anything but promising. How long it had been severed from its parent I failed to ascertain, but it has made three shoots, each about a foot long, and, I doubt not, will, in time, make a healthy tree. I have two specimens of the *Gratioli* of Jersey, one on a Quince, the other on a Pear-stock, the scions of which were taken from the head of a tree grown in France, but which was broken off on its journey to England, and lay for some time apart in the purchaser's garden. My experience, though somewhat limited, extends over a period of more than thirty years, during which time I have never been able to discover any decided advantage in removing the scions many days before they are attached to their stocks, as is generally recommended; indeed, I was once assured by an old jobbing gardener, that he always found the recently severed scion succeed, while others failed, in his hands. Apples and Pears do not seem to be particular with reference to the time of their insertion, but Plums I have found invariably to fail if the operation of grafting is delayed till the buds begin to show colour. Last year, all but one that I had put on failed, owing, probably, to the buds being too forward; whereas, from one long shoot of an *Imperial Gage* on a former occasion, at an earlier time of the year, I made six portions, rejecting the terminal one, but successfully grafting the others. A matter of more importance, perhaps, than the time for cutting off the scions, and their treatment generally, appears to be the time when the stocks should be headed back. No doubt it is a very safe plan to have this operation performed some weeks before the time for grafting, though here, again, I am unable to trace failure in any instance to having delayed this operation to the moment of joining the scion to the stock. The truth is, Nature is very patient, and not unfrequently interposes to keep alive what the theories of the horticulturists, however correct in principle they may be, would have doomed to destruction. Nevertheless, it may be well for those who intend to graft, to prepare their stocks at once, cutting them back to within an inch, or so, of the place where the grafts are to be inserted. There is no need to tamper with Nature, and it is not unreasonable to suppose that the sudden removal of about nine-tenths of a tree, after the terminal buds have opened, will injuriously affect any scion that, under such circumstances, has been attached to it.

B. S.

PEACHES IN BLOOM IN JANUARY.

AS SOME of our early Peach trees are now in bloom, perhaps a minute description of the way in which we treat them may be of use to some of your readers. It is as follows:—The temperature of the Peach-houses wherein the trees are now in bloom, we have raised from 50° to 55° at night, and it is not allowed to exceed the latter with fire heat, but throughout the day it is permitted to range from 60° to 65° with sun heat. Air is freely admitted on all favourable occasions, in order that the condensed moisture may evaporate, as a great many failures in setting result from the pollen being wet. Syringing is suspended, until the petals begin to fall off, after which time the operation will be carefully resumed twice a day. Although the trees at this stage are not syringed overhead, the house is never allowed to become dry, else an attack of red spider will be inevitable, and the trees and fruit crop impaired in consequence. The paths and borders are sprinkled with tepid water night and morning, and two or three times during the day, should the sun be sufficiently strong to dry the atmosphere. The pipes, too, are sprinkled in the mornings, as the blossoms are greatly refreshed by the fine dew thereby produced. Assuming that the borders have had a liberal supply of rather weak manure-water when the trees were started into growth, they will not, as a rule, require more heavy watering until the fruit has attained the size of Peas, when a limited quantity of pure water will be applied, and which will suffice until the stoning is completed, after which period manure-water in abundance will be given. When the blossoms have fully expanded, a camel-hair brush is used to disperse the pollen, and thus enable the fruit to set; but, as the flowers are not all open at the same time, the operation is repeated two or three times. Some disbud the fruit-buds while the trees are in blossom, others when the petals have fallen off and the fruit is set, and others when the fruit has stoned, the latter practice being the one we adopt, and consider the most commendable in the case of early forced Peaches. The wood-buds are thinned when sufficiently large, and if the bearing wood has been well ripened, the fruit, too, are thinned a little, if thickly set, when well formed; but when the fruit has stoned, it may be done with more safety. Nothing can be more vexing to a gardener than, after he has finished thinning, to find two-thirds of those left fall off, but as opinions differ so much in the performing of this operation, it is best to study the strength and vigour of the plants, and act accordingly. Green fly sometimes make their appearance in the case of neglected trees, when the wood-buds begin to grow, and they should be checked at first sight with syringing and fumigating, but the latter operation ought to be practised when the trees are dry, and when they are not in bloom. The fumigator we use is a very simple and effective one, and consists of a wire sieve inverted; the tobacco or tobacco-paper, after being chopped and teased, is placed in a little heap on the middle of the sieve, and over it is inverted a 10-inch pot with a chip out of the side at the brim. The hole in the bottom of the pot is enlarged a little to admit a piece of a 2-inch drain tile, which is therein inserted, and acts as a vent, causing a suction or draught. The tobacco-paper being fired, a good volume of smoke is produced, and the fumigator can be readily moved about whilst in use, and fed by lifting off the pot and replacing it again. The man in attendance has always a can of water along with him in order to quench any flame, as the hot dry air therefrom is extremely detrimental to all sorts of plants, and it wastes the fumigating material as well.

JAMES MORRISON.

Wotton Gardens, Aylesbury.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Out-door Grapes.—Would you kindly name the best black and white Grapes for out-door purposes?—J. L. H. S. [Black Hamburgh and Esperione, black; Royal Muscadine and Sweetwater, white.]

Gum in Peaches and Nectarines.—I have been filling up vacant spaces in my Peaches and Nectarines by means of herbaceous approach. Can any of your readers inform me what I should do to get rid of the gum which comes at parts where the grafting was done?—H. S.

Apricots as Standards.—I should be much obliged to any of your readers who would inform me if the Apricot perfects its fruit as a standard tree in any part of England, and if so, where. I have heard of good crops being gathered from a tree in Worcestershire.—J.

Wash for Fruit-tree stems.—This is a good time to remove the green mould from the stems of young fruit-trees by the application of strong brine. I find that those done last year do not require any cleaning this. For small trees an old toothbrush is perhaps the best instrument to use.—B. S.

Vines for a Hamburgh House.—Would some of your correspondents kindly furnish me with the names of the best Vines to plant along with black Hamburghs, say three white and three black sorts? There are now so many sorts from which to select, that one is at a loss what to plant. Would the Duke of Buccleuch do for a Hamburgh House?—G. S. D.

Bottoming for Vine-borders.—Will some of your correspondents say whether slates are good things, or not, to use in the way in which they are put (placed on the roof of a house) to keep decomposing soil from mixing with rubbish in a Vine-border? Fungus I object to, because of Fungus, and turves quickly rot. Will the slates answer as well?—G. W.

THE FLOWER GARDEN.

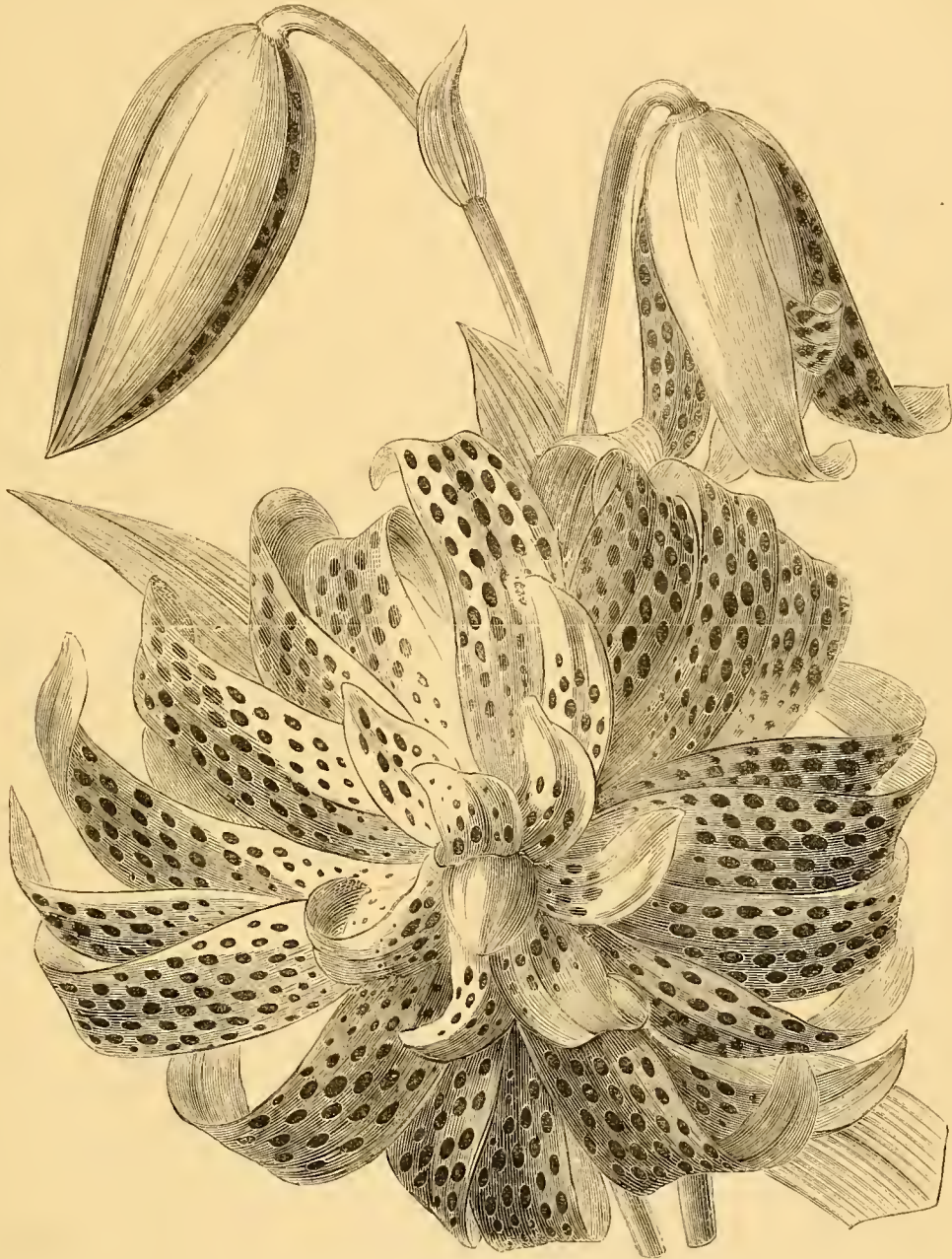
THE DOUBLE TIGER LILY.

OUR old friend the Tiger Lily is a very showy and valuable plant, but it is surpassed in value by the splendid double form which we this week figure. It is, of course, as hardy and as easily grown as the common Tiger Lily, but, being rarer,

plant grows from 3 to 7 feet high, and its fine double flowers are well shown in the accompanying illustration.

PELARGONIUM TRIAL AT CHISWICK IN 1873.

As in former reports regarding the Pelargoniums grown at Chiswick, we have selected those kinds only to which First-class Certificates



Flower of the Double Tiger Lily.

deserves the best attention we can give it in the way of deep and rich soil. As the good plan of placing Lilies here and there among dwarf masses of Rhododendrons is now happily becoming fashionable, this kind will come in as a valuable aid to those already used for that purpose. It should be in every garden. It is one of the many fine Lilies which Mr. William Bull has introduced, and of which he holds a large stock. The

have been awarded, under the direction of the Floral Committee, or at least marks equivalent to that distinction.

PELARGONIUMS AS BEDDING PLANTS.

Golden-variegated Zonals (Golden Tricolors.)

Of the older sorts, Amy Richards, Louisa Smith, and Macbeth proved to be varieties of first-class merit, and to be the three most distinct of the stronger-growing sorts, whilst Florence was the best

in the dwarf group. The following sorts were tried for the first time as bedders :—

BEAUTIFUL FOR EVER.—Bright shining foliage, with broad very bright red zone, and very little green; a very good variety.

COL. LLOYD LINDSAY.—Leaves, flat, rounded; zone, bright rosy-red, of moderate breadth, with even golden margin; moderately vigorous.

COUNTRESS OF ENNISKILLEN.—Leaves, large, in the centre greyish; the zone rosy-red, irregularly vandyked, with broad edge of creamy-yellow; habit, vigorous.

MADONNA.—Leaves, with broad zone of deep bronzy-red, and narrow edge of yellow; bold and good.

ORIENTAL.—Flat foliage, with broad zone of very bright red; a moderate grower, and very effective.

PETER GRIEVE.—Leaves, large, flat, with fiery orange-red zone, and broadish margin of yellow; telling.

PRINCESS LOUISE.—Leaves, large, flat, with a medium edge of yellow, and a broad zone of orange-red; effective.

The above were all contributed by Messrs. E. G. Henderson.

Silver-variegated Zonals (Silver Tricolors).

CIRCASSIAN BEAUTY (Hodgson).—Leaves, small, with very bright pink zone; free and good; covers tolerably well, being of close growth.

FAIR ROSAMOND (E. G. Henderson).—Leaves, well developed and of good colour.

LA SŌ GOWRIE (E. G. Henderson).—Leaves of medium size, rather crumpled, with very broad and bright zone, and creamy-white edge; very effective.

Silver-margined.

Among the older sorts, Albion's Cliffs was considered the best amongst the larger and stronger-growing varieties; and Flower of Spring the best of the dwarf, compact-growing, creamy-edged sorts. Miss Kingsbury and Silver Chain were also noted as varieties of the first order, the former with cerise-scarlet, and the latter with rosy-tinted flowers. The following were grown for the first time :—

GOLDEN BRILLIANTISSIMA (H. Park).—A form of the old Brilliant, of compact growth, with the leaves irregularly edged with yellow and creamy-white; flowers, very freely produced, of a brilliant orange scarlet; remarkable for its mixed gold and silver variegation.

LAURA (Bland).—In the way of Albion's Cliffs, but more erect; strong grower and rather coarse; leaves with brownish-red zone and cream-coloured margin; bears large trusses of pale scarlet flowers.

In this group, White Lady and Waltham Bride, both dwarf sorts, were retained for their white flowers; while the following were discarded :—Alma, Brilliant, Maitre d'Hotel, Mrs. Lennox, Mountain of Snow, Pearl, Princess Alexandra, Snowflake, Variegated Stella.

Golden-leaved.

In this section, the committee decided that both Creed's Seedling and Crystal Palace Gem retained the high character they had already received. The former was subsequently noted as the best of the purely golden-leaved sorts. The Crystal Palace Gem is of spreading habit, and its golden-tinted leaves have a central green patch; it is in the way of Cloth of Gold, but smoother.

Bronze Zonals.

A very useful group for bedding purposes, but amongst the varieties of which there is necessarily great similarity. Among the good sorts of older date, the committee specially approved Maréchal MacMahon and Black Douglas, and Rev. C. C. Peach was noted as of strong and rather coarse habit. The novelties included the following :—

GOLDEN HARRY HIEOVER (E. G. Henderson).—Dwarf spreading habit, with small cupped foliage of a bright greenish-yellow, with narrow dark zone; very free and good; flowers, pale scarlet. This is very distinct in habit from the ordinary Bronze Zonals, being much less vigorous, and altogether of smaller growth.

CROWN PRINCE (Acton).—Leaves, even, bright yellow, with broad bright dark brown zone; small pale scarlet flowers; a favourite with the market florists; habit, neat.

EMPEROR OF BRAZIL (Downie & Co.).—Free grower, of compact habit; leaves, greenish-yellow, with broad dark brown zone and narrow margin; the leaves are inclined to cup.

FRELIGHT (Carter & Co.).—Leaves of moderate size, even, clear yellow, with very broad bright reddish zone, and narrow even edge; habit, very compact; flowers, salmon-colour. A really first-class variety.

MRS. ELLIOTT (Downie & Co.).—Leaves, yellow, with bright bronzy zone.

REINE VICTORIA (E. G. Henderson).—Leaves, large, flat, bright yellow, edge of medium width, and broad bright red-brown zone; the marking bold and effective.

Pink-flowered.

Several new varieties of this section were tried, of which the following were approved :—

AMARANTH (Pearson).—Free habit; leaves, green; flowers, deep

rosy-pink, almost magenta, medium-sized; large trusses on very long stalks.

BELLA (Carter).—Leaves, green; flowers, bright rose-pink, with white blotch on upper petals; very pleasing and effective.

CLEOPATRA (Barrett).—Free spreading habit, and free-flowering; leaves, green; flowers, bright rose pink, self-coloured, on long stalks, abundant.

EVANS'S SEEDLING (Evans).—Dwarf compact habit, with zoned leaves; in the way of Welbeck Nosegay, but of closer and smaller growth; flowers, bright rose-pink, with white blotch on upper petals; very free bloomer, and very bright-looking.

MRS. HALIBURTON (Bland).—Growth, free but compact; leaves, green; flowers, rose-pink, self-coloured; in the way of Christine, but an improvement on that fine old sort.

WELBECK NOSEGAY (Tillery).—Compact free-growing habit; leaves, dark-zoned, slightly cupped; flowers, abundant, large, bright, deep rosy-pink, with white blotch on the upper petals; good.

Scarlet and cerise-flowered, &c.

The following varieties were selected for approbation, namely :—

BEGERE (Downie & Co.).—Habit, vigorous; leaves, with broad and moderately-dark zone; flowers, bright scarlet, in very large trusses; one of the nosegay race.

CHUNDER SEN (E. G. Henderson).—Habit, vigorous; leaves, lobed, with narrow vandyked zone; flowers, very bright orange-scarlet, fine.

DR. LIVINGSTONE (Carter).—Of moderately vigorous habit; leaves, flat, broad, with a medium zone; flowers, very bright scarlet, large, and of fine quality.

DON GIOVANNI (W. Paul).—Of free habit; leaves, with broad, darkish zone; flowers, scarlet with white eye, of fine form and high quality.

FOREST HILL NOSEGAY (Downie & Co.).—A most exquisite variety, of free, dwarfish, compact habit, with the leaves lobed and faintly zonate; flowers, abundant, in large trusses, rosy-salmon, paler down the centre of the petals.

Of other sorts which were considered as meritorious, the following deserve to be particularly mentioned :—Warrior, Punch, Excellent, Vesuvius, Jean Sisley, Lucius, Bayard, Soleil, and Waltham Seedling, all well-known varieties, were regarded as standard sorts of their respective colours and habits.

Marbled-leaved Zonals (Fancy Zonals).

This group, distinguished by the marbled-green of its leaf-blades, and the pale stripings of its stems and flower-stalks, has received an addition of some merit, namely :—

KATE CREED (Creed).—A free-blooming variety of good quality, the leaves marked, in addition to the marbling, with a very dark zone varied in hue, and the flowers being of a light reddish-scarlet.

Ivy-leaved.

About a dozen varieties of this group were bedded out with but partial success. *Peltatum elegans* was very pretty, with deep rosy-lilac flowers of good form. Duke of Edinburgh and Ariosto were the same, or indistinguishable. Argus was of vigorous habit, and had dark-zoned leaves and rose-coloured flowers. Dolly Varden had golden-green leaves, marked with a bronzy zone.

PELARGONIUMS FOR POT CULTURE.

It having been found, after several years' experience, that the Pelargoniums of the salmon-coloured class especially, were not adapted for bedding purposes, while they were known to be exceedingly ornamental as pot plants, the Floral Committee decided last year not to grow them and the allied kinds again in the open beds, but to institute a trial under glass. This was accordingly done, and, with the results indicated below, the whites and the ocellate varieties—those, that is, with pale colours spotted near the centre or eye—being also included in the trial.

Marks of merit were awarded to but one variety, which proved still more beautiful as a pot plant than it had as a bedder, namely :—

FOREST HILL NOSEGAY (Downie & Co.).—Remarkably free in growth, without the least coarseness; leaves, lobed and slightly zonate; flowers, very freely produced in large trusses, of a bright orange-tinted salmon shading off, the centre of the petals being paler, with a bluish flush; very handsome.

The following annotated sorts were selected as the best of the different shades of colour, the notes being made from the plants as grown under glass.

Salmon-coloured and ocellate sorts.

BELLE ESQUINOISE (Fraser).—Very large flowers of fine shape; white, with pink centre; extra good.

DR. NEWHAM (E. G. Henderson).—One of the marbled or fancy

set; habit, spreading; leaves, with pale centre; flowers, abundant, in neat trusses, of good shape, rosy-salmon; good.

EMILY LICAU (Ball).—Leaves, with dark zone; flowers, in compact trusses, neat, deep orange-tinted salmon; good.

EUGENE MEZARD (Veitch).—Leaves, zoned; flowers, in compact moderate-sized trusses, salmon-pink with white eye; good.

GLOIRE DE CORBENY (Fraser).—Leaves, with dark zone; flowers, in long-stalked trusses, bright deep orange-salmon, pale at the edge.

HOGARTH (Ball).—Leaves, zoned; flowers, in close trusses, of a deep orange-salmon colour; good.

HORTENSIA (Fraser).—Leaves, zonate; flowers, very freely produced, in large trusses, delicate pink, with paler centre, not unlike a *Hydrangea* in appearance; good.

LA FONTAINE (Low).—Leaves, zonate; flowers, free, in neat trusses, deep salmon-orange; good.

LE PROPHETE (Fraser).—Of dwarfish habit; the leaves zoned; flowers pink with deep salmon eye; good.

MADAME VAN HOUTTE (F. & A. Smith).—Leaves, zonate; flowers, veiny bluish, with a conspicuous ring of scarlet around the eye; good.

MONS. C. ROUILLARD (E. G. Henderson).—Leaves, zonate; flowers, flat, in neat trusses, finely-shaped, deep salmon with deeper eye.

PRESIDENT THIERS (E. G. Henderson).—Leaves, zonate; flowers, large, in neat trusses, deep orange-salmon; good.

PRINCESS ALICE (Downie & Co.).—Of dwarf neat habit; the leaves zoned; flowers, white with bright scarlet eye; good.

POLLY KING (G. Smith).—Leaves, zonate; flowers, large, in large compact trusses, salmon-pink with white eye.

QUEEN OF BEAUTIES (F. & A. Smith).—Leaves, darkly zonate; flowers large, in large close trusses, bluish with deep salmon centre.

REMUS (W. Paul).—Of neat habit, the leaves zonate; flowers, in fine compact trusses, of excellent shape, white with salmon eye; very good.

RENOWN (Ball).—Leaves, darkly zonate; flowers, in good compact trusses, deep orange-salmon; good, better shaped than *Emily Licaui*.

WILHELMINA WEICK (W. Paul).—Leaves, zonate; flowers, large, in large bold trusses; bluish with pink centre; good.

White-flowered.

MISS COLLINWOOD (Pearson).—One of the marble-leaved or fancy group, and very effective; leaves, zonate; flowers, large, of good form, bluish-white, growing in neat trusses.

PURITY (Ball).—Leaves, zonate; flowers, large, pure white; good.

THE BRIDE (Veitch).—Leaves, zonate; flowers, large and freely produced, of a faint bluish-white; good.

VERGO MARIA (Fraser).—Leaves, zonate; flowers, white; tall-growing.

WHITE CLIPPER (Fraser).—Leaves, zonate, bright green, with faint zone; flowers, large, in good trusses, in the way of *Virgo Maria*, but of better shape, the lower petals being less open; good.

WHITE PRINCESS (E. G. Henderson).—Of dwarf habit, with the leaves zonate; flowers, in neat compact trusses, pure white.

WHITE SWAN (Downie & Co.).—Leaves, zonate; flowers, of good form, on long-stalked trusses, pure white.—*Royal Horticultural Society's Proceedings*.

RAISING BULBOUS PLANTS FROM SEEDS.

By HERR MAX LEICHTLIN, Karlsruhe, Baden.

I NOTICE, at page 55, of THE GARDEN, a query as to the way in which seedlings of Liliaceous plants should be grown, or, rather, what management is required to keep the seed-pans clear of Moss, and ensure germination of such seeds as lie a considerable time in the soil before they germinate. Those experienced in such matters know that the different species of one and the same tribe, or genus, require one and the same time to germinate; this, however, is only a general rule, to which there are some exceptions, more especially in regard to Lilies; but, *Calochorti*, *Amaryllids*, *Gladioli*, and *Erythroniums*, for instance, no matter of what species the seeds may be, will all start to grow about the same time. With respect to Lilies, all the rhizomatous-rooted ones, like *L. superbum*, and *canadense*—in fact, nearly the whole of the American species—take a whole year to show their first seed-leaf. The same holds good with all *Martagons*, with the Indian species, and the speciosum section. *L. Szovitzianum* and *monadelphum*, Caucasian species, form, in from six weeks to two months after having been sown, little bulblets under ground without showing their seed-leaf. Seeds of Liliaceæ, in most cases, are comparatively large, and are not particular as to the depth of soil which is put over them. I, therefore, rather like to sow them somewhat deep, but I always have the soil that is put over them finely sifted,

in order that the first leaf may not find any difficulty in pushing through it, or even through the Moss, if there is any. If, in the course of a year, the Moss on the pans has formed itself into a hard crust, I carefully remove it, giving a little top-dressing of fresh sifted soil, and the seeds begin to germinate soon after this, that is to say, exactly at the time when the parent plants start into fresh growth. *Gladioli*, one and all, dislike having their seeds buried; they must be sown on the surface, and covered only with a little *Sphagnum Moss* finely cut; unless this precaution is taken, they come up sparingly. Of course, old Cocoa-nut refuse, or worn-out tan from a hot-bed, might answer the same purpose, and might even be useful as a preventive against the growth of Moss. If the seeds, as in the case of some kinds of bulbous plants, are large enough, I even like to entirely renew the soil in the seed-pan in which they are sown, taking out the stratum wherein the seeds are imbedded, and washing the soil clear away from them by gentle movements in a sieve under water, so as to loosen and dissolve the soil by degrees into small particles. By thus sifting under water, the seed is left unhurt, a matter of some importance, especially if it has begun to grow. As a rule, the best way is to sow seeds of bulbous plants at once when ripe; but, if maturity takes place late in the year, say in October or November, it is preferable to wait until January before sowing, because, if sown so late in the season, the seedlings do not gain sufficient strength to withstand the winter, but, on the contrary, are apt to perish in dull damp weather. I may add that, with care, seedlings of bulbous plants may be transplanted safely even in the midst of their vegetating period.

Variegated British Ferns.—In the article on variegated Ferns (see p. 52), *Scolopendrium vulgare variegatum* is described as a dwarf variety. You will see from the frond I enclose, which is from one of three distinct variegations of this species I have found myself, that it is of fair proportions. I have another quite large form, but the fronds are not at present in a fit state to send. While on this subject, I may add that I have found five distinct variegations, all constant, of *Polystichum angulare*, and one of *Polystichum aculeatum*; my plant of the latter I believe to be unique. Of *Lastrea Filix-mas*, *Blechnum Spicatum*, and *Pteris aquilina*, I possess variegated varieties. I forward for inspection specimens of *Polystichum aculeatum* and some of the *P. angulare* variegations. I should observe, however, that the colours or markings are much brighter in the young growth than in the ripe state.—J. M., *Hawkechurch, Axminster, Devon*. [The variegations in question are distinct and beautiful, especially those of the common Hart's-tongue.]

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The Fuchsia Trial at Chiswick.—It should be remarked in reference to this trial that the names attached to the varieties, do not denote the names of the raisers, but of the growers who sent them for trial. Of the kinds enumerated (see p. 80), four were raised by us, and one by Mr. Banks, and sent out by us, viz, Crown Prince of Prussia, La Favorite, Wave of Life, Weeping Beauty, and Noblesse.—E. G. HENDERSON & SON.

Yucca Off-sets.—At what time may I cut off-sets from *Yucca gloriosa*? I want to increase my plants of it; but I am afraid of taking them from the parent-stem, not knowing the right season at which this may be done.—J. H. W. T. [Remove your off-sets in March, cut their bases clean with a sharp knife, and insert them firmly in a good yellow loamy soil. Neither sand nor leaf-soil need be mixed with the earth, and they may either be rooted in pots or boxes, in frames, or in the open ground.]

Lilies from Cuttings.—Mr. Barr increases his Lilies in some cases by means of cuttings, made of the tops taken off before flowering. Some taken off last year, and inserted in pots plunged in a gentle bottom-heat in frames, have rooted well and have now formed nice bulbs, about the size of marbles. Lilies may, therefore, now be increased in at least five different ways, viz, by means of bulbs at the roots, scales of the old bulbs, bulbils found on the stems, cuttings, and seeds.—F.

Plants in Bloom.—The following are now in bloom in the open air at Weybridge Heath, viz:—*Cyclamen Atkinsii*, *C. Conn* and its white variety, *C. verum*, *C. ibericum*, *Iberis Gibraltarica*, *Arabis procumbens*, *Aubrieta deltoidea*, *Hepatica angulosa*, *H. single mauve*, *H. single pink*, *H. single blue*; *Primroses* (including *Primula denticulata*), *Lithospermum prostratum*, *Erica carnea* and *Codonoides*, *Daisies*, *Yellow Crocus*, *Erantius byemalis*, *Christmas Roses*, *Colchicum autumnale flore pleno*, *Jasminum nudiflorum*, *Lonicera fragrantissima*, and *Czar and Roman Violets*.—GEORGE F. WILSON, *Heatherbank*.

Argemone hispida.—The Prickly Poppies in common cultivation are of annual duration only. This species is perennial in its native habitat, the dry plains lying between the Mississippi and the Rocky Mountains; but whether it will prove of the same duration in our climate remains to be tested. It is a most showy plant, growing to a height of 23 to 3 feet, with glaucous spiny foliage, and numerous large pure white flowers. It has, however, one defect, that of requiring, like so many other American perennials, to be sown as soon as ripe, otherwise the seed remains dormant some time before vegetating. It will probably prefer sandy soils to such as are of heavy nature.—W. S.

GARDEN STRUCTURES.

MR. LASCELLES'S HOUSE-TOP GARDEN.

MR. CHARLES READE, with his accustomed clearness and vigour, has written a good deal to prove the house-top, as at present arranged, a death-trap; and so it has proved to many. For some time past, an idea has obtained that the garret

storey, now the least attractive, might, without much extra expense, be made the pleasantest in the house. Mr. Read held that the roof itself should be as easy of approach as any other floor in the house, and that, with a flat properly-constructed roof, surrounded by an ornamental railing, the house-top would, in fine weather, prove an agreeable airing place for the household. A step further, and we have the house-top garden, or the house-top conservatory. There can be no doubt that the proper carrying out of this idea, in a variety of ways, would prove one of the most agreeable innovations ever made in gardening. To Mr. Lascelles, the horticultural builder, of Bunhill Row, Finsbury, belongs the credit of first showing us what may be done in this way, even in the heart of London. The roof conservatory forms the roof-storey of Mr. Lascelles's offices; the floor of the conservatory, which is on a level with the bottom of the cornice shown in our illustration, forms also the roof of the storey beneath, is well formed of concrete,

with iron imbedded in it, to secure all the needed strength. Brick beds have been formed round the sides of the house, and these contain earth for Vines, which cover the roof. The surface of these beds forms a convenient standing-place for plants in pots. The house is of wood, bent by the aid of steam, and well, but not expensively, constructed, and the effect from the street is very good. The glass is not bent, although it is so in appearance. With dense shade overhead, a house of this kind would form a Fernery, and, without such shade, fruits that endure a dry

atmosphere might be grown after the orchard-house fashion. Abundance of water would, of course, be required in any case, but this would not lead to much inconvenience, as the ordinary supply to the house could be made available by the cistern being placed on the conservatory floor. The roofs of large public buildings, such as theatres, would afford capital sites for winter gardens on a large scale; water in abundance is required on such roofs, and that is the

chief requirement of the plants. In such cases, the winter-garden would form a new and most attractive feature of the establishment. As regards business houses, a modification of the same plan might be desirable, where very good light was required in the upper storey. Such a pleasant innovation in the city naturally suggests many ways in which a like kind of glasshouse might be made to add to the comfort and elegance of private houses of every class, from those who could afford a

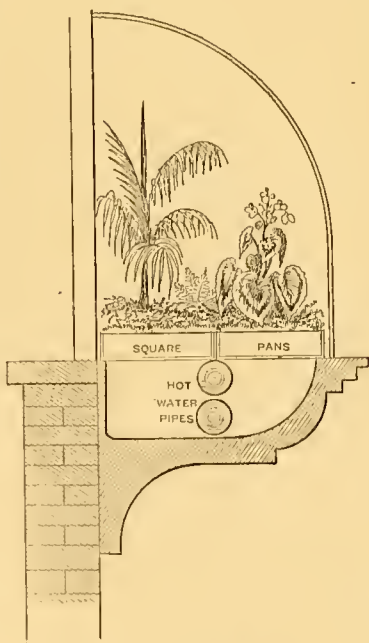
well-furnished winter-garden to those who could only use the upper storey as a playground for children. We are assured that the architectural difficulties (even in the present state of our knowledge of the subject) are surmountable. The ordinary square type of glasshouse would, of course, be unendurable over any handsome house. The fact, however, that Palms, and many other sub-tropical plants suited for decoration, thrive perfectly in a less brilliant light than that of a common greenhouse, would relieve the architect from the necessity of making the roof a glass shed.

If the approaches to the conservatory floor were, as they should be, roomy and convenient, the difficulties of moving the soil, plants, &c., would not be so great, as they might, at first sight, appear. This, however, seems a case to which the principle of "co-operation" might be advantageously applied, and we commend the suggestion, for what it is worth, to the attention of those who are interested in the matter. Suppose, for instance, a builder is about to

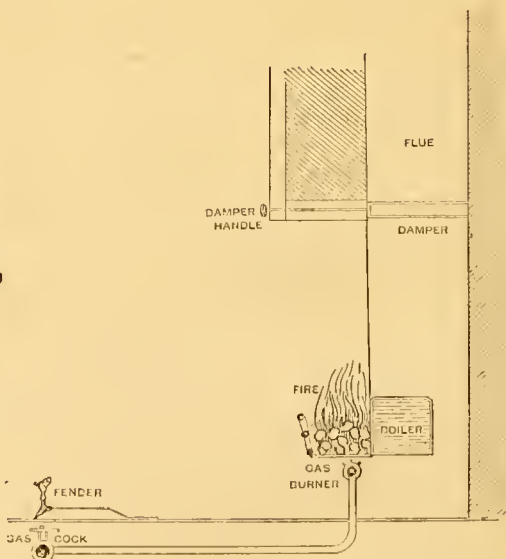
erect a row of a dozen or so of good large houses, each of these might be furnished with its conservatory on the roof communicating with the conservatories of the houses on both sides, so that the whole would form one continuous greenhouse, uniform in height and architecture, and so presenting a much more pleasing appearance, when viewed from the road or street, than if the conservatory of each house was detached and built in a different style. This would form a very fine winter-garden, common to all the inhabitants of the row or block of houses, much



Mr. Lascelles's Office Plant-case.



Section of Office Plant-case.



Mode of Heating Office and Case by Gas.

in the same way, as is at present the case with many London gardens now. One consideration in favour of the house-top conservatory is the facility with which it might be heated; for temperate-clime plants the always ascending heat of the house would suffice. It could be kept in excellent order by one gardener, paid by subscription from each family, who would thus, at a trifling expense, enjoy all the advantages of an extensive first-class

winter-garden on their own premises, as it were. Another point gained would be that, by the use of one common lift (constructed while the houses are building), soil, plants, &c., for the entire row could be raised to the roof, and thus spare each family the trouble and inconvenience of having such things carried up through the house. Some persons, from a desire of complete privacy, might object to this arrangement; but we believe that, considering the many advantages which it possesses, others may be induced to give it a trial, and it is, at least, one deserving of some consideration.

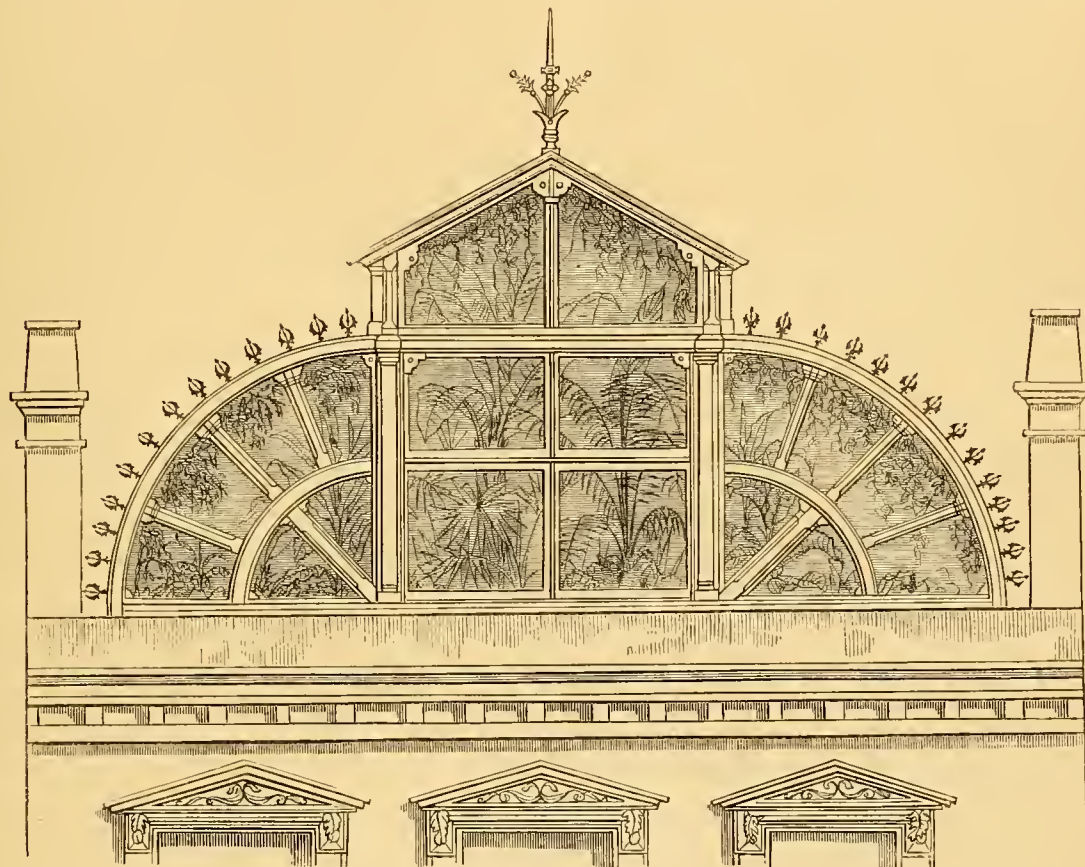
On our visit to the busy establishment, above alluded to, we were particularly struck with a Fernery or plant case which runs the whole length of the front windows, seven in number, and is heated by a small boiler placed behind the fire-place, as shown in the accompanying sketch. From this a 2-inch flow and return pipe is taken through the case, so as to heat it when required. The space around the pipes can be filled with

rarely being necessary except during severe weather. In the example now alluded to, gas is used as the heating agent, and is probably cheapest in the generality of cases. Our first illustration shows a portion of this case as seen from Mr. Lascelles's private office, and was very tastefully arranged at the time of our visit with choice Ferns, Selaginellas, Begonias, Ficus, and other decorative plants, while more recently, we believe, several species of choice Orchids in hanging-baskets have been added.

THE ARBORETUM.

THE OAKS OF AMERICA.

THE one great genus above all others in usefulness is that of the Oak. No other in the flora of the world, perhaps, contains so many valuable species in point of durability, hardihood, rapidity of growth (for the Oaks are rapid growers when once fully established),



Mr. Lascelles's House-top Garden in the City.

bark, or water, if desirable, so as to produce a moist and genial bottom-heat. The Ferns, Mosses, and other decorative plants are arranged in flat square pans of zinc or earthenware, as shown in our sectional sketch, and the effect of the whole, especially when seen from the offices within, is very effective, and affords relief to the eye which would otherwise look out on a dismal prospect of blackened roofs and soot-begrimed chimney-pots. We look on this elegant innovation as a great improvement, and think, with its originator, that, if generally adopted, the appearance and comfort of our dwellings and offices in the town would be considerably enhanced. Everyone who has attempted growing choice plants in cases must have felt the want of having them heated efficiently and at a slight cost. By placing the boiler—a very small one and of simple construction will suffice—behind the ordinary fire-grate, it may be heated at a very slight cost, the only extra expense incurred being the prime cost of the little apparatus required and the fuel necessary to keep up the heat during the night, the latter

freedom from insects and diseases, as well as pecuniary value in the market. Another item to be taken into account is their ready propagation from seeds, thus enabling us to reproduce them in unlimited numbers, at a comparatively trifling cost.

Natural Groups.

The grouping of these trees is generally well defined; so well, indeed, that an acquaintance with a single member of most of the sub-genera, is apt to convey a very accurate impression of the character of all the others belonging to it. The first of these is known as the White Oak group, and is composed of the well-known and valuable White Oak (*Quercus alba*), Post Oak (*Q. obtusiloba*), its dwarf southern form (*var. parvifolia*), Burr or Mossy-cup Oak (*Q. macrocarpa*), its western form (*var. oliviformis*), and the true Over-cup Oak (*Q. lyrata*). The second is called the Chestnut Oak group, and is composed of the Swamp White Oak (*Q. bicolor*), Swamp Chestnut Oak (*Q. prinus*), its variety, the Rock Chestnut Oak (*var. monticola*), the Yellow Chestnut Oak (*var. acuminata*), a southern form (*var. Michauxii*), and the Dwarf Chestnut or Chinquapin Oak (*Q. prinoides*). We next have what might be termed

the Live Oak group, although consisting of but one true southern species and two other well-defined dwarf forms. The Live Oak (*Q. virens*) is considered to be the most valuable of the whole genus, owing to the indestructibility of its timber. The forms alluded to are the Seaside Oak (var. *maritima*) and the Tooth-leaved Oak (var. *dentata*). All of the foregoing are what is termed annual-fruited species—that is, they perfect their Acorns during the autumn of the first year on the wood of the same season. The group which might be termed the Willow Oaks form the first of the biennial-fruited section, or those in which the Acorns arrive at a perfection during the autumn of the second year. This group embraces the Upland Willow Oak (*Q. cinerea*), its dwarf form (var. *pumila*), the true Willow Oak (*Q. Phellos*), its two southern forms (var. *lanrifolia* and var. *arenaria*), the Laurel or Shingle Oak (*Q. imbricaria*), a probable hybrid, Lea's Oak (*Q. Leana*), and another of the same character, most likely a sport from the true Willow Oak, called Bartram's Oak (*Q. heterophylla*). We next arrive at a small group, having thick, leathery, shining leaves, with from three to five lobes. The first is a true southern species, termed the Water Oak (*Q. aquatica*); it has also a form with longer leaves and smaller fruit (var. *hybrida*), the Black Jack Oak (*Q. nigra*); also two western forms called by Dr. Engelmann (var. *tridentata* and var. *quinqueloba*). Lastly, we have the largest group of all—the Black and Red Oaks. Two species belonging to this are classed by themselves, owing to the soft downy character of the underside of the leaves; these are the Bear or Scrub Oak (*Q. ilicifolia*), and the Spanish Oak (*Q. falcata*). With smooth leaves we have the southern Turkey Oak (*Q. Catesbæi*), the Scarlet Oak (*Q. coccinea*); its variety, the well-known Black Oak (var. *tinctoria*); another form, the Gray Oak (var. *ambigua*); the Red Oak (*Q. rubra*), its western form with small fruit (var. *raucinata*), the Pin Oak (*Q. palustris*); and a little shrubby southern species, the Georgia Oak (*Q. Georgiana*), completes the list east of the Mississippi. West of this great division the whole character of our flora appears to undergo a complete change, and the species of Oak bear a resemblance to those belonging to foreign countries.

Useful Species.

First, let us consider those of undoubted hardness, such, for example, as will endure the climate of our northern and western States. Commencing with the well-known White Oak, it seems almost superfluous to attempt a description, so well it is known to every one in the country, even to the schoolboy, who eagerly gathers its nuts in lieu of a more palatable fruit. The timber is of the most durable character, firm and fine-grained; hence it is largely in demand for innumerable uses in the mechanic arts, &c. To the farmer it is invaluable, and enters into all the routine of his daily duties; his fencing material, his implements, his farm-buildings, and indeed, almost every article used in his vocation. In the market, its timber commands a high price, and is always of ready sale. The bark, is, likewise, excellent as an astringent. The Post Oak grows, so slowly, and at best forms only a second-class tree, that I am in doubt about recommending it for cultivation, and yet its fine, close-grained, durable wood is, certainly, no mean incentive to the timber-grower who is looking to the future for fencing material. It is mostly found on high dry soils, but, like many other species, will succeed on the opposite extreme, as has been fully tested. As a general rule, the drier the soil the finer grained and more durable we find the wood. The Chestnut Oak cannot be recommended as furnishing the best quality of timber, although the Rock Chestnut Oak exceeds them all in this respect, possibly on account of its higher and dryer habitat. It is, also, the best species for fuel. The form known as the Swamp Chestnut Oak, grows to a large size, and is well worthy of cultivation. The timber of the Black Oak, Scarlet Oak, and true Spanish Oak, are neither of very excellent quality, but the bark of each are of more or less value for dyes or tanning; and the latter is said to be the best of all Oaks for tanning hides. The Pin Oak ranks next to the White Oak in excellence. It is a rapid grower, makes a firm wood, which is eagerly sought after by mechanics, and thrives satisfactorily either on dry or moist lands. The Gray Oak is a true northern species, being frequently found in high latitudes, which may add an additional value to it for cultivation. The wood is reasonably durable, although not equal to most of the foregoing. The Shingle Oak, as its name implies, is used throughout the west, where it is well-known, for sawing into shingles, although its timber is not of best quality. We now reach a species that is, undoubtedly, the most valuable of the genus; but, unfortunately, it is too tender for the North and West. We allude to the Live Oak of the South. The greatest drawback to its culture is its slowness of growth, hence the exceeding compactness of its wood. It is, also, emphatically a seaside tree, being rarely found many miles from the coast.

Ornamental Species.

For lawn planting, where sufficient space is allowed for perfect

development, and where the surroundings are extensive enough to warrant the use of our largest sized trees, the Oaks are unsurpassed for this purpose. Nothing can surpass the White Oak, view it in any light we will, and although the entire genus are almost unexceptionable for ornamental planting, still, this well-known species must take preference over all others. The Pin Oak will, perhaps, come next, having rapidity of growth, grace of outline, and beauty of foliage, as leading characteristics. The foreign writers on horticulture have pronounced this species to be the finest of the genus, but we prefer the White Oak. The Scarlet Oak has so many excellences to recommend it, that I cannot conceive why it is not more frequently used. The tree is perfection itself, added to which the foliage is always handsome, whether in the green garb of summer, or tinted with its scarlet autumnal hue. Its growth is moderately rapid, and it is well suited for dry locations. The Willow Oak, with its narrow leaves, is at once curious and attractive. It always forms a prominent feature in a collection, and may be classed as one of the most desirable native trees for ornament. The Burr Oak is perhaps more curious than handsome, owing to its corky bark. It forms a medium-sized tree, and should be more extensively used. I have always felt a great partiality to the Black Jack Oak, rough and rugged-looking as it is frequently seen; its large wedge-shaped, shining, dark green leaves, contrast well in a collection. It is a small-sized tree, found mostly on dry sandy situations. Among the Chestnut Oaks, I prefer the Yellow Oak, or as some prefer to call it, the true Chestnut Oak. Its resemblance to the Chestnut tree is strikingly apparent, in fact, to the ordinary observer the two are scarcely distinguishable. It also forms a medium-sized tree, and looks well in a group on the lawn. The Red Oak, in good soil, grows to a large size, and is one of our most conspicuous trees during the autumn months. The deep, almost purplish, crimson hue, makes an effect that cannot well be surpassed. It is at all times, however, a fine tree for ornament, and should receive due regard from planters. Several other species might be mentioned, whose claims entitle them to notice, but the foregoing comprise the best.

Propagation.

All the species are easily grown from seeds, provided we give them sufficient care. Acorns should be gathered as soon as ripe, which is determined by their bold on the tree. If readily shaken off, they must be collected at once, and placed in comparatively dry sand; that is, with a very slight amount of moisture. They germinate easier than almost any of our native trees, and especially in some instances, where I have noticed them sprouting while attached to the limb of the parent tree. When the latter is the case, they must be cautiously dried somewhat before placing in sand. It does not matter about the end of the young root being either shrivelled or decayed, as the fibres will start out fresh from the base of the seed-leaves all right. In the spring, prepare level beds, say about 4 feet wide, and after sowing the seed thinly over the surface, cover slightly with sand, when a few warm days will bring the young plants through. They should be left in these beds for two years, keeping them meanwhile scrupulously clean. The first year they make but little top, but plenty of roots, and afterward the top grows rapidly. The rare forms not propagated from seed may be grown by means of grafting, as the Oak is not difficult to work. Side-grafting is preferred close to the ground, and then the soil is drawn up and pressed around the whole, allowing only the top bud to be uncovered. [The above interesting article is by Mr. J. Hoopes (in the *New York Tribune*). Mr. Hoopes is the author of "The Book of Evergreens," is well acquainted with the trees and shrubs of his country, and an able practical horticulturist, as proved by his extensive and richly-stored nurseries near the pleasant town of West Chester, in Pennsylvania. These nurseries are among the best we saw in America. Such information, coming from one who knows the trees so well, should prove useful to tree-lovers in this country, where these fine trees are too much neglected. We have observed that North American Oaks thrive well both in England and France, and regret that the finer species are not more frequently grouped on lawns and in parks. We should be obliged to any of our readers who would send us the measurements of the largest specimens of American Oaks they know of in this country.]

BEECH BLIGHT.

I OBSERVED in THE GARDEN (see p. 34) a note as to a disease or blight said to have attacked the Beech trees in Westphalia of late, and which is there described. A similar blight or disease showed itself on Beeches in my grounds at Hickleton, near Doncaster, nine or ten years ago. The soil is magnesian limestone. It has appeared on several trees, old and young. In the old trees the bark decays and comes away. One tree, attacked some

years ago, appears to be recovering. Half another very fine tree is dying. Young bark sometimes appears on the edge of the dead wood. Funguses appear on the decaying wood. The young sprigs die. On the younger trees no apparent symptoms of decay have appeared. I have heard of similar symptoms having appeared on the property of a friend of mine, on Beeches, in Yorkshire, growing on chalk. No apparent cause for the disease has been discovered. The notice, to which I have referred, does not suggest any cause or any remedy. I shall, therefore, be grateful for any information as to the supposed cause, or any remedy for the disease. The oldest trees affected may be between one and two hundred years old, the youngest from fifty to sixty.—HALIFAX, *Belgrave Square*.

[On submitting this communication to Mr. Murray, we have received the following reply:—"I have nothing to add to what I have already said regarding this 'blight' in reply to Mr. Monius' inquiry, except, perhaps, to say that as to the amount of injury done by this insect, Lord Halifax's letter contains more information than any that I have hitherto met with. I remember in the year 1861 being consulted by the late Marquis of Salisbury as to the best mode of treatment of some Beech trees of his that were attacked by it (I think at Hatfield). The trees were on one side as white as snow (a block was sent to the Horticultural Society), and, perhaps, the present Marquis or some of his people may remember the trees, and could tell in what state they are now, so as to enable us to follow the progress of the mischief."]

The American Larch.—This was introduced to us early in the eighteenth century; but, even in the present, it is but rarely to be found in any plantation, wood, or forest, in this country. Compared with the European Larch, the American kind is inferior in quality of timber, and is a less beautiful tree; but the common Larch, in its present diseased condition, cannot be depended upon to produce good, sound, and perfectly matured timber, and it can only be profitably cultivated with a view to quick returns in the shape of hop-poles, fencing-rails or pailings, pit-props, railway-sleepers, temporary buildings, or other ordinary rural purposes; therefore, until we can obtain a new and healthy progeny of the European Larch, I would recommend the American Larch as a useful and profitable, though coarse-wooded, tree, for the climate of Great Britain and Ireland. It is equally hardy, and of equally rapid growth, with the common kind, and quite as accommodating as to soil and situation, and would produce equally quick returns in poles, &c.; though, as I have stated, the wood is somewhat coarser. Its cones and foliage are smaller than those of the common Larch, and its branches longer and less regularly disposed. There are several forms or varieties of it, the whole of which are hardy and useful enough in elaborate ornamental planting.—J. N.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Elder v. Flies.—I have heard it stated that common Elder, planted near dairy or larder windows, will prevent the ingress of flies. Will some of your correspondents, therefore, kindly say whether or not that is the case?—W. N.

Picea Parsonsi.—This is, without doubt, one of the most beautiful, if not the most beautiful, of Californian Firs ever introduced. The extraordinary length of the leaves, which are incurved in a peculiar manner, displaying the silvery green of the under surface, the wonderful vigour, rapidity of growth, and beautiful regularity of the branches, which in most cases are arranged in whorls at the end of each year's growth, combine to render it one of the most lovely of its tribe. In hardihood it exceeds many of our indigenous trees, having withstood the frosts of 1860-1-4, and the extraordinary frost of the 1st of June, 1865 (when many Larches in the neighbourhood were completely killed), not one leaf being injured.—W. BARRON, *Borrowash*.

Seedling Araucarias from Scotch-saved seed.—It is worthy of notice, that at Castle Wiff, Wiltshire, two Araucarias, male and female, were plentifully covered with cones in the summers of 1872 and 1873. Mr. Fairgrieve, gardener to Lieut.-Col. Hathorn, having carefully manipulated these, the seeds ripened. He sowed them under glass early in November, and, when I was there on the 10th inst., several strong young plants were showing above ground. I believe I am right in saying that these, if not the first raised from British saved seed, are, at all events, the first from Scotch seed. Will you give your opinion in reference to this point?—SALMONCREE. [We are not aware of any other instance in which Araucarias have been raised from Scotch saved seed; but Messrs. Lane have raised seedlings in abundance from seeds saved from trees in their nursery at Berkhamstead in Hertfordshire.]

The Cherry Plum.—Cuttings of this are struck extensively in the nursery of Messrs. A. N. Baumann & Co. at Bollwiller (Alsace), where they are used as stocks for different kinds of Plums to form dwarf trees, as espallier, cordons, &c., for which purpose this *Prunus* is well adapted, and much used in many large nurseries in France. The treatment they require does not differ in any way from that of other cuttings of deciduous trees; that is, they are cut to about 1 foot long, having at the base an eye or knot, and are inserted in good soil, so that about two or three eyes may be visible above the surface of the ground. As for the time, I would state that we used to cut them, as well as other cuttings, all through the winter; using the wood of plants which had been budded during summer, and had been cut back over the inserted eye. I noticed that the early-made cuttings struck more freely than the later ones, owing to the advantage the former had of becoming callused during the winter.—G. UINIK, *Ealing*.

THE LIBRARY.

THE LITTLE FLOWER SEEKERS.*

This is a very elegantly got-up book. Paper, printing, binding, and illustrations, are all of the best, and the letter-press contents are agreeably written. The illustrations comprise twelve chromographs, representing flowers in their natural colours, and mostly of their actual dimensions. They are copies from originals, in water colours, by W. H. Fitch, W. French, and F. E. Hulme. It is a pretty present for children.

THE AMATEUR'S GREENHOUSE AND CONSERVATORY.†

This is intended mainly for the use of amateur and villa gardeners who possess a greenhouse or conservatory in addition to their little outdoor gardens. It is written in a popular manner, and contains many valuable hints on the erection and heating, as well as on the after management of plain and ornamental conservatories, and moderately cool plant-houses. The different cultural details are set forth in a pleasing manner, each popular greenhouse or florist's flower having, in most cases, a separate little paragraph or chapter to itself. This renders the book handy for occasional reference, and we have but little doubt as to its proving useful to the hundreds of amateurs who

Love a garden and a greenhouse too.

Propagation, suitable soils, and manures, find a place in it, as well as directions for potting, watering, and the other ordinary but needful operations of a garden which are required daily, and by which the amateur gardener is frequently puzzled. There is also a calendar of hints and operations arranged for each separate month of the year, which will doubtless prove acceptable to beginners. The book is illustrated by coloured plates and numerous wood engravings, the latter being very variable both as regards subject and general excellence.

THE PREPARATION AND MOUNTING OF MICROSCOPIC OBJECTS.‡

This useful little volume will be found to contain very full and plain instructions on the subjects of which it treats. It is a matter of no little importance to the investigator with the microscope to be able to prepare and mount his objects properly, as on this very much depends his power of examining them with accuracy and precision. In these matters he will find Mr. Davies's book an excellent guide. As an example of the manner in which the various subjects are treated of, we quote the following extract:—

Somewhat approximating to the forementioned phenomenon [the circulation of the blood in reptiles, fishes, insects, &c.], is the rotation (or cyclosis) of fluid in the cells, or, as it is usually termed, the circulation of the sap, of plants. This is shown in certain vegetable growths as a constant stream of thick fluid, wherein small globules are seen; which stream flows round the individual cells, or up the leaf, turning at the extremity, and down again by a different but parallel channel. There is little or no difficulty in showing this in many plants; but some are, of course, better than others, and require a different treatment; we will, therefore, notice a few of these. Perhaps the best of all is the *Vallisneria spiralis*, which is an aquatic plant, frequently grown in, but not really belonging to, this country. As it somewhat resembles Grass, the leaf is not used in its natural state, but a thin section cut lengthwise with a razor or other sharp instrument; this section, however, is much better when the outer surface has been first removed. It should then be laid upon a slide with a drop or two of water, and covered with a piece of thin glass. Often the cutting of the section seems to be such a shock to the leaf that no motion is visible for awhile, but in a short time the warmth of an ordinary sitting-room will revive it, and with a quarter-inch object-glass the currents will be rendered beautifully distinct. Where the stream is unusually obstinate, the warmth may be slightly increased, but too high a heat destroys the movement altogether. In the summer, any of the leaves shows this

* "The Little Flower Seekers." By Rosa Mulholland. With coloured illustrations. London: Marcus Ward & Co.

† "The Amateur's Greenhouse and Conservatory." By Shirley Hibberd. Pp. 272, illustrated. London: Groombridge & Sons, 5, Paternoster Row.

‡ "The Preparation and Mounting of Microscopic Objects." By Thomas Davies. London: Robert Hardwicke, 192, Piccadilly.

circulation very well; but in the winter the slightly yellow ones are said to be the best.

The *Vallisneria* requires to be cut in sections to show this circulation; but there are many plants of which it is but necessary to take a fragment and lay it upon the slide. The *Anacharis alsinastrium* is one of these; it grows in water, having three leaves round the stem, then a bare portion, again another three leaves, and so on. One of these leaves must be plucked close to the stem, and laid upon a slide with a drop of water. Thin glass should be placed upon it, and along the mid-rib of the leaves the circulation may be seen most beautifully when a good specimen has been chosen, but it requires rather more power than the *Vallisneria*. This plant is very common in many parts of the country, a great number of our ponds and streams being literally choked up by it. In the *Chara vulgaris* and two or three of the *Nitelle*, &c., this phenomenon may also be seen with no preparation except plucking a part from the stem and laying it upon a slide, as with the *Anacharis*. In using the Frog-bit, the outer part of the young leaf-buds must be taken to obtain the best specimens for this purpose, but a section of the stem will also show the circulation, though not so well. The plants before-mentioned are all aquatic, but the same movement of the globules has been observed in several kinds of land plants, as in the hairs upon the leaf-stalks of the common Groundsel; but these do not show it so well, nor are they so easily managed as the preceding.

THE TREASURY OF BOTANY.*

ALTHOUGH botany, as a science *per se*, is not brought forward in our pages, we are always anxious to give prominence to those features which bear upon the horticultural profession. Indeed, while fully admitting that a man may be a first-rate gardener, and yet know nothing of scientific botany, it is in every way desirable that science and practice should go hand in hand as far as possible. The botanist learns much from the gardener, and the gardener need not hesitate to acknowledge a similar debt to the botanist. The work under notice is an admirable example of a book which, while strictly botanical, is nevertheless one which should be on the shelves of every gardener who has a library, however small. We know of no single work which gives so much compendious information as may be found in the "Treasury of Botany;" nor do we know of any scientific publication which is at once so cheap and so thoroughly trustworthy. The horticulturist, who may wish to supplement his practical knowledge with the botanical history of a genus will, in most cases, find a sufficient account of it in this book. In the present edition, a supplement is added of nearly a hundred pages, mainly contributed by Dr. Masters, Mr. Jackson of Kew, Mr. James Britten of the British Museum, and Professor Dyer; and almost every page indicates, by the alterations which occur upon it, a conscientious and successful effort to bring the work up to date. The price of the two volumes, however, remains the same. The work is well illustrated throughout with steel engravings and numerous woodcuts, which add considerably to the value of the descriptions given, and it moreover includes a very complete glossary of botanical terms. One of its most peculiar and useful features is the ample and satisfactory list of the French names of plants, given in alphabetical order, with their English equivalents. We have much pleasure in confidently recommending the "Treasury of Botany" to our readers.

Garden Trespassers and their Punishment in Japan.—

In a long list of new Japanese "Ordinances" directed against minor offences punishable either by fines or imprisonment, we find the following pertaining to gardens and other rural matters, viz.:— "Gathering Sea-weed, or other water plants, on the property of another person, without his permission; stealing Bamboo or Mushrooms out of another man's field; doing damage to any dyke, or beach, excavate in any field or garden, &c., belonging to another; cultivating vegetables by the road-side, or making a dust-heap, thereby causing an obstruction; cutting Grass in a field or meadow belonging to another village or person; cutting, breaking, or otherwise injuring any trees, or plants, in any public or private garden or ground; leading a horse or ox across a garden or other place, thereby destroying plants; causing any obstruction at the places used for drying edible Sea-weed; damaging Bamboos or trees, or gathering fire or brush-wood on another's land; damaging or destroying another person's fence; damaging any trees or plants on any road; allowing one's horse or oxen to trespass and damage any crops or garden; setting fire to any wood, or Grass, &c., on any mountain, plain, or field; throwing stones, tiles, soda, sticks, or any other matter, into any field or garden; picking any flowers or plants that are public property, or breaking or damaging any plants in any public garden."

* "The Treasury of Botany." Second Edition, with Supplement. Longmans & Co. 1874.

THE GARDENS OF ENGLAND.

ALNWICK CASTLE.

THIS fine old baronial residence of the Dukes of Northumberland has features and surroundings peculiar to itself. In approaching it from the railway station, we have to pass through the crooked and irregular streets of the ancient town of Alnwick, in which, on either hand, stand rude erections of the past, not the least conspicuous amongst them being the old gateway through which we pass on entering the town. It is the last remnant of the old wall that enclosed the place when the rude Northmen were more expert at the bow and spear than they were at the plough or pruning-knife. After wending our way along a short and narrow street, we find ourselves very unexpectedly in a large open space right in front of the castle. As we look upon it for the first time, our mind is carried back to a period when our modern ideas of a combination of the arts of architecture and gardening were never dreamed of. As we look upon the time-worn battlements that surround both it and the ancient gateway through which the stout Earl of Northumberland

With fifteen hundred how-men hold, all chosen men of might,
Who knew full well in time of need to ayme their shafts aright,

went forth to kill the fallow deer upon the far-famed Chevy Chase, we experience a feeling of thankfulness that so grand a memorial of the past has been spared to us, and that no attempt has been made to introduce modern innovations, in the shape of flower-beds, upon the green sward that surrounds the castle; and it is with feelings of pleasure that we look down from the battlements upon a landscape every way in keeping with the noble building. Right below, the river Alne (with numerous water-fowls floating upon its surface) winds its way eastward to the sea through a vale rich in the varied beauties of nature. A path from the castle leads down the steep incline to the river side, where it conducts us to what is called "the dairy grounds." A more sylvan or enchanting spot than this is seldom seen, indeed the only place I know to compare with it is the far-famed woods of Hawthornden or Roslin on the River Esk, near Edinburgh. From the "dairy grounds" we cross, by a pretty bridge, to the north side of the stream, a shady walk leading us to the Abbey grounds. The tower and gateway of the building are still standing. At about 200 yards distance the old Abbey mills are still at work, doubtless occupying the very site of the mills that ground the corn of the monks, for many years after the foundation of the Abbey, in the year 1147. The monotonous splash of the ponderous water-wheel and the music made by the water falling over the weir, complete a picture of romantic scenery rarely met with. The Alnwick Horticultural Society have the privilege of holding their annual show on this charming spot; the beautiful haugh or holm that stretches from their tents for half-a-mile up the left bank of the stream, makes a promenade for the numerous visitors that attend this annual gathering which they seemingly enjoy much. Many walks radiate from it that leads to all the objects of interest within the park, amongst the most notable are the fine ruins of Alne Abbey, a tradition exists that it was founded by a crusader who selected this spot as bearing a resemblance to Mount Carmel, the river Alne having a resemblance to the Kishion that runs under Carmel. Another interesting spot to visitors is that where Malcolm, King of Scotland, was slain when besieging Alnwick Castle in the year 1093, a cross marks this interesting spot, and it is with reluctance that we retrace our steps to seek the more modern gardens belonging to the castle, which, like the castle, unexpectedly appear before us in all their autumn glory. We soon see, from the very nature of the locality, that it has taken all the practical skill and ingenuity of the landscape-gardener to make the flower garden what it is. Hedged in on the western and north-western sides by the old town of Alnwick, from which the ground slopes irregularly to the east—where it is enclosed by a Peach-wall, well covered with fine young trees just beginning to bear excellent crops—the broad border along the base of this wall is very striking and effective, when filled, as it has been this season, with choice bedding plants. A large and lofty conservatory divides it into

nearly equal parts, the promenade along the border leads into the conservatory. At either end another noble promenade runs from it right up the whole length of the flower-garden, dividing it into nearly equal portions. Looking from the conservatory, the visitor obtains perhaps the best general view of the flower garden. From its arrangement and situation the flower-beds have to be large to give them effect, and, as the eye runs up the centre walk, which becomes rather steep at the higher end, it is arrested by the pleasing effect produced by a chain of beds filled with evergreens, and arranged in the form of drapery along the face of the steep green terrace that overhangs the garden. Looking down from the higher end of this centre walk, the whole of the flower garden is seen to good effect; and, if the visitor is lucky enough to see it under such circumstances as we happened to do, upon a lovely afternoon in the last week of September, he will carry away a mental photograph not easily effaced. Until Mr. Ingram undertook the management of the gardens here, about six years ago, no attempt had been made, I believe, in the way either of winter or spring flower gardening, nor had sub-tropical plants been used to any extent in the decoration of the flower gardens, and, considering the short time that such plants can be grown in the open air, in the north of England, the result has been, upon the whole, satisfactory, and a new and attractive feature has been added to the flower garden here. The same may be said of the spring garden; indeed, it has been so pleasing and attractive that I believe Mr. Ingram is now devising ways and means to carry out his spring flower gardening upon an extended scale: Violas, Primroses, and all hardy bulbous plants, with a host of other spring flowers that might be named, thrive wonderfully here, and seem to acquire their brightest tints under a northern sky. Either from necessity, caused I presume by local circumstances, or from the idea that fruit and flowers ought to grow together, all the forcing-houses are within the flower garden. They are fine noble houses made of iron, curvilinear in shape, which makes them externally light and pleasing to the eye, and everything has been done to make them harmonise with their surroundings, so that the visitor, who threads his way through them upon an autumn day, will pronounce them not the least pleasing feature of the flower garden. Grapes, Peaches, and Pines, are all grown here to perfection, which will be noticed in a future number. Mr. Ingram began his operations in this department by lifting and renewing the whole of the Vine borders in succession, and the result has been most satisfactory. A seedling Grape raised here was pointed out to me which, I think, possesses points of merit sufficient to recommend it to the approval of a fruit committee. A Fernery and a long span-roofed stove and greenhouse filled to over-flowing, stand just outside the flower garden, and here one can see indications that Mr. Ingram has not forgotten his old favourites in the great number of fine young stove and orchidaceous plants

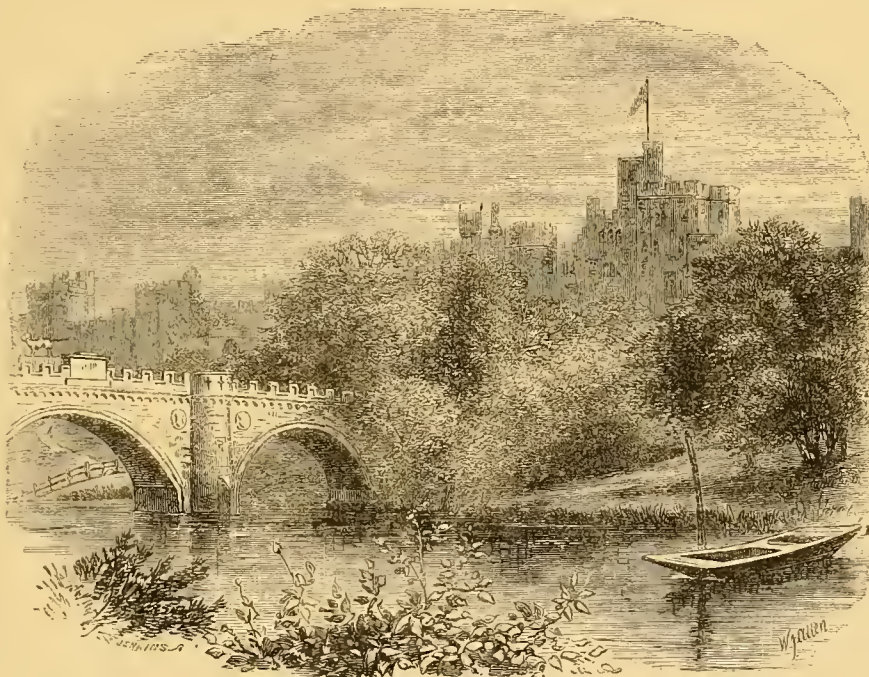
which he cultivates. His Grace the Duke of Northumberland kindly opens his grounds to the public one day in the week, and I can assure any of your readers, who may wish to visit them, that they will find a day spent at Alnwick Castle both pleasing and instructive.

J. T.

NATURAL ROCKERY PRODUCED BY EXCAVATION.

As a garden feature, natural rocks, *in situ*, produce an effect with which no building up of artificial rockwork, however artistically managed, can ever compete. There is a breadth, and simplicity, and grandeur in pure nature, especially as regards masses of rock, that can scarcely be imitated; but those compositions of artificial rockwork which approach natural models most closely are always the most successful. A natural rockery produced by excavation can scarcely compete with one in which masses of rock have assumed their grand natural forms above the surface; but if accidental cleavages are left undisturbed, and massive projections sought for and carefully turned to account, the effect of a rocky valley may be very successfully attained. A very

good example of rockwork, formed by excavation in a rocky soil, is that which has been recently brought to light in the Botanical Garden of Birmingham. I have incidentally mentioned this successful piece of rockwork in a previous article on garden rockwork, but I did not state how extensive it was, nor how successfully it is clothing itself with vegetation of a suitable and picturesque character. The excavation was originally made for the purpose of getting out material for raising some of the lower portions of the gardens, and was subsequently used as a great rubbish-pit. The members of the garden committee



Alnwick Castle from the River Alne.

eventually, and, in fact, quite recently, conceived the idea of converting that portion of the garden, which had been "planted out" as an eyesore, into an attractive feature. The old red sandstone lies at only a few feet below the surface of that part of Warwickshire, so that the entire sides of the excavation are composed of great masses of the natural rock; and as it has remained in a rough and untrimmed state, the main forms are very grand and picturesque; and now, with the foliage of carefully planted trailing plants, drooping tufts of Ferns, and a variety of rock plants made to nestle in snug nooks and along tiny ledges, the general effect begins to be very attractive. Drooping mantles of Ivy and Bramble drape a portion of the more bare and flat surfaces of the vertical rock, while on the more salient projections masses of Foxglove, Verbascum, and some of the finer Thistles have been established with excellent effect; the flooring of the valley being enamelled with Primroses and Violets, which play their parts with their softly contrasted colours in the spring, along with Saxifrages and other early flowers; while summer and autumn furnish an equally attractive and beautiful series of many beautiful kinds of alpine plants.

H. N. H.

THE HOUSEHOLD.

MR. BRIGHT ON INDIAN CORN.

A MERCHANT having addressed a letter to the Right Hon. John Bright, urging the importance of introducing Indian Corn as an article of food for the people of this country, received the following reply:—"Dear Sir,—I duly received your interesting letter of 28th April last, and I have submitted it to Mr. Buckmaster, who has been giving lectures on cookery at South Kensington, and have asked him to consider how far anything can be done on the subject of the use of Indian Corn in this country. Hitherto nothing has been done, and there are difficulties in the way which it will take time to overcome. The greatest difficulty is that which attends all new things—the indisposition of the people to give a favourable, or even an impartial, attention to what is new. The chief hindrance to the use of Indian Corn has always been the want of knowledge as to the various modes of cooking it. I speak now of those who are favourably disposed towards it. There must be men and women in this country who are familiar with this branch of cookery as practised with you, or, if not, it would not be difficult to engage some American man and woman cook who would undertake to instruct in it. I shall probably see Mr. Buckmaster again when I go up to London, and I shall urge him, and those with whom he is associated, to arrange for some provision by which all that is known in the States with respect to Indian Corn may be also known in this country. We have always to import a large portion of our food, and it seems very strange that an article of such great consumption with you should be so very little favoured or known among us. I cannot say more on the subject now, but I will not forget it, or your letter upon it. "JOHN BRIGHT."

[A more important question still is, why do we not use the Indian Corn in a green state, as the Americans and Canadians do? Though we seldom ripen the grain here, in all parts of the southern counties we might grow the "Corn" to the green state with ease. A more delicious vegetable food than "green Corn" we are not acquainted with.]

The Best Way to Cook Chestnuts.—Place the Chestnuts in a saucepan of cold water, and boil till they are soft; then puncture the skin of each with a knife, and toss in a frying-pan till they become dry and mealy.

To Prepare Haricot Beans.—Soak them four-and-twenty hours in luke-warm water, then put them in a saucepan with plenty of water, with a little salt and a piece of butter, lard, or dripping, and simmer gently (not boil) for three hours; strain them, and place them in a Yorkshire-pudding tin under meat, so as to let the gravy drop on to them for a quarter of an hour.

Medlar Jelly.—Take Medlars when they are quite ripe, wash them, and put them in a preserving pan, with as much water as will cover them; let them simmer until they have become a pulp, then strain them through a jelly-bag, and to every pint of liquor add three-quarters of a pound of loaf-sugar, and boil an hour and a half. Or the jelly may be made thus: When the Medlars are quite ripe, bruise them and put them in a large stew-pan, cover with water, and boil half-an-hour, then strain through a flannel bag; to a pint of juice add three-quarters of a pound of lump-sugar, boil the juice three-quarters of an hour, then put in the sugar and boil it twenty-five minutes. Another plan: Put the Medlars in a pan and cover them with water, boil to a pulp, then strain through a cloth, and to every pint of the liquor add one pound of lump sugar, and boil the same as Apple or Currant jelly. When Medlars are scarce, a second supply of water may be added.

NOTES AND QUESTIONS ON THE HOUSEHOLD.

Worcester Sauce.—Can any of your correspondents inform me how I can make a sauce resembling in flavour the Worcester sauce? I have plenty of Shallots.—D.

Preserve Jars.—Fruits and vegetables should never be preserved in tin vessels; the acids attack the solder, and produce soluble lead salts, which are very poisonous. Glass vessels are the best for the purpose.—T. H.

Good Coffee.—To produce this with certainty at all times has long been a desideratum with many. I have tried many ways of extracting the aromatic virtues of the Coffee berry, but never succeeded to my satisfaction so well as with Ash's Kaffeekanne (sold at 315, Oxford Street), and this little contrivance I heartily recommend to lovers of good coffee.—A. F. [We have tried the contrivance and find it invariably successful in the production of good coffee.]

The Potato as a Cleanser.—Dr. Elsner states, according to the *Journal of the Franklin Institute*, that the accidental use in his household of the water which had been employed to boil Potatoes for cleaning silver-ware, led to the unexpected result that this was much superior in its cleansing action to the polishing powder so generally employed. It was found that by simply rubbing the article with the fine deposit of Potato-flour, it took on an excellent polish, without the disagreeable necessity of subsequently using the brush to remove the material, as is necessary where powders are used instead.

THE INDOOR GARDEN.

THE CULTURE OF THE FUCHSIA.

I FIND Fuchsias very useful in the form of small plants in 60 or 32-sized pots for purposes of decoration, but even large plants might be grown in smaller pots than they often are. I need hardly mention that Fuchsias look well planted out and trained to columns, pruned closely like Grape Vines. Another mode of training is what might be termed "bush" fashion, but, in my opinion, a naturally grown pyramid is the best. Beginning with my natural pyramids, I propagate them from cuttings in January or February, and, as soon as they have rooted, pot them off singly into 60-sized pots, keeping them in a temperature of about 60°. At the end of February or beginning of March I re-pot them into 32-sized pots, placing them in a greenhouse having a temperature of about 50° by night, the day temperature greatly depending upon the weather. As solar heat causes the house to get warm, ventilate freely on favourable occasions. I place a stake to each plant, train the centre shoot upright to it, and stop the side shoots equally, so as to form a pyramid. Some varieties branch more than others, and require more stopping. In May the plants are shifted again, and the shoots stopped. If I want to grow large specimens, I keep the blooms picked off until six or seven weeks before the plants are required for exhibition. I also place them out of doors about the first week in June, under a north wall, on a bed of ashes. Syringe them on fine days, morning and evening. Manure-water, such as the drainings of piggeries, cow-houses, and stables, is given to them alternately with pure water without any dilution; but care is taken to guard against its being too strong. If these plants grow as they ought to do, they are between 4 and 5 feet high in September, and proportionate at the base. If they are kept growing without flowering until the next May, by shifting them in October, and placing them in a temperature of 50° to 55° during the winter, they make grand plants.

The central stake is supported by three small copper wires fastened to the top, and tied to a wire under the rim of the pot. The number of specimens to be grown depends upon circumstances. It is advisable to have a succession of young plants annually, so that in two years the old plants may be dispensed with. They are kept in an out-of-the-way place, where frost is excluded, and are potted in February or March, but it is advisable to get them to break before re-potting. After flowering our plants, supposing them to be at their best in June, in August they are removed from the conservatory to a somewhat shady place out of doors, gradually dried off, and pruned some time about the end of the month. As soon as they begin to grow again, they are re-potted in the same pots they occupied, but the pots are only filled to within three inches of the rims, so as to allow for future top-dressing. As soon as frost is apprehended, they are removed into a temperature of about 50° to 55°, for their winter quarters, and syringed, in fine weather, with tepid water, which is also used in watering them. By spring, these plants ought to be 7 to 8 feet high, and resembling in shape a well-grown *Wellingtonia gigantea*. The soil I use consists of equal parts of loam, peat, and leaf-mould, with the addition of some cow-dung and silver sand, used in a roughly-chopped condition, and sometimes enriched with a little bone-dust; I use half-inch bones instead of crocks. The following are a few good varieties that are worth growing, viz., *Triumphans*, good and free; *True Blue*, free; *Father Ignatius*, good, slow-growing, but bushy; *Avalanche*; *Arabella*, very free grower; *Purple Prince*, fine double; *Rose of Castile*, old, but good; *Guiding Star*, *Harry Williams*, and *Woman in White*, which is one of the best double-white sorts for flowering in a small state.

Court Garden, Great Marlow.

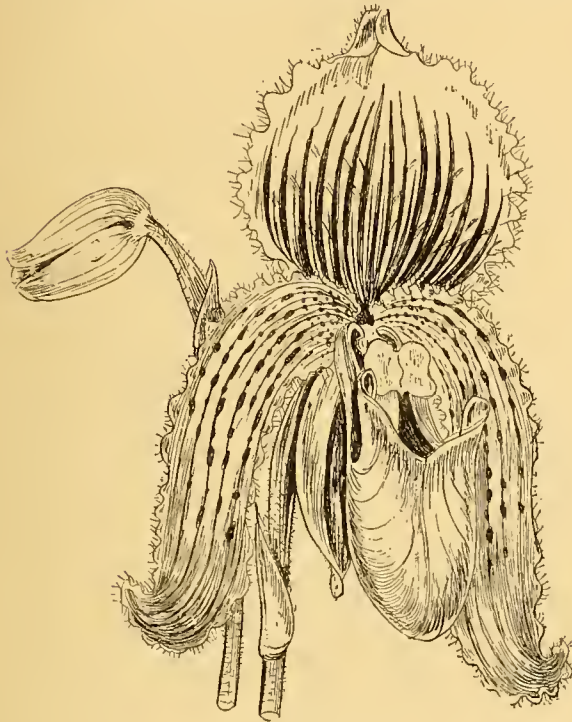
D. GILLET.

THE PEA-FLOWERED LADY'S-SLIPPER.

(*CYPRIPEDIUM VEXILLARIUM*).

THIS pretty hybrid Lady's-Slipper was raised by Mr. Dominy in the Royal Exotic Nursery, Chelsea, where I recently saw it in flower, and took the opportunity of sketching it. It is a cross between *C. Fairieanum*, a beautiful and distinct species already figured in our columns, and the well-known *C. barbatum* from Mount Ophir. In its habit of growth, as well as in the form and colouring of its flowers, it is nearly exactly intermediate between its two parents. The foliage has a tendency to spread out horizontally, as in *C. Fairieanum*, and it resembles that of *C. barbatum* in its dark markings. The peculiarly curved petals remind one of the former species, and the dorsal petal has the form and markings of the latter. It is a curious fact that all the hybrid Lady's-Slippers are inter-

mediate between their parents in form, colour, and general habit—much more so than are the generality of crosses between different species. The top sepal is white at its apex, and heavily streaked with purple at the base, its margins, like those of the petals, being crisped or wavy, and closely set with short dark purplish hairs. The petals are tipped with purple, and streaked and spotted with the same colour towards the base. The slipper-shaped lip is intermediate in size and form between the parents, and is of a bronzy-purple tint with deeper veins. The plant grows freely in Messrs. Veitch's Nursery, and, when more generally distributed, cannot fail to become a favourite. It grows well in fibrous peat and living Sphagnum Moss, planted in a shallow pan thoroughly well drained. Like all its congeners, it requires an abundant supply of water at the root when growing, and likes a sprinkling with a syringe overhead during hot summer weather.



Cypripedium vexillarium.

This treatment does much towards preventing the ravages of thrips and red spider during the heat of the summer months.

F. W. B.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

The Lion's Tail (Leonotis).—I have been interested in Mr. Niven's account of this old-fashioned plant, and shall be obliged if you, or any of your readers, will kindly tell me where to procure it.—J. [We do not know where plants of it may be obtained, but we have raised it from seed supplied by Mr. W. Thompson, of Ipswich.]

Origin of Double Zonal Pelargoniums.—I have to correct an error committed in my letter (see p. 51), on this subject:—National and Signet were raised from seed by Mr. William Bull, of Chelsea, and sold by him in 1867. My notes prove this fact, and it is a slip of the pen that caused the mistake.—JEAN SISLEY, Lyons.

Solandra grandiflora.—A nice specimen of this is now in bloom in Mr. Parker's nursery, at Tooting. This Solandra, though an old-fashioned plant in gardens, is now rarely seen; it has large tubular whitish blooms, and thick fleshy leaves. In spring, it should be kept in a brisk moist temperature and pinched occasionally; in summer, it should be plunged out of doors or in cold pits somewhat cramped for pot room. It is this way it sets abundance of flower-buds, and, if introduced into the stove in winter, the blooms open satisfactorily.—F.

The Scarlet-fruited Abrobra (A. viridiflora).—This, though still a novelty in this country, will undoubtedly become a favourite when better known. It is a half-hardy perennial climber, belonging to the Cucurbits, with deeply cleft, dark and shining leaves, white fragrant flowers, and scarlet fruit of a pretty oval shape. It attains the height of 4 or 5 feet, and is admirable for training over low arbours and trellis-work screens about windows. It blossoms the first year from seed, early in the summer, in June or July, and, in the autumn, the fleshy roots may be lifted, and preserved in dry earth until spring.—B.

THE KITCHEN GARDEN.

REPORT ON POTATOES GROWN AT CHISWICK IN 1873.

By A. F. BARRON.

THE Fruit and Vegetable Committee, having decided upon testing the numerous varieties of Potatoes that are in cultivation, and ascertaining their various characteristics, I made application among the growers, and succeeded in obtaining no fewer than what purported to be 271 distinct varieties. These, with a few exceptions, were planted on the 24th of March, and the sets used were good medium-sized whole tubers, when these could be obtained; but in some instances they were small, and then the produce was much inferior. The ground was well dug in the autumn of the previous year, but not manured, this having been done for the crop of Peas which had just been removed. The tubers were planted in lines 3 feet apart, and 20 inches between the tubers. The plants came up regularly, with a strong growth; and on the 20th of May they were attacked by a strong frost, which cut them very much, some of them being as much as 6 inches above the ground. They soon, however, recovered and grew luxuriantly, being subjected to the usual mode of cultivation, by hoeing and earthing up. On the 29th of July the disease first made its appearance by attacking the variety called Golden Gem, spreading in a few days with great rapidity to Lapstone, Fortyfold, Red Emperor, nearly all American kinds, and the Regent class. The haulm of all these sorts was soon destroyed; and of the tubers, those of Regents suffered most severely, about nine-tenths being diseased, and of some kinds, although there was an excellent crop, scarcely a sound tuber remained. There was no variety that was not more or less diseased, those escaping with the least injury being the very early and the very late kinds. During the growing season, the collection was examined five times by the committee, and the first result arising from the experiment had been to reduce the 271 varieties to 115; and this number may be still further reduced by rejecting those that are inferior and worthless.

Series I.—Skin White or Straw-coloured.

§ 1. Long or Kidney-shaped.

Ashleaf Kidney (syn., Marjolin, Oakleaf, Duckstone).—Haulm, fleshy, spreading, rarely more than two or three from one tuber, 12 to 18 inches long; stem of a pale green colour; leaflets, large, broad, rounded, slightly cupped, bright green, shining; flowers very rare; tuber, medium-sized, long, tapering, kidney-shaped; eyes, full, situate at one end and on big knobby protuberances, giving the tuber an irregular appearance; skin, smooth, pale straw-coloured; flesh, pale yellow or straw-coloured, firm; quality, excellent; moderate cropper. First early; July and August. This is considered the old or original type.

Kentish Ashleaf Kidney (syn., Veitch's Improved, Cave's Seedling, Cambridgeshire Kidney, Nutbrown, Alma Kidney, Early May, Benson's Seedling, Shepherd's Kidney, Reynard, Nonesuch, Tory, Conqueror, Mona's Pride, Champion, Early Ranelagh, Laing's First Crop, Stillyan's Kidney).—Haulm, slender, several stems from one tuber, 12 to 18 inches long; stem, having a strong purplish tinge; leaflets, small, pointed, green; flowers, very rare; tuber, medium-sized, long, tapering, kidney-shaped, not so much knobbed as the true Ashleaf; eyes, full; skin, smooth, pale straw-coloured; flesh, pale straw-coloured, firm; quality, excellent. Excellent cropper. First early; July and August.

Myatt's Ashleaf Kidney (syn. Rivers's Royal Ashleaf; Sandringham Kidney, Myatt's Prolific, Gloucestershire Kidney, Derbyshire Prize-taker, Lee's Hammersmith Kidney).—Haulm and tuber similar to Kentish Ashleaf; flowers, pale lilac, and sparingly fertile. Excellent quality. Great cropper.

Advancer.—Haulm, slender, spreading, 12 to 15 inches long; stem, pale green; leaflets, small, pointed, pale green; flowers, very rare; tuber, short, flat kidney-shaped; eyes, full; skin, smooth, pale straw-coloured; flesh, pale, firm. Moderate cropper. First early.

Jackson's Improved.—Haulm, similar to Kentish Ashleaf; tuber, medium size, long, tapering, kidney-shaped, slightly knobbed; eyes, a little sunken, few and small; skin, rough white; flesh, very pure white, firm; very handsome; excellent cropper; first early; July to September.

Nettle-leaved (syn. A Feuille d'Ortie, Hardy's Improved Albert, Improved Royal Albert, Carter's Champion Forcing, Early Bedford Kidney).—Haulm, slender, spreading, 1½ to 2 feet in length; stem, with a purplish tinge; leaflets, small, much curled, slightly rugose, light green; tuber, medium-sized, very long, tapering, rounded, but sometimes flat, with knobs; eyes, full; skin, smooth, pale straw-coloured; flesh, firm, pale straw-coloured. Good cropper. First early.

Early White Kidney.—Haulm, moderately strong, spreading, about 1½ feet in length; similar in character to the Ashleaf, but stronger; stem, pale green; leaflets, medium-sized, curled, pale shining green; tuber, large, of a rather irregular shape, a little knobbed; eyes, full; skin, smooth, white; flesh, white, firm. Quality, excellent. Good cropper. First early. First-class certificate.

Alice Fenn.—Haulm and habit of growth very similar to Ashleaf, about 1½ feet in length, spreading, pale green; leaflets, small, much curled, showing the under-surface; tuber of medium size, resembling the Ashleaf; eyes, few; skin, smooth, pale straw-coloured; flesh, pale straw-coloured, firm. Good cropper. First early. First-class certificate.

Little Gem (syn. Early Gem).—Foliage and general habit of growth similar to Ashleaf, but stronger, and a later grower, and stems lightly tinged with purple; 1 to 1½ feet; tuber, small, rather long, but neat kidney-shaped, with a few small knobs; eyes, full, rather large;

skin, pale straw, smooth; flesh, pale yellow, firm. First early. First-class certificate.

Early Border.—Habit and appearance of Kentish Ashleaf; haulm, very slender, about 9 inches in length; tuber, small, short, or half-round kidney; eyes, full; skin, smooth, pale; flesh, pale. Very early. Useful for frame work.

Reine de Mai.—Haulm, slender, spreading, $1\frac{1}{2}$ to 2 feet in length; stem, pale green; leaflets, broad, pointed, green, slightly rugose; flowers, small, white, fertile; tuber, medium size, round kidney shape; eyes, small and few; skin, smooth, yellowish; flesh, pale yellow. Good cropper. early.

Marjolin Tetard.—Haulm, robust, spreading, resembling Ashleaf, but much stronger, about 18 inches long; stem, pale green; flowers, white, fertile; tuber, large, very broad, flat at the crown end, and tapering like a wedge to the stalk end; eyes, full, but few; skin, smooth, dark straw; flesh, straw-coloured. Heavy cropper. Early, succeeding the Ashleaf.

Woodstock Kidney.—Haulm, robust, spreading or prostrate, about 2½ feet in length; stems few in number, dark purplish colour; leaflets, large, shining, deep green; flowers, white, fertile; tuber, medium size, rather broad, irregular-shaped kidney; eyes, few and small; skin, rough, dark straw; flesh, white, firm. Moderate cropper.

Burpitt's Bountiful.—Haulm, slender, spreading, about 12 inches in length; stem, purplish; leaflets, small (like the Nettle-leaved), deep green, but much later; flowers, light purple, fertile; tuber, medium size, short, broad, flat; eyes, few and small, full; skin, smooth, pale straw; flesh, white. Fine quality; average cropper. Second early.

Multum in Parvo.—Haulm, slender, about 12 inches in length; leaflets, small, the whole plant much resembling in general appearance a dwarf form of Kentish Ashleaf; flowers, very rare; tuber, small, short, flat, kidney-shape; eyes, small, about level with surface; skin, a little rough, dark straw-colour; flesh, firm, white. Very small cropper. Very early.

Yorkshire Hybrid (syn. *Quarantine de la Halle*).—Haulm, robust, about 2½ feet in length; stem, deep green; leaflets, broad, rugose, green; flowers, pale, produced abundantly, and followed by berries in great abundance; tuber, large, rounded, long kidney-shaped, tapering somewhat to each end, a little coarse in appearance; eyes, large, slightly sunken; skin, smooth, pale straw-coloured; flesh, pale straw, firm. A moderate cropper. Second early.

New Early Racehorse.—Very similar to Yorkshire Hybrid, having broader leaflets, and growing to little more than half the height. Moderate cropper.

Pioneer.—Haulm, slender, 12 to 18 inches in length; stem, pale green; leaflets, abundant, small, rugose, pointed, pale green; flowers, very rare; tubers, medium size, very irregular, kidney-shaped, coarse-looking; eyes, numerous, sunken; skin, smooth, dark straw; flesh, yellow, firm; throws the tubers out on the surface of the soil. Moderate cropper. First early.

Waterloo Kidney.—Haulm, slender, 1½ feet in length, somewhat resembling Myatt's Prolific, but having the leaflets much more crumpled; berry-bearing; tubers, large, long, tapering, and handsome; eyes, a little sunken, rather numerous, situate over nearly three-fourths of the tuber; skin, pale straw, smooth; flesh, firm, white. Excellent quality. Moderate cropper. Second early.

Dawe's Matchless (syn. *Webb's Imperial*, *Wormsley*).—Haulm, moderately strong, of somewhat spreading growth, about 2 feet high; stem, slightly purple at the base; leaflets, of medium size, deep green, and much crumpled or rugose; flowers, small, dirty white, fertile; tubers, large, long, flattened, of regular form; eyes, rather numerous, prominently diffused over three parts of the surface; skin, pale, smooth; flesh, white, firm, fine quality. A very handsome Potato; good cropper. Second early.

Excelsior Kidney.—A stronger-growing and much improved form of Dawe's Matchless, producing a larger and finer sample. Extra fine quality. First-class certificate.

Berkshire Kidney.—Haulm, moderately robust, spreading, about 1½ feet long; stem, tinged with purple; leaflets, broad, pale green, rugose, with rather short petioles; flowers, dirty white, fertile; tubers, medium-sized, flat, kidney-shaped; eyes, few, and rather full; skin, smooth, pale; flesh, straw-coloured, rather close-grained. Light cropper. Second early.

Jaune de Brie.—Haulm, robust, of erect growth, about 2 feet in length; stem, pale green; leaflets, small, rugose, like the Regent type, pale green; flowers, pale blue, very fertile; tubers, above average size, long, cylindrical, tapering; eyes, small, slightly sunken; skin, smooth, pale yellow; flesh, pale yellow, firm. Moderate cropper. Second early.

Prince of Wales.—Haulm, moderately robust, spreading, and seldom branching, about 2 feet in length; stem, tinged with purple; leaflets, large, broad, deep shining green, very distinct; flowers, pale blue, fertile; tubers, large, kidney-shape, somewhat tapering; eyes, full, at times situate on raised knobs like the Ashleaf; skin, smooth, clear; flesh, rather coarse, pale straw. A very handsome Potato, but not of good quality; average cropper. Second early.

King of Flukes (syn. *Queen of Flukes*, *Birmingham Prize-taker*, *Derbyshire Prize*).—Haulm, &c., similar to Dawe's Matchless, moderately robust, from 1½ to 2 feet in length; leaflets of medium size, deep green, rugose; flowers, pale blue; berries, large; tubers, large, broad, flat, of even form; eyes, full; skin, smooth, pale straw; flesh, pale straw, hard. Very handsome Potato; has the habit of growing out on the surface of the ground, many of the tubers thus becoming green. Moderate cropper. Second early.

Vanguard.—Haulm, rather slender, from 1½ to 2 feet in length; stem, tinged with purple; leaflets, deep green, rugose; similar to Dawe's, Matchless, but dies off earlier; tubers, medium, short, flat; eyes, full, few in number; skin, smooth, pale; flesh, pale, firm. Moderate cropper. First early.

Beta.—Very similar to preceding, but later and inferior.

Sextus.—Haulm and foliage somewhat similar to Dawe's Matchless, of a neat, sturdy growth; tubers, medium size, short, flat, of regular form; eyes, few and small; skin, rough, pale straw-coloured; flesh, pale, firm. A handsome Potato of the Fluke section. Moderate cropper.

Harbinger.—Plant of the same character as Sextus. Tubers, rather small, short, flat, and irregular in form; eyes, small; skin, smooth, pale; flesh, pure white, firm. Fluke section. Light cropper. Third early.

Lapstone (syn. *Haigh's Seedling*, *Cobbler's Lapstone*, *Almond's Yorkshire Hero*, *Pebble White*, *Headley's Nonpareil*, *Huntingdon Kidney*, *Yorkshire Hero*, *Perfection*, *Rixton Pippin*, *Ashtop Fluke*).—Haulm of moderately robust growth, from 1½ to 2 feet in length; stem, pale green, sometimes tinged with purple; leaflets, large, broad, very pale green, of a very distinct character; flowers, white, produced in great abundance, but very rarely succeeded by berries; tubers of medium size, of rather irregular form, some being kidney-shaped, others broad, flat, and some cylindrical and rounded; eyes, small, full, and few; skin, smooth, pale straw-coloured, generally having a tinge of purple at the crown, which is a characteristic feature; flesh, pale straw, firm. Very apt to supertuberate in some soils and seasons, and to continue to grow late instead of ripening off; a great cropper; of most excellent quality. Rather subject to disease. The varieties of this Potato are very numerous, but have no permanent distinctive characters. Second early; fit for use from October until May.

Fluke.—Haulm of robust growth, from 1½ to 2 feet long; stem of a dark purplish colour; leaflets, rather small, rugose, deep green; flowers, small, crumpled, white, fertile; tubers, large, generally broad, flat, of somewhat irregular form; eyes, full; skin, slightly rough, of a dark straw colour; flesh, pure white, firm. A heavy cropper in some soils; excellent quality. Late.

Model.—Haulm and foliage very similar to Fluke; leaflets, a little pointed; grows very late; flowers, white; tubers, short, broad, flat, with a blunt end; skin, smooth, pale straw-coloured; flesh, white, rather close. A very handsome Potato; heavy cropper. Late.

Amazon.—Haulm and foliage of the Berkshire Kidney character, but of somewhat stronger and later growth; height, 1½ feet; flowers, white; tubers, medium size, short, broad, flat, rather irregular; eyes, few, a little sunken; skin, smooth, pale; flesh, pale straw, firm. Moderate cropper. Late.

Uttils.—Haulm, of strong-growing Fluke character, somewhat spreading, about 2 feet long, and foliage shining; tubers, large, flat, coarse, and irregular; eyes, small, sunken; skin, rough, pale straw-coloured; flesh, pale, firm. Light cropper. Late.

Cobble.—Haulm, rather slender, spreading, somewhat of the character of Dawe's Matchless, from 1½ to 2 feet long; leaflets, broad, shining green; flowers, dirty white; tubers, large, long, flat, but somewhat irregular, the end blunt; eyes, small, full; skin, smooth, pale straw; flesh, pale, close. Moderate cropper.

Sedilla.—Same haulm and foliage as Cobble; tubers, large, flat, irregular; end, blunt or flattened; eyes, a little sunken at crown; skin, rough, dark straw-coloured; flesh, close, yellow. Moderate cropper. Late and worthless.

Clipper.—Haulm, moderately vigorous, from 1½ to 2 feet long; stem, deep green; leaflets, broad, rugose, green, flowers, pale, berry-bearing; tubers, large, long, cylindrical; eyes, very numerous, much scattered, forming large knobs on the tuber, giving it a coarse appearance; skin smooth, straw-coloured; flesh, pale straw, close-grained. Light cropper. Second early. Worthless.

Eureka.—Plant of compact growth, very robust; haulm, green, about 2 feet long, grows very late; leaflets, small, deep green, somewhat crumpled and rugose; flowers, bright purple, seldom producing berries; tubers, large, broad, flat, of the Fluke character; eyes, full; skin, pale, a little rough; flesh, white, firm. The latest of all to ripen off. Moderate cropper. Sample, very irregular.

Princesse.—Haulm, slender, spreading, but of compact growth, about 1½ feet long; stem, light green; leaflets, smooth, light green; flowers, pale blue, producing berries; tubers long, narrow, cylindrical, somewhat tapering and twisted; eyes full, very numerous, scattered over the entire surface; skin, coarse, pale; flesh, pale, firm. A peculiar but utterly worthless variety. Light cropper. Second early.

Oxfordshire Kidney (syn., *Minchin's Eclipse*).—Haulm, moderately robust, of erect growth, with the character of Dawe's Matchless, 2½ feet long; stem, pale green throughout; leaflets, pale green, rugose; flowers, bright blue, fertile; tubers of average size, rather short, flat, of even and regular form; eyes, few and small; skin, very rough, dark straw-coloured; flesh, pale, firm. Good cropper. Grows late. Handsome.

§ 2. Half-long.

Giant King.—Haulm, slender, of the character of the Kentish Ashleaf, 12 to 18 inches high; leaflets, somewhat pointed, rugose, with a purplish tinge; tubers, large, broad, flat, somewhat irregular; eyes, large, sunken; skin, smooth, straw-coloured; flesh, pale straw-coloured, rather close. Average cropper. Rather a handsome large tuber from so dwarf a plant. First early.

Milky White.—Haulm, slender, of spreading growth, about 12 inches long; stem, reddish; leaflets small, crumpled, like those of the

Nettle-leaved; flowers, light blue, fertile; tubers, rather below medium size, half long, rounded; eyes full; skin, smooth, pale; flesh, very white, firm. A moderate cropper. Comes rather early into use.

Peake's First Early.—Haulm, slender, of the character of the Kentish Ashleaf, about 9 inches high, ripens off very early; tubers, medium-sized, half-long, broad, flattened, resembling Giant King; eyes, a little sunken, mostly situate at the crown; skin, smooth, pale straw-coloured; flesh, yellow, rather close. A fair cropper. Very early.

Bresee's Climax (syn. Gravenstein, Coppermine, Climax).—Haulm, moderately strong, about 1½ feet long; stem, light green, erect, branching; leaflets, large, broad, pale green, frequently blotched with yellow; flowers, rare; tubers, large, long, rounded, somewhat tapering; eyes, a little sunken, rather thickly situate near to the crown; skin, rough, straw-colour; flesh, white, firm. Excellent quality, great cropper, and the best type of the American white Potatoes. Second early. First-class certificate.

Early Goodrich (syn. Bushell's Seedling).—Haulm, very similar in character to Climax; tubers, smaller, and of a coarser appearance than Climax, but much resembling it; inferior. Moderate cropper. Second early.

Springfield White (syn. Harrison's).—Haulm and foliage of the same character as Climax, but paler and of a much stronger growth, and leaflets more pointed; flowers, white, sterile; tubers, very large, half round, frequently flattened, rather coarse in appearance; eyes, large, a little sunken; skin, smooth, nearly white; flesh, close, pure white. Heavy cropper. Second early.

Bresee's Peerless (syn. Peerless).—Haulm, moderately vigorous, from 1½ to 2 feet long; stem, deep green, of the same general character as Climax; leaflets, broad, green; flowers, very rare; tubers, large, long, broad, flat, somewhat tapering; eyes, a little sunken, having a faint tinge of pink; skin, slightly rough, straw-colour; flesh, white, firm. Heavy cropper. Very handsome. Mid-season.

Bresee's Prolific (syn. Brown's Prolific Kidney).—Haulm, vigorous, 1½ feet in length; same character as Climax, but having the leaflets rather smaller; stem, pale green; tubers, large, long, flat, even, handsome shape; eyes, full, a little sunken, of a pretty pink colour; skin, thin, smooth, straw shaded with faint pink; flesh, white. A heavy cropper and particularly handsome. Mid-season.

Charden.—Haulm, very robust, branched, about 3 feet in length; stem, pale green; leaflets, pale green, rugose, pointed; flowers, abundant, pale shaded lilac; berries, few; tuber, very large, very coarse and irregular, of a long rounded form, somewhat tapering; eyes, numerous, wide, very much sunken; skin, smooth, pale; flesh, pale straw. A great cropper. A very coarse cattle Potato. Mid-season.

Golden Gem (syn. Jaune ronde hative).—Haulm, slender, spreading, from 2 to 2½ feet in length; stem, pale green; leaflets, small, rugose, pale green; flowers, pale; tubers, medium-sized, of a long rounded form; eyes, numerous, scattered, much sunken; skin, smooth, yellow; flesh, yellow, firm.

Dourie Hall Favorite.—Haulm, robust, of compact growth, about 3 feet in length; stem, pale green; leaflets, large, broad, pale green; flowers, bluish-white; berries none; tubers, medium-sized, half round, sometimes long; eyes, few; skin, a little rough, pale straw-coloured; flesh, white, firm. Good cropper. Mid-season. Very distinct.

Faterson's Victoria.—Haulm of strong upright growth, about 2½ feet in length; stem, pale green, tinged with purple; leaflets, small, rugose, somewhat pointed, green; flowers, purple; berries, numerous, very large; tubers, medium-sized, half-round, frequently a little flattened, with a blunt end; eyes, a little sunken; skin, rough, but sometimes smooth, pale straw; flesh, white, firm. A very excellent even-cropping Potato. Late.

§ 3. Round.

Regent (syn. York Regent, Mitchell's Prolific, Early Oxford, Pink-eyed Regent, Rintoul's White Don, Scotch Don, Rusty Coat, Rough Jacket).—Haulm, moderately robust, spreading, from 2 to 3 feet in length; stem, pale green; leaflets, small, rugose, green; flowers, scarce, pale blue, seldom producing berries; tubers, round, generally of even medium size, but sometimes large, long, flat, and coarse; eyes, a little sunken; skin, rough, pale straw; flesh, white, firm. Excellent quality. Productive. Mid-season.

Dalmahoy (syn. Goldfinder).—In haulm and general growth not distinguishable from Regent; ripens off earlier, and has the habit of throwing the tubers a little more on to the surface of the ground; tubers, above medium size, generally of more even and regular form than those of Regent, but of very similar character. A very productive excellent Potato for general use.

Walker's Early.—Like a strong Regent, but having the tubers much smoother in the skin and with deeper eyes than Regent.

Early Prince.—Haulm, &c., same character as Regent, but ripens off much earlier; tubers, large; eyes, rather deep; skin, smooth, like Walker's Early. Second early.

Early Shaw.—Haulm, &c., of somewhat slender Regent character of growth, and ripens off earlier; flowers, sterile; tubers, medium size, roundish, frequently half long and broad; eyes, large or wide, a little sunken; skin, smooth, pale straw-coloured; flesh, pale straw-coloured. Average cropper. Second early.

East Somerset Champion.—Haulm moderately robust, of the Regent character, but stem slightly coloured; tubers, very large, broad, flat, of somewhat irregular form, being blunt at the crown and hollowed at the stalk; eyes, small, rather sunken; skin, a little rough, pale straw-coloured; flesh, pale straw, rather close. A very heavy cropper. Ripens same time as Regent, but is in best condition for use late in spring.

Early Perfection.—Haulm, &c., of somewhat slender Regent character of growth, about 18 inches in length; leaflets, rather broad, flat; flowers, pale blue, sterile; tubers, below medium size, roundish, but frequently long; surface, very even and regular; eyes, very few and full skin, clear, pale straw, a little rough; flesh, pale straw. Light cropper. Early.

Early Union.—Haulm, rather slender, of the character of the Kentish Ashleaf, about 1½ feet in length; flowers, pale lavender, sterile; tubers, medium size, round, of even regular form, a little flattened at the crown and hollowed at the stalk; eyes, few, a little sunken, nearly all situate at the crown; skin, clear pale straw, a little rough; flesh, pale straw. A good cropper. Very nice clean-looking Potato. Early.

Rector of Woodstock.—Haulm, rather slender, spreading, from 2 to 2½ feet in length; stem, slightly coloured purple; leaflets, small, rugose, green; flowers, bluish, succeeded by berries; tubers, rather below medium size, of roundish form, frequently a little flattened at the crown; eyes, small, mostly situate at the crown; skin, smooth, clear, pale straw; flesh, pale straw, very firm. Excellent quality. Moderate cropper. Early. A very pretty Potato. Previously certificated.

Fenn's Early Market.—Haulm, slender, resembling the Ashleaf Kidney, about 12 inches long; stem, green; leaflets, small, curled, green; sterile; tubers, medium-sized, of roundish form, sometimes a little broad and elongated, and hollowed at the crown; eyes, slightly sunken; skin, a little rough, very clear, pale straw; flesh, pale straw. Excellent quality. A very clean, handsome-looking Potato, and a good cropper. First early. First-class certificate.

Bonne Wilhelmine.—Haulm, rather slender, spreading, about 2 feet in length; stem, a little coloured; leaflets, rather broad, rugose, pale green; flowers, pale blue, fertile; tubers, below medium size, half round, even form; eyes, few and full; skin, smooth, clear, pale straw-coloured; flesh, pale straw-coloured. A moderate cropper. Second early.

Seedling No. 1.—Haulm, of weak erect growth, about 12 inches in length; stem, green; leaflets, small, rugose, green; tubers, small, roundish; eyes, few, full; skin, a little rough, pale straw; flesh, pale straw. Light cropper. Second early.

Prince's Favourite.—Haulm, &c., slender, of the character of Kentish Ashleaf, about 18 inches long; tubers, very small, round; eyes, few, a little sunken; skin, clear, pale smooth; flesh, pale straw. Worthless. Second early.

Paxton's Wonder.—Haulm, moderately vigorous, about 1½ feet in length; stem, green; leaflets, broad, pale green, like Lapstone, but rugose; sterile; tubers, small, round, even, and regular; eyes, few, full; skin, smooth, clear; flesh, pale straw. Small cropper. Early, but too small.

The Bloomer.—Haulm, slender, very spreading, from 12 to 16 inches long; stem, green; leaflets, very much curled, pale green; flowers, pale, fertile; tubers, small, round, of even regular form; eyes, full; skin, clear, smooth; flesh, pale straw-coloured. Small cropper. Early. Too small.

Pritchard's Seedling.—Haulm, small, of erect growth, about 12 inches long; stem, green; leaflets, broad, deep green, rugose; flowers, pale, fertile; tubers, medium-sized, half round, even form; eyes, few, full; skin, smooth, pale straw; flesh, pale, firm. Light cropper. Mid-season.

Royal Danish.—Haulm, small, of erect growth, from 18 inches to 2 feet long; stem, a little coloured purple; leaflets, small, much pointed, rugose, bright green; tubers, below medium size, half round, a little elongated; eyes, sunken; skin, smooth, pale; flesh, pale, yellow, soft. Light cropper. General season. Too small, worthless.

Onwards.—Habit, same as Kentish Ashleaf, with somewhat darker and more rugose leaflets; flowers, sterile; tubers, very small, flat, round, irregular; skin, pale straw-coloured; flesh, pale. Early. Too small. Worthless.

No. 2, White-blossomed.—Haulm, robust, but prostrate, about 2 feet long, not branched; stem, of a purplish tinge; leaflets, very broad, rugose, green; flowers, white, sterile; tubers, large, broad, flat, coarse, and uneven; eyes, prominent; skin, smooth, pale, straw-coloured; flesh, white, rather soft. A moderate cropper. Second early.

Series II.—Skin Red.

§ 1. Long or Kidney-shaped.

Early Sovereign.—Haulm, of compact growth, about 12 inches long, ripens off early; stem, pale, green; leaflets, very large, broad; flowers, rare; tubers, average size, of a long, narrow, cylindrical form, slightly tapering; eyes, scattered over the entire surface, but not too numerous, a little sunken; skin, smooth, of a pale rose colour; flesh, white. A good average cropper. Early.

American Late Rose (syn. American Pale Rose).—Haulm, of free vigorous growth, about 2 feet long; stem, pale green; leaflets, large, broad, very pale green; flowers, white, generally sterile; tubers, very large, long, cylindrical, from 7 to 10 inches, and generally a little flattened; eyes, not numerous, but scattered nearly over the entire surface, a little sunken, of a deep rose colour; skin, smooth, pale rosy-pink, very pretty; flesh, white and floury. Excellent quality. A most enormous cropper, from eight to ten large tubers being produced at a single stool, and frequently much more, and these tubers often weighing over a pound each. Second early. First-class certificate.

American Early Rose.—Haulm and habit of plant exactly resembling the Pale or Late Rose; ripens off earlier, and is not so tall in stem or so productive; the tubers, also, are smaller, more kidney-shaped, and of a more uniform pink or rose colour. Much inferior to the Late Rose.

Extra Early Vermont.—Haulm and habit of plant similar to Early Rose, but only about 12 inches long, ripens off very early; tubers, large, long, cylindrical, somewhat flattened, very similar in all characters to Late Rose, but is ripe some ten days earlier; flesh, white and floury. Very excellent quality. Average cropper. Early. First-class certificate.

Belvoir Kidney (syn. Taylor's Kidney, Regnon Rose).—Haulm, rather slender and straggling, about 2 feet in length; stem, tinged red; leaflets, rather small, dark green, rugose; flowers, white, sparingly fertile; tubers, average size, long, flat, regular kidney shape; eyes, very few and small; skin, smooth, dull pink; flesh, yellow. Handsome in appearance. Average cropper. Mid-season.

Wonderful Red Kidney.—Haulm, rather slender, very much in character of Kentish Ashleaf, from 12 to 18 inches long; leaflets, small, rugose, having a reddish tinge; tubers, rather small, but neat in form; eyes, few, full; skin, smooth, pale red; flesh, yellow. A great cropper, but the greater portion are very small and worthless. Early.

Pousse Debout.—Haulm, vigorous, of compact growth, about 2 feet in length; stem, reddish; leaflets, broad, green; flowers, white, fertile; tubers, small, long, narrow, tapering, rounded kidney; eyes, full, on raised knobs; skin, smooth, pale red; flesh, pale, firm. A great cropper, but the greater portion are quite small and worthless. Mid-season.

Sausisse.—Haulm, rather slender, but growing to nearly 4 feet in length and branching; stem, reddish; leaflets, small, rugose, green; tubers, average size, short, broad, flat, rather irregular in form; eyes, full, even; skin, smooth, deep rose; flesh, yellow, hard, frequently streaked with red. A great cropper, but very inferior. General season.

French Red.—Haulm, very vigorous, branching, from 3 to 3½ feet in length, grows late; stem, reddish; leaflets, small, rugose, deep green; tubers, average size, but very irregular in form, some being round, others long, cylindrical; eyes, numerous, scattered over the entire surface; skin, rough, red; flesh, yellow. A great cropper, but the greater portion very small and worthless. Late.

Cottager's Red.—Haulm, moderately vigorous, straggling, about 4 feet in length; stem, reddish; leaflets, small, rugose, green; tubers, average size, of rather irregular form, some being long, broad, and flat, whilst others are nearly round; eyes, scattered, a little sunken; skin, rough, bright red; flesh, yellow. A somewhat irregular cropping Potato.

Rosee de Conflans.—Haulm, vigorous, of compact growth, from 3 to 3½ feet in length; stem, reddish; leaflets, broad, green; flowers, white, fertile; tubers, average size, very long, narrow, cylindrical, twisted, and tapering, with knobs; eyes, full, scattered; skin, smooth, dull red; flesh, yellow, streaked with red. A very peculiar-looking, but altogether worthless, variety.

Prince Imperial.—Haulm, moderately robust, spreading, from 2 to 2½ feet in length; stem, reddish; leaflets, small, pale green, rugose; flowers, white, fertile; tubers, average size, of rather irregular form, a long pointed kidney, frequently twisted like a crab's claw; eyes, few, full; skin, rough, reddish-purple; flesh, yellow. Moderate cropper. General season. Worthless.

Vitelotte.—Haulm, very robust and gross, about 2½ feet in length, and grows late; stem, green, with a reddish tint; leaflets, rather broad, rugose, green, with reddish veining; flowers, white, fertile; tubers, small, long, narrow, cylindrical, and pointed or tapering; eyes, deep, covering nearly the entire surface, so that it appears to be nearly all eyes; skin, smooth, reddish-purple; flesh, white, streaked with red. A very singular variety, but entirely worthless. Fit to be grown only as a curiosity.

Bountiful.—Haulm, rather slender, spreading, from 1½ to 2 feet in length; ripens off early; stem, reddish; leaflets, small, green, rugose; flowers, white, fertile; tubers, of true kidney shape, medium size, short, even, and of very regular form; eyes, few, full, giving it a very smooth, even surface; skin, smooth, reddish-purple; flesh, pale, firm. A very neat, handsome Potato, and a fair cropper. Second early.

Regnon Violet.—Haulm, rather slender and straggling, about 3½ feet in length; stem, purple; leaflets, small, rugose, dark green; flowers, white, fertile; tubers, large, long, flat, kidney shape, of even regular form; eyes, full, scattered, but not numerous; skin, smooth, of a reddish purple; flesh, pale straw, firm. A fair average cropper. Late.

Callo.—Whole plant, somewhat of the Lapstone character; haulm, moderately robust, about 2 feet in length; stem, pale green, tinged red; leaflets, broad, pale green, quite smooth; tubers, medium size, long, cylindrical, regular form; eyes, wide, scattered, of a dark purple; skin, smooth, reddish-purple; flesh, white, firm. A heavy-cropping Potato. Late.

California Kidney.—Haulm, slender, about 1½ feet in length, ripens off early; stem, pale green; leaflets, broad, green, rugose, of the Regent type; flowers, few, pale blue, sterile; tubers, large, long, cylindrical; eyes, numerous, deeply-placed, and scattered over entire surface, giving it a rough, uneven appearance; skin, smooth, bright red, occasionally flaked with white; flesh, pale straw, hard, coarse. Moderate cropper. Early.

Truffe d'Aout.—Plant of vigorous compact growth, of the appearance of Myatt's Prolific, about 1½ feet in length; flowers, pale, fertile; tuber, below medium size, of short, oblong shape; eyes, deep, numerous, scattered; skin, a little rough, dull red; flesh, pale yellow, streaked with red. A moderate cropper, but a very bad, worthless sort. Late.

§ 2. Round.

Red Emperor.—Haulm, slender, straggling, and spreading, about 4 feet in length; stem, tinged with red; leaflets, small, pointed, rugose,

light green; flowers, light blue, sparingly fertile; tubers, medium-sized, round, somewhat flattened, very even and regular; eyes, full and few, of a bright red; skin, generally smooth, of a clear light red, sometimes with a flake of white; flesh, pale straw, firm. Excellent quality. A very handsome Potato. Average cropper. Second early. It is somewhat tender and subject to disease.

Combe Hays.—Very similar to Red Emperor, but somewhat later. Bears berries in abundance, and the tubers have somewhat rougher skins.

English Rose.—Haulm and foliage, similar to Kentish Ashleaf, about 12 inches high, ripens off early; flowers, reddish-white; tubers, small, round, with a smooth even surface; eyes, full, small; skin, smooth, pale red; flesh, white, streaked with pink. Early, but too small, and not of good quality.

King of the Earlies.—Haulm, of compact growth, about 12 inches long, ripens off very early; stem, pale green; leaflets, very large, broad, of a very pale green; flowers, very rare; tubers, average size, half round, flat; eyes, a little sunken; skin, smooth, of a faint rosy-pink colour; flesh, white. Moderate cropper. Early.

Rouge de Strasbourg.—Haulm, very robust, much branched, of erect and compact growth, about 3 feet in length, grows very late; stem, purplish; leaflets, rather broad, dark green-shaded purple; flowers, purplish-white, seldom fertile; tubers, medium size, long, roundish, irregular, coarse; eyes, deep, numerous, scattered over entire surface; skin, smooth, deep red; flesh, white, close-grained. Bad. A coarse, heavy-cropping, late Potato.

Red Regent (syn. De Zelande).—Haulm, very robust, much branched, of erect and compact growth, from 3 to 3½ feet in length; stem, reddish; leaflets, rather broad, light green; flowers, white, seldom fertile; tubers, large, exactly resembling the Regents; skin, rough, deep red; flesh, pale. A heavy-cropping late Potato, suited for field culture.

Wood's Scarlet Prolific.—Haulm, moderately robust, of erect, compact growth, about 2 feet in length, grows very late; stem, light green; leaflets, pale green, rugose; flowers, light purplish, fertile; tubers, very large, long, flattened, even, and regular, nearly all of the same size at a stool, and are borne close to the haulm; eyes, deep, scattered over surface; skin, rough, reddish-purple; flesh, white, occasionally streaked with red. A very handsome late Potato, and a great cropper. Second-class quality.

Webb's Red Blossom.—Haulm, robust, erect, but much branched, about 2½ feet in length, grows very late; stem, green; leaflets, broad, rugose, green; flowers, white, sterile; tubers, long, flat, very irregular, some being large and handsome, but the greater portion small; eyes, deep, scattered; skin, rough, bright, purplish-red; flesh, pale straw, streaked with red. Very coarse-growing. Great cropper. Late.

Vermont Beauty (syn. Brownell's Beauty).—Haulm, small, of the same character as Early Rose, about 1½ feet in length, ripens off early; leaflets, broad, pale green; flowers, purplish-white; tubers, very large, long, broad, and flattened, very uniform in character, and borne close to the haulm, about five or six to each stool, with seldom any small ones; eyes, wide open, scattered, but not numerous; skin, rough, of a dull brick-red; flesh, white, floury. Excellent quality. A remarkably handsome second-early red Potato, and a heavy cropper. First-class certificate.

Red-skinned Flour-ball (syn. Improved Red-skinned Flour-ball, Berkshire's Red-skinned Flour-ball, Red Peach-blossom, Boston Red, American Red, Kentish Red).—Haulm, strong and robust, frequently much branched, from 3 to 3½ feet in length; stem, pale, with a reddish tinge; leaflets, medium-sized, flat, pointed, rugose, pale green; flowers, shaded lilac or lavender, produced in great abundance, very seldom fertile; tubers very large, round, but frequently a little flattened, and often of very coarse and irregular form, one stool producing handsome well-formed tubers, whilst another produces them of all shapes and sizes; eyes, mostly situate at the crown, which is a little sunken, and it is also a little hollowed at the stalk; skin, rough, of a light red colour, but on many of the malformed tubers quite smooth, and of a deep red; flesh, white, and, for a large Potato, of excellent quality. It is a large and heavy cropper. General season.

White Peach-blossom.—Haulm, of strong and compact growth, much branched, about 3 feet in length; stem, green; leaflets, broad, pointed, smooth, green; flowers, rosy-purple, fertile; tubers, very large, round, coarse in appearance; eyes, few, but deep, of a bright rose-colour; skin, rough, of a pale pink colour; flesh, white, firm. A very heavy-cropping, but coarse, late Potato.

Series III.—Skin Purple or Blue.

Paterson's Blue (syn. Morayshire Blue).—Haulm, robust, of compact, rather erect growth, about 3 feet in length; stem, reddish; leaflets, small, rugose, deep green; flowers, purplish-white, occasionally fertile; tubers, large, round, flattened, frequently elongated, rather coarse in appearance; eyes, deep, scattered; skin, smooth, reddish-purple; flesh, white, very firm. Moderate cropper. Late.

Purple Regent.—Plant, habit of true Regent, but having a reddish stem, and the leaflets of a somewhat deeper green; flowers, purplish-white, seldom fertile; tubers, medium-sized, half long, a little flattened, seldom uneven, but rather coarse in appearance; eyes, small, scattered; skin, smooth, reddish-purple; flesh, white, firm. A very poor cropper, and a generally bad sample. General season.

Compton Surprise.—Haulm, very robust and gross, from 2½ to 3 feet in length, ripens off early; stem, green, tinged with red; leaflets,

very large, broad, pale green; flowers, white, sterile; tubers, large, long, flattened, coarse in appearance; eyes, numerous, very deep, scattered over entire surface; skin, smooth, dark purple; flesh, white, firm. A moderate cropper. Mid-season. Rather coarse.

Scotch Blue (syn. Duneau's Seedling).—Haulm, moderately vigorous, about 2 feet in length, ripens off early; stem, reddish; leaflets, large, broad, rather pale green; flowers, none; tubers, medium-sized, oblong, flattened, frequently much elongated and cylindrical, with a smooth, even outline; eyes, wide open; skin, smooth, dark violet; flesh, white, firm. Very handsome, but a very uncertain cropper. Mid-season.

Summer Hill Seedling.—Haulm, very strong and robust, from 2½ to 3 feet in length; stem, having a reddish tinge; leaflets, large, broad, pale, with a tinge of red; flowers, bluish, fertile; tubers, medium size, oblong, flattened, of a finely-rounded, even outline; eyes, small, full; skin, smooth, dark purple; flesh, white, firm. A very handsome Potato, and a fair average cropper. Late.

Black Jack (syn. Black Bob, Black Nigger).—Haulm, robust, straggling, and somewhat branching, about 3½ feet in length; stem, reddish-purple; leaflets, small, rugose, deep green; flowers, blue, seldom fertile; tubers, medium-sized, round; eyes, deep; skin, smooth, very dark purple, almost black; flesh, dark mottled purple and white. A poor cropper and utterly useless late Potato. Fit only to be grown as a curiosity.

Series IV.—Skin Streaked or Flaked.

Gleason's Late (syn. Hundredfold Fluke).—Haulm, robust, branching, about 2½ feet in length; stem, of a reddish tinge; leaflets, flat, pointed, green, with coloured veins; flowers, purple, generally sterile; tubers, large, generally broad, flat, like a Fluke, but frequently of very irregular form, as if two or three were joined together; eyes, few, full; skin, smooth, very pale, with large patches of rosy-purple, giving it a very singular piebald appearance; flesh, white, rather hard. A good average cropper. Late. Very handsome.

Painted Lady.—Haulm, strong and robust, of the Fluke character, but dies off earlier, from 2½ to 3 feet long; stem, green; leaflets, small, rugose, green, like Regents; flowers, rosy-red, fertile; tubers, very irregular in size and form, but chiefly small, of a long, flat kidney shape; eyes, few; skin, on some tubers rough, and on others smooth; some pure pale straw-coloured, others streaked and splashed with deep rosy-purple; flesh, pale, firm. A light cropper, the greater portion being small. Late. Worthless.

Willard (syn., Belgian Wax Ball).—Haulm, moderately strong, erect, from 1 to 1½ feet in length; stem, pale green; leaflets, broad, rugose, pale green; flowers, very rare; tubers, large, long, cylindrical, inclining to conical, generally of even and regular form; eyes wide, even with surface, scattered; skin, rough, bright red, much flaked with white around the eyes; flesh, white, hard, and inferior. A very handsome Potato. Moderate cropper. Second early.

Red Breadfruit.—Haulm, slender, of rather compact growth, about 2 feet in length; stem, green; leaflets, small, rugose, green, of the Regent character; flowers, pale blue, fertile; tubers, rather below medium size, round, somewhat hollowed at the crown and also at the stalk; eyes, full; skin, smooth, reddish-purple, flaked with white; flesh, pale straw-coloured. A moderate cropper. Second early.

Pink-eyed Rusty-coat.—Haulm of strong but straggling growth, from 3 to 3½ feet in length; stem, purplish; leaflets, small, pointed, rugose, green; flowers, deep rosy-purple, borne in great abundance, generally sterile; tubers, large, of very irregular round form, and coarse; eyes, wide open, of a rosy-red colour; skin, smooth, white, flaked with pink; flesh, white, firm. A heavy-cropper, but rather coarse Potato. General season.

Blanchard (syn., Fillpeck—Peake).—Haulm, slender, spreading, from 12 to 18 inches in length; stem, dark purple; leaflets, small, rugose, dark green; flowers, light or pale blue, fertile; tubers, medium, round, flattened at the crown, even and regular sample; eyes, nearly all situate at crown, full, of a dark purple colour; skin, smooth, pale straw, flaked with purple; flesh, yellow, firm. A clean, pleasant-looking Potato. Good quality. Moderate cropper. Second early.

Rintoul's Striped Don.—Haulm and habit of a robust-growing Regent; tubers, very large, roundish; eyes deeply set, of a dark purple colour; skin, rough, pale straw, streaked and flaked with purple; flesh, pale, firm. A handsome and excellent great-cropping Potato. Second early.

Fortyfold.—Haulm and habit of Regent, but a little more slender; tubers, scarcely medium size, round; eyes, few, a little sunken; skin, light, reddish purple, flaked with white; flesh, white, firm. Excellent quality. Moderate cropping. Second early.

Free-bearer (syn., Benson's Round).—Haulm and habit of a strong-growing Regent, exposes the tubers on to the surface of the ground; tubers, very large, rather coarse, long, rounded form, like Striped Don; eyes, large, deep; skin, rough, dark purple, flaked with white; flesh, white, firm. A heavy-cropper Potato, and good for general crop field culture.

Oxfordshire Kidney Potato.—Through the kindness of Messrs. Sutton & Sons, I have been enabled to try this, which may, with truth, be called the Prince of Potatoes. The skin is rough—as rough can be, which alone, according to my way of thinking, forms a chief point. The tubers are kidney-shaped, and their size the happy medium of what Potatoes should be. They are, in my case, free from disease, in consequence of their strong woody-like growth. From sets 2 oz. in weight, the produce was sixty in number, fair sizeable Potatoes, weighing 11 lbs. Lastly, the quality is all that can be wished.—R. GILBERT, *Burghley*.

WORK FOR THE WEEK.

PRIVATE GARDENS.

The Flower Garden.—In re-arranging flower-gardens, hardly evergreen shrubs may be employed with the best results; for, in the working out of parterre patterns, judiciously disposed groups with graceful outlines, associated with bedding plants, are more effective and desirable than many of the tender subjects now so freely used for such purposes, necessitating, as they do, the employment of unusual care and fertility of expedients on the part of the cultivator, and often, after all, producing but a small amount of success. One of the most important points in connection with flower-garden operations, at this season, is preparation of the beds and the securing of proper composts. Where beds are not planted with spring-flowering things, advantage should be taken of the fallow, so to speak, to which they are subjected, to have them deeply worked up and prepared for planting. Upon poor soils, too little attention is often paid to our flower-beds, which are kept under crop year after year, without taking into consideration that the ground is becoming annually poorer. Flower-beds, to be perfectly successful, must be treated according to the crop which they are intended to carry. Some things, as for example, Abutilons, Aralias, Canoas, Ferdinandas, Ricinus, Solanums, Wigandias, &c., require a large amount of manure to give them nobility of aspect and perfect leaf development. In preparing beds for these, especially in cold wet localities, it will be advantageous to place the soil on brick rubble, which will secure good drainage, and tend to raise the temperature of the soil a few degrees higher than it otherwise would be. The compost should be used in rather a rough state in order to promote healthy development by gradual decomposition. Hardy Clematises grown as bedding plants should now have attention; their blooming season may be considerably prolonged by pruning them at three different periods, viz., in autumn, mid-winter, and early in spring. Cut them back now to the ground, and surface-dress with rich rotten manure. This is especially necessary in order to ensure continuity of bloom. Fill up all vacancies which may now occur among spring-blooming plants, and pay every attention to securing neatness and order. If the plan for the bedding out of the flower-garden has not yet been determined upon, it should now receive immediate attention, in order that some idea may be formed as to what quantities of different subjects must be secured by means of propagation.

Shrubberies.—This is a good time to re-plant and re-arrange masses of the better kinds of Rhododendrons, which, when grouped with taste, are gorgeous in the extreme. Their hardiness and luxuriant deep green foliage render them desirable at all seasons; but many, nevertheless, are deterred from growing them from an impression that they do not succeed without peat. No doubt sandy peat is the best soil for them when procurable; but, where it cannot be had, they will not only grow, but luxuriate in a sandy fibry loam. In preparing positions for Rhododendrons resting upon calcareous matter, it is imperative to success that the whole of the soil in the beds should be above the ground level, otherwise the drainage from the surrounding grounds will penetrate the beds and destroy the plants. In planting, hardy Azaleas must not be overlooked, their brilliancy of flower and delightful fragrance rendering them most desirable. They may be grown in masses by themselves, or interspersed with Rhododendrons, or used promiscuously in mixed shrubberies. Kalmias are not so much planted as they deserve to be, for they are amongst the most elegant of plants grown, their charming delicate blossoms and dark glossy foliage contrasting admirably with most kinds of vegetation with which they may be associated. They grow freely in low situations; and, moreover, the Kalmia is one of the few plants that gamo will not molest. Attend to previous directions as to planting and pruning. Common Laurels should be cut down; but under no circumstances should specimen Portugal Laurels be pruned now, as the searing winds we often experience after this time disfigure the foliage to such an extent as to render it unsightly for months, which late pruning will, in a great measure, obviate.

Conservatories.—These are now gay with Dutch bulbs, Cyclamens, Chinese Primroses, Cinerarias, Camellias, Azaleas, forced shrubs, Epacris, Heaths, Acacias, and a few other plants. The pretty water-plant, Aponogeton distachyon, is in full flower, both in the coolest part of the greenhouse and also in cold frames; it is so easily grown, too, that a large inverted bell-glass, or flower-pot or pan with all holes stopped up, forms a sufficient home for it. Pot, cut back, and start into growth, in the warmest corner of the greenhouse, some Fuchsias and Lemon-scented Verbenas. Some Cineraria seed may be sown in gentle heat to furnish flowers late in autumn; and young Cyclamens may be pricked off into pots or pans. Mignonette should now be sown in pots for early blooming; plants of it that are up should be thinned, and Tree-Mignonette should be trained and

tied into proper form. Pelargoniums may be shifted and placed in a warm corner of the greenhouse. Tropæolums should be trained twice a week, and, as soon as their flower-buds are well set, weak manure-water may be freely given to them. Remove dead foliage from Carnations in pots, and stir and top-dress the soil. Divide and re-pot plants of *Isolepis gracilis*, and place them for a time in a moist heat. Selaginellas may also be separated, and potted in a mixture of loam, peat, and leaf-mould in equal proportions, with a good admixture of sharp sand. Borders of these little plants may also be renovated. If a good stock of seedling Ferns is at hand, one or two of a sort may be stuck into a pot containing Hyacinths and Tulips; they hide the surface soil, and render the pots more pleasing in appearance. Greenhouse Ferns should be kept as dormant as possible yet, especially such as are deciduous, and also hardy Ferns in pots, but a dust-dry condition is injurious.

Indoor Fruit and Forcing Department.—If the weather be fine, push down the lights of Pine pits about half an inch for two or three hours at mid-day. Cover frames containing Pines with mats at night. To such as are planted out in frames give no water if the heat is kept up by means of fermenting material. Watch carefully fire-heated pits or houses. For Vines coming into flower, maintain a night temperature of 65°. Admit a little fresh air as long throughout the day as is practicable when the blossoms have expanded, keeping up the temperature by means of fire-heat at the same time. If the air comes heated into the house by being made to travel along or over hot-water pipes, so much the better. Syringe Vines breaking into leaf, and, if possible, maintain the desired amount of heat by fermenting material. Remove loose bark from late Vine rods, and wash and paint them with some insect-destroying mixture. Syringe daily Peach trees whose fruit has set. Ventilate a little, day and night, houses in which plants are in flower, and give fire-heat at the same time. Prune the latest trees, and shut up another house for succession. If French Beans are not already in Vineries or pits, place them along the narrow front shelf in Pineries. Place a few sprays of Birch twigs in each pot, and run a cord along next the path, so as to prevent the twigs or plants coming in contact with the clothes of the workmen. Syringe them frequently and water them abundantly. Sow Mustard and Cress in boxes according to demand, and keep the boxes in early Vineries or Peach-houses. Introduce also some roots of Mint and Tarragon. Keep up a succession of Rhubarb, Seakale, Endive, Chicory, and Dandelion, in the Mushroom-house, or in any other place where a temperature of 55° can be maintained. If Seakale be forced too slowly, it becomes stringy. Asparagus is best forced in hot-beds. If a large quantity of roots has been lifted at once, lay them in a heap, but not so thickly as to cause fermentation, and cover them over with a mat. It is better, however, to lay them into the soil quite thickly, and to lift as required. Construct hot-beds for Potatoes. Start the tubers in some of the forcing-houses, and after they have pushed into growth an inch or two in length, plant them out in the frames. Sow some Radish seed over the soil, the young Radishes from which will be ready for use before they become an obstruction to the Potato crop. Prepare hot-beds consisting of two parts of leaves, and one of litter for Turnips, Cauliflowers, Lettuces, Celery, Onions, &c. Brisk hot-beds are also necessary for Tomatoes, Melons, Cucumbers, &c.

ASHANTEE VEGETATION.

THIS is described by the special correspondent of the *Standard* as follows:—"Thicker and higher grew the bush as we neared Akroful, on our way to Coomassie. One could see by the aspects of many of the trees that winter had begun. Almost all the gigantic Cotton trees, towering from 200 to 250 feet on their perfectly straight, round, even trunks, were now leafless, looking like the skeletons of some giants of primeval vegetation raised above a sea of foliage below them. Some of the other kinds of trees had also begun to shed their leaves, and the road was at times thick with them. There is another forest giant which almost, although not quite, rivals the Cotton tree. This the natives call the "Wa-wa." It is similar in growth and character to the Cotton tree, but the latter has a small feathery foliage like that of the Acacia. The Wa-wa has a leaf resembling, as far as I could judge, that of the Beech. The varieties of trees in this tropical bush are immense, but, innumerable as the trees were, there were two or three species which especially struck me, and of these I saw two specimens of one which was a very striking one. It was 50 or 60 feet in height, and bare of branches for more than half its height from the ground; it had shed its foliage, and was as thick as a Pear tree in spring, with a greyish-pink blossom. One of the trees hung over the road, and some of the blossoms had fallen. They somewhat resembled in form those of a *Salvia*. Another of the trees which struck me particularly was a very large one, with a dark green foliage, somewhat resembling that of the evergreen Ash. This

tree was in seed, and the effect was singular and picturesque; the seeds hung in bright green clusters of some 2 feet long; they were flat, and somewhat oval in form, and arranged with curious regularity, having the aspect, at a short distance, of huge clusters of Grapes. Both these trees were so striking that they could not have escaped my observation had they grown within eyesight of the road and yet I only saw the number I have named along the whole line from Cape Coast to this place. Of flowers I saw a few white Lilies, a few pink flowers of some bulbous-rooted plant, the stripes of yellow occasionally upon an Acacia, and a climbing plant like that of the Dog Rose, and some yellow flowers in some of the old village clearings. With the exception of a few *Convolvuli* and some small ground-like creepers these were nearly all the flowers that I have seen since leaving the open bush. As to the luxuriance of the foliage of these tropical jungles, the pen fails altogether to convey any impression. Fifty paintings by the hand of a master might give a fair idea of the tangle and confusion, the glorious variety, the exquisite beauty, the grand magnificence, the brightness of some spots, and weird gloom of others; but volumes of written matter would fail to give any adequate impression of the tropical bush and forest. Everywhere it was beautiful; but some little bits struck me as especially lovely. There was one glade where a stream ran across the road. Upon one side of this stream the sun shone brightly; upon the other was a cool deep shade. A great clump of Bamboo grew on either side of the road, over which these drooping stems met, forming a magnificent arch of feathery foliage of fully eight feet span. Behind the forest closed thickly in, turning everything beyond the arch into deep shade, with just a stream or two of sunlight falling upon the road. Such a scene, entitled "The Bamboo Palace of the Wood Spirits," would make the fortune of an extravaganza, and was, I think, without exception, the most lovely little bit of scenery I ever saw. Between Akroful and Dunquah the foliage was more tropical—according to the received idea upon the subject—in its character than it was beyond. Plantains, Palms, and Bamboos, formed the larger portion of the bush, but beyond Dunquah these became more rare, the forest grew denser, the interlacing of creepers and parasites thicker, and the undergrowth proportionately less. Here, were it not for the giant Cotton trees and Wa-wa's and the broad leaves of the climbers, it would not be difficult to imagine oneself in some forest at home, where the heir is a minor, the estate in Chancery, and the woods allowed to choke themselves uncared for.

The Improvements in St. Paul's Churchyard.—An important improvement in St. Paul's Churchyard was formally dedicated the other day, by the Dean and Chapter and the Lord Mayor, to the use of the public. The space thrown open comprises an area of 7,000 square feet. This space has been purchased from the Dean and Chapter by the Corporation of the City of London for the sum of £15,000. Of this sum, however, the Dean and Chapter had expended about £6,000 in the work of carrying out the improvements. The roadway has been enlarged by above 7,000 feet, and a space, semi-elliptical in form, has also been flagged in front of the Cathedral, inclosing upwards of 15,000 feet. This ground will remain the property of the Dean and Chapter, but foot passengers will have access to it. Upon the occasion of important services in the Cathedral, this will be temporarily inclosed by barriers fixed to the granite posts which mark the boundary.

The So-called New Substitute for Coal.—This is by no means new. About fifteen years ago my coal supply running short, I hit on the following expedient:—I took half slack coal and half mud (mud is best where it can be procured; if not firm, sub-soil will answer), I added a small quantity of soda, mixed all together to the consistency of paste, then divided and rolled into balls of sizes to suit my grate, and allowed them to dry; this is all that is required. A few of these balls will last the whole day, and preserve a steadier temperature than coal itself.—M. PICORR, *The Gardens, Castle Hyde, Fermoy*.

A new mode of Artificial Fertilisation.—We learn that a process, indicated by M. Hooibrenk, of Vienna, for facilitating the fertilisation of plants, has proved successful in the Botanical Gardens there. The process consists simply in touching the end of the pistil—that is, the stigma—in a flower, with a pencil dipped in honey, or, better, in honey having mixed with it some pollen of the plant operated upon. A Hibiscus mexicanus, which had never yielded fruit, having undergone this treatment, produced quite a large quantity of good seeds. With several fruit-trees the process also succeeded. Further, after operating on certain branches only of trees which did not yield fruit, it was found that fruit formed on these, while the branches left in the natural state gave none. The effect, if real, may be explained by supposing that the honey retains the pollen grains on the stigma, and thus favours the formation of a pollen tube, which is indispensable to the fertilisation.

THE GARDEN.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

GARDEN INSECTS AND THEIR DESTRUCTION.

(RED SPIDER.)

If the size of this insect was proportionate to the damage it does to plant-life, it would be much more formidable in appearance than it is, but, being exceedingly small, it frequently escapes detection, until the plants upon which it makes its appearance have sustained serious injury. Great numbers of cultivated plants, especially such as are grown under glass, suffer from its ravages; but such as have thin soft leaves, like Vines, Cucumbers, and Melons, are more subject to it than others. The living insects cannot exist in a low temperature, but their eggs are proof against the lowest temperature of our severest winters. The red spider has a great aversion to moisture in the atmosphere, and still more to its application directly overhead by the use of the syringe or garden engine, a fact which at once indicates the means most likely to prevent its appearance where water can be used plentifully without injury, in other respects, to the general health of the plants. In the stove, the fruit-bearing Banana, and the acrid-juiced Croton, or Euphorbia, alike furnish food for it. Dipladenias, Hibiscus, Ixoras, Francisceas, Amaranthus, Palms, Ferns, Dracenas, together with quantities of other plants, are affected by it. Through the growing season, a plentiful and continuous application of water overhead with the syringe is necessary, and it frequently happens that this is insufficient to keep it down, unless used in quantities that will make the soil too wet, and, consequently, injurious to the roots of the plants. Where such is the case, for hard-wooded plants, a weak solution of "Fowler's Insecticide," 2 oz. to the gallon, will be found a very effectual remedy. In the autumn and winter seasons, when the usual afternoon syringing is discontinued, Red spider is frequently very troublesome, and any plant affected by it should receive a washing with the insecticide as often as it makes its appearance. In the stove, I do not advocate sulphuring the pipes, as there generally are numbers of plants that suffer from that practice: neither is the application of sulphur dusted over the plants safe in all cases, as it frequently causes quantities of the leaves to fall off. Orchids are not so often attacked by this insect as other plants. The humid atmosphere kept up in the houses devoted to them, keeping it in check; yet the introduction of an infected plant will sometimes cause a good deal of trouble amongst the thin-leaved species, such as Dendrobiums, Lycastes, Sobralias, Odontoglossums, and some Oncids; and, if a considerable number of plants are affected before it is discovered, it takes a serious amount of labour to eradicate it completely, as there is no method that can safely be employed, except sponging every leaf with clean water; this requires to be thoroughly done, going regularly over all affected plants without omitting a single leaf, and repeating the application until no trace of the insect can be found. Ferns are not often attacked by this insect, yet sometimes it appears on the fronds of tall Tree varieties, that happen to be near the roof glass, and in that case copious washings with the syringe are the best means to employ for eradicating it. Conservatory climbers, particularly such things as Mandevilla suaveolens, Kennedyas, &c., are very subject to spider, and it spreads from such plants apace over everything under them on which it can live. Persistent use of the syringe or garden engine, is all that can be done in such a case, except the application of sulphur to the pipes, in a way hereafter to be recommended for Vines. Some greenhouse plants are very subject to red spider, as, for instance, Fuchsias, Staticeas, Pleromas, Pimeleas, Chorozemas, as well as numerous soft-wooded plants; but a liberal use of the syringe, and, if this is found insufficient, "Fowler's Insecticide," 2 oz., to the gallon, will destroy it. There is one greenhouse plant which red spider seems to like better than almost all others, viz., the Glory Pea (*Clianthus puniceus*). Wherever this, or anything

that is similarly subject to this insect, is grown, they should be examined, during the growing season, every few weeks, for, if they are neglected, and the insect is permitted to thoroughly establish itself, it not only completely spoils the plants upon which it first makes its appearance, but spreads to any others standing near them. Pimeleas should be regularly syringed during the growing season every evening, getting well to the undersides of the leaves, for, if these plants ever get thoroughly infected with this insect, they never afterwards get into a free habit of growth. Even Heathes, if placed in contact with plants suffering from this pest, will be seriously damaged by it, if not discovered before it has got much hold of them. For any plant of slow growth, which retains its leaves naturally for years, it will at once be obvious that the destruction of its foliage is far more serious than in the case of deciduous plants, or such as are of quick growth, and consequently are enabled to recover from any injury of the kind. Plants grown for the beauty of their foliage, such, for instance, as Cordylines and Dracenas, if the leaves of these are injured by the ravages of insects, they can never be replaced, as, when once they get yellow, which they quickly do through the effects of this insect, they fall off prematurely.

On Vines.

To Vines red spider is extremely partial, and it does more harm to them than all other insects put together. Where it has established itself, during the season, as soon as the leaves are off, the Vines should be pruned, taken down, and the oldest outside bark removed (without stripping it too closely as is often done, and which does serious injury), getting well into any hiding places where the eggs are deposited, then paint the whole of the canes thoroughly, from the collar to the extreme point, with the usual dressing of water, clay, and a little soot, mixed to the consistency of thick paint, to which add 1 lb. of flowers of sulphur to each gallon. Scrub all the wood and iron-work thoroughly with soap and water, limewash all the brickwork. If there is an inside border, remove 2 inches of the surface soil, and add an equal amount of new material. When the house is again started, and until the Vines come into bloom, use plenty of moisture in the atmosphere, and syringe regularly overhead. Those who aim at high-class Grape-growing, with the berries as heavily covered with bloom as possible, generally cease syringing after the opening of the first bloom; but to the amateur, or those who have not had much experience, I would say, begin syringing again as soon as the berries are set, and continue to do so daily, until the fruit begins to colour; it will make the bloom thinner, and so far will injure the appearance of the fruit, but the chances are that the Vines will finish the crop better, without distressing them half so much as if the syringe had not been used after the flowering stage, for the spider is almost certain to make its appearance before the fruit is near ripe, if the syringe is not used. Hundreds of Vines that get into a bad condition have the evil laid to the charge of over-cropping, when the cause is due quite as much, or more, to the ravages of this insect. The most effectual means for its destruction is the application of sulphur to the pipes or flues, but if the house is flued, care must be taken that the sulphur is not laid on the flue too near the furnace, or the consequences may be most disastrous on account of the ignition of the sulphur. With hot-water pipes, this cannot occur. To one part fresh lime add two parts flowers of sulphur, and mix with as much water as will bring it to the consistency of thick paint. On a mild dull evening, if possible, get the water in the pipes as near boiling as can be, close the house and saturate the atmosphere, with water, then regularly paint the pipes over with the mixture. If the weather is dull, so as to require little or no air during the following day, so much the better. An almost general impression prevails that if sulphur is applied to the pipes before the berries are stoned, the skin will be injured. In the case of tender-skinned sorts, like Buckland Sweetwater or Foster's Seedling, if the bunches are near the pipes such will be the case, but Hamburgs, Muscats, Alicante, or Lady Downes, will not suffer. If the atmosphere is thoroughly saturated, the skin of the berries becomes coated over with the moisture, which appears to shield them from injury; but for the thorough destruction of the insect, and freedom from injury to the fruit, the above directions as to thorough

saturation of the atmosphere must be carried out in their entirety, and the operation must be repeated in the course of ten days, by which time any eggs that have been deposited will have come to life. I may here state that no insecticide can with safety be applied to Vines, except to the bare wood when at rest; any dressing after the berries are formed will disfigure them, and if applied in the late stages of growth, will leave unmistakable evidence of its presence by tasting the fruit.

On Cucumbers and Melons.

Cucumbers are subject to red spider, but on them it can be kept under by the use of the syringe. Melons are especially subject to spider in the early stages of their growth, and whilst the fruit is swelling the syringe will keep it under; but when the fruit begins to ripen, necessitating a drier atmosphere, it is more difficult to manage. In houses or pits heated with flues or hot water, it can be treated as in the case of Vines; but in dung-pits or frames it is difficult to manage. During the ripening season, a close watch should be kept, so as to detect the insect as soon as it makes its appearance, carefully sponging the leaves thoroughly both on their upper and under surfaces.

On Peaches and Nectarines.

The Peach-house is one of its favourite haunts, if there is an insufficiency of water applied to the trees overhead; but where the syringe is used freely in the early stages of the growth of the fruit, it has not much chance of getting established. Neither should it be allowed to run riot over the trees after the fruit is gathered, as such has a most baneful influence upon their strength, causing the leaves to fall prematurely, and thereby destroying the vital power of the trees. Peaches and Nectarines on open walls are alike subject to this insect; but, here again, it is attributable to an insufficient use of the garden engine. The Peach, in its native habitat, is subject to a great amount of moisture, and an insufficiency of this at once renders it a prey to every insect that revels in a dry atmosphere. To keep red spider down, the Peach wall should have a good washing with the garden engine twice a week, from the time the trees go out of bloom to their commencing to ripen.

On Ordinary Hardy Fruits.

Fruit-trees, when removed, after they have got to a considerable size, or after root-pruning, more especially Apples, are frequently severely attacked by red spider to an extent that will seriously injure the fruit both in size and quality. Where the trees are of moderate size, and not in too great numbers, a good washing with Gishurst Compound—3 oz. to the gallon—as soon as the insect makes its appearance, together with the use of the garden engine once a week for a time afterwards, will effect its destruction. This is essential, as, if the insects are permitted to take their course, they will leave, each autumn, a brood of eggs that will regularly supply a numerous colony of the insects every spring. In the case of very large trees that are affected, or where they are numerous, nothing can be done, as the labour involved would be too much.

On Outdoor Plants.

Amongst the more important of outdoor flowering-plants, Hollyhocks are very subject to spider, and, unless means are taken to destroy it before it has got any considerable hold, the plants will be spoiled, as they will quickly become denuded of their under leaves, a state which, in addition to unsightliness, renders them too weak to flower satisfactorily. Regular use of the syringe or engine, with clean water, is the best means to keep the insects in check. As a preventive to the attacks of this pest, plants under glass, as well as wall fruits and other things grown out-of-doors, on which it is possible to cope with it, a sufficiency of water at the roots and overhead, in the shape of regular syringings, or the use of the garden engine, is indispensable and the only remedial measure possible. Any plant subject to the attacks of spider that is allowed to suffer at the root for want of water, is almost certain to become infested with it. Any check to vigorous growth appears to render the juices of plants more palatable to the spider, and better calculated to favour its

increase. Strong healthy growth, on the other hand, induces a crude condition of the sap, unsuited to the requirements of the insect. Plants in houses, that stand anywhere near forest trees that are subject to spider, such as Elms or Limes, are sure to suffer from it, as an infected leaf, blown in through an open light, is quite sufficient to introduce and establish a colony upon any plant on which it will live. T. BAINES.

Southgate.

THE BLACKBIRD.

MR. TILLERY, and some of your correspondents, seem so determined to destroy this glorious singer, the "Bad Shots" using traps, &c., to assist them in their work, that I send you a copy of a song on the subject by another well-known singer. If you reprint the song, it may, perhaps, soften the determination of some of your readers in their search after rat-traps and other engines for blackbird destruction.

R.

THE BLACKBIRD.

O BLACKBIRD! sing me something well:

While all the neighbours shoot thee round,
I keep smooth plats of fruitful ground,
Where thou may'st warble, eat and dwell.

The espaliers and the standards all
Are thine; the range of lawn and park:
The unnetted black-hearts ripen dark,
All thine, against the garden wall.

Yet, tho' I spared thee all the spring,
Thy sole delight is, sitting still,
With that gold dagger of thy bill
To fret the summer jenneting.

A golden bill! the silver tongue,
Cold February loved, is dry:
Plenty corrupts the melody
That made thee famous once, when young:

And in the sultry garden-squares,
Now thy flute-notes are changed to coarse,
I hear thee not at all, or hoarse
As when a hawk hawked his wares.

Take warning! he that will not sing
While yon sun prospers in the blue,
Shall sing for want, ere leaves are new,
Caught in the frozen palms of Spring.

—ALFRED TENNYSON.

NEWSPAPERS AS PLANT PROTECTORS.

MR. GUILFOYLE, of Merion, writes on this subject to the *Gardener's Record* as follows:—The weather is often so variable in winter and early spring, that, even under the most favourable circumstances, the gardener is frequently puzzled. Many a gardener in the country lives at a distance from his charge, as also do his assistants; expecting frost, fires are lighted before leaving off work; perhaps the men are scarcely at home when the scene changes, the sky is overcast, making fires a good deal worse than useless, because positively injurious to many things, with a waste of fuel besides. Slaking down of fires then becomes necessary, which would not be of much consequence if the men were resident in the garden; but when it comes to a mile or so across country it is no joke. And just as the gardener is indulging in the comfortable anticipation of a night's rest, the stars begin to peep out one by one till the whole firmament is studded over with them; frost again commences; he gets nervous about his plants, and he starts his fires again, sometimes not without a good deal of labour. Even if he does get to bed, he is up looking at the sky and the thermometer outside his window. Newspapers will relieve him of much of his care. He may spread them over his plants at nightfall in uncertain weather; the labour is slight; and, being so light, they will not injure the most delicate growths; and I know, from experience, that they will exclude a considerable amount of frost. They are also most useful in hard frosts as aids to the fires and inside frames, with or without mats. To gardeners growing specimen Pelargoniums, and other plants that do not like any excitement during winter, they are invaluable. They do away with the necessity of having strong fires. They ought to be thoroughly dried by being thrown across the pipes or flues, or by other means, before being put on at night. It does not take many minutes to cover a house of plants with them, and the security and peace of mind they give the gardener who is anxious about his charge is not to be undervalued.

[We consider the foregoing a valuable suggestion, and any of our readers can very easily give it a trial.]

THE KITCHEN GARDEN.

THE NEW AMERICAN POTATOES.

IN spite of what has been said in favour of Compton's Surprise, it will, I fear, not meet with any great encouragement from Potato growers in this country. It is noteworthy that it has not done well at Chiswick, and that it has also been much affected with disease. As has been stated in reports of Potato trials in America, this variety has a tall strong-growing haulm, and coarse haulm is generally allied to coarse ungainly tubers, which are rarely of good quality, and when disease prevails late in the season such Potatoes are the most certain of all to succumb to its ravages. The tubers of Compton's Surprise closely resemble those of the old Jersey Blue, or Paterson's Blue, being large and very deep-eyed. The flesh is white, but, in that respect, not superior to our purple kinds; whilst, as a table Potato, or for exhibition, it is not equal to Scotch Blue or Summer-hill Seedling, two of the handsomest and most acceptable purple-skinned Potatoes in cultivation. Who that has any taste for a good Potato cares about one that produces tubers from 1 lb. to 2 lb. in weight? Such kinds are only fit for cattle feeding, or if cooked for table they have to be cut into several pieces before they can be cooked, and Potatoes served up so are unacceptable. Nice medium-sized tubers, that will all cook alike, and which, when dished up, look like balls of flour, are the sort of Potatoes which are liked in this country. The extra early Vermont is, on the other hand, a Potato worth looking after, and enough of it has already been sold in this country to make it pretty abundant next summer. That it will supersede the Early Rose there can be little doubt, as it is earlier, more prolific, and has a dwarfer top—all points in its favour. Its quality is also good, as it received a first-class certificate at Chiswick after it had been cooked. It has, however, the fault common to nearly all American Potatoes—that is, it has a large number of eyes. Where it is desirable to increase the stock of any kind, that is an advantage; but, when the stock becomes abundant enough to store for table use, then a superabundance of eyes is undoubtedly a fault. In the case of this variety, a tuber 1 pound in weight has upwards of twenty eyes, all of which, instead of being deep, are rather prominent, and this characteristic will enable people in this country to comprehend the possibility of one pound of Potatoes being made to yield so many. Now, the evil of a superabundance of eyes is evident when tubers are stored. As such kinds soon spurt into growth, not one or two, but twelve or twenty shoots at once, the exhaustion of the tuber is most rapid. It is like having a full tub with twenty leaks in it instead of one or two; and, in consequence, it is sooner emptied. The Early Vermont is found to be quite flabby before Christmas—much more so, indeed, than even the Ash-leaved Kidney; and this is owing entirely to the excessive number of sap-exhausters which it has in the shape of eyes. Now, a really good keeper, because a much later ripener, is Brownell's Vermont Beauty, a remarkably fine and handsome Red-skinned Potato, and one as notable for the specific gravity of its tubers as it is for its even cropping qualities. It has the drawback of an abundance of eyes, but that is not so detrimental as in the case of the Extra Early Vermont, as it is much later in starting into growth. The shape of the tuber is that of an elongated flat-round, and it is remarkable that it never produces any small ones. The flesh is rather yellow, and boils soft and good. This variety has also an exceedingly short haulm, and was greatly admired at Chiswick. The Extra-Early Vermont has, I believe, escaped disease because it ripens so early, but Brownell's Vermont Beauty has not been so fortunate, and therefore must not be considered disease-proof. After all, there are few better American Potatoes than the late or pale American Rose. It is, however, not paler in colour than any other of the Rose family, and the skin is slightly netted. The medium-sized tubers of this variety are really handsome, and very telling in any collection. It is about a fortnight later than the Early Rose, which, in the haulm, it closely resembles. It is not probable that we shall ever beat the Americans in the matter of raising crops. Our tubers won't be so large, although we may get as many to a root. This will be no evil, but rather a gain, as we shall get better quality. A. D.

CULTURE OF PARSLEY.

PARSLEY must be produced in quantities at all seasons, for the kitchen, to be used in frying, boiling, stuffing, and flavouring many things, and, also, for garnishing purposes. Good curled-leaved Parsley is everywhere now obtainable, and is no more expensive or troublesome to cultivate than the old plain-leaved sort was formerly. To grow it to perfection it requires good rich soil, and will pay for a good preparation as well as any known vegetable. It may either be sown in single rows as a boundary edging to cultivated quarters, in horders, or in beds, on quarters, in rows 12 to 18 inches apart. Make the first sowing in February and the last in July. Thin the sowings early, and keep them thoroughly clean by constant surface-stirring. Sow or transplant some in large pots or boxes, to be placed indoors, or otherwise sheltered in winter, so that a supply for the whole year may be secured. Respecting surface-dressings, there is no kind of manure, that I could ever discover, that produced such luxuriance and colour in Parsley, and kept it so free from canker, as light dredgings of fresh chimney soot. It is also a good plan, where there is no convenience of sheltering Parsley, or housing in pots in mid-winter, to select in summer some of the best bits, and carefully and methodically dry it, and, when done, to rub it up, and bottle it; I have found the best method for drying it is to place the leaves between paper, and never expose them to the full rays of the sun, thus it will dry a beautiful natural green colour without having its virtues dried or roasted out of it. Beds and borders of Parsley may always be sheltered partially when severe winter weather sets in, by placing round them a double row of short stakes, temporarily, and filling in between them with straw, Fern, Haulm, evergreen boughs, Heath, Furze, or roughly made bands twisted up out of any rubbishy material. JAMES BARNES.

DEEP CULTIVATION.

DEEP culture has been recommended, and more or less practised for ages, and there cannot, I think, be a doubt that deeply-worked land renders us in a great measure independent of the seasons; or, rather, what I wish to convey is, extremes of dry or wet weather do not disastrously affect land that has been deeply-stirred for a series of years. In a wet season, the excessive rainfall easily percolates through the deeply-worked land without doing any injury, whilst in a season of drought the roots meet with no impediment in their descent to the cool deep stratum, in search of the necessary moisture to carry on growth. Deeply-stirred land, too, is warmer, and, consequently, earlier, than that which is only subjected to a mere surface digging or scratching. And it is less urgent to follow out to the letter any particular system of rotation of cropping. Even this is a great gain; for in a garden that is closely and continuously cropped, any particular system of rotation cannot always be strictly adhered to. And, in addition to all this (taking a series of years), its general adoption will pay by increased crops, and, by reducing the necessity for watering so much in dry weather, for the extra labour incurred in moving the earth deeper. I think, however, there is a right and a wrong season for performing even trenching, and which depends principally upon the character of the soil and sub-soil of each particular locality. For instance, the sub-soil of a large portion of this county is composed of what geologists call "the Oxford oolitic clay," and is of considerable depth or thickness. As a general rule, all trenching should be performed upon soils of this character in the autumn or early winter months, for the coarseness of the granules or fragments of soil, if deeply trenched in spring or summer, may become so excessive as to render it unfit for cropping within any reasonable time. I have known this to occur even where there was no particular difficulty in working up a fine tilth on the surface. The land, in fact, lacked the necessary firmness or consolidation, and was, for the time being, almost barren from this cause alone. Judging from my own experience upon different soils, it is always best to proceed cautiously in introducing any new system, unless we are thoroughly acquainted with the chemical composition of the soil we are working upon; as I believe it takes several years' experience in the management of some soils before the best mode of treatment can be discovered and practised with certainty as to results. I should say, however, this has reference more especially to heavy cold clay lauds, as the various kinds of sandy loams may be trenched at any time when opportunity serves. One good rain is generally sufficient to consolidate it for the reception of almost any crop except Onions, Broccoli, Cabbage, or Strawberries, which always do best in land that has been deeply-stirred and afterwards settled. E. HOBDAV.

NOTES OF THE WEEK.

— THE work of laying out Leicester Square is rapidly progressing. We strongly recommend a broad sweep of fresh green turf in the centre in place of the contemplated gravel walks and central fountain.

— WE understand that a consignment of hardy North American plants is to be sold at Stevens', on Thursday next. Among these are the beautiful *Cypripedium spectabile*, *Sarracenia purpurea*, *Trilliums*, and other plants of that description.

— THE Botanic Garden at Adelaide, South Australia, has been enlarged by the addition of eighty-three acres, for the laying out and planting of which a sum of £6,000 has been granted by the Government.

— THE transformation of the old State kitchen-garden at Versailles into a national school of horticulture has already commenced. M. Hardy, for many years chief gardener at Versailles, has been appointed director of the new institution, and is about to visit Holland and Belgium, in order to become acquainted with the arrangements of similar institutions in those countries.

— THE rare *Aloe abyssinica* has just flowered in Mr. Peacock's collection at Sudbury House, Hammersmith. This species is a robust grower, bearing great smooth glaucous leaves, dentate along their margins, and it differs from most of its congeners in the colour of its flowers, which are a clear yellow throughout, and borne on spikes with 8 or 10 branches, while nearly all the other species in cultivation bear orange or orange-scarlet flowers on spikes with fewer divisions.

— NO DOUBT many think that those beautiful Tulips now to be seen in Covent Garden Market are grown in the pots in which they are sold, but they are not. Market gardeners insert their Tulip bulbs very thickly in boxes or pots, and therein grow them until they are nicely bloomed, when they turn them out of the pots or boxes, and pot them afresh, placing from four to five bulbs in each pot. The Tulips being thus transferred with as good roots as possible, and otherwise treated kindly, soon make abundance of fresh roots, and do not suffer in the least from the shift.

— IN the last number of the *Gartenflora*, Dr. Regel figures and describes, under the name of "*Geranium Backhousianum*," a very handsome species which he received some time since from Messrs. Backhouse, of York, under the name of *G. Lambertianum*. He states that, although nearly allied, the two species present very marked points of difference, *G. Lambertianum* being distinguished by its geniculate branching stem, which, as well as the branches and leaf-stalks, is covered with thinly-set hairs; by its leaves being bluntly-toothed, and less deeply lobed; and by the lilac colour of its flowers; it is figured and described in Sweet's "*Geraniaceae*," vol. iv., tab. 338.

— ACCORDING to a Blue-book return, just published, the extent of land used for fruit-trees of any kind in Great Britain in 1873 was 148,221 acres. This is a smaller acreage than was returned in 1872; but the decrease has chiefly occurred in consequence of incorrect returns under this head in previous years, in those parts of England where fruit-trees are not extensively planted, and in Wales. The extent of market-gardens in Great Britain in 1873 was 37,884 acres. Of this number 34,743 acres were in England—the counties of Middlesex, Essex, Kent, and Surrey containing 15,542 acres, or 44.7 per cent. of the market-garden land in England.

— TWO very interesting lectures on the history, government, and products of Japan were delivered during the last week in January to the *employés* of Messrs. Veitch & Son, in the institute provided for the comfort and convenience of the young gardeners employed in the Royal Exotic Nursery at Chelsea. The lectures abounded in anecdote and useful instruction, and were illustrated by numerous specimens of Japanese books, china, toys, drawings, and other articles collected by the late Mr. John Gould Veitch. The attempts made by Messrs. Veitch & Son to improve the social status of their numerous *employés* ought to bear good fruit, and we hope that other firms will follow their excellent example.

— THE present winter being not only unusually mild, but also in the district of Wigtownshire unusually dry, it may be interesting to record some of the results of such weather. There are in bloom in the gardens at Airlour, Port William, the following plants, viz., *Aubretia deltoidea* and *grandiflora*, *Anemone coronaria* and *Hepatica*, *Myosotis dissitiflora* and *sylvatica*, *Omphalodes verna*, *Scilla sibirica* (not quite expanded), *Erica carnea*, Snowdrops, *Cyclamen Coum*, *Crocus* (yellow and purple), *Primula denticulata*, double and single *Primroses* of all colours except white, *Auricula*, *Soldanella alpina*, *Saxifraga Cymbalaria*, *Linaria Cymbalaria*, *Schizostylis coccinea*, *Nemophila insignis*, *Eranthis hyemalis*, *Arabis albidula*, *Pulmonaria mollis*, *Helleborus niger* and *abchasicus*, *Tritoma Uvaria*, intermediate Stocks, Wall-flowers (single and double), *Vinea major* and *minor*, *Laurustinus*, *Jasminum nudiflorum*, China Roses, Daisies in variety, Violets, *Pansies*, *Polygala Chamæbuxus*, *Lithospermum prostratum*, *Garrya*

elliptica, *Cydonia japonica*, Spurge Laurel, *Arbutus*, *Berberis Aquifolium* and *nepalensis*, *Phlox frondosa*, *Symphytum caucasicum*, and *Dondia Epipactis*.

— LIVERPOOL is to have an aquarium and winter-garden. An excellent site, near the Philharmonic Hall, has been secured, and the greater part of the capital has, it is said, been subscribed without any public appeal. It is in contemplation to build an aquarium, conservatory, and other buildings, at an estimated outlay of £15,000.

— *CAREX BACCANS* is now fruiting in the Palm-house at Kew. It has bright green grass-like leaves, and bears nodding branched spikes of crimson berry-like fruits of quite an ornamental character, on stems about 2 feet in height. It comes from the Himalayas, and if well grown, would make a desirable plant for conservatory decoration, while its graceful spikes would be useful for cutting.

— THE article on red spider, which forms our leader this week, is one of a series, by Mr. Thomas Baines, the well-known plant-grower. It is rarely we find the highest cultural skill accompanied with the power of fully expressing, in writing, the knowledge on which that skill is based, but that these qualities are combined in Mr. Baines is well shown by his writings. We commend these articles to our readers, as the best ever written on the pests of our gardens.

— A COLOURED illustration of Bradley's new Strawberry, named *Amateur*, is given in the *Florist and Pomologist* for this month. It is said to be a great bearer and a free grower. Its fruit, which keeps well, is large, obovate, cockscombed, and of a deep red colour, both outside and inside. It has been awarded a first-class certificate by the Royal Horticultural Society, and is a valuable late Strawberry, which comes into use just before the Frogmore Late Pine.

— THE exhibition of appliances for the economic consumption of coal, which has been formed in the Peel Park, Salford, by the Society for Promoting Scientific Industry, was formally opened on Friday. Mr. J. Lowthian Bell, who had been announced to open the exhibition, was prevented from being present, but forwarded the copy of an address which he had intended to deliver. This was read by the secretary, Mr. Larkins. The exhibition will remain open some weeks, and will, doubtless, receive its share of public notice when the elections are occupying less attention than they are at present.

— *DRABA BRUNIIFOLIA*, a very diminutive yellow-flowered species from the eastern Caucasus, is figured and described by Dr. Regel in the last number of the *Gartenflora*. It forms dense tufts of leaves, arranged in rosettes, which are each about $\frac{1}{2}$ inch in diameter, and in June and July are surmounted by an abundance of golden flowers on stems about 2 inches high. The plant is nearly allied to *D. aizoides* and *D. cuspidata*, but, according to Dr. Regel's experience, is much harder than either. The plants of *D. bruniifolia*, which flowered last year in the Botanic Gardens, St. Petersburg, were raised from seed gathered at an elevation of 8,000 feet.

— AMONG plants figured in the *Botanical Magazine* this month are *Stapelia Corderoyi*, a dwarf singular-looking kind from southern Africa; *Iris Douglasiana*, a showy Californian species, with flowers varying from white to lilac-purple; and *Odontoglossum roseum*, an old acquaintance recently imported by Messrs. Backhouse, of York. It is a variable plant, the best and larger forms of which remind one of the new *Mesospinidium volcanicum*, both in habit and flower, and, like that species, it has one leaf on its two-leaved bulbs smaller than the other. Its flowers are of a rosy colour, varying to reddish-crimson, the column and base of the lip being creamy-white. The lip is slightly adpressed to the column, as in *Mesospinidium volcanicum* and this gives the flowers an Epidendroid appearance. It is a free bloomer, and, when well grown, very showy. In the figure in question the bulbs are much too highly coloured. Of *Gaillardia amblyodon* and *Solandra oppositifolia*, both figured in this number, notices will be found in other columns.

— MR. ELLACOMBE writes to us from Bitton Vicarage, and sends the following list of plants in flower in his garden there, Feb. 2:—*Galanthus nivalis*, *G. n. plene*, *G. plicatus*, *Crocus mosiacus*, *C. susianus*, *C. biflorus*, *C. b. Parkinsoni*, *C. lagenatorius*, *C. Aucheri*, *C. luteus striatus*, *Primulas* (single and double), *Rhododendron atrovirens*, *Keria japonica*, *Hepatica alba*, *H. a. stam. rubris*, *H. rubra*, *H. r. plene*, *Leucojum vernum*, *Daphne Fioniana*, *D. indica rubra*, *D. Mezereum*, *D. pontica*, *Eranthis hyemalis*, *Vinea major*, *V. minor*, *Garrya elliptica*, *Gorse*, *Petasites alba*, *Anemone hortensis*, *Lonicera fragrantissima*, *Tussilago fragrans*, *Cydonia japonica*, *Viburnum Tinus*, *Erica herbacea*, *E. codonodes*, *E. mediterranea*, *Helleborus niger*, *H. n. major*, *H. eupreus*, *H. orientalis*, *H. antiquorum*, *H. abchasicus*, *H. lucidus*, *H. dumetorum*, *H. odoratus*, *H. atrorubens*, *H. olympicus*, *H. purpurascens*, *Arabis albidula*, *A. rosca*, *Pansies*, *Daisies* (single and double), *Cyclamen Coum*, *C. vernum*, *C. Ibericum*, *C. l. album*, *Mahonia japonica*, *M. Aquifolium*, *Sisyrinchium grandiflorum*, *Violet Czar*, *Chimonanthus fragrans*, *Iris stylosa*, *Iberis semperflorens*, *Clematis cirrhosa*, *Scilla sibirica*, *Hyacinth* (small white), *Omphalodes verna*, *Jasminum nudiflorum*.

THE FLOWER GARDEN.

FLOWER GARDEN DATURAS.

By W. THOMPSON, Ipswich.

AMONG the numerous plants available for garden decoration, but which are mostly conspicuous by their absence, several species of annual *Daturas* occupy a prominent place. Whether the fact be due to the abundance of the material offered nowadays to the gardener's hand, to the fastidiousness of modern horticultural tastes—which thrust aside all plants unfit for exhibition purposes, for the button-hole, or for the decoration of the dinner-table—or whether it arises from the somewhat weedy character of their foliage, it is none the less certain that the best of them are far more rarely grown than they deserve to be, in spite of the defect alluded to, and which they share with so many other members of the same family. The genus includes five or six species, possessing some claim to notice, but those which more especially merit the attention of the amateur are the *D. ceratocaula*, the *D. meteloides*, and the *D. fastuosa*, with its double varieties. The first-named, *D. ceratocaula*, is probably one of the best known. It grows from 2 to 3 feet high, branching dichotomously; the foliage, which is less obtrusive than in most of the species, being lanceolate, with sinuated margins, and hoary beneath. Its somewhat defective habit is amply redeemed by the noble, sweet-scented, trumpet-like flowers, produced from the axils, the corolla being often 6 inches in length, and 4 or 5 across the limb, which is white, tinged with violet-purple externally and at the angles. The calyx in this species is cleft on one side, and the pendulous seed-vessel quite smooth. The flowers, both of this and the following species, expand towards the close of the afternoon and close the following morning. The *D. meteloides*, a native of Texas, of which a figure is here given, differs from the preceding in its broader foliage, which varies from ovate to cordate-ovate, as well as in its somewhat large flowers, in its calyx-tube not being split on one side, and in the capsule being spiny; the limb of the corolla is usually more completely suffused with pale violet, and, like the *D. ceratocaula*, it is fragrant. The *D. fastuosa*, if less remarkable for the size of its flowers than the species already referred to, has, nevertheless, merits peculiar to itself. Even the single form of this plant, which in the type is creamy-white on both surfaces, yields a very effective variety with the corolla of a deep violet externally, the interior being white, as in the type; but the most striking forms of this species are those bearing double flowers, the primary corolla having a second, and, sometimes, a third arising from its tube, all perfectly regular in form, and often parti-coloured, as in the single variety with violet flowers. The *D. fastuosa* Huberiana, of the seed catalogues, and several varieties of it which are offered, are reputed to be hybrids of this species with the dwarf *D. chlorantha* fl. pleno or *D. humilis* flava of the gardens; but, although they offer a greater variety of colour, they are less hardy than the older forms just described, and appear to require a warmer climate for their complete development. The culture of these *Daturas* offers no especial difficulty. Fresh seeds are readily raised in an ordinary hot-bed, and the young

plants should be pricked out singly in pots while small, and finally planted out where they are to stand. They need ample space for their full development, and should be grown in light sandy soils in preference to such as are of a heavier nature. But few gardens exist where appropriate situations for one or more of the species may not be found, and in most there is abundance of room for all those here named. It may prove an additional recommendation to some amateurs that most of the *Daturas* thrive well in the neighbourhood of the sea.

HARDY LADY'S-SLIPPERS.

(*CYPRIPEDIUM SPECTABILE*.)

As I feel sure that this extremely handsome hardy Orchid is not nearly so well known as it ought to be, I am induced to say a few words respecting it. It certainly is one of the finest, if not the very finest, hardy Lady's-Slipper that has, as yet,

been introduced, and it is by far the easiest to cultivate; when strong, it attains a height of from $1\frac{1}{2}$ to $2\frac{1}{2}$ feet; each stem bearing at its summit from one to three large handsome white flowers, with a deep rose, much-inflated lip, though in some varieties the lip is so delicately tinged that the flower is nearly all white. It is a fine sight to see a strong tuft of this noble plant, with from twelve to twenty stems rising from one root, bearing from thirty to forty flowers. This could have been seen last year at the York Nurseries; in fact, the plant was flowering there so freely that it would have been an easy matter to have cut a hundred blooms at one time. In gardens where there is a natural bog, or a wet place, by turning in a few barrow-loads of peat-bog, leaf-mould, and sand, this plant might be grown to perfection. It also thrives well planted in a shady part of a Rhododendron bed. I have adopted the following plan of growing it, for these last six years, and have found it to answer well, as the plants both grow and increase in number: I select a bed $3\frac{1}{2}$ feet wide, and long enough to accommodate the quantity of roots which I have to plant, in such a situation as to be screened from the mid-day and afternoon sun; I then



Datura meteloides.

dig out the ordinary earth 18 inches deep, enclosing the bed by common building bricks placed on end; I then make it up to about 14 inches, that is, to within 4 inches of the surface, with a compost consisting of three-parts peat-bog, one-part leaf-mould and river sand; I now set the plants in their proper positions, taking care to carefully spread out their roots horizontally, as this Lady's-Slipper always roots in that way when there is sufficient room for it to do so. I then cover them with about 3 inches of the compost just named, leaving the bed in a light state, as the rains and watering are quite sufficient to consolidate it. During their growing season the plants are copiously supplied with water, and they receive no protection at any period of the year. When they have had a season's growth, the bed will have sunk about 3 inches lower than when it was first made, and, by laying on it 3 inches of the compost mentioned above, the plants, when they commence to grow, will make an effort to rise to the surface by lengthening their rhizomes and freely emitting new roots into the fresh covering. The following winter I take them up carefully with

a fork and cut away the upper part of the rhizome, with its new roots, from that which is below, and, if the plants have been well supplied with water during their growing season, the old roots will divide into two or three, and thus furnish new plants. I have tried to raise this Lady's-Slipper from seed, but without success.

R. P.

York.

THE TREE-HEATH.

(ERICA ARBOREA.)

YOUR correspondent, "Enquirer," wishes for some further information respecting this Heath, to which a brief allusion was made at page 12 as being then in full bloom in Messrs Lee's Nursery at Feltham. This species of Heath, for such it really is, as its name indicates, possesses a true arborescent character, in proof of which I may adduce the fact that in my juvenile days I well remember climbing into a bush of it nearly 10 feet high to inspect a robin's nest. It is, however, many years since I have seen a specimen of anything like that size; still, no doubt, in the south-west of England, and in Ireland also, some true representatives of the typical character of this old plant are yet to be met with. The great drawback to its full development arises from the serious effects of heavy snow storms. The myriads of tiny leaves arrest every flake that falls upon them, and the brittleness of the wood, especially marked under the influence of a severe frost, which causes it to split in all directions with the weight of superimposed snow, snaps off even strong-looking vigorous stems, or bends the tops level with the ground, while at the bend itself an entire disruption of the tissues in a longitudinal direction takes place, the result being that the plant has to make a fresh start in life from the old stump. This ordeal occurring every few years, renders its true arborescent occurrence of an exceptional character. Perhaps this is as well, as in such old plants the blooms are few and scattered, and certainly would not justify the remarks made on the appearance of the plants at Feltham Nursery. There, unquestionably, the vigour of youth, would be well exemplified, both in the denser character of the foliage, and in the larger, as well as more bountiful, production of blossoms. Seeing that our friend the Tree-Heath, though it has been a denizen of our gardens for a couple of centuries at least, is rarely met with, I will endeavour to give a brief description of its appearance. Like many of its congeners, its leaves are exceedingly narrow, arranged in whorls of threes round the stem, which, being of a slightly grey colour, gives a nice contrast to the foliage, varying from light to dark green, according to the vigour of the growth. In habit, the branches rise somewhat erect, but in old plants they acquire a more spreading character. The flowers are small, slightly campanulate, usually called white, but more correctly characterised as white suffused with a delicate lilac. They are not, as in many other Heaths, grouped into dense heads, but are scattered along the previous year's growth, charmingly intermingled with the slender foliage, which makes them so appropriate, as giving a spray-like elegance to any grouping of cut flowers. From this brief description, it will be at once seen that it possesses no ordinary value as a decorative plant; but I must caution my readers that it is the most tender of our hardy Heaths. Such a winter as 1859-60 cut it off root and stump in many localities, and to this fact is its rarity to be attributed. Nor will this be at all surprising when I say that its home is in Greece and in those happy climes bordering on the Adriatic; and in Sicily it is associated frequently with the Date Palm. The greater wonder, to my mind, is that it stands our climate at all, rather than that it should suffer from these ever-recurring seasons of Arctic winter to which we are subject.

As regards soil and cultivation, it will grow freely wherever *Rhododendrons* thrive. Like all the representatives of the natural order to which it belongs, it abominates lime and chalk, and all soils containing such ingredients. Its propagation is readily affected by the process of layering; not, be it noted, in the Picotee and Carnation sense of the word, but merely by placing round the neck of the plant a little bank of nice sandy peat, gently pressing the stems outward, so that the two-year-old wood becomes bedded on this cushion, placing as much of the same material above the branch as

will hold it down, and finishing off with a stone—a flat circular paving-stone answers admirably; it keeps the soil cool and moist, and, moreover, prevents the birds from scratching it away, which, without some protection of that kind, they are sure to do. Should the plant on which you propose to operate be old, and the branches proceed from the stem some little distance above the ground, do not attempt to bend them down, as they are sure to break; but, lifting the root, lay the whole plant down on its side, and then proceed as before described. To this exceedingly mild winter it must be attributed that the plant mentioned in your columns has blossomed at such an early period—April and May being its general time. A close ally to the subject of our notice is *Erica mediterranea*, hardier in constitution, almost as vigorous in habit, but, owing to its more upright growth, even more liable to damage from snow-storms; and, though not blooming so profusely, well worthy of cultivation. Of this we have many dwarf varieties, most of which are free spring-bloomers; but I have sundry doubts as to whether they are correctly referred to the old Mediterranean Heath at all. But there is one species I must not omit, namely, *Erica australis*. It is a most abundant bloomer, and would rival many of our greenhouse Heaths. Its flowers are a deep lilac, produced in such masses as almost to hide its deep green foliage. It grows freely, is hardier, somewhat dwarfier than the Tree-Heath, and has no equal amongst our taller-growing hardy Heaths.

Botanic Gardens, Hull.

J. C. NIVEN.

EFFECTIVE FLOWER BEDS.

A LOVE of plants is a very different thing from a mere love of flowers. Now that the extreme rage for bedding plants is on the wane, there is some chance of a wider range of plants becoming known to, and cultivated by, amateurs, and a deeper knowledge of gardening and plants induced, not merely a surface knowledge, such as is required for the ordinary style of bedding-out florists' flowers. It is, perhaps, hardly fair to disparage a system that has satisfied so many, for so long, without, at the same time, proposing a substitute, and to those who are, as yet, mere lovers of show flowers the following combinations for beds of hardy and annual plants, may not be useless. The climate of Scotland is generally considered suitable for these last, but Edinburgh, where the situation is exposed, and the soil light and warm, is not, naturally, the best locality for delicate fragile seedlings, and, therefore, it is right to explain that annuals, grown under such circumstances, require more trouble and preparation of the soil, than are needed for variegated *Geraniums*, for instance. One seldom sees now the finely raked border, and a neat row of rings, with a stick in the centre, and the name of the annual stuck through the split stick; often was the name the only thing seen of the seed. Deep hoeing did not answer for fine raking, so the soil was a solid cake below the dressed surface; now, annuals must have cool and well-worked deep soil to do them justice, or rather to enable them to grow at all and flower for any length of time. The beds of hardy and annual plants, which I shall now enumerate, possess an amount of show and colour sufficient to make them attractive, and they remain long enough in flower to satisfy any reasonable lover of a garden. I may observe, too, that, with the exception of No. 7, which was seen in perfection at Messrs. Jackmans', at Woking, and No. 19, I have not happened to meet with any of these beds which we have tried ourselves, and found to suit our garden.

1. I begin with the latest-flowering bed which I have, and which is now (January 20) covered with little white stars, viz., *Aster ericoides*, the first flowers of which expanded in October. This is a remarkably neat-growing plant, and its Heath-like appearance is attractive, even when not in flower. The pair of small beds which I have of it consist of a centre plant of Golden Queen Holly, the outside edging *Euonymus radicans* variegata, the rest being filled with alternate plants of the little *Aster* and dwarf double-red Sweet William. Even when done flowering this *Dianthus*, owing to its dark reddish foliage, contrasts well with the variegated evergreens and light growing *Aster*.

2. *Campanula carpatica* (blue), with a broad edging of the yellow *Oenothera missouriensis*. By preventing the *Campanula*

from seeding, this bed will last a mass of flowers nearly four months, beginning with June and July.

3. *Ononis rotundifolia* (Rest Harrow), a bright pink Pea-flowered plant, mixed through with *Dactylis glomerata variegata*. This makes a lovely summer bed.

4. Common double white Pink, edged with *Heuchera lucida*. Among the Pinks are small single red Tulips, which come up and flower year after year, and which well contrast with the grey foliage of the *Dianthus* and blue *Scilla bifolia*, through and outside the brown-leaved *Heuchera* edging. This bed in summer is a mass of white, and, by dotting in a few plants of crimson Mule Pinks, there are some flowers in autumn. No. 4 is a good winter and spring bed, and a most fragrant one in summer.

5. Alternate plants of *Erica carnea præcox* and *Heuchera*, with room between each of these permanent plants for a tuft of *Campanula carpatica*, or *C. turbinata*; or, if an annual is preferred, dwarf China Asters, purple, pink, and white; or *Tagetes signata pumila*, the lively green foliage of which is pleasing even before the plant comes into flower.

6. (Large bed), centre plant, Golden Yew, the rest of the bed being filled with three shades of red, consisting of the *Phlox Drummondii* pegged down twice, either mixed, or shaded, from light to dark, or *vice versa*, according to taste. The mass of *Phlox* is surrounded with a belt of the pure white *Eurothera marginata*, and an outside edging of *Heuchera*. *Dianthus Heddegi* would do equally well with the permanent plants, if a change is wished from the *Phlox*; both come into flower early in July, and are superior to *Verbenas*, and last until November, when the winter beds require to be planted.

7. *Clematis Jackmanii*, and its varieties, edged with *Vinca* major elegantissima, minor aurea or argentea, or *Euonymus radicans variegata*, or *Lonicera reticulata*, but, although hardy, this last loses most of its leaves in winter, and *V. elegantissima* is spoilt by severe frosts; the small *Periwinkles* and *Euonymus* are surest. I was surprised to find, on cutting over the *Clematis* this winter, fine roots where it had been pegged down, as I had always thought it must be increased by grafting. If a high bed is wished for, some suitable branches for the *Clematis* to crawl over, quickly make the bed any height desired. I have seen *Tropæolum speciosum* grown in this way in Perth and Aberdeenshire with most brilliant and beautiful effect, but it does not succeed about Edinburgh. The *Clematis*'s first flower opened in July, and the last in November.

8. *Erica carnea* or *præcox*, *Violas*, and *Pausies*, in alternate lines or rings, and in colours according to taste. It is hardly possible to go wrong with this bed. When the Heaths are too much grown to admit of *Violas* between them, and you are not inclined to part them, *Phlox Drummondii* (mixed) will give bright eyes of colour all summer and autumn, and, if thinly planted, will do not the least harm to the Heaths, which, of course, must never be overgrown by other plants, but, by clipping over the dead flowers, and trimming in sprawling pieces, they will last for years undivided, if so wished.

9. *Dactylis variegata* and *Phlox Drummondii* intermixed make a light mixed bed.

10. *Anemone Honorine Jobert* (white) alternated with *Chrysanthemum Bob* (dark red), the edging being *Heuchera*, makes a pretty bed.

11. The small *Fuchsia pumila*, with white *Vittadenia trilobata*, makes a very neat and lasting bed. Some think the *Vittadenia* too like a Daisy, but I am fond of all rayed flowers, and prize any plant that lasts six months in flower; it sows itself (if one chooses to let it), stands the early frosts, fades into pinkish-lilac, so as to produce various shades of colour at the same time on the plants, and requires no pegging or cutting off of dead flowers. As it is not a Daisy, it does not shut up in sunless weather, or in the afternoon. It also makes a good hardy greenhouse basket plant.

12. Groundwork, the little yellow *Eurothera prostrata*, thinly dotted with *Viola Perfection*, or any other purple, lilac, or blue *Viola* or *Pansy* of compact habit.

13. Centre plant *Yucca gloriosa*, set in a groundwork of dark blue *Ajuga purpurascens* (summer), dotted with *Sedum spectabile* (autumn), the last having fine large pink tassels of

bloom which stand the first frosts. This bed is edged with variegated Ivy.

14. Groundwork, the lovely *Mesembryanthemum tricolor*, dotted over with *Echeverias* of different sorts, and edged with *Antennaria tomentosa*. By the time the groundwork has ripened what seed is required, and the plants are removed (not that this is necessary in the case of this *Mesembryanthemum*, as it spreads out so regularly, and the flat red fleshy seed-vessels are peculiar-looking), the *Echeverias* are in bloom. I was surprised and delighted by the way in which the little *M. tricolor* flourished and opened freely in the wet summer of 1872, a circumstance I suppose to be attributed to our light soil, which would be the better for rain every second day; the only thing we have to guard against is, to see that the boxes of seedlings are thoroughly and gradually hardened off before planting out; when so prepared they can be turned out in the middle of the hottest day, require no watering, and do not give the least trouble, and we find that this little succulent is one of the quickest of annuals to flower. I fancy by having two sowings, and not saving seed, we could have this groundwork in perfection the whole season, except during the short interval between the second planting and flowering of the same. I mean to try it, for this bed was beautiful, and gave us no trouble.

15. Large or small beds of *Dianthus Heddegi* are invaluable. This year, some beds were the admiration of every one, both nurserymen and amateurs. We never had such beautiful Chinese Pinks, of every shade of red, from delicate pink to dark blood red, lilac to purple, white, and all degrees of blotched, and streaked and spotted in every delicate shade, and decided markings.

There were twenty small divisions filled with these bedding *Dianthuses*, and in each compartment there were different varieties. We regretted having to transplant them, still in flower in November, on account of some necessary alterations that had to be made in the beds. The *Dianthuses* were edged with *Artemisia Stelleriana*. They last well in water, and bear close inspection.

16. Large bed (to look down upon); centre plant, a tuft of best Gardener's Garters (*Phalaris arundinacea elegantissima*), surrounded with *Aster bessarabiensis* (best blue), then scarlet *Pelargoniums* (somewhat large plants), a band of *Helleborus niger* major, the edging being alternate plants of purple-leaved *Plantago rubescens*, and *Funkia japonica cordata*. As all our beds and borders are edged with hardy bulbs, No. 16 has flowers in winter (Christmas Roses), spring (Crocuses), summer (scarlet *Geraniums* and lilac *Funkia* bells), and autumn (Asters); and, owing to the variety of shape and colour of the foliage-plants, beauty is still maintained in the intervals between the times of flowering of the different plants. *H. niger* major should be grown for a foliage plant, even if it never flowered. In old gardens in the north I have, at a distance, mistaken clumps of this Christmas Rose for those of *Pæonies*.

17. Centre plants *Spiræa*, with one plant of *Tritoma grandis* on each side. These three plants were surrounded by *Delphinium formosum* (selected seedlings of good clear blue), the small double yellow Sunflower, then a ring of alternate plants of *Saxifraga cordata*, and the finest and earliest flowerer of the large-leaved *Saxifrages*; one we got unnamed from Mr. Niven, of Hull, belonging to the *Ciliata* type. This bed is edged with *Heuchera*, and between each *Saxifraga* are dwarf Lilies, *L. veunstum* (red) or *L. superbum* (yellowish), alternated with the white trumpet *L. eximium* or *longiflorum*, and between every plant of *Delphinium* and Sunflower is *L. croceum* (orange). This bed has flowers in it in spring (dwarf *Narcissus*, for bulb edging, and *Saxifrages*), summer (*Spiræa*, Lilies, and *Delphinium*), and autumn (Sunflowers, Lilies, and *Tritomas*, which last continue to flower long after the Sunflowers).

18. Foliage-bed—Centre plant, Golden Yew, surrounded with *Cineraria acanthifolia* or *Centaurea ragusina*, the last of which stands most winters with us. The *Cineraria* is perfectly hardy; we did not have it, however, in 1860-61. Then a broad mass, pegged down, of Red Spinach (seed from Belvoir—very superior to what is usually bought as Red Orache, and does not acquire so much of the rusty colour when old. Next a ring of pegged *Artemisia annua*, the outside edging by the

Grass being *Stachys lanata*. This bed was so satisfactory, that we had it two or three years in succession, and the Spinach came up of itself more than we required, although the beds had been filled for winter, and thoroughly dug.

19. *Lobelia fulgens* intermixed with *Tussilago Farfara variegata*. This is a grand bed, and unlike every other; but I must admit that the *Lobelia* does not succeed with us as I have seen it in Dumfriesshire, where the climate is damp and the soil heavy—conditions which suit both plants. The dark red-pointed foliage of the *Lobelia* contrasts well with the round bold Coltsfoot, and it is a good bed before the intense scarlet flower-spikes come into bloom.

For a distant bed or row—to shut out kitchen-garden crops, for instance—alternate plants of *Symphytum officinale* fol. var. and *Dielytra spectabilis* make a beautiful combination, both of colour and form; and I was much struck by it when first I saw it in a friend's garden. By persistently pinching out the flower-buds of the Comfrey, the plants are kept bushy, and do not run up, as they naturally incline to do; and, by preventing its flowering, the fine creamy foliage is kept handsome much longer than it otherwise would be. Pinching out is a far better plan than cutting over the flower-stems, which we used to do, thus having fine variegated leaves close to the ground. By pinching, you have a big bush covered with fine leaves.

Vinca major elegantissima, grown as a pillar about 5 feet, for back rows of herbaceous border, looks uncommonly well; the effect is finer and the growth more graceful than either variegated Ivy or variegated Bramble, and it is not deciduous like *Acer Negundo*. When the large blue flowers are in bloom it must be beautiful; it has stood unhurt through the winter, from 1869 to 1874, and when I saw it at a distance I mistook it for *Cobæa scandens variegata*.

My list of our proved hardy beds is not exhausted, but the arrangements I have mentioned must suffice for the present; our beds are all on Grass, and, being circles and ovals, simple in shape, the Grass-cutter runs round them all without loss of time, and, in clipping the edges, the shears have not to be lifted and reversed.

One of the most immediate benefits gained by filling beds with the plants recommended in this paper, and one patent to all, even rigid bedders-out of exotics, is, that the extent of glass, always too limited and over-crowded, even in the largest places, at times, is set free for its legitimate occupants and the miserable crammings, and makeshifts for storing away the struck and lifted hedding stock, through the winter, and still more harrassing time of spring, are done away with. Not merely does the hedding system, carried to extremes, curtail the variety of plants in our flower-gardens, but the interesting and valuable contents of frames, greenhouses, and stoves, are all injured and limited on account of this one object; even Vineries and Peach-houses are not improved by the multifarious and multitudinous collections of bedding-plants that are thrust into them.

F. J. HOPE.

Wardie Lodge, Edinburgh.

A HINT FROM NATURE ON PLANTING CYCLAMENS.

WHILST walking round my garden the other morning, admiring the beauty of *Crocus Imperati* and its various relatives of the early-flowering group, with fifty other gay and beautiful flowers basking in the sun, I came to a fine tuft of *Cyclamen hederifolium* some 18 inches in diameter, with splendidly marked foliage of dark and light green, shining like wax, and lighted up with the bright red flowers of *Cyclamen Ibericum*, the root of which had strayed or come from a chance seedling in the midst of the ample foliage of the more robust *hederifolium*, forming an exquisite group. This hint afforded by nature was not to be disregarded, therefore I at once set to work to group some others of the spring-blooming section in like manner. *C. hederifolium* and its more finely marked var. *græcum*, are splendid plants for the border or for rock-work, when well grown with some 100 to 200 flowers springing from a single root, succeeded by its beautifully marked foliage, lasting the dreary winter months through, but the absence of well expanded leaves whilst blooming in some measure detracts from its merits in the opinion of some, yet, when its ample and exquisitely marked foliage is fully developed and

mixed with the flowers of the spring-blooming section, the bright red of *Coum*, *Ibericum*, &c., and the pure white of *Atkinsii*, the combination so formed is not to be surpassed, more especially at this dull season of the year. The foliage of the spring-blooming section being rather scant in proportion to the abundance of their flowers, the charms of both are much increased by the combination.

J. ATKINS.

Painswick.

Rare Species of Tulips.—I have read with intense interest Dr. Regel's article on the various species of Tulip, and I sincerely hope and trust it will stir up all those who have the means and the opportunity to procure and grow all the known species of this beautiful family. I have lately been endeavouring myself to procure living bulbs of all the species I could get hold of, and have now the following:—*T. sylvestris*, *T. pulchella*, *T. Biebersteiniana tricolor*, *T. biflora*, *T. fragrans*, *T. baotica*, *T. Oculus-solis*; *T. Persica*, *T. Gesneriana maculata*, *T. viridiflora*, *T. carinata-rubra*, *T. retroflexa*, and *T. elegans*. I shall be glad to know to what species the four last-named really belong. I have had, but lost, *T. Orphanidea* and *Celsiana*. I shall be only too thankful to be supplied with any of the other species enumerated by Dr. Regel. It is quite lamentable to think that such numbers of lovely hardy bulbous plants should be so completely neglected. Syria, Persia, Armenia, Palestine, the Crimea, Ionian Isles, Greece, and many another Oriental lands, teem with *Scillas*, *Crocus*, *Muscari*, *Hyacinthi*, *Sternbergia*, *Ixiolirions*, *Tulipas*, *Fritillarias*, and many other lovely bulbous gems which ought to deck our gardens, and gladden our eyes each returning spring. If Mr. Cook would only fill his pocket with bulbs each time he takes a party to the east, and Baron Renter would order a case of miscellaneous "oignons" to be sent home by every mail from Persia, what treasures we might some of us possess. Thanks, however, to the labours of such men as Mr. J. G. Baker, Dr. Regel, Herr Max Leichtlin, and others, we are waking up to the value of these neglected and despised jewels, and I do not despair of seeing a bed of *Tulipa Greigi* in full bloom in my little garden at Drayton-Beauchamp. I have just made up a small round bed of that lovely *Crocus*, *C. Imperati*, which I mean to leave untouched for three years, and if I may judge from the effect of a bed of *C. vernus* var. *Sir Walter Scott*, treated in a similar way, my eyes will be gladdened by a marvellously lovely sight. If I had a garden large enough, I would have a small bed of every species of *Crocus* I could procure, vernal and autumnal. When the morning sun shines out bright, their beauty is passing strange. Since I wrote this I have procured *Tulipa Julia*, *T. Celsiana*, and *T. altaica*.—H. HARPER CREWE, Rectory, Drayton-Beauchamp, Tring.

Hardy Plants now in Bloom.—On paying a visit to the interesting garden of Mr. Atkins, at Painswick, on January 27, I saw in flower in the open ground, the following plants:—*Tropeolum pentaphyllum*, *Pyrus japonica* fl. pl., *Jasminum nudiflorum*, *Crocus Imperati*, *C. Cloth of Gold*, *C. biflorus*, *Galanthus Imperati*, *G. nivalis*, *G. plicatus* (just opening), *Primula denticulata* (very fine), *Myosotis dissitiflora*, *Helleborus niger*, *H. colchicus*, *H. abchasicus*, *H. orientalis*, *Eranthis hyemalis*, *Erica carnea*, *Aubrietia purpurea*, *Iberis sempervirens*, *Cheiranthus præcox*, *Auemon blanda* (just coming out), *Cyclamen ibericum*, *C. Coum*, *C. vernum*, *C. Atkinsii* (and several varieties all in perfection), *Primroses* of several vars., including a blue *Polyanthus*, a very fine yellow *Oxlip*, double white and lilac, &c., *Hepaticas* (blue and double pink), *Arabis alba*, *Claytonia sibirica*, *Saxifraga Rocheliana*, and *S. Burseriana*. The last-named *Saxifraga* was one of the most beautiful Alpine plants I ever saw, and, being a very rare and difficult one to grow, gave more pleasure, both to Mr. Atkins and myself, than anything else in the garden. It is a dense-growing tufted species with hard leaves and large white flowers; the calyx is hairy, and of a reddish-brown colour; and the bright yellow anthers are very conspicuous; the whole plant in flower does not exceed 3 inches in height. The list of plants I have given, amounting to thirty-five species, shows what a variety of flowers may be had in the dead of winter by those who love them, as Mr. Atkins does. Would there were more like him.—H. J. ELWES.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Iris stylosa.—I send you a bloom of this *Iris*, the first we have had this season, though several more are in the bud state.—T. S. WARE, Hale Farm Nurseries, Tottenham. [A charming winter-flowering *Iris* with beautiful purplish-lilac flowers streaked with orange.—En.]

Planting Ixias Sparaxis, &c.—Now is the time to plant *Ixias*, *Sparaxis*, *Babianus*, and similar Cape bulbs, which, unless planted early, do not bloom in such perfection as they otherwise would do. They should be planted in rows across 4-foot beds, 2 inches deep. Dig up the soil in the beds loosely, and on no conditions trample on it, and some rough sand should be strewn in the notches under and over the bulbs at planting time. The sand is not only beneficial to the bulbs, but it is also useful in showing where they are at lifting time, when, from being so small, they are otherwise often overlooked.—F.

THE INDOOR GARDEN.

ECHINOCACTUS MYRIOSTIGMA.

THIS may be described as a civilised Cactus, inasmuch as it has laid aside its spines and other asperities, and put on an elegant attire, bespangled with silver. This little Mexican gem has generally five deep angles, though sometimes they number seven or eight; at the apex, on the margins of the angles, are borne a quantity of silky, yellow, star-like, sessile flowers, which open during sunshine, and close about four o'clock in the afternoon. They keep expanding for four or five days in succession, according to the intensity of the sunlight, and they last longest when least exposed; the blossoms begin to open in June and continue expanding, at intervals, until October, during which period a good plant, such as that represented by the accompanying illustration, will bear from ten to twenty blossoms, $1\frac{1}{2}$ inches in diameter. The ground colour of the plant is dark green, and its whole surface is thickly and regularly beset with white star-like scales, which give it a very beautiful appearance, especially under a microscope. Its culture is in no way different from that under which other Echinocacti thrive, but it must not be subjected to a temperature below 40° , otherwise it will be sure to suffer more or less from cold, and will not flower satisfactorily. J. CROUCHER.

WINTER ORCHIDS.

WE have just seen a very fine display of these beautiful plants in the Royal Exotic Nursery, at Chelsea. The chaste flowers of *Odontoglossum Alexandræ*, of snowy purity contrasted with the rosy-flowered crimson-lipped *Lælia anceps* and the vivid orange-scarlet flowers of *Sophranitis* and *Ada aurantiaca*, would alone make a show, apart from the scores of other choice species here, growing under a few feet of glass. The pearly-white *Lycaste Skinneri* looked whiter beside the deep crimson-blotched lips of other varieties belonging to the same species, while the unavoidable stiffness of Orchids *per se* was admirably corrected by the judicious introduction of choice Palms of feathery lightness.

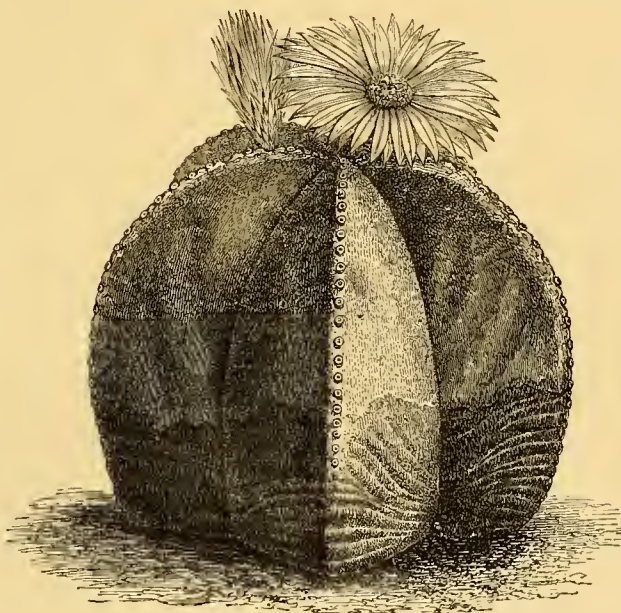
Everyone who requires a very choice assortment of cut-flowers nearly every day during the winter months, will find a small collection of the best winter-blooming Orchids very useful. Many of the best of all winter and early spring-flowering Orchids are amenable to cool treatment, while all are easily grown, if ordinary care be taken in their every-day management. Many of the finest of all Orchids may be grown in an ordinary plant-stove, although, for the convenience of management, they are certainly better in a structure to themselves, if only for convenience sake. Cut-flowers of the Orchids now form a distinct and striking feature in the daily supply of flowers sent to Covent Garden Market, while all the best bouquets contain a few choice flowers of *Oncidiums*, *Odontoglossums*, and other species equally valuable. We append a short descriptive list of the best of the common species, all of which may be grown for their supply of winter flowers.

CÆLOGYNE CRISTATA.—This is a well-known Indian Orchid, found on the hills of Nepaul, and having plump glossy two-leaved pseudo-bulbs, and pendulous spikes of five to seven snowy-white flowers, with a blotch of pale yellow on the boat-shaped lip. It is one of the most profuse-flowering Orchids in cultivation; well-developed specimens, grown either in pans

or on blocks bearing about 100 spikes each. The finest plants in this country are grown by Mr. R. S. Yates, of Sale, Cheshire, who grows them in an ordinary partially-shaded plant-stove, in company with *Gardenias* and other choice cut-flowers. The plant grows well in fibry peat, thoroughly well drained, and the bases of the bulbs should be elevated above the margin of the pot or pan. It requires a plentiful supply of water when growing, and should never be allowed to become dry enough to shrivel. As a winter-blooming plant it is unsurpassed, and its free habit of growth makes it a general favourite. A specimen, bearing ninety-seven spikes of flowers, many having seven flowers each, was exhibited, from the Duke of Devonshire's gardens at Chatsworth, in 1868. This plant was growing on a block.

LELIA ANCEPS.—This is another free-flowering species, having thick one-leaved pseudo-bulbs, of a glossy green colour. It produces tall two-edged spikes of flowers, 3 to 4 feet high, and is very showy when in bloom, which lasts a considerable time in perfection. The sepals and petals are of a bright rosy colour in the throat, streaked with lake, and tipped with a broad blotch of dark velvet-like crimson. It bears from three to seven flowers on a spike, and deserves general cultivation, even by amateurs, whose appliances are limited.

ODONTOGLOSSUMS.—There are several showy species of this genus that flower most profusely during our winter months, and, as most of them are amenable to cool treatment, they are doubly valuable to those whose facilities for heating are not of the best description. *O. Alexandræ* is, perhaps, the best of the winter-flowering *Odontoglossums*, and bears gracefully curved spikes of snowy-white blossoms, 2 to 3 inches across, each spike bearing twelve to eighteen flowers. Different individuals vary in their tints and markings; indeed, this variability constitutes one of their principal charms. *O. grande* bears five to eight yellow flowers blotched with brown, each being 6 to 8 inches across. It is easily grown, but requires an intermediate temperature to do it justice. It is one of the most showy winter-flowering Orchids we have, and deserves general cultivation as a decorative plant. It can be grown well



Echinocactus myriostigma.

in any ordinary warm greenhouse or plant-stove. *O. pulchellum*, a pretty little species bearing pearly-white flowers, is very valuable for cutting, and well-grown plants bear twenty or thirty spikes of flowers. It does well with cool treatment. There are many other species of this genus that bloom very freely during the winter and spring, all more or less beautiful. *O. gloriosum*, *O. tripudians*, *O. blandum*, *O. Lindleyanum*, *O. rosenum*, *O. Insleayi*, and many others may be included in collections for the sake of variety if required. *Odontoglossums* grow best in small well-drained pots, and a fresh open compost of living Sphagnum and fibrous peat, with the addition of a few handfuls of crocks and dried horse-droppings, suits them admirably. All the species like a humid atmosphere and abundance of tepid water at the root when growing.

PHALANOPSIS.—These may be considered the most beautiful of all Orchids, and, as they come from the warmest and most humid parts of the earth's surface, they require a corresponding degree of heat and humidity when cultivated here at home. Nearly all the best species of this charming group may be termed universal bloomers, and their chaste flowers are specially valuable during the duldest parts of the year, either for cutting for bouquets or general purposes of decoration. *P. grandiflora*, *P. amabilis*, and *P. Schilleriana*, are the best species for winter-

flowers, and, if half-a-dozen plants of the first-named species be well grown, there will be little want of a good supply of pearly moth-like blossoms. They grow well either in well-drained pots, or on flat blocks suspended from the roof, or on the sides of a partition near the light. For small plants, blocks are preferable to pots, and when the plants get too large for the blocks they need not be removed, as much injury would probably ensue. The best plan is to partially imbed the block in a pot of fresh open compost. They require a liberal supply of moisture when growing, and should never be quite dry at any season of the year, or a loss of one or more lower leaves will follow such neglect. Within the last few days I have seen some beautiful spikes of flowers on *P. grandiflora*, *P. amabilis*, and *P. Schilleriana*, and these may be considered most useful for general cultivation.

SOPHRONITIS.—There are two or three species of this genus, all beautiful, but *S. grandiflora*, *S. coccinea*, and *S. violacea* are the best. The first-named is one of the brightest winter-flowering plants in cultivation; its brilliant scarlet blossoms contrasting very effectively with the snowy flowers of *Odontoglossum Alexandræ*, *Phalanopsis*, and other white-flowered species. These plants may be grown either on blocks or in pots in a cool house, and flower most profusely in December and January, lasting a month or six weeks in perfection. They grow well in the compost recommended for *Odontoglossum*, and should be suspended near the light, as their flowers come much brighter in such positions. *S. violacea* somewhat resembles a *Barkeria*, and bears lilac flowers on an erect spike.

TRICHOPILOA SUAVIS.—This is a well-known Orchid, easily grown in any plant stove, and remarkable for its profuse flowering qualities. In well-grown specimens the flowers form a perfect wreath around the base of the flattened one-leaved pseudo-bulbs. Its flowers are borne three to five together, on a short drooping spike, and are of a crystalline whiteness, spotted with faint rosy-lilac, and delicately scented. It is one of the easiest grown of all Orchids, and, as it may now be obtained for a few shillings, it should be grown in quantity so as to produce a succession of its delicate and fragrant flowers.

DENDROBIUM.—This is a well-known genus, and several of its species are welcome for the profusion of their winter blooms. *D. nobile* is one of the best of all winter-flowering Orchids, as it rarely fails to cheer us with a most abundant supply of its rosy-lilac crimson-blotched flowers. It may be grown to perfection in any ordinary plant-stove, and, where a dozen or more plants are grown, it may be had in flower for three or four months of the year. In order to do this the earliest plants require a little gentle forcing, and the treatment required by *Azaleas* and other forced shrubs suits them admirably. Fine specimens of this plant, like those at Chatsworth, where it is much appreciated as a winter-bloomer, are 3 to 4 feet in diameter, and are literally one mass of flowers. In the Pine-apple Nursery, and other places in the Metropolis, this plant is largely grown for cut-flowers, and these come in very useful for bouquets, flat vases, button-holes, and dinner-table decorations of all kinds. The plant is readily propagated by division, and does well in fibrous peat, crocks, and living *Sphagnum*. Some of the rarer species are well worth growing, although few flower so profusely as the last-named. *D. heterocarpum* bears pale sulphur-yellow flowers, most delicately scented, like Violets, and is a general favourite with many ladies on that account. *D. crassinode* is another pretty species, having curiously knotted pseudo-bulbs and white flowers, blotched with yellow on the lip, while its sepals and petals are tipped with lilac-purple. *D. japonicum*, *D. transparens*, and several other species, may be added for variety.

BARKERIAS.—Two or three species are well-worth growing for winter-flowers, one of the best being the new *B. Lindleyana* var. *Centræ*, recently imported by Messrs. Veitch. This bears flowers as large as those of the summer-flowering *B. spectabilis*, the sepals and petals being of a bright rosy-lilac, while the oblong lip is crisped at the margin and bears a deep purple blotch at its apex. It appears to be a very strong grower, and is, certainly, a most profuse bloomer, a small plant on a block an inch or two in length having borne two fine spikes, each bearing nearly twenty flowers. *B. Skinneri*, and its variety "superba," are well worth general cultivation

for their deep claret-coloured flowers, borne very freely on erect spikes, 12 to 16 inches high. Like the last, it does well on a block, but large clumps may be grown in pans suspended near the light.

LYCASTE SKINNERI.—This plant is of remarkably easy culture, and so hardy in constitution that it may be placed in a drawing-room for several successive weeks when in flower, without incurring the slightest danger of its being injured, provided always that frost is excluded. Mr. B. S. Williams, author of the "Orchid Grower's Manual," one of our ablest Orchid growers, speaks very highly of this beautiful and variable plant as a drawing-room ornament. The different varieties of this species vary from pure white to the deepest rose-coloured flowers, having a richly crimson-blotched lip. In the Royal Exotic Nursery at Chelsea, I recently noted a deep rosy-petalled flower, with a lip of the purest white, and the effect of this flower was very striking, although, of course, nothing when compared with the pure white variety itself—*L. Skinneri alba*. This species grows freely in fibrous peat, on a well-drained bottom, and should be liberally supplied with tepid moisture when growing, and at no time should it be actually dry at the root. Some growers allow its pseudo-bulbs to shrivel in order to induce it to flower freely; this practice, however, only serves to weaken its energies, and, consequently, has a contrary effect in the case of *Lycastes*, all of which bloom most freely when well grown. We have seen plants, in ordinary 32-pots, bearing from fourteen to twenty flowers each, and when seen in this state, the plants are very ornamental and invaluable during the dull portion of the year for conservatory or drawing-room decoration. This species is so easily grown, and its period of flowering extends over such a lengthened period, that it should be included in the list of every amateur who has a liking for Orchids.

CATLEYAS.—Of all the species, *C. Trianae* is the best for the purpose above indicated, and those who love variety in a really good thing may here indulge their taste to its fullest extent. The many varieties vary in colour from snow-white to the deepest rose and crimson. A few years ago (1870) Messrs. Low and Co. introduced a splendid batch of white-petalled varieties of great size and substance, and some of these have lips of the deepest velvety crimson, the brilliancy of which is much enhanced by the broad white segments with which it is surrounded. All the innumerable forms of *C. Trianae* are profuse bloomers, and deserve to be grown in quantity wherever choice cut flowers are required for the drawing-room vases. All the *Catleyas*, if we except *C. Dowiana*, grow well in a warm greenhouse, and prefer a compost of tough fibrous peat, crocks, and fresh *Sphagnum*. Care must be taken to use small pots, as much injury often results from over potting. Elevate the plant slightly above the rim of the pot, and see that it is well drained. *Catleyas* require a humid atmosphere, with abundance of air during fine bright weather. Water freely when growing, and, if possible, induce them to root during the dull portion of the year. Great care must be taken not to check them when growing by any irregularity, either in temperature or moisture, for, if this is done, the plants often break again from the base, thus making two growths instead of one, and neither of them have strength to bloom. *Dendrobes* and *Catleyas* are often seriously weakened in the manner above described, and, in nine cases out of ten, this is the result of irregular treatment.

F. W. BURBIDGE.

HYBRIDISING ZONAL PELARGONIUMS.

(ORIGIN OF THE DOUBLE VARIETIES.)

IN raising from 3,000 to 5,000 seedling Zonal Pelargoniums yearly, with the view, to some extent, of obtaining novel colours, and greater perfection in the form of flowers, my special desire and aim has been to ascertain, if possible, the influence borne by the respective parents, as regards the transmission of properties to, or the production of new qualities in, their offspring; consequently, a considerable proportion of my seedlings have resulted from experimental fertilisation directed to this object only. I, therefore, derived much pleasure from the perusal of M. Jean Sisley's letter concerning the origin and production of the double varieties; the latter bearing upon the subject of my experiments, and confirming my experience, upon the prepotence of the male parent, which is at variance with

the pre-conceived notions of florists, and also denied by experienced raisers of novelties in the Pelargonium family. I am at a loss to account for the colour in the case of Aline Sisley being derived from the female parent. I should like to know if this was an isolated result out of many seedlings from the same cross? Also, whether M. Sisley has found that white varieties are more powerful in transmitting their colour to their progeny, than varieties of other colours; for, in crossing pinks upon whites I obtained a preponderance of white seedlings, whites upon scarlets produce salmon or scarlets blotched or streaked with pure white, white upon pinks mostly pure whites; it seems to me that white varieties are tenacious of reproducing white, and do not blend so much as other colours. There are one or two points in reference to the origin and conubial affinities of the varieties named by M. Sisley, as having been employed by M. Lemoine and himself, in the production of the double varieties, upon which I should much like to be furnished with information. The first double variety, M. Sisley states, "was found growing at Clermont-Ferrand." How that variety came there, and whether it originated from a sport or as an accidental seedling, I conclude is not known. It was stated to me, on what seemed good authority, that the doubles first imported to us from the Continent originated as sports from Beauté de Suresnes; but, according to M. Sisley's statement, M. Lemoine raised them from that variety and the pollen of the one found at Clermont-Ferrand, which suggests another point upon which I am very desirous of obtaining information. As these varieties were produced by fertilisation with Beauté de Suresnes, has either M. Sisley or Lemoine been able to cross these varieties with the ordinary Zonals? Also what relation to these, or from what origin, did the variety M. Sisley used in fertilising Madame Vaucher come? I ask these questions because, although I have tried hundreds of times, I have never succeeded in obtaining seed either from Beauté de Suresnes, crossed by an ordinary Zonal, or from an ordinary Zonal crossed by Beauté de Suresnes, and it has always been found impossible to do so by many experienced cross-breeders in England. Although I was the first to publish this fact, and, at the time of my doing so, it was noticed by Mr. Charles Darwin, and considered to be a point of great importance and interest, as bearing upon the subject of the formation of species, by his correspondence he seemed to think it possible that this variety, or a variety or two, might have diverged gradually from their ancestors in certain properties, and had come to a stop, retaining and perpetuating the acquired properties, fertilising with each other, but ceasing to become fertile with the varieties from which they had originally sprung, and so formed what is termed a distinct species. I should state that I found that Beauté de Suresnes was fertile with one old variety, known by the name of The Duke of Cornwall, which variety possesses a most decided zonate foliage; in fact, it has a darker and broader zone than any variety I have ever seen. Neither it nor Beauté de Suresnes differ in appearance from the ordinary Zonals, with the exception of being of unusually robust habit of growth. The Duke of Cornwall is also unfertile with any of the ordinary Zonals, but both it and Beauté de Suresnes are fertile with the double varieties first imported. I could not, by the aid of the microscope, perceive any difference in size or otherwise in the pollen granules of these varieties and the ordinary Zonal pollen, and am utterly at a loss to conceive why they should not cross. As Beauté de Suresnes came from the Continent, perhaps M. Sisley can give some account of its origin; and M. Sisley will also see my reason in asking for the origin of the variety he crossed upon Madame Vaucher, believing that, if it has sprang from the Beauté de Suresnes strain, he could not have effected it. Mr. Laxton, of Stamford, has raised some fine double varieties belonging to the ordinary Zonal class; but I am ignorant of the origin of his strain—whether he originated it, or whether it came from the Continent. Probably it did, and is of the same strain as the variety from which Aline Sisley was obtained. All these points would interest me much to know, and, doubtless, many who are working in the same field of inquiry.

JOHN DENNY.

Stoke Newington.

Growing Terrestrial Orchids without Soil.—The Editor of the *Irish Farmers' Gazette*, in a recent number, says:—"Every one, who knows anything of Orchids is, of course, aware that most of the epiphytall section may, in our plant-houses, if the atmospherical conditions be favourable, be grown with a certain amount of success on blocks or branches of wood, or on earthenware imitations of them. They must be also familiar with the fact that, when grown in pots their roots appear to eschew the body of the soil, and cling with tenacity to the sides of the pot, or the fragments of potsherds which form the drainage. It was from observing this, very probably, that Mr. Sayers was led to have recourse to his somewhat anomalous

potting material. The pot is simply filled with roughly broken potsherds, occasionally mixed with a few lumps of charcoal. On these the plant was placed and made firm, and the surface coated over with fresh-growing Moss, Hypnum proliferum or similarly-habited species. To this new pasturage the plants soon took most kindly and sent abundance of healthy roots to revel and rejoice in what appeared to be a most congenial medium, and the whole collection soon began to assume a new and healthy appearance. It is not every one, however, who would think it possible to grow and flower the members of the terrestrial section without soil; and yet, at Rockville we have seen such things as *Bletia Tankervillei*, *Calanthe veratrifolia*, *Phajus maculatus*, *Peristeria*, and *Cypripediums* quite at home, and some of them flowering, and apparently growing, in their light and airy medium, as well as if their roots were luxuriating in a rich compost, the ingredients of which had been selected and prepared *selon le règle*."

A Blue Pelargonium (?)—In the garden, of which I had charge in 1872, there grew in one of the herbaceous borders a fine plant of *Geranium pratense*. I am perfectly sure that there was not another plant of that species within a circuit of many miles. With the view of hybridising this plant, and thus raising hardier varieties than our common Zonals, and with better flowers than those of *G. pratense*, I commenced to operate on it. I cut off every flower-spike but one small one, and as the flowers on this spike opened I removed the anthers before the pollen grains were ripe with a pair of forceps. Then, when the pistil was in a suitable condition, I fertilised it with various greenhouse kinds of Zonals, and in every case a seed pod formed and ripened. I then sowed the seed, which germinated quickly and grew freely. The seedlings had the foliage of *G. pratense* and its herbaceous character, and owing to that I lost them, as one of the men threw them out during the winter. If any of your correspondents who disbelieve that crosses in this way can be effected will try the experiment, they will soon be compelled to alter their opinion.—JAMES SIMPSON. [We should like to see more exact proof than this that a cross was effected.—Ed.]

How Lily of the Valley is grown for Market.—When a market gardener pots his Lily of the Valley, he puts as large a clump of crowns into each pot as he possibly can, and if these come up well, the shoots, are, as a matter of course, too thick; as he finds that he gets as much money for a moderately and regularly filled pot-full of this favourite plant as he does for a thickly filled one, he thins his pots of all superfluous crowns when the shoots are about 3 in. in length and have formed their flowers, removing them with as many roots as he can. The pots being still well filled, have their surface soil settled a little, and are replaced in warm quarters to develop their flowers and leaves properly. The thinnings are likewise potted, and otherwise treated in the same way as the others, but they never make nice specimens, as they fail even to produce a single fresh rootlet, the sole aim for potting them being that they may develop a few flowers that come in well as cut blooms, of which an abundance may now be seen, amongst other early flowers, in Covent Garden Market.—F.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Pelargonium Bowkeri.—Can any of your correspondents inform me where I could procure plants of this *Pelargonium* (true), which is said to have yellow flowers?—J. S.

Winter-flowering Fuchsia.—The correspondent who sent us the other day specimens of a rare Fuchsia to be named, will greatly oblige by sending us his address, which we have mislaid.

Calanthe curculioides.—This rare and showy Orchid has just flowered in the East Indian house, at Kew. It bears erect rigid spikes of deep orange-yellow flowers, and is, so far, quite distinct from its congeners, nearly all of which bear snowy-white or pale purple flowers.—B.

Solandra oppositifolia.—This is figured in the "Botanical Magazine" for this month, under the name of *Fagraea zeylanica*. It comes from Ceylon, and is one of the handsomest species of a fine tropical Asiatic and Polynesian genus. Its flowers, which are white, large, and showy, are borne in terminal clusters, and the foliage, which is ample and deep green, sets them off to good advantage; altogether it is a handsome indoor shrub.

Double-flowered Cinerarias.—These, which were first raised by Messrs. Haage and Schmidt of Erfurt, about six years ago, are now grown in their nurseries in every shade of colour in which the single *Cinerarias* are found. The raising of these double-flowered varieties was a very important gain for our conservatories, as, with all the variety and beauty of colour of the single-flowered kinds, they continue in bloom for a very considerably longer period than the latter do.

The Double Tiger Lily.—It may interest some of your readers to know that I saw upwards of two dozen plants of this Lily planted out last summer in the conservatory of the Jardin d'Acclimatation, Bois de Boulogne, Paris. The plants in question were flowering freely and had a brilliant effect, being planted on a cool fresh bed of *Selaginella hortensis*, which is one of the best of all plants with which to surface beds and borders in cool conservatories of the natural style. I can fully corroborate all you have said respecting this effective bulb, and hope to see it plentifully distributed, and, as it is, of course, perfectly hardy, it will make an effective plant in outdoor beds or borders, as well as those indoors.—J. S. JAMES, Rydenham.

THE LAWSON NURSERIES, EDINBURGH.

OUR leading nurserymen have proved their right and title to take rank among our merchant princes. The amount of capital embarked in their undertakings, the energetic spirit in which those enterprises are carried forward, and the various kinds of knowledge required in order to ensure the successful prosecution and management of such pursuits, undoubtedly place the profession of a leading nurseryman in the first rank of commercial enterprise. Every successive horticultural season, with its magnificent fruit and flower shows, which continue uninterruptedly to increase in extent and importance, are attracting larger and larger numbers of the general public to take a lively and intelligent interest in plant and tree culture, whether as means for increasing the beauty of our parks and pleasure gardens, or for the realisation of improved and extended crops of culinary vegetables and table-fruits. Scarcely forty years ago, only a few horticultural enthusiasts, supported by a very small and straggling band of lukewarm amateurs, could be cited as true patrons of horticulture; and it was not till such men as Lawson, Knight, Perry, Veitch, and others, whose names deserve equally honourable mention, had, by their enterprise and success, thoroughly aroused public attention, that the present wide-spread interest in their important vocation was firmly established. It was their boldly speculative importations of valuable and beautiful novelties, and their interesting experiments and improvements in various modes of culture, that created the present highly advanced state of the national taste in matters horticultural, and, in many instances, even a passionate love of their pursuit. By the unflagging energy of such men, and that of their collectors, aided by the labours of other explorers, the earth is being ransacked, so to say, in its entire circuit, in pursuit of its hitherto unknown vegetable treasures; and scarcely a year now passes unmarked by the exhibition of some new and valuable flower, to be gazed on for the first time by European eyes; some new and graceful Pine from the mountain recesses of California; some new fruit, as a delicious addition to the delicacies of the table; or some new root, grain, or Grass likely to become of practical value to our rapidly increasing population.

Among the first who stepped boldly out from the previously humble position of the routine nurseryman, was the ancestor of the late Messrs. Lawson & Son, whose extensive establishments have been recently purchased by a company (in January, 1873) which intends to prosecute vigorously the various enterprises which they have thus taken up. The energetic character of Mr. Peter Lawson, the founder of the house, may be partially estimated by his spirited advertisement in the *Caledonian Mercury*, of November 21, 1780, nearly a century ago. Among a goodly list of trees, roots, and seeds, we find, in the paragraph devoted to bulbous and tuberous-rooted plants, "a large assortment of Turkey and Persian Ranunculuses," announced as "imported direct from Holland;" that beautiful tribe of flowers being then scarcely known as hardy garden flowers, even to the most advanced English florists and amateurs of the time. In the same advertisement he announces the arrival of "a very large assortment of fruit trees," from the celebrated nurseries at Brompton Park, as just received by the good ship the *Lovely Mary*; and he further states that by the *Jemima* and the *Mary*, both of the port of London, he has also received other kinds of nursery stock, including garden and agricultural seeds, the newest kinds of gardeners' and farmers' tools of all kinds, and many other articles connected with horticulture. In his nurseries he was eminently successful in raising forest trees of all kinds in immense quantities, from seed, which he duly announced as ready for sale, either as seedlings, or once or twice transplanted. One may easily imagine, conducting his enterprises with this amount of genuine earnestness, that he succeeded in founding a very extensive business, far in advance of that of most other contemporary establishments of the kind either in England or Scotland.

When, in due course of nature, the concern thus established by the father passed to the son, in 1821, the late venerable Mr. Lawson found himself, while still in the prime of life, in possession of a great and thriving business, in a condition of rapid expansion, which his superior knowledge and energy soon

made still more important and valuable. In the very beginning of an independent career he introduced several new and valuable trees; among others the valuable *Pinus austriaca*, the robust hardiness of which, in addition to its other attractions, renders it extremely useful as a nurse, or rather shelter, to young plantations of more tender trees. Every branch of the business, in short, received a new impetus under the skilful and energetic management of the new head of the firm. He laid himself out especially to give a vast extension to the agricultural seed department; which, under such management, soon assumed dimensions which might appear incredible to such as are not acquainted with the vast scale which this branch of commerce has assumed. The Messrs. Lawson paid much attention to Grasses, and the kind of land to which they were respectively the best suited to produce heavy and succulent crops of herbage—and succeeded by careful and long studied selection in discovering profitable kinds for culture in almost every kind of situation. It was in 1833 that Peter Lawson & Son made the valuable addition of the *Lolium italicum* to our list of cultivated Grasses; a plant which cannot be over valued both as herbage and forage, and for its profuse growth. The work entitled "*Agrostographia*," produced and published by them in 1842, is an elaborate treatise on cultivated Grasses and other herbage and forage plants, such as Clover, Trefoil, Lucerne, and others, which have been called artificial, as distinct from natural Grasses. It has proved extensively useful to landowners and farmers, and has gone through five editions, printed at the Lawson press. The work (founded on many detached essays) first appeared in a collected form in 1842, and the fifth edition was issued by the authors in 1855. In this important work, the Grasses or other plants suitable to different situations and climates, and the quantity of seed to be sown per acre, are set forth with an instructive distinctness which does the authors great credit. Other important works issued from their private press, among which may be mentioned a "*Synopsis of the Vegetable Products of Scotland*," a "*Descriptive Catalogue of the Fruit Trees, Shrubs, &c., Cultivated in the United Kingdom*," the "*Agriculturists' Manual*," and, more recently, a magnificently-illustrated work on *Coniferae*, called the "*Pinetum Britannicum*." The Messrs. Lawson had been for several years seedsmen to the Highland and Agricultural Society of Scotland, when, in 1853, they were appointed the Queen's seedsmen for Scotland.

After having either introduced or distributed many genera and species of the cone-bearing family of trees, especially the *Wellingtonia*, and being among the first who successfully raised from seed a large stock of that magnificent tree, the crowning success of their enterprise in that direction was the purchase of the first stock of plants and seeds of the exquisitely beautiful *Cupressus Lawsoniana* of Mr. William Murray, the well-known Californian explorer, who, after a successful expedition in 1855, also discovered and brought over, for the first time, *Pinus Beardsleyi*, *P. Craigana*, *Abies Hookeriana*, *Taxus Lindleyana*, *Cupressus McNabiana*, and, above all, *Cupressus Lawsoniana*, so named by Mr. Murray in honour of that spirited firm, who had purchased of him the whole botanical results of his expedition at a most liberal price, after he had failed to obtain anything like a valuable offer in England. This kind of open-handed commercial generosity naturally secured for the late Mr. Charles Lawson, the head of the firm, the esteem of his fellow-citizens. He was elected Master of the Merchants' Company of Edinburgh, and became Lord Provost of the city, during which tenure of office, like the Herriots and Greshams of the past, he became the friend and host of royalty, having had the honour of receiving the Prince and Princess of Wales in his own house during their visit to Edinburgh. Such is but a short sketch of the commercial career of one who only recently departed this life at the ripe age of seventy-nine years. The Company which has taken over his vast business in all its branches, intends to carry it on in a spirit worthy of its founders, and with the large capital at their command, aided by an able staff of officials, many of them experienced *employés* of the late firm, will, no doubt, be eminently successful in their great undertaking.

I recently explored the vast warehouses at George IV.



THE LAWSON COMPANY'S NURSERY, EDINBURGH.

Bridge, and likewise their nurseries in the suburbs, and all I saw distinctly bore the impress of energy and success. On entering the nurseries the finely laid out and richly planted flower garden, backed by a selection of ornamental evergreens and other shrubs, forms a very charming *coup d'œil*. Here are displayed a number of novelties, many of them raised by the company or their predecessors, a glance at which is enough to rouse the most sluggish admirer of the beauties of nature into becoming at once an enthusiastic florist. In the greenhouses were three new varieties of the large-flowered Clematis family, all perfectly hardy. The variety named Lawsoniana had several flowers measuring fully 9 inches across, the eight petals being of a delicate rosy-purple veined with red. C. Henrii, with flowers of a creamy-white, is remarkably beautiful and delicate, and Symeana, with flowers of soft pale mauve, exhibited blooms nearly as large as those of Lawsoniana. All the families of ordinary greenhouse and garden flowers, both shrubby and herbaceous, were extensively represented, but important as this branch of the business has become, it is the finer kinds of forest trees, especially those belonging to, or allied to, the Fir tribe, that have always formed the grand staple of the Lawson Nurseries. In the department of Coniferae, all the kinds worth growing are raised in large numbers, from the smaller kinds of ornamental lawn shrubs, to the noblest foresters of the family; from Larch, Scotch Fir, and Norway Spruce, to the giants of the Californian forests. To convey some idea of the extent to which the production of the commoner and hardier species of the Fir tribe is annually carried, such as Larch and Scotch Fir, for instance, it may be stated that I found several millions of young seedling Larches ready for sale, the demand for which is such that scarcely a sufficient supply will be left in stock for transplanting and forming one and two year-old plants, and to produce this number of growing Larches, over 2 tons of Larch seed are annually sown. Other trees are grown upon a corresponding scale, though scarcely, perhaps, to be counted by millions; but there are acres on acres of various kinds of Chestnuts, Oaks, Ashes, Elms, and Maples, both for forest use and for ornamental plantation, the variegated varieties being sedulously developed to meet the prevailing taste. Among the large collection of trees and shrubs specially cultivated for their variegated foliage, I noticed one of the dog-woods, *Cornus mascula variegata*, which is superior in the striking character of its white maculations, even to the favourite *Negundo fraxinifolia*, and also a variegated Turkey Oak, equally remarkable; many other finely variegated trees being under experiment as to the permanency of their leaf-markings. A sort of principle seems to be pretty well established that those leaf-variations, which take the form of a border, are much more likely, as a rule, to remain permanent than those which assume the form of irregular blotchings, though, of course, there are striking exceptions. The rule was, however, well exemplified in the case of Hollies, of which a splendid series of beautiful varieties have been raised, supplies of which are generally grown from cuttings instead of grafting, by which last-named process great shoots of green foliage from the stock are so liable to occur. In order to enable planters to produce effects of light foliage in front of dark, the Sea Buckthorn, with its cinereous leaves, and the pale green Tamarisk, are abundantly grown. But, to a casual visitor, as was my case, it is the long walks and avenues, bordered with splendid specimen plants, chiefly Conifers, that present the most alluring attractions; their fine growth and endless variety of form, and the exquisite gradations of green, yellow, and brown which they display are, indeed, very fascinating. There is the grandeur of *Picea nobilis*, the towering grace of *Cedrus atlantica*, the golden hues of *Thuja aurea*, the rigid and regular growth of *Araucaria imbricata*, and the novelty both of hue and growth of the *Sequoia*, which form together such noble galleries of the beauties of evergreen vegetation as at once arrest the attention of the most indifferent observer; while, more beautiful than any of those alluded to is the Lawson Cypress. It was one of the trees discovered in Mr. Wm. Murray's explorations in 1855; and his brother Andrew, in his graphic description of the results of that successful raid among the magnificent vegetation of the Sierra Nevada, says, "this was the handsomest tree seen

in the whole expedition. It was found on the banks of a stream in a mountain valley, growing to the height of about 100 feet. The foliage is most graceful, and the branches hang down at the tip like an ostrich feather, while the top shoot droops like that of Decodar." It is well to note these features; so graphically described by Mr. Murray, which form the chief characteristics of the tree in its own region, because many of the plants raised from seed in this country vary so remarkably as occasionally to lose entirely the natural character of the tree. Those seedlings, therefore, which exhibit the true and original type should, as a rule, be selected; though several extremely pretty varieties are well worth preserving. Beautiful as are the splendid specimens of this tree as grown in the Lawson Nursery, we can as yet know little of the noble aspect it will assume when it shall attain its full dimensions of 100 feet in height. It will be for the children of those who are fortunate enough to secure some of the largest and finest specimens now obtainable in England or Scotland, to see this grand addition to our recent acclimatised Coniferous plants in all its magnificence.

In order to convey some idea to the readers of THE GARDEN of the beauty of the walks and avenues of the Lawson Nurseries—which (by permission) form one of the more favourite promenades of the suburbs of Edinburgh—the editor requested me to select a point of view from which a drawing, suitable for a large engraving, might be taken. I have chosen one which, I believe, cannot be matched, for the vista it commands, by any nursery in Europe. The outline of the Calton Hill which terminates the landscape from the point selected, crested as it is by the Nelson memorial, by that of Burns, that of Playfair, and others, and by the grand colonnades of the incomplete national monument, looking like the commencement of another Parthenon crowning a modern acropolis, presents a combination of noble objects and a *coup d'œil* not to be surpassed, while the slight mist in which it was veiled at the time during which the drawing was taken, adds to, rather than detracts from, the beauty of a picture that can be but very inadequately reproduced by the labours of the draughtsman and the graver, be they ever so skilful.

The great warehouses at George IV. Bridge are as worthy of note as the nurseries of this establishment, though they do not admit of or require so much detail in their description. Like all the buildings in Edinburgh (even many private houses) these warehouses consist of separate flats, five in number, the principal one being devoted to the various offices of the company. Some idea of the dimensions of these flats may be conceived when it is stated that the one entirely devoted to Turnip seed is capable of containing upwards of 20,000 bushels; the arrangements for the special growth of this seed being naturally on a corresponding scale. One grower in Kent grows 200 acres of Turnips for seed for this firm, and they employ several other growers in different parts of England and Scotland. The great celebrity obtained by Messrs. Lawson & Son for root and Grass seeds, in consequence of the persistent care with which their stock has been kept true to sample, and the seed thoroughly ripened, necessarily led, with the general advance in agricultural skill throughout the country, to as extensive arrangements respecting all kinds of agricultural seeds as those named in regard to Turnip seed. It will, therefore, not be necessary to more than hint at the thousands of bales of Rye Grass seeds annually imported from the Continent in addition to that grown in England and Scotland, with many other sorts for mixing and for sowing on soils of special character, nor to refer to seeds of other kinds. It should be added, however, that the entire of the lower flat is devoted to Clover and other weighty seeds, and to the extensive machinery for dressing the Rye Grass seed, and that every part of this extensive warehouse, or rather series of warehouses (for such in reality they are, each division being fire-proof), is annually re-filled with an abundant supply of every variety required either for field or garden use. In conclusion, while endeavouring to form some idea of the great extent and importance of this business, I must not omit to state that the London warehouses belonging to this enterprising firm, in Southwark Street, are nearly as important as those in Edinburgh.

H. N. H.

THE FRUIT GARDEN.

CULTURE OF THE RASPBERRY.

On this subject Mr. Hobday has given your readers much sound practical advice at page 72. I wish to supplement what he has said, and also to differ a little from him. I have reasons to believe that, however deep, rich, and moist the soil may be, it requires also to be sandy or porous. The Raspberry dislikes a stiff clay soil, and, should it be strongly impregnated with iron, few things will be more difficult to thrive upon it; the plants seem to do best in a light, rich, decomposed vegetable soil. One seldom sees Raspberries doing badly in the oldest kitchen garden, if they have been duly attended to. My experience goes to convince me that deterioration is the result of neglect, and not because the plant gets at last tired of the ground in which it is grown. Instead of quantity and quality being deteriorated at the end of five or six years, I should then expect them to be just coming into bearing, and to continue so, without deterioration, for twenty years at least. I should be rather loth to destroy them sooner if doing well; surely we should never treat Raspberry canes like Strawberry plants! If Raspberries are best treated in that way, Currants and Gooseberries must share the same fate. I agree with Mr. Hobday, in having the canes or plants at a good distance apart; there is no question that is far more profitable than to have them bundled together. I cannot, perhaps, do better than describe the manner in which those were grown that were considered the best that came to market in the seaside towns of South Devon; they were grown in rows, 5 feet between the rows, and 4 feet apart in the rows, the earth being a rather light sandy loam, about 2½ feet deep, with rather cold sub-soil. We will suppose the plants to be five years old. The treatment was simply this: Commencing in the autumn after the foliage had fallen, with yellow twigs of Willow tied by his side, my father would proceed to prune the canes; he never would leave more than five or six canes to each stool, selecting the largest and best ripened canes, which were the thickness of one's finger; he took half of them in each hand, opening the hands pretty wide, and going around as far off, so that the canes might begin to twist well at the bottom, keeping them in his hands and going around until they were twisted to the desired height, corkscrew fashion. At 5 feet from the ground one end of a little Willow twig was thrust into the middle of the canes; it was then twisted around for three times, and the other end also thrust between the canes; the whole of the tops were then cut off, and he proceeded to the next stool. After the pruning and tying up, next came a fair dressing of dung, this being made from the cuttings and cleaning of all the garden and vegetables going to market, and well worked about until rotten by a lot of pigs. This was then spread and dug in. It was not dug deep, only one spit in the middle, the rest merely covering the dung. At the same time a row of early Cabbage plants were planted between the rows of Raspberries. These as soon as fit were sent to market, and the stumps sent to the pigs; the hoe was kept plying between them, and all suckers, except those to be left for the next year's crop, and one here and there for other purposes, were cleared away, no support as yet being employed; but as soon as the growth commenced, a stake, such as is used for runner Beans, was placed to each and tied with a Willow. As the summer advanced, and the crop swelled, the water-barrows were set going. When the fruit was all gathered, all the old canes were cut away, the stakes taken up, and stored away until the following year, the young canes were just loosely tied together to keep them from being broken, and left so that the sun and air could play amongst them; this is a most important thing. I have seen whole quarters swept away, even in Devonshire, after a wet autumn, and then a hard winter, particularly with the double-bearing varieties. Besides, the quick and simple means of getting over the work, the saving in stakes alone is such that it should commend itself to all, and especially to market gardeners and amateurs. It is surprising what an enormous quantity of water, like Strawberries, they require in a dry summer. If they once get really dry, the fruit will be small and indifferent. Mulching, after a good soaking, will be of the greatest importance. By no means encourage autumn

bearing, if you wish to save the canes, or to have a crop the following summer; there is a season for Raspberries as well as other fruit: late Raspberries are of little use in autumn, they are so watery and flavourless, and, moreover, are a sure sign of little fruit the coming season, if the plant survives. We used to grow (after trying many other varieties) mostly the Falstaff, not the round variety, but a stronger grower, of the same hardier variety, and not so given to bear the autumn crop; the fruit was like a woman's thimble in size and shape. We had an early variety that was much earlier than the Antwerp, the fruit was not so long as in that variety, canes quite as strong again, of pale colour, and covered with small thorns throughout; it was quite local, and the earliest I ever met with. And now, as to growing under difficulties—in shallow, dry, poor ground, Raspberries do but indifferently, consequently it is best to grow them in trenches, to afford them a better chance of being supplied with moisture, both natural and artificially; the best way is to have trenches taken out two feet wide, and one deep, and, if necessary, take out some of the sub-soil, if not deep enough without it; place in this trench 6 to 10 inches of good rich vegetable soil, from the rubbish heap, for instance; place the plants on it, cover the roots with the same; place a little of the surrounding soil over this, but leave the ground between the rows at all times the highest. Although Raspberries love moisture, there is poor chance of success in cool, wet, clay soils; here, then, plant on the ridge instead of in the furrow, proceeding thus:—Have the ground well trenched and well manured, set the line in its place, have one man to hold the plant in its place on the surface, while another places a good coat of the aforesaid compost over its roots, then throw up the earth from the middle on each side, and keep it so ever after, merely forking the sides, and giving a good coat of dung annually.

Maesgwynne, Whitland, South Wales.

JOHN TAYLOR.

Gumming in the Kaisha Apricot.—I was induced by the favourable opinion of the Kaisha Apricot, expressed in your paper of August 16, to order some trees of it from my nurseryman, and, although it is too soon to express any decided opinion as to the merits of the tree, I must own to considerable disappointment in reference to the "gumming" in the branches, from which it was said to be comparatively free, but, in my short experience, this is by no means the case.—C. E. [Mr. Tillery, of Welbeck, the writer of the article in question, and to whom your remarks have been submitted, says: "I expect the trees which your correspondent ordered from his nurseryman were young, and, being planted only last autumn, the nails used in fastening them to the wall wounded the bark of the gross young shoots, thus causing the "gumming" of which he complains. All kinds of Apricots, Peaches, and Cherries, will gum when young, if the nails used for fastening the shreds are so close to the wood as to injure the bark. I have a collection of all the best known varieties of Apricots on a south wall, 850 feet in length, and amongst them are many trees of the Kaisha, of a good size, and without ever having lost a branch from canker or gumming. It is different, however, with the Moorpark, and some other sorts, for some large branches, every other year, mysteriously canker, and have to be cut out. The soil here is very suitable for the Apricot, being of a turfy character, brought from a magnesian limestone rock, and the sub-soil is concreted and well drained. The Kaisha is a variety which ripens a little earlier than the Moorpark; it is smaller than that variety, but equally good, either for preserving or for dessert; I, likewise, have found it to set better in the last two bad Apricot seasons than any other variety which I cultivate."]

Packing Fruits for Travelling.—How to pack fruits, so that they may be conveyed in a green state through varying temperatures, has long been an unsolved problem. Mr. Carson, President of the Horticultural Society of Victoria, however, succeeded in sending to the late International Exhibition at Vienna fresh Apples, Pears, &c., grown in Victoria. They were carefully gathered, and each fruit was wrapped up in clean unused tissue paper. A layer of dry cotton-wool was then laid in an ordinary case, and on this a layer of Apples in paper. More cotton was rammed in between the Apples and the sides of the case, as well as between the fruits; another layer of cotton succeeded, followed by fruit as before, and so on until the case was filled. The lid was then nailed on in the usual manner, and the packing was complete. The cases were placed in the ice-room of the steamers until landed. The result was that the fruit when unpacked at Vienna was in fine condition, and excited both admiration and astonishment.

THE GARDEN IN THE HOUSE.

FERN-FROND DESIGNS.

SOME time ago we gave directions for leaf and Fern printing, and we now propose to treat of a plan by which very pretty designs may be made at little trouble and expense. Many of our lady readers may like to make designs or pictures of Fern fronds and other foliage, and a little application and manual dexterity will suffice to effect this, if the following directions are carefully followed: The materials necessary are Fern-fronds and leaves, a few sheets of white drawing-paper, or, better still, Bristol boards, a stick of common Indian ink, an ordinary tooth-brush, an ounce of small entomological pins, and a common saucer or palette in which to mix the ink. A few other little extra conveniences will be found necessary by the operator, but these will easily be supplied, as required, by a little forethought and ingenuity. In order to form a design, take a sheet of paper and fasten it securely to a flat drawing-board; if it be damped and glued round its edges, so much the better; but if Bristol boards are employed all they require is four pins at the corners. Now arrange your Fern-fronds or leaves, as gracefully as possible, on the paper, for the more neatly they are arranged the better will be the design produced. Secure the Ferns to the paper by sticking the small pins all over them, especially around the edges of the fronds, as every little lobe and pinnule must be securely pinned down to the paper, as the work of arrangement proceeds. Do not arrange one frond over another, and, when the group is completed, according to taste, proceed as follows:—Take your stick of Indian ink, and rub it with a little water in a saucer; now dip your tooth-brush into the ink, and placing the board, on which your Fern design is placed, upright against a larger board or other support, proceed to sprinkle it with the ink by drawing a pin across the bristles of the brush. This throws ink in small drops and spots all over the exposed parts of the paper not actually occupied by the fronds. By careful manipulation, a delicately-shaded effect may be obtained, and it will be noticed that, after the brush is first dipped, the ink is thrown in larger spots, and they gradually become smaller and smaller, until the brush is empty. With practice, the margin around the design can be shaded off into the white paper, so as to produce a very delicate and pretty effect. After the tint is worked on deep enough, and the whole is dry, the fronds may be removed, and the form of each will be found in white, surrounded by the tinted ink ground. A very little practice will suffice to enable any one with moderate ingenuity to make charming ornaments for screens, albums, or portfolios. By the above simple method, when well done, every little pinnule is as true in shape as in the Fern itself, and the representations thus obtained are the best of portraits. Large bold fronds or leaves are best to commence with, but the most delicate Maiden-hair and Filmy Ferns can be copied with fidelity by practice, all they require being a little more delicacy in the manipulation. If desired, the mid-rib and principal veins can be drawn in with a fine lithographic or etching pen and Indian ink after the fronds are removed. A pretty design for an album or portfolio may be made by using a bold leaf, such as that of *Ficus elastica*, Maple, or Lime, as a centre, arranging a border of Ferns around it; this forms an oblong or heart-shaped space, in which a verse of poetry may either be written or printed and illuminated. Another plan is to cut a scroll out of paper and pin it down, surrounded by a border of small Ferns, then, on removing the paper and Ferns the white space remains for a motto or text. Our readers are now in possession of the way to form very pretty designs, and one of their greatest charms consists in the immense variety of size, form, and arrangement that may be adopted according to taste. The ink employed can be varied in tint by mixing it with water colours, or the pure colours may be used alone instead of the ink. Burnt sienna or sepia gives a very nice effect, and other tints, either in water-colours or Judson's dyes, may be adopted according to taste. By employing a different tint with each group, a great variety of effect may be obtained; and, in this way, a large album might be filled with the most graceful designs, so varied in colour, outline, and expression, that no two pages would present subjects which resemble each other.

F. W. B.

THE ARBORETUM.

LONDON PLANE-TREES.

ARE you sure you are right about *Platanus occidentalis* being the London Plane? Loudon, Selby, and others, all say *P. orientalis* is hardier than *P. occidentalis*, and I always understood that the greater part of the trees in London consist of *P. orientalis acerifolia*. If this is the case, it ought to be planted in Sackville Street, Dublin; but, perhaps, you have spoken from better authority. W. B. SMITH.

[Our authority is Mr. Gordon, author of the "Pinetum," who thus writes concerning the Planes in question:—All the large Plane-trees in and about London are unquestionably the *Platanus occidentalis* or American Plane, and the reason why it is considered tenderer than the Oriental Plane is, because it not unfrequently suffers severely from having its young leaves and fresh growth half killed by late frosts in May, particularly after mild winters and early springs. In all other respects it is as hardy as the Oriental Plane, as was proved by the severe winter of 1837-8, when none of the large trees in and near London suffered the least injury, although the thermometer sunk to 4° below zero. The Maple-leaved or Spanish Plane has the same spreading habit and fruit as the Oriental Plane, and never grows near so tall as the American Plane. The Oriental Plane is unquestionably the best of all the Planes, both for shade and handsome foliage; but it is not nearly so rapid a grower as the American Plane, particularly when young. It forms a round and rather dense-headed tree, seldom exceeding sixty feet in height, with a comparatively short but massive stem, which soon divides into several robust arms, the lower ones of which are the largest, and spread horizontally to a very considerable distance. The greatest difficulty in the way of planting Oriental Planes—as trees for shade along a public thoroughfare—is in getting them with stems sufficiently tall to raise, when full-grown, their lower and wider-spreading branches high enough so as not to interfere with vehicles passing under them.—ED.]

TREES IN CHURCHYARDS.

THE planting of trees about town churches, which is now becoming prevalent, is a praiseworthy renewal of a good old custom which was formerly very general around the churches of our provincial towns of the seventeenth and eighteenth centuries, when few were to be found without a spacious churchyard surrounding the structure, and in many cases this enclosure was encompassed by a broad walk bordered with trees, which frequently became a favourite promenade of the town's-people on Sunday afternoons; or when the merry chime of the morning bells attracted different classes of people at other times, more especially when the ringers were practising for a match, in the leisure hours of the evening, when the routine toils of the day were over. Tastes are not so simple now-a-days. There are few ringing matches for the exciting prize of "a leg of mutton and trimmings," and keen discussions as to the merits of "triple bob-majors" now no longer form the basis of musical *réunions*. But, leaving out of the question the matter of the churchyard being made a promenade or public lounge, a state of things that, with other obsolete customs, has faded away into the limbo of the past, the planting of trees in connection with churches, wherever there is room, may be safely advocated, with at least two good and sufficient reasons to back it. The first is, that the necessarily rigid lines of all architectural structures are softened and rendered more picturesque by a foreground of trees—which should not, however, be so planted as to obscure too much the work of the architect; yet none could criticise adversely such judicious planting as that of the pretty and tasteful church garden, as shown in the illustration which accompanies this article. Even the architect himself—though he might, if consulted, have objected to the hiding of a single stone of his structure—would necessarily be converted to the opposite principle if he could be shown two pictures by artists of equal merit, one displaying his handiwork bleak and bare as "Bleak House" itself, and the other showing it partially concealed by a lacy veil of foliage, casting its soft and ever-moving shades on the sculptured walls, like the shadows of scudding clouds on a fair landscape, and making shelter for a merrily-chirping choir of birds at times when church-doors are closed and the songs of the human choir are silent. Secondly, in the long lines of our treeless streets and

terraces, the greenery of a group of trees would mark the situation of the place of worship very pleasantly; and the passing beneath their branches to the church door would, to some extent, fitly distinguish it from the stony and bare approach to interminable rows of stucco porticoes. In many situations, where the aspect is favourable and the space sufficient, flowers might be added, as they are in our country churchyards, a custom which has sprung up in recent years, as part and parcel of that love of flowers and of general horticulture which has happily increased among us; and the presence of flowers thus introduced has generally tended to make the churchyard the prettiest spot in the village, instead of, as it used to be, the most dingy and desolate, when the sombre foliage of a solitary Yew, in days that are fortunately of the past, formed the only kind of vegetation permitted, except the rank Grass that half concealed the mouldering and neglected tombstones. This is still the case in many instances I could name, where the pastor is careless in such matters. The introduction of flowers is always pleasing, but it should be observed that in too many cases where the attraction and appropriate beauty of flowers near the tombs of the departed is fully appreciated, the planting of trees is entirely neglected; though recent introductions have furnished us with such a variety of trees of beautiful growth, specially suited to the purpose, such as the exquisitely beautiful Lawson's Cypress, the *Cupressus funebris*, and many evergreen trees of different families. The planting of churchyards, in short, should form a special study; and then, with the attention of some of our most eminent landscape-gardeners devoted to the subject, we should soon obtain very pleasing results. In the case of town churches, where the surrounding space is generally limited, under the most favourable circumstances, care, both in the selection of the trees and the placing of them, is very important. Even in the most confined space there is a right and a wrong place to plant a tree, and the wrong one is as often selected as the right. Our respect for the art and science of horticulture is yet very young, and we do not consult its professors as often as we should. We never think of employing any but a tailor to make a coat, nor any but a milliner to make a bonnet; indeed, we are very particular that educated practitioners of those arts should be employed in these comparatively unimportant matters; the results of both tailors' and milliners' ingenuity being flung aside within the twelvemonth; while it is but too commonly thought that any one can plant a tree—a thing that is intended to increase in beauty each year, and to endure for a century, or may be centuries. The fact, however, is indisputable that a well-digested knowledge of trees and their requirements is as necessary to a proper utilisation of their capabilities as intelligence and experience are to the successful carrying out of any other object. H. N. H.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

The Loquat (*Eriobotrya japonica*).—This is seldom seen in plant-houses, and yet it is neither wanting in beauty as a decorative plant, nor in utility as a fruit producer. In the gardens at Cottingham Grange, in Yorkshire, there is a compact and handsome specimen of this plant, in the form of a standard, bearing fruit in profusion in two stages, and the gardener, Mr. Cottam, assured me that it ripens three crops in a season. This fact is worthy of remembrance by those who can afford it house room, and are fond of Loquats.—G.

***Berberis vulgaris atropurpurea*.**—This is a handsome variety, with foliage which, in spring, is of a deep wine colour, passing gradually into brown, and, in autumn, becomes of a purplish-green. As the plant is most attractive in a young state, a means has been discovered of perpetuating the charms of its youthful foliage by cutting the stems down close to the ground every second year. This generally prevents the occurrence of flowers or fruit, but as the plant is valuable for the effect of its early foliage only, its flowers and fruit are well sacrificed to obtain it.

CLIMATIC CHANGES IN SCOTLAND, AS EVIDENCED BY GARDEN VEGETATION.

ONE of the chief topics (says Mr. McNab, in his opening address to the Botanical Society of Edinburgh) which has occupied my attention for many years, and the one which will form the principal feature of this address, is the difference observed in open air vegetation previous to the years 1837-38, as compared with what is seen at the present time. The observations which it is my intention to make will not be complete without much meteorological research. I trust, however, that my excellent friend, Mr. Buchan, will be induced to supply from his store of meteorological treasures the desiderata necessary to render this paper of greater importance than it can possibly be in its present shape. Many of the shrubby plants at one time familiar to the oldest members of the society, in this part of Scotland, are now rarely to be met with in the open air, and certainly not in the same state of perfection. Whether this is owing to a deterioration of our ordinary summer climate, or to the non-ripening of the wood from the want of sun-heat, it is not easy to say, but true it is that a change has taken place during the last forty or fifty years, as I shall endeavour to prove to you. Three severe winters, viz., those of 1837-38, 1841-42, 1860-61, carried off by death a large quantity of fine plants; of those killed many of the kinds were replaced, some succeeded well, while others have never since shown the vigour of stem, leaf, flower, or fruit they were wont to do in former times. To illustrate my remarks on the effects of climate, numerous examples might be quoted; a few, however, will be sufficient to explain my meaning.

Trees and Shrubs, &c.

For a considerable time, both before and after the year 1835, the *Hydrangea* used to be grown abundantly in the gardens and pleasure-grounds in this district of Scotland, producing in many cases from twenty to forty heads of bloom on each plant, according to its size. The wood ripened by the sun was usually protected during the winter with mats or Spruce Fir branches. About the same time the sweet-scented *Verbena* (*Aloysia citriodora*) also formed large round clumps, and flowered freely every year; now this plant, like the *Hydrangea*, can scarcely be got to survive long in the open air, except in some very sheltered places near the sea, and flowering is nearly out of the question. Numerous varieties of the *Rock Rose*, or *Gum Cistus*, were extensively cultivated in our gardens about forty years ago. The gorgeous bloom, and the various tints and colours

of their flowers, were always a source of interest. Now many of the varieties of these plants are quite lost to the country, and few varieties are seen in any garden, although for the west coast of Scotland the varieties of *Gum Cistus* ought to be admirably adapted.

About the same period the common *Myrtle* was seen in a vigorous condition, both trained on walls and as standards. Wall-trained specimens used to flower and fruit abundantly, but now flower and fruit are rarely to be met with, particularly in this part of the country. During the memorable winter of 1860-61, a large *Myrtle* was killed on the garden wall at Leuchie House, North Berwick. This plant had stood in the same position for 100 years, and flowered regularly. The examination of a section of the stem proved that this plant was exactly a century old. Along with these suffruticose plants may be enumerated *Punica granatum*, *Benthamia fragifera*, *Ribes speciosum*, *Maclura aurantiaca*, *Cupressus sempervirens*, *Aristotelia maqui*, *Photinia serrulata*, *Eriobotrya japonica*, *Azalea indica alba*, and *Ligustrum lucidum*. The *Ligustrum*, although occasionally seen in shrubberies, shows a spindly habit in comparison to what it did in former years. The *Mespilus Pyracantha* is another shrub which used to grow freely, and flower and fruit abundantly on our walls, but it is rarely now to be seen in that perfection, or in anything like the frequency, formerly observed. The *Catalpa* tree, which used to attain to a height of 18 to 20 feet, seems fast dwindling away. The *Fuchsia*, particularly the *F. coccinea*, *F. gracilis*, *F. tenella*, and *F. discolor*, with the hybrid variety called *F. Riccartoni*, used to stand our winters well, with the exception of the two last-named, which, on this side of the island, are frequently cut to the ground, but never killed; the others are now scarcely to be met with.



A Church Garden.

A notable tree much admired in former years is the Almond, which used to produce flowers nearly as fine as those in the neighbourhood of London; our climate now does not seem to be sufficiently hot to allow it to ripen its wood so as to enable it to produce flower-buds, as most plants now seen in bloom are imported from England with the flower buds already formed.

The *Acacia dealbata* or *affinis* is a New Holland tree, which used to luxuriate in the open borders; I have seen it growing both in the botanic and experimental gardens, averaging about 26 feet in height, with stems 20 inches in circumference at the base, and frequently producing flowers. This species was also at the time standing near the rock-work in the garden of the late Dr. Neill at Canonmills. The tree was 12 feet high, with a stem 10 feet in circumference at the base. Numerous other examples of this tree were seen about the same time in various gardens in the east of Scotland. *Eucalyptus pulverulenta* is another New Holland tree which used to be an ornament on our lawns, but, like the *Acacia*, it now ceases to exist as a standard. Specimens are occasionally planted on exotic walls, but, even with the greatest care and protection, it is with difficulty that we can keep them alive for many years together. How different it is on the west coast of Scotland, where the plants above mentioned are often seen growing luxuriantly. It is surprising that with such a mild climate advantage is not more generally taken to cultivate in the open air many plants which in the eastern districts of Scotland we are obliged to grow in conservatories. Everyone who has travelled in Argyllshire, particularly round the more sheltered parts of the coast districts, must have been surprised at the vigorous state of the *Fuchsias*, many of them of great size and age, and seeding abundantly. Many seedlings are now found in situations which make it evident that the berries must have been eaten, and the seeds passed by birds. So much is this the case, that in another generation the *Fuchsia* will probably be set down as an indigenous plant. In the western districts of Scotland, besides the *Fuchsia*, we frequently see the *Hydrangea*, *Arbutus*, *Escallonia*, particularly *E. macrantha*, with many other half-hardy plants, growing strong and flowering well. Among suffruticose plants, *Melanthus major*, *Euphorbia elliptica*, and *Erythrina laurifolia*, used to grow freely in the Edinburgh garden, and in several of the leading gardens of East Lothian. It is now a rare occurrence to see them, except in very sheltered situations near the sea; the vigour of former times, however, seems totally gone from them.

Our exotic walls, previous to 1837-38, used to be profusely covered with the flowers of *Magnolia conspicua* and *grandiflora*, *Passiflora cœrulea*, *Indigofera australis*, and *Bignonia radicans*. Although these plants still live, they do not run off into the flowering condition which we were formerly accustomed to see. The *Passiflora cœrulea* may occasionally produce a shoot sufficiently strong to bear a few flowers, but its beautiful golden fruit is not now to be met with. While on the subject of *Passiflora cœrulea*, I may state that during my frequent visits to Dublin, particularly about the year 1832, it was a rich treat to see the *Passiflora cœrulea* growing on many of the houses facing the south, in the southern suburbs of that city. The plants were trained on the houses with branches 30 or 40 feet in length, and covered in autumn with golden fruit—a sight which I have not seen even in Dublin for many years. About forty years ago the Strawberry tree, *Arbutus Unedo*, used to be one of the greatest ornaments of our shrubberies, particularly during the winter months, being then literally covered with clusters of beautiful red berries. During the year 1838 no fewer than 300 plants, exclusive of hedges, were killed in the botanic and experimental gardens, many of them averaging from 8 to 10 feet in the circumference of the branches. The largest specimen destroyed was 60 feet in circumference, and 18 feet high. At the same time a large *Arbutus Andrachne* was likewise killed; this plant was also 18 feet high, and the circumference of its branches 70 feet. The two latter shrubs were removed from the botanic garden at Leith Walk during the year 1822, when of large size, and planted in a border in front of a south wall. At the time of their death they could not have been less than 80 years of age, showing that they had enjoyed a climate suitable for their growth during a long series of years. About the time alluded to, the *Kalmia latifolia* also used to flower profusely in the open air, the plants being from 4 to 8 feet in circumference. For the last thirty years it has been a rare occurrence to see the *Kalmia* in bloom, and if seen, only a truss here and there, and that after a warm summer. To see the *Kalmia* in perfection now we must import them from the south, with flower-buds formed on them. At the present time the *Kalmia latifolia* is one of our handsomest evergreen shrubs, whether growing in black peat soil or leaf-mould and sand, and free from the roots of deciduous trees, often forming dense hemispherical plants, 4 feet in height, and from 20 to 30 feet in circumference. Few shrubby plants used to grow better and flower more freely than the *Erica arborea* and the

E. australis. They formed large bushes both on walls^a and as standards. Although the former species now thrives and occasionally flowers, it is frequently cut down by frost, whilst the *Erica australis* has almost disappeared.

Proposed Substitute for the Larch.

The Larch also calls for a few remarks. I am inclined to think that a deterioration of climate must have taken place since the Larch was first introduced into this country; for how else does it happen that, from the enormous quantity of seeds annually imported, few of the progeny seem to have the vigour of the original trees introduced to Dunkeld and Monzie about 135 years ago? I do not wonder at debility existing in some of our Larch forests planted with seedlings raised from home-saved seed, as they are not unfrequently taken from trees covered with cones, and often diseased, which, indeed, causes many of them to assume a free-coning condition at an early period of their growth. But, when we see trees raised from foreign seeds becoming diseased before assuming a proper tree-growth, I am inclined to think that our Scotch climate is not what it was when the original Larches were first introduced into this country. A substitute for the Larch has long been talked of, but nothing definite has yet been adopted. I may here remark that I should like to see the *Wellingtonia* planted as a nurse-tree, as has long been done with the Larch. Independently of seeds, which can be got and often imported in very large quantities, no tree of recent introduction can be propagated faster, as it grows very readily by cuttings, which soon make proper and handsome specimens. A group of *Wellingtonias*, twenty-six in number, now in the botanic garden, were struck from cuttings about fifteen or sixteen years ago; they are all handsome and vigorous, averaging from 9 to 14 feet in height. From what I know of these trees I feel satisfied that if planted and brought up amongst other trees they will do better than planted singly on Grass lawns, as we are accustomed to see them. It is said that the wood is soft on account of its free-growing nature; this may be the case in its native country, but in a climate like this it grows more slowly, and its wood, in consequence, may be fitted for many useful purposes.

It may be supposed by some that the Yew tree is not so hardy now as it once was, from the circumstance of few being seen coming on to take the place of the old trees now existing in various parts of the country. This, however, is not the case, as far as hardness is concerned, but from the want of stem-pruning at an early period, so as to induce a tree growth. Many planted during the last thirty or forty years in gardens and shrubberies have been allowed to go on as bushes, instead of being stem-pruned at an early stage, so as to encourage an upward growth. It is on this account that we see some of our finest and perhaps oldest Yew trees in churchyards, where, at an early period of their growth, they had from necessity been stem-pruned, to prevent their low branches spreading over much valuable ground. If the same pruning had been adopted in gardens and shrubberies as has been done in the churchyards, we should have many more of these beautiful trees scattered over the country than we now see. I feel convinced that the stem-pruning as recommended for the Yew, which would never assume a tree form without it, will be found equally beneficial for many other evergreen shrubs, such as the Cedar of Lebanon; many of those planted during the last forty or fifty years are often seen as large rounded evergreens, instead of assuming a tree habit, as would have been the case if stem-pruning had been early done. The same remarks hold good with many plants of the beautiful Atlantic Cedar, as well as with *Deodars* and *Cupressus Lawsoniana*. Many of the unpruned specimens of this latter shrub will in time become like large unseemly specimens of *Arbor-vitæ*, laid open with every fall of snow, and spreading in all directions, which can never be the case with stem-pruned specimens. I feel certain that the stem-pruning of the shrubs just named, besides being beneficial to them by encouraging a tree growth, has also a tendency to render them more hardy, from the fact of the bark on the pruned stems being freely exposed and hardened, instead of being rendered tender by being closely surrounded with branches while in their shrub-growing condition. Numerous examples of pruned and unpruned specimens of the above species are to be seen in the botanic garden; the upward growth of the pruned stem over the unpruned is well marked, and I feel satisfied that during a severe winter the stem-pruned specimens will stand better than the unpruned ones of the same kinds.

At the periods to which I have alluded, we had not the advantage of horticultural periodicals to give us an account of the state and progress of vegetation of bygone periods for comparison with those of the present time; I have, therefore, to detail what I have myself seen. These, with innumerable other examples, might be quoted to prove that a change must have taken place in our climate during the last fifty years. It must be evident to all that we have not the

amount of summer-heat that we were wont to experience in former times, nor yet the regular seasons in winters when frost at Christmas was as certain to be looked for and to come as Christmas itself, and which often lasted for weeks. Of late years, with but few exceptions, we have often as mild weather at Christmas as at any time during the year. The causes of these changes in our climate I am unable to explain, but changes have taken place, as evidenced by the almost total disappearance in the open air of the trees and shrubs alluded to, notwithstanding all the care and trouble taken to introduce them again into open-air cultivation.

In opposition to some of the remarks above given, I may state a circumstance which has recently come under my observation with reference to the *Tamarix gallica* which abounds in the villa gardens all round the south shores of England, its lively green colour being the admiration of all tourists, but it is rarely seen in the gardens or nurseries of Scotland. In a garden facing the sea at the East Bay, North Berwick, and having a northern aspect, the Tamarisk is growing admirably; the plants are each about 6 feet high, and present a contrast to the Fuchsias, Buckthorns, and other plants in the neighbouring gardens. Notwithstanding its beauty, it is strange to say that this plant is still confined to one villa. Judging from its weakly appearance in gardens away from the sea, I was of opinion that our maritime climate was quite unsuited for its growth.

Contrast between the Climate of England and Scotland.

It is undeniable that the climate of England is very superior to that of Scotland. Such trees as the *Catalpa syriaca*, *Paulownia imperialis*, *Gleditsia triacanthos*, and *Taxodium distichum*, cannot be grown in Scotland to the same state of perfection as in England. This, I believe, arises wholly from the deficiency of summer heat in Scotland, for in no instance are standard trees of these plants totally killed by any increased severity of winter cold in our northern climate, but as the new wood is not sufficiently ripened during summer and autumn, a considerable portion of it is regularly killed during the ensuing winter. It is also well known that the cold of winter, instead of being greater in Scotland, is in many parts not so severe as it is generally in England. Hence it happens that many plants, whose constitution renders them in a great measure independent of summer heat, can be grown in many districts of Scotland quite as well as in England, such as the *Yucca gloriosa*, *Y. recurva*, and *Y. filamentosa*, *Cordylus australis*, *Tritoma Burchellii*, and *T. Uvaria*, *Phormium tenax*, *Callistemon salicifolius*, &c. Neither is any difference observable in the growth and flowering of *Piptanthus nepalensis*, *Wistaria sinensis*, *Weigela rosea*, *Jasminum nudiflorum*, *Cydonia japonica*, *Andromeda floribunda*, *Lycasteria formosa*, and *Garrya elliptica*, when compared with plants of the same species to be met with in English gardens. All arboricultural observers who have travelled through England must have noticed the frequent difference in height of many of the English forest trees, particularly those standing alone on a level surface, as compared with those in similar positions in Scotland. Many of our Scotch trees seem to be somewhat dwarfed, rounded, and more twiggy at their points, as if a heavier atmospheric pressure had rested on them than on the southern trees of the same species. This is particularly noticeable in the Elm, Ash, Lime, Plane, and Sycamore. In Scotland, with the exception of the Silver Fir, few other trees are seen to mount so high, except in deep rich dells, where trees are generally tall, by being drawn in these peculiar localities. In some cases the flowering of certain hardy deciduous trees does not necessarily follow upon a fine summer. The Tulip tree (*Liriodendron tulipifera*) and *Magnolia tripetala* are exotic trees which stand our climate well, and the wood, both young and old, has never, to my knowledge, been injured, even during our hardest winters. The flowering of these trees, however, is very irregular; in some years but few flowers are produced, while in others they are in abundance. The Walnut is another exotic tree which grows admirably in Scotland; in some years it produces fruit very scantily, in others in great profusion. The flowering and fruiting of these trees do not always occur after a fine summer. During the years 1870 and 1871 Walnuts were plentiful in Scotland on standard trees, but few or none were seen at Edinburgh during 1872. The Tulip tree and *Magnolia tripetala* flowered freely during 1872, but no flowers were seen on them during 1871; last year (1873) no flowers were seen on the Tulip tree, and the *Magnolia* only produced a few, showing that in some cases it takes more than one year to ripen wood sufficiently to bear flowers and fruit. It is very generally observed that the fruit of our ordinary forest trees ripen best during a good season, but in all cases when it has been preceded by a warm summer.

Fruit Trees.

During the years 1828, 1831, and 1834, I saw the Black Esperione Grape produce clusters of fruit on a south wall at Edinburgh, quite as ripe and as well coloured as during an ordinary season in England. During the same years the Black Mulberry was ripened to perfection.

Although the Mulberry not unfrequently produces fruit, I have never seen them in the same state of maturity at Edinburgh as they were during the years 1828, 1831, 1834, and 1868. Figs used to be frequently grown on open walls in many districts of Scotland, but how rare it is now to see fruit produced in a thoroughly ripe condition, without the aid of fire-heat. Figs, like the Vine and Mulberry, do not always ripen during an ordinary warm season, unless it is succeeded by another warm summer, when the wood becomes thoroughly matured. I need scarcely state that fruits which require hot-house culture to bring them to perfection, such as Pine-apples, the finer kinds of Grapes, also Peaches, Apricots, Nectarines, and Figs, notwithstanding an unfavourable season, and the frequent want of sun-heat, can be grown under artificial circumstances, to as great perfection in Scotland, both as to size and flavour, as can be done in almost any part of England. The foregoing observations on the effects produced by climate lead me to notice an article which I read in the *Journal of Horticulture* for December, 1871. It treats on the subject of Roses, and advises that observers in the different counties of England should select, out of a list of thirty-six kinds, the names of the twelve Roses which succeed best in their particular district. This is a step in the right direction, as far as the English climate is concerned, but we want a similar investigation for the climate of Scotland, not only for Roses, but for all open-air fruits, flowers, and vegetables. Of late years the rage for novelties both in the flower, fruit, and vegetable departments, has been greatly on the increase, and nurserymen have much to do in catering to supply the demand. It is well known that many novelties are produced in England, and considered deserving of cultivation, and often highly lauded in advertisements. Such novelties, although well adapted for the English climate, are not always suitable for the climate of Scotland, although many of them in time become distributed over the length and breadth of the country, either by seeds, plants, grafts, cuttings, layers, or runners, and after many years of careful trial, finally fail. If, as recommended for Roses in England, central committees could be formed to collect information throughout the various counties in Scotland relative to the best hardy varieties of Apples, Pears, Plums, Gooseberries, Strawberries, &c., and to ascertain which succeed best in each of our Scotch counties, it might lead to the securing, in each particular district, of an annual supply of fruit, fit for the table, instead of having a garden full of undoubtedly fine sorts, but which our Scotch climate is not sufficiently hot to mature. The wood of our finest Apples, like the Apples themselves, cannot be thoroughly ripened without heat. They become stunted in growth, and on the return of a fine summer it will be found that the wood has been so much injured that it is often impossible to get them into a good fruiting state again. How often do we see brakes of Gooseberry bushes, of the large fruiting Lancashire sorts, which rarely ripen to perfection in our most favoured Scotch counties, taking the place which ought to be filled by those varieties which have been thoroughly tested during a long series of years, and which are known to succeed well in a medium climate. The Strawberry is another fruit which has received much attention, and been considerably improved during late years. The improvement, however, has mostly been for the south. Many of the kinds recently introduced into our northern gardens, although growing freely, produce, except during a warm summer, but little fruit, in comparison with the old established sorts formerly cultivated; and I am sorry to find many of them rapidly disappearing to make room for so-called novelties, which frequently turn out failures owing to our fickle climate. Many of the old free-fruited sorts, although producing comparatively smaller berries, are still to be had; it would in many cases be advisable to raise seedlings from them, in order to secure varieties that will suit some of our colder northern districts. Seedlings raised from the large southern varieties will not always produce so hardy a progeny as seedlings taken from sorts long in cultivation, and proved to stand well in this country. How often do we see in the amateur villa gardens throughout Scotland the finest varieties of named Apple and Pear trees with high sounding characters selected from catalogues, or sent by first-class English nurserymen as being very superior kinds. I have known numerous examples of such first-class fruit trees being rooted out or cut down and re-grafted as being bad, and this after many years of abortive trial although the kinds in reality were good. The want of fruit, however, was generally owing to deficiency of climate. It has been too much the practice of recent years for new gardens to be supplied direct from southern nurseries, and it is quite natural to suppose that if left to the nurserymen themselves they will only supply superior kinds. It would be doing an act of justice if all our local or county nurserymen were to make themselves thoroughly masters of all the fruits which succeed best in their own district, and propagate accordingly; besides, such local nurserymen would do well to have a portion of ground set apart for maturing the kinds known

to succeed best in their respective counties. Buyers would then see and judge for themselves, and thus save much disappointment to amateurs and gardeners. Of what use would standards of the New York Pippin, Spitzenburg, or Blenheim Pippin be in many of our Scotch counties? I have seen trees of the New York and Blenheim Pippins on Scotch walls, with fruit miserably small, much deformed, and quite unfit for use. They are sorts for fine climates, requiring more sun than we can possibly expect, to ripen the wood, still more the fruit. The same remarks hold good with innumerable varieties which are now abundant throughout the middle districts of Scotland. After these observations I am inclined to recommend growers in each district to attempt the raising of seedlings, both Apple and Pear, from pips taken from kinds which are known to succeed best in their particular locality; by this means we may in time see many of our northern gardens stocked with a variety of Apples and Pears having well ripened wood and fruit, instead of innumerable trees stunted from the unpropitious climate, and eventually thrown out. At one time experimental gardens existed in London and Edinburgh, for the purpose of testing all the newly introduced varieties of open-air fruits, and for selecting the kinds to be recommended for growing in each respective country. To suppose that fruit proved suitable for London should be good in many districts of Yorkshire, or that those proved at Edinburgh would be adapted for many of our Highland districts, would be ridiculous. With the aid of walls and espalier rails the case is different, as, by their aid, some of the less tender kinds can be ripened successfully. Considering the average of our Scotch climate, I do not think it advisable, even on walls, to risk any very tender varieties; the fruit of such kinds is often small and flavourless for want of sun-heat. It is well known that some of the finer stone-fruit on unfired walls cannot be generally ripened to the same state of perfection as in former times, particularly Peaches and Nectarines. Flowers are generally produced in abundance, but little fruit ever comes to maturity. This also is attributable to the want of summer-heat to ripen the wood sufficiently to produce strong and healthy blossoms. Being weak, the blossoms, although produced in abundance, mostly fall off, even though protected from spring frosts by any substance except glass or heated walls.

Vegetables.

Besides fruits, there are several vegetables which have been introduced into English gardens which are considered too tender for our ordinary Scotch climate, unless in very favourable situations. Of Peas, many superior varieties have recently been raised and greatly extolled, but not more so than they are justly entitled to, being in many cases great improvements on kinds formerly cultivated. But, like the Gooseberries and Strawberries, we are better off with our well-known old and proved hardy kinds than with the highly-lauded new sorts. During a fine summer, the produce of the new kinds may turn out good, but during a season like 1872, a large proportion of Pea-straw was produced by some of these new kinds, with pods few in comparison with the extent of ground occupied to grow them. The Asparagus is another vegetable which in olden times used to be extensively grown throughout Scotland, but which of late years has become more and more scarce, evidently from the want of sufficient summer-heat to ripen the stems. In many of our newly-made gardens, Asparagus beds are dispensed with altogether, owing to the extent of ground occupied, and the irregular and often scanty crop produced. During former years, the Edinburgh market was freely supplied with this vegetable, reared by the market-gardeners in the district; now, it is mainly to be procured in the vegetable and fruit shops, the supplies being chiefly obtained from London. Many years ago, a variety was introduced into our northern gardens under the name of Giant Asparagus, which for several years was extensively used for planting. It soon turned out that the general temperature of our climate was insufficient for it, and it gradually disappeared, as well as much of the ordinary kind which had been so long grown. Of late years, many methods have been tried to induce a general crop of this favourite vegetable, such as the tying up of the summer-made shoots, instead of allowing them to blow about and break, which, no doubt, proves very detrimental to the shoot of the following year—likewise giving the beds a coating of sea-ware; but notwithstanding the precautions used for the stems, and the manure supplied, it is evident that our Scotch crop of this esculent does not increase. The Tomato is another esculent which in former years used to ripen and colour well, particularly against a south wall. Of late years it has rarely been seen with ripe fruit unless protected by glass. It is doubtful whether the Potato crop possesses the vigour it was wont to have. Occasionally, however, it is good. The fruits of the Potato, or Potato Apples, as they are called, do not now show themselves in that abundance in which they used to be seen almost regularly. Now, except after a very fine summer, they are of rare occurrence. Between the years 1820 and

1830, Mushrooms used to be found in the utmost abundance in many districts of Scotland, but few individuals at that time took an interest in them, from the feeling that they might not be the true sort. During the summers from 1823 to 1826, I was residing in the neighbourhood of Dollar, Clackmannanshire. All along the southern sloping portions of the Ochill range of hills, Mushrooms used to abound. I have myself picked on a limited space from two to three gallons in one morning. From information recently received from that district, I learn that this favourite esculent is now rarely to be met with on these slopes. The same remarks apply to several other districts of Scotland where I had been in the habit of seeing them. During moist warm summers they are occasionally got, but certainly not in the quantities in which they used to be found, and this is due to the fact that evidently the ground rarely gets sufficiently warm and moist for the growth of the spawn. In many districts of England, on the contrary, Mushrooms are produced in abundance, and almost every year, and although large quantities are annually gathered for the market and for private use, no diminution in their quantity is noticed, if the weather is at all favourable for them.

Acclimatisation.

Leaving the effects of climate on certain shrubs, fruits, and vegetables, I shall now offer a few remarks on what is termed the acclimatisation of plants; this is a subject which has long occupied public attention. I happen to be one of those sceptical individuals who do not believe in it, and still maintain the opinion that a plant is as hardy when first introduced into this country as it is after being half a century in cultivation. This, in a great measure, may be accounted for by our limited knowledge of the precise altitudes from which many plants were originally procured. It is well known that many of the plants of Upper India, Australia, and New Zealand will stand with impunity through two or three mild winters, and be killed outright during the third or fourth; but, to suppose that such plants, after standing out for several winters, are sufficiently hardened always to stand unprotected is quite a mistake. One of the plants which is often quoted as being thoroughly acclimatised in this part of the country, but chiefly, I may say, in the Edinburgh Botanic Garden, is the *Aponogeton distachyon*, which now grows vigorously in the pond. This plant is a native of the Cape of Good Hope, and was originally grown as a stove plant in the Edinburgh garden. It was afterwards cultivated in a large water-tank in the greenhouse, where it grew equally well. As the plant continued to increase rapidly, a quantity was placed by my late father, about forty years ago, in shallow pans and boxes, and sunk to various depths from 2½ to 4 feet, in different parts of the pond. This plant now covers several large spaces, the largest being about 24 square yards, and growing entirely in the muddy bottom. It flowers abundantly every year, and even through a mild winter, but during a severe one it is often killed down to its truncated fleshy roots. From its apparent hardiness, and profuse flowering, it is eagerly sought after by cultivators, but comparatively few ever succeed in growing it. A circumstance, however, attending the growth of this plant at Edinburgh which ought to be more generally known, and which I am in the habit of impressing on those individuals anxious to cultivate it, is this:—The situation of the pond was originally a marsh; it was excavated to the depth of from 2 to 5 feet. The bottom was composed of peaty clay, and is full of springs. When the pond was made, the bottom was causewayed with stones fully half an inch apart, to allow the spring water to rise freely between them. The bottom has now a thick coating of mud produced from the leaves of neighbouring trees, which are blown into it every autumn. In consequence of the springs bubbling up in all directions through the mud in which the roots are growing, ice is rarely seen on many portions of it. It is to these constant springs that I attribute the success of the culture of the *Aponogeton*. If this plant had been placed in the pond when it originally came from the Cape of Good Hope, it would have succeeded quite as well as it did with the stove and greenhouse culture it received before reaching the pond. Roots of *Aponogeton* have been sent to many ponds and lakes throughout the country. In Scotland very few individuals have ever succeeded, unless in those ponds treated with the condensed water from steam mills, evidently from the want of constant springs. Another example, and one which has been recorded as the result of acclimatisation, is the case of an old plant of a yellow-flowering evergreen Jessamine (*Jasminum revolutum*), a native of Madeira. The plant in question was for many years cultivated on the open wall. It was originally grown in a border, in a conservatory at the old botanic garden at Leith Walk. On relinquishing the old grounds, to give this Jessamine tree a chance for its life, it was brought over to the new garden during the year 1822, and placed against the open south-exposed wall, where it continued to thrive and flower in abundance, until injured by the severity of the frost which occurred during the winter of 1837-38. It partially recovered and

produced some new wood from the lower plant of the plant; but, although it grew freely for a time it never again assumed its original vigour, and was finally killed by the severity of the frost which prevailed during the spring of 1841. This, with numerous other examples, may be quoted to show that certain plants, although long grown in a conservatory and planted out while in full vigour, will thrive during a series of good seasons, but will succumb after an adverse summer followed by a severe winter.

Hybridisation.

The subject of acclimatisation leads me to another and very important matter connected with our open-air vegetation. After the introduction of the scarlet *Rhododendron arboreum* from India, which took place about fifty years ago, some of the original specimens, after being matured in the conservatory, were planted in the open air in various parts of the country. With a slight protection some of these plants survived over several winters, but finally died out. It was then generally remarked that there was an end to our ever seeing scarlet *Rhododendron* cultivated in the open air; but what could not be accomplished by acclimatisation was within eight or ten years successfully arrived at by means of hybridisation. We have not now the *Rhododendron arboreum* itself in the open air, but we have its colours infused into our ordinary hardy varieties, particularly those originally introduced from Gibraltar, Switzerland, North America, and the Caucasus, which at the time alluded to were abundant in our gardens. Those plants of *Rhododendron arboreum* cultivated in our conservatories soon flowered, and many individuals set to work to produce hybrids, both by placing the pollen of the hardy kinds on the scarlet *R. arboreum*, and likewise by fertilising the hardy varieties with the pollen of the scarlet kinds. The hybrids of the first-named cross, taken from the *R. arboreum*, were by no means quite hardy, and the colours far from being improved; while the latter crosses, using the scarlet *Rhododendron* as the male, proved eminently successful, and three distinct breeds were soon in cultivation. One between the *R. catawbiense*, a North American species, fertilised by *R. arboreum*, produced the varieties known, as $\times R. alta-clerense$ and $\times R. russellianum$, with a host of others which are nearly allied, and known under the name of $\times R. catawbiense arboreum$. The Gibraltar species, *R. penticum*, fertilised with the *R. arboreum*, produced the $\times R. cunninghamii$, also many other varieties very distinct both in habit, colour of flowers, and shape of leaf, when compared with the *catawbiense* breed. The plants produced from the two last named crosses have on several occasions been cut down by frost, but they always spring up again, which gives them more a bush form than a tree growth. Some of them, however, in sheltered situations among trees, do grow to a large size, and are frequently seen assuming a tree-like habit. Those plants raised between the Caucasian species, *R. caucasicum*, fertilised with *R. arboreum*, are exceedingly hardy and free-flowering. The ordinary *R. caucasicum* flowers abundantly in the open garden during the months of January and February, and the hybrids, which are now endless, are generally known under the name of $\times R. nobleanum$, and are often seen in flower in the open border during the same early months. So truly are the varieties produced between the kinds just alluded to that we have only now to give orders to raise a batch of $\times R. nobleanum$, $\times R. cunninghamii$, or $\times R. alta-clerense$, as the case may be. Many of the hybrids are now made seed-bearing plants, and fertilised both by hybrids and true species; so much is this the case, that the varieties of *Rhododendrons* are now endless. Bees have also been instrumental in giving us many excellent varieties. Of recent years numerous species of *Rhododendron* have been introduced both from Sikkim and Bhotan; although many are comparatively tender, others grow freely in the open air; they are, however, subject to have their young growths destroyed by spring frosts, which makes them branch freely, and assume rather a bushy appearance. The wood in consequence rarely ripens sufficiently to produce flower-buds, and hence they require conservatory treatment, excepting, however, the *R. ciliatum*, *R. glaucum*, and *R. anthopogon*, which flower abundantly in the open air. These are Alpine forms resembling in some respects the *R. ferrugineum* and *R. hirsutum* of Switzerland. If a little trouble were taken, I do not see any difficulty in procuring some interesting hybrids, by crossing some of the hardy British or continental Heaths with some of the Cape species, as has already been done with the *Rhododendrons*. Size and colour might thus be given to an interesting race of plants sufficiently hardy to stand the climate of Britain. No doubt the operation will be a little tedious, but any cross produced will amply repay the trouble taken. A hybrid has been raised, or rather, I should say, a has been effected, between the *Menziesia empetriformis* and *Rhododamnus Chamæcistus*. The cross is a plant well-known in cultivation under the name of *Bryanthus erectus*—a name which, by the way, it has no title to claim, that appellation being previously occupied by another Ericaceous plant. The production of this hybrid shows that, with a little trouble, difficulties may

be overcome by crossing some of the *Menziesias* with Heaths, *Rhododendrons*, or dwarf *Rhododendrons*. The hybrid in question was first raised by Mr. James Cunningham, of the Comely Bank Nursery, and the identical hybrid was afterwards produced by Mr. Anderson-Henry, of Hay Ledge, from the same parents.

Evergreens.

Notwithstanding my remarks on the climate of Scotland, no one can deny that it ranks amongst the best in the world for evergreen shrubs, being neither too hot nor too cold for the generality of them. They are all to be met with in Scotland in as great a state of perfection as anywhere in England or Ireland; and, strange as it may appear, it is nevertheless true that certain exotic shrubs will thrive in Scotland, while the deciduous trees from the same countries are more or less injured from the want of climate. Great Britain (independently of Conifers) can perhaps boast of as many indigenous evergreen plants as almost any country, which naturally proves that it possesses a climate very suitable for them; and I think I am right in saying that the climate of Great Britain enables us to cultivate infinitely more species and varieties of hardy evergreen shrubs than any other civilised country in the world can at present boast of; and, although I have stated in this paper that our Scotch climate has been deteriorating with regard to certain species and varieties of evergreen shrubs, new species and varieties imported, or produced by accident or tentative measures, are increasing rapidly in this country. Evergreens, indeed, are not cultivated to the extent they ought to be. No doubt they are a little more expensive than deciduous shrubs. This extra expense is, however, well repaid by the clothed appearance which they give to our gardens and policy grounds, both for summer and winter effect. So much is this the case, that foreigners are always particularly struck with the quantity and size of the evergreens cultivated in this northern portion of the British dominions, such shrubs being particularly missed in France and Germany, and even America, which furnishes us with some good evergreen shrubs, such as *Kalmia latifolia*, *Rhododendron maximum*, and *R. catawbiense*; but they are generally found growing in a natural state in well-sheltered woods, where the severe winter frosts cannot reach them. The same remarks hold good with evergreens from European countries, where the summer climate is infinitely superior to that experienced in Great Britain.

THE ROYAL HORTICULTURAL SOCIETY; AS IT IS, AND AS IT MIGHT BE.*

In the form of a shilling pamphlet Mr. Wilson has issued the above reprint of his able letters on this subject, which have already appeared in *THE GARDEN*, and other horticultural papers, in addition to several replies from various quarters. We recommend this brochure to the attention of those who desire to possess the entire correspondence in a collected form. Mr. Wilson concludes with the following *resumé* of the questions discussed:—

I hope the perusal of these letters may lead others to the conclusion to which their facts have brought me:—1. That the society in its present form cannot last.—2. That the causes which have led to so much contention can only strengthen.—3. That it is no longer any question of who are on the council.—4. That the existing circumstances would baffle any council.—5. That the Society consists of two sections with different interests. The horticultural section, which requires admission to only a small portion of the South Kensington Garden for its meetings and shows; and the Kensingtonian section, which requires a large recreation ground.—6. That it is desirable that each section should have arrangements made with the commissioners for their respective requirements.—7. That, freed from the load of debt, of liabilities, and of charges, the society could carry on horticulture successfully with the subscriptions of 5,000 fellows at a guinea each.—8. That the consideration of a transferable ticket, admitting to all the society's shows in town and country, admissions to, and cuttings from, Chiswick Garden, and a vote by proxy, would be sufficient to induce 5,000 fellows to join the renovated society.—9. That a large number of fellows would join, not intending to visit many of the shows, but with the view of supporting a real national representative society for advancing horticulture.—10. That such a society would vastly spread the taste for, and knowledge of, horticulture throughout the country, and itself become stronger and stronger.

MR. THOMAS SURTON, the photographer, states that, if calico is dipped for an instant in dilute sulphuric acid, it is rendered waterproof. The knowledge of this fact may be useful to gardeners.

* "The Royal Horticultural Society; As It Is, and As It Might Be." By G. F. Wilson, F.R.S. London: S. & T. Gilbert, 36, Moorgate Street. 1874.

THE END OF DE CANDOLLE'S GREAT DESCRIPTIVE WORK ON PLANTS.

At a recent meeting of the French Academy of Sciences, M. Alphonse De Candolle announced the publication of the seventeenth and last volume of that *magnum opus*, which had been commenced by his father in the early part of this century, and is entitled "Prodromus Systematis Naturalis Regni Vegetabilis." While the original design has not, as we shall see, been fully completed, the event, as it stands, is yet worthy of notice; and the following account of the work (for details of which we are mainly indebted to an interesting paper, by the younger De Candolle, in the current number of "Archives Des Sciences") may not be unacceptable to our readers. At the time when Augustin Pyramus De Candolle conceived the idea of his undertaking, the Linnaean classification ruled throughout Europe; and, in its brevity of description, it seemed to make botanists forget that there was aught in a plant but stamens and pistils. De Candolle early recognised the superiority of the Natural system, and became its apostle. His thesis on the medical properties of plants (1804) showed the uniformity of properties of each organ and each family; the "Flore Française" (1805) was the first flora of certain importance according to the natural method; and the "Théorie Elementaire" (1813) expounded the new principles with a conviction almost passionate. The completion of such work was evidently to apply the same ideas to the entire animal kingdom, to plants of all countries, and to all degrees of classification; particularly to sub-divisions of families and of genera, which had commonly been neglected. An entire revision of the vegetable kingdom did not then seem beyond the powers of one man. Some 25,000 to 30,000 species were known; and, by a singular illusion, it does not seem to have been considered how small was the surface of the globe already explored, or that each region had its distinct flora. Thus, however, an important work was begun, which has continued sixty years, and which, though coming short of its original aim, has yet produced an unexampled series of 214 monographs of families of Dicotyledons, comprising 5,134 genera, and 58,975 species; that is, twice as many species as were thought to exist when the work began, and eight times as many as are found in Linnaeus's two volumes of species. The first articles for the "Systema" were prepared by M. De Candolle himself (the Elder), from an examination of French and English collections. He was at pains to cite the localities, the travellers, the collections, the descriptions, and the figures published in all the countries (a thing which had been little done before); adopting the principles of Tournefort for genera, of Linnaeus for species, and of Jussieu for families, the innovations were to group the families in cohorts, the genera in tribes, the species in sections or paragraphs, according to the principles of the natural method. He disregarded no details of information furnished; he was wont to say, that if he were to choose a motto it would be, "Nihil botanicum a me alienum puto." The two volumes of the "Systema," published in 1818 and 1821, contain eleven families, and had taken seven or eight years of work. De Candolle (not foreseeing the enormous growth of collections, &c., in later years) estimated that it would require eighty or one hundred years to complete the review of the vegetable kingdom thus, considering the number of species then contained in herbaria. And it was not till 1832 or so that he began to contemplate the need of co-operation. The two first volumes of the "Prodromus" (1824 and 1825) were edited in the most concise form. The first third of the first volume contains an epitome of the eleven families of the "Systema," with addition of some genera and species; then follow fifty-three other families, including the specially important Leguminosae. Volumes III. to VII. were a little fuller, and were, like the first two, edited by De Candolle almost entirely alone. The "Prodromus" now became the regulator of descriptive botany. The order adopted for families was followed by most publications. Travellers from abroad furnished their collections in a most disinterested way; and, on all hands, the author was supported and encouraged in his enterprise. His last and supreme effort was the revision of the family of the Compositae. A serious illness suspended work for a year, and it seemed urgent to secure a number of *collaborateurs* among

the eminent botanists of the day. Promises were obtained from the following, among others:—MM. Bentham, Duval, Decaisne, Grisebach, Choisy, Duby, Boissier, Moquin-Tandon, and Meissner. De Candolle died on the 9th September, 1841, and it fell to the son, M. Alph. De Candolle (then thirty-five years of age) to direct the work which had been successfully begun. With the aid of, altogether, some thirty-three *collaborateurs* he has been able, in thirty-two years, to add ten volumes of monographs to the seven his father published. He takes special notice of assistance from MM. Bentham, Meissner, and Müller, the keeper of his herbarium. Commenting on the slowness of the appearance of the "Prodromus," M. Alph. de Candolle makes reference to the manifold difficulties connected with such an undertaking; more especially, those incident to an extensive co-operation of the kind indicated. There is, too, the great development of science; and the author points out, that, with the abridged form adopted in the first volumes of the "Prodromus," it was possible for his father to edit as many as ten articles of species in one day; now, on the other hand, a monographer, having so many more specimens and books to compare, and having to investigate the most minute characters relative to ovules, embryos, &c., cannot well study and describe more than 300 to 400 species in a year, say, on an average, one species daily. The "Prodromus" has only been carried to the end of the greatest class of the vegetable kingdom, that of Dicotyledons; and it there meets Kunth's "Enumeratio Plantarum" which contains the families of the Monocotyledons, with the exception of Orchideae. The two works thus contain the *ensemble* of the Phanerogams; edited, indeed, very differently (the "Prodromus" being more detailed, and having more new species), but treated according to the natural method and the state of science about the middle of the nineteenth century. "If it were required," says M. De Candolle, "to commence a new series of monographic works on a scheme similar to that of the 'Prodromus,' it would not only be necessary to compare many more books and herbaria, but to examine the characters of evolution presented by living plants, and those of the anatomical composition of the bark, wood, &c., all which call for the use of the microscope. The first thing to do would be to read all the works or memoirs of anatomy, and all the treatises which deal with elementary organs, so as to note what has been observed, in, say, twenty years, in such and such a species or genus of plants. Facts of this nature should distinguish the groups. Unhappily, anatomists give little in the way of *resumé*, and when they do give it, it is with forms of speech which little allow of comparison between one book and another. The character of species, genera, families, &c., in works of descriptive botany, are enunciated in a way which facilitates comparisons; but there is nothing of this in the treatment of organs. To know accurately how two authors, differing in opinion, consider a particular layer of cells to be placed or formed, it is sometimes necessary to study 100 pages, and in different languages. The introduction of microscopic details into the regular text of a description of forms, thus demands a peculiar bibliographic labour. Classification itself requires to be extended and completed; the sub-divisions of species can no longer (as formerly) be neglected. The time is not far distant when all genera will be known, as all families already are; but the number of species will still increase sensibly to the end of the century, and even beyond it. The volumes of the *Prodromus*, while they have destroyed many bad species, have added regularly to science 25 per cent of new species. * * * A work similar to the 'Prodromus' if now undertaken, would give, for the first half of our volumes, an increase of species by 80 per cent. at least, and, taking the second half into account, the increase would, perhaps, be 50 per cent. for Dicotyledons. This is the more likely, as the work would last a greater number of years, during which new species would be introduced. The 'Prodromus' contains 58,975 species of Dicotyledons, and if the Artocarpeae had been edited in time, there would have been altogether about 60,000 species. Add a half more, and the revision to be made now would contain 90,000. If we waited twenty or thirty years there would be more than 100,000, and we should then, I suppose, be near knowing all the species of this class which exist. The Monocotyledons, according to Lindley's probable estimate, are in number about a fifth of the Dicotyledons.

There would thus be 18,000 to 20,000 species to add for this class, and the Phanerogams would thus comprise from 100,000 to 120,000 species, according as the revision was made now, or later, and with more extensive collections. Suppose 110,000 species. This number, at the annual rate specified for an active botanist, having complete resources in the way of books and herbaria, would require 366 years; say, thirty-six or thirty-seven years for ten botanists; eighteen or nineteen years for twenty; or fifteen or sixteen years for twenty-five. It is hardly possible to allow a greater sub-division, because the family of the Compositæ cannot be divided, and it would require fifteen or eighteen years' work for one man alone. Moreover, experience has taught me that, increasing the number of *collaborateurs*, we do not advance proportionately. The essential thing would be to have capable botanists, working regularly and devoting themselves entirely to making monographs, or, at least, leaving it only so far as was necessary to prevent their succumbing to the fatigue of their labour. Will these twenty or twenty-five monographers be found? It appears to me very doubtful. Assuredly, when all the volumes of the 'Prodrômus' have become old, and are no longer more abreast with science than the first part now is, and the work of Kunth on Monocotyledons; when thousands of species will have been described in different ways, in a multitude of books and papers; when compilations, more or less good, have shown the little squidity of many of these species, and how desirable it is become to revise them according to nature in a comparative manner; there will then be a demand, on all sides, for a new work dealing with the whole. Some daring spirits will, perhaps, commence such a work, but if they have not found a means of co-ordinating a vast system of labour in Europe and America, they will assuredly fail. I doubt also if a single director will suffice, and that he will be found in the future. The original author of the 'Prodrômus' was a true master of a school. By his character, his superiority, his activity, he attracted numerous friends and disciples. His undertaking, greater than he thought it, has been continued by his sons and grandsons. It proceeded, moreover, from a small, weak, neutral country, intermediate between the great countries which are so jealous of each other. This is an advantage for a work which must be essentially cosmopolitan, and in which recourse must be had to *savants* of various nationalities. It is necessary to perform the work with a completely impartial spirit; without touching susceptibilities foreign to science. It is thus we have had *collaborateurs* belonging to different nations. But at the present time, it is less than ever possible to suppose Germans and English submitting to the direction of a Frenchman, or French and English consenting to impulsion from a German. Further, if we conceive a botanist in one of the smaller countries, like Holland, Denmark, Belgium, Switzerland, forming a scheme like that of the 'Prodrômus,' he would find it difficult to combine the direction with a considerable share in the editing. I may say, from my own experience, that the one occupation is adverse to the other. The impulsion must rather, it seems to me, be collective; and the way in which I suppose it will occur, perhaps twenty or thirty years hence, when the confusion of works on botany has become very great, will be somewhat as follows:—I imagine that proprietors or directors of six, eight, or ten of the principal botanical establishments, public or private, will conceive the idea of arranging to edit, each on his own account, monographs of certain large divisions of phanerogams, on a plan pretty uniform. Each of these *savants* will engage *collaborateurs*, choosing them himself. He will publish their work as and when he can do so. The Dicotyledons will, e.g., be entrusted to five, six, or seven directors. One will take the Compositæ, another the Corollifloræ, a third the Thalamifloræ, and so on. The Monocotyledons will be entrusted to other directors. Once the work has begun, through the agreement of a small number of men, a laudable emulation will spring up between the different centres. National self-love, in place of injuring, will, in this case, further the cause of science. * * * With the system I have indicated, not only the authors, but also societies, general protectors of science, and Governments, would be roused by a sentiment of honour to promote the enterprise in each country." M. De Caudolle finally urges the importance, meanwhile, of

publishing good monographs of families, tribes, and important genera; and he puts his library and herbarium, in Geneva, at the service of any monographers who may wish to make use of them.

A CHEAP STOVE.

AN economical and efficient stove for a small greenhouse or conservatory can now be purchased for 8s. 6d. It is named "The Glow-worm," and consists of an iron pot on four short legs; an aperture being provided in front for the draught, with a moveable piece to regulate it. It has also a ring top and cover, both moveable. The grating is about 1 inch from the bottom, and the flue rises from the back at the top, and so saves an elbow joint; its entire height is 12 inches. It is used by nearly filling the pot with coal, in small pieces (no dust), leaving a little hollow in the centre for some paper and half-a-dozen pieces of firewood; a little more coal is placed on the wood, and then lighted. Place the ring and cover on at once to prevent the escape of smoke, and it will burn for seven or eight hours. But I find, by placing a piece of sheet iron or tin on the grating, covering about three-fourths of it, it will burn for twelve or fourteen hours without any attention whatever. I generally light it about 8 o'clock in the evening, and at 8 next morning I remove the cover, shake the fuel together, and add coal and coke; and at 8 the next evening I repeat the process, emptying the stove about every third day. The best way to do this is to tilt the stove in front and draw it out of the flue, carry it out of the greenhouse, and empty the contents into a sieve; the larger pieces can be returned to the stove again, and you have no dust in the house. I have added a top to my stove, of sheet iron, about 8 inches high, and if some coke is placed in this after the stove has burnt some eight hours, it may safely be left for sixteen or eighteen hours more without attention. If it burns too fast, reduce the supply of air by means of the regulator. My house is 12 feet by 6 feet 6 inches, rising 8 feet high, and, as the chimney stack is 30 feet from the stove, the iron flue-pipe is nearly horizontal, and warms the house equally throughout.

A SUBSCRIBER.

A SPADE-HOE.

THE accompanying is an illustration of a tool I use for hoeing up Potatoes, Cabbages, &c.; or, for any work where a furrow



is wanted. It is simply a boy's spade, 5 in. wide and $8\frac{1}{2}$ in. long in the blade, cut sharp at the end, and having about two-thirds of the plate turned up at an angle of 45° . In using it, one foot follows the spade, the other being in the next row. The advantages are, that the sharp point goes easily into the ground, and much or little of the soil is thrown up as may be required. As it is a new tool, gardeners generally may not like it, but amateurs who want to save labour and time, should not be without it.

C. J. C.

WORK FOR THE WEEK. PRIVATE GARDENS.

Flower Garden.—Snowdrops, Hellebores, and winter Aconites still continue to expand their blossoms; Crocuses, too, are beginning to bloom, and bulbous plants, in general, are making good leaves that still seem unscathed. Wallflowers are now blooming freely, and different kinds of Viola, Arabis, and Aubrietia are beginning to unfold their flowers, although the weather is at present anything but favourable for spring-blooming plants. Daisies and Hepaticas, also, promise a profusion of floral beauty, while walls are ornamented with the cheerful yellow blossoms of *Jasminum nudiflorum*, and *Chimonanthus fragrans* in many places is still in good condition. *Berberis Aquifolium*, and *B. Darwinii*, with its small leaves and deep golden flowers, likewise contribute nobly to the enrichment of our gardens now, and will continue to do so even more extensively during the next two months. All empty flower-beds should receive a good dressing of leaf-mould and decayed manure, and be deeply dug or trenched. Where hardy material can be spared for replanting

flower-beds and borders, planting may be proceeded with. Pansies, Daisies, Arabis, Alyssums, and similar early-blooming plants, transplant as well now as later in the season; indeed, if carefully removed, they suffer little or no check in the operation. Ground for the reception of hardy herbaceous plants should be trenched and heavily manured, but the sub-soil, unless good, must not be incorporated with the surface soil. Where *Lythrum roseum* is used in ribbon-border making, it should now be lifted, cut up into good crowns, and replanted in a line about 15 or 18 inches apart. *Salvia fulgens* in light soils may be treated in the same way. Sweet Peas should now be sown where they are to bloom, and some should be put in beds from which to make up deficiencies in case of failure; sow a few in a box under glass. Sow, also, some *Mignonette* in rows broadcast, where early-blooming plants of it are wanted to flower. Some *Saponaria calabrica* seeds should be sown on a wall border for transplanting. A few seeds of *Tropaeolum canariense* may also now be sown in a similar position, and a few twigs of Broom stuck in front, so as to protect the young plants, when they come up, from cold winds and frost. When the weather is dry add some tufty loam and well-decomposed manure to beds where large plants, such as those of *Ricinus*, *Ferdinanda*, *Wiganda*, and other gross feeders, are to be grown, i.e., if the beds are now empty. If the soil last year was found to be too moist, turn it out, and place a layer of stones, broken bricks, &c., in the bottoms of the beds. Mulch all newly-planted shrubs or trees, and affix strong, but neat, stakes to such as require support. Prune back, pretty hard, some Clematises for early-flowering; some of the hardier Rose plants may also be pruned for the same purpose. Tree-Pæonies, Myrtles, the Japanese Quince, and several other rather tender plants, should have a little protection from frost; for, although their roots and principal stems might escape unhurt, their young shoots might be considerably injured. Lay Box and other edgings, and prune and tie up climbing plants. Where new lawns are intended to be made, the ground should now be cleared of all superfluous trees and shrubs, and the soil should be trenched over, turning all rough material into the bottom of the trenches, and making the whole perfectly level, smooth, and firm by means of rolling and raking. The seed should be sown in the latter half of this month.

Bedding Plants.—Hot-beds should now be put up for the propagation of these where hot-water-heated structures are not available for that purpose. Such beds may either be raised above the ground or sunk, and in extensive places some of both kinds will be found serviceable. A little extra warmth may be communicated to ordinary frames by means of a lining of fermenting material applied to their sides; this additional heat will induce the plants to start into growth and to soon begin to yield material for cuttings. Where two, three, or more *Pelargoniums* were placed together in one pot in the lifting season, for convenience of storage, they may now be separated, potted singly, according to size, and kept without water for some days after the operation. Keep the house or frame rather close for some little time after potting. Lose no time in obtaining and striking as many cuttings of all plants as possible, for the stronger they are, and the earlier propagated, the harder and the more vigorous will they be when turned out in the latter end of May. *Calceolaria* cuttings seldom root well in spring; nevertheless, the tops of autumn-saved plants may be economised for that purpose in the event of an otherwise deficient supply. If struck in a cold frame early this month, in the same manner as autumn cuttings are, they sometimes root very satisfactorily. *Verbenas*, *Heliotropes*, *Ageratums*, *Tropæolums*, *Petunias*, *Lobelias*, *Colenses*, *Alternantheras*, *Iresines*, &c., when rooted, should be potted singly or transplanted into boxes, and still be kept in heat, as their tops can very soon be taken off for the same purpose, and also their side shoots, so that, with plenty of heat and convenience, a large supply may be obtained before the end of the next two months. Sub-tropical plants must also be increased as expeditiously as possible. Side sheets taken off for cuttings soon make good plants. Seeds of the various kinds commonly raised by that means should now be sown in a brisk hot-bed or warm pit. *Acacia lophantha*, *Wigandias*, *Cannas*, *Ferdinandas*, *Ricinus*, *Zeas*, and many others, can be readily raised from seeds. *Canna* roots saved from last year should now be divided and started in heat. *Dahlia* roots may also be started. If beds be dug out about 18 inches or 2 feet deep, and filled with leaves trodden firmly, so as to be covered by a frame, and some light rich soil be placed therein, they will form excellent positions in which to plant *Calceolarias*, *Verbenas*, or *Heliotropes*, so as to have grand plants before they have to be set out in beds.

The Early Peach-house.—The fruit will now be set in the earliest house, and syringings morning and evening will be required in favourable weather. Attention should likewise be paid to the thinning of the fruits where they are set thickly, but this rarely happens when forcing commences so early. The dis-budding of the shoots is a process best performed by taking off only a few of the

strongest at different times, so as not to give a check to the roots. The temperature at night may be maintained at about 60°, with a rise to 70° by day, and by sunheat 6° or 8° higher. Green-fly will begin to make its appearance, and the infested shoots must be picked off; but fumigation with tobacco will have to be resorted to at the last. Some of the new patented fumigators are very efficient for the purpose, for by making a hole in each door of the house for introducing the nozzles from the outside, the house can be soon quite filled with smoke, and kept so for any length of time required.

MARKET GARDENS.

This mild winter has enabled market gardeners to push on their outdoor work with comfort. Digging and trenching are now in a remarkably forward state compared with this time last year, when the ground in some districts was completely flooded. Outdoor vegetables have been excellent this winter, and *Seakale*, *Rhubarb*, and *Asparagus* are furnished in large quantities from frames and forcing-pits; while from France come *Asparagus*, *Lettuces*, and other salad vegetables. The third crop of *Radishes*, being now sown, should be kept covered with litter until the young plants appear above ground. The earliest-sown plantation requires no more protection from birds; but the covering should be replaced in the event of frost. Remove into the alleys between the beds, every fine morning, the litter-covering belonging to the second plantation, so that the plants may gather strength, become green, and also that the surface-soil may get dried, as well as the litter covering it. Use a long-toothed wooden rake for removing the litter, and a steel-pronged pitchfork for replacing it. Keep a boy at each plantation to frighten the birds, which, if permitted, are very destructive to the *Radishes* after they appear above ground. Various bird-scares have been used; but none are so effectual as boys. *Rhubarb* is beginning to grow a little naturally; therefore, rake all litter lodging about the crowns into the alleys, which should be dug as soon as possible, if not already done, and the crowns in open plantations covered with fresh litter; but those under the shade of fruit-trees may remain until the last. A good forkful of strawy litter is sufficient for each crown, and is of great service in protecting the crowns from cold, and preserving the leaf-stalks from grit; besides, the *Rhubarb* produced under the litter is always crisper and milder than that grown without any protection. It is impossible to wheel or cart manure on to the plantations with impunity, therefore get some of the workmen to fill baskets with litter, and others to carry them on their heads to the place where the litter is required to cover the crowns. Before digging the ground lately occupied by *Seakale*, let some women go over it and pick up every piece of root they can find, otherwise they will grow and cause annoyance. In digging the ground, too, every bit must be picked out and thrown on the surface, to be gathered off afterwards. Cut up the best pieces of the *Seakale* roots, that were cut off the forcing crowns, into finger-length pieces, and lay them quite thickly on a well-packed raised bed, and place a layer of soil, an inch or two in depth, over them. Leave them there until March, then, after dressing them, dibble them in amongst *Cabbages* or *Cauliflowers*, so that they may occupy the ground after these crops, and one of *Lettuces* have been obtained from it. All refuse roots throw into a heap, and burn them, or decompose them with lime. Uncover, throughout, every dry honr frames containing *Lettuces* and *Cauliflowers*. Thin the *Lettuces*, if thick, especially if *Carrots* are growing amongst them. Tilt up the hand-lights over *Cauliflower* in fine weather, which, if very mild and warm, the hand-lights may be lifted off the plants during the day, but replaced at night. See the ground between *Cabbages*, for a loose and warm surface soil is very beneficial to them. Keep *Onion*-beds free from weeds, and prepare a slight hot-bed for sowing some *Leeks* in, for early transplanting. For early *Turnips* prepare some beds by the following method: Cast out trenches, or beds, from 4 to 6 feet wide, and about a foot deep; fill these with fermenting manure and cover it over with a few inches of soil. Then sow the seeds and cover them thinly with mould, and ever all place a mulching of litter a little deeper than what is generally done over *Radish* beds; when the seedlings appear this mulching must be removed and replaced daily, as in the case of *Radishes*. *Mushroom*-beds are bearing well this winter, and, in order to keep off heavy rains and retain their heat, place mats over them; a declining of the heat, however, can be greatly remedied by additional covering of litter. Continue to force, in succession, beds of *Asparagus*, *Seakale*, and *Rhubarb*. Frames are unnecessary for these, providing the alleys are well filled with manure, some of which should, also, be placed over the surface of the beds, which ought then to be covered with hoops and mats, strewn over with straw or strawy litter. Collect and burn all refuse, such as old and useless trees and bushes, and prunings. These should be burnt in a heap in one place, and the ashes carefully collected and mixed with manure intended for beds of any choice vegetables.

THE GARDEN.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE ORIGIN OF DOUBLE PELARGONIUMS.

By THOMAS LAXTON, Stamford.

THE friendly glove thrown down by Dr. Denny in last week's GARDEN aeneat the origin of my strain of double Pelargoniums, which he suggests I may have obtained from the Continent, impels me, in the midst of political strife, to accept the challenge, and to enter upon ground I had not just now intended, M. Sisley's and Dr. Denny's communications being so full of interest to raisers of new plants. In 1866, I commenced crossing the *Triomphe de Gergoriat* or *Inquinans* race of double Pelargoniums with the ordinary single Zonals, but, after a three years' trial, I found it impossible to get out of the vigorous and "fat" growth of that class of doubles, all my seedlings, with one exception, showing no material variation from or advance on their parents, the exception being the result of a cross of *Triomphe de Gergoriat* with single Zonal *White Princess*, which had foliage approaching that of the pollen parent, and small reddish flowers with whitish reverse of petals. This was the only seedling I succeeded in raising from many attempted crosses of any of the *Madame Vaucher* race with the *Inquinans* doubles, and it was infertile. I ought to state that I have only exceptionally used the single varieties as seed-bearers, on account of the greater security from self or foreign fertilisation which, under ordinary treatment, the opposite method affords, and I have never been able to obtain seed from any of these doubles by fertilising them with single Zonal *Beauté de Suresnes*; the converse I have not tried. In 1869 finding that so little was to be gained by crossing the *Gergoriat* or *Champflour* type, I discarded it for *Madame Rose-Charmeux* and Mr. W. Paul's *Cottingham*, the two double Tom Thumbs, the origin of which I should much like to ascertain; doubtless, they are both sports from Tom Thumb, for I have found *Rose-Charmeux* to throw out a branch (probably a reversion) with single flowers only, and which I could not distinguish from Tom Thumb. I am afraid M. Jean Sisley's account does not touch on the origin of these, nor does he seem to have noticed in one of the English papers of the past two years, a quotation from a Scotch publication of about 1826, from which it would appear that a double Zonal was in existence, in a Belgian nursery, nearly fifty years ago, and, from the not over-flattering description of the plant, I take it to have been a similar variety to *Marechal de Champflour*. From *Madame Rose-Charmeux* I obtained *Jewel* by fertilising with Lord Derby and E. J. Lowe, by using the pollen of a seedling from Mrs. Pollock, and it is remarkable that the vigour of this variety exceeds that of either of its parents and that of the other seedlings produced by fertilisation with the non-variegated single Zonals. Most of the seedlings from *Madame Rose-Charmeux*, having double flowers, were infertile, and from *Jewel* I could only get a single seedling, which I have since lost. Rather more than half the produce of over 1,000 seedlings from *Madame Rose-Charmeux*, raised in four years, came double or semi-double, the foliage and habit taking a more or less intermediate form, and none having the characteristic zone of the male parent entirely absent in the foliage. I have never been able to get nearer a white-flowered double than a light pink, and this appeared to be an exceptional sport, no white or pink variety having been used in the cross. A corresponding circumstance has occurred in crossing the single dwarf scarlet Zonal *Harry Hieover* with another scarlet Zonal, one seedling from it having flowers nearly white, or parti-coloured, not unlike the Continental variety *Cora*, but I could never get anything like a white flower by crossing *Madame Rose-Charmeux* with the *Madame Vaucher* type, and I have always found the white in flowers much less than other colours; and, in both the cases alluded to, the parents had each scarlet flowers, the light colours being probably due to reversion. It will, therefore, deeply interest me to know the origin

of the parents of M. Jean Sisley's break in *Aline Sisley*, which has quite the *Madame Vaucher* habit and character, and no traces of *Inquinans* blood appearing in it. I have now several hundred seedlings from crosses of the double Tom Thumb race with the single Zonals and *Nosegays*, many showing remarkable variations in colour and improvement in form. I have others, also, crosses between these and a shrubby single-flowered dwarf Zonal, having *Parsley-like* foliage, and which may be, and has been, considered a hybrid between an old self-coloured show *Geranium* and a scarlet Zonal; but, as I have not followed out carefully the results of some crosses which I attempted in this direction a few years ago, I am unable to speak with certainty on the point; although the appearance, scent, and general want of fertility of the parent seedling indicate such an origin. In conclusion, I would ask hybridisers not to come to a hasty determination, from Dr. Denny's observations in crossing the Pelargonium, as to the prepotence of the male parent; for, although the doctor's experiments have been undoubtedly carefully conducted, and his observations on the results are equally reliable, I maintain that all such highly interbred plants as the Zonal Pelargonium, the *Rose*, florists' flowers generally, and even cultivated fruits, afford no safe field for such a deduction, because reversion, and the causes alluded to by Mr. Darwin, are too likely to affect the results. On the other hand, after nearly twenty years' experience in the cross-fertilisation and hybridising of plants, during which time I have conducted, and, in many instances, carefully recorded the results of some thousands of crosses and counter-crosses with genera less interbred, and, consequently less liable to reversion, and especially the *Leguminosæ*, which are not easily subject to the accidental influences of foreign pollen, I have not been able to obtain any evidence that the influence of one parent, in the vegetable kingdom, predominates over the other, although I have had frequent proofs that the general results of cross and counter-cross are indistinguishable. The particulars of these experiments I hope, if spared, at some future day to codify.

In allusion to the paragraph in the same page of THE GARDEN, headed "A blue Pelargonium," I must be allowed to repeat what I have before written, that I doubt the probability of a hybrid being raised between *Geranium pratense* and the Zonal Pelargonium. Eighteen years ago, I tried ineffectually to cross them in a variety of ways, using for the purpose *Madame Vaucher* and the principal whites of the period, both as the male and female flowers, and, although I have seen some of Mr. Lowe's seedlings, I must still give my verdict as "not proven."

The Nutmeg.—This spice, so much used in every family, is indigenous to the Moluccas, reaching its greatest perfection in Amboyna. This island belongs to the Dutch, who do not permit the cultivation of the Nutmeg in the other islands under their control. The Nutmeg-tree is 25 or 30 feet high when fully grown, with foliage of a rich dark green, and very plentiful. It reaches maturity, or full productiveness, at the fifteenth year from planting. From the blossom to the ripening of the fruit takes about seven months; but, as the tree is a perennial bearer, there are always blossoms, green fruit and ripe on the tree. The yield is most plentiful in the last four months of the year. The average yield per annum of a healthy tree is 5 lbs. of Nutmegs and 1½ lbs. of Mace. A plantation of one thousand trees requires the labours of seven coolies, fifty oxen, and two ploughs, for cultivation and harvesting. The fruit is gathered by means of a hook attached to a long pole. It is shaped like a Pear, about the size of a Peach, and has a delicate "bloom." The nut has three coverings; the outside one is a thick fleshy husk, having a strong flavour of Nutmeg. This husk, preserved in syrup when young, is a favourite sweetmeat in the East Indies. Under this husk is the bright red mace, which is carefully flattened by hand and dried on mats in the sun. It loses its rich scarlet, and becomes a dull orange colour, and requires to be kept perfectly dry to preserve its flavour. After the Mace is removed from the fruit, the nuts, in their brown shells, are placed on hurdles over a slow fire, which is kept constantly burning under them for two months. The nuts then rattle in the shells, which are cracked with a wooden mallet, the sound nuts selected and packed in wooden cases, and sprinkled over with dry sifted lime, and are then ready for market. The best Nutmegs are dense, emit oil when pricked with a pin, and can always be known by their heavy weight. Poor ones are light and easily detected.

NOTES OF THE WEEK.

— IN the Royal Botanic Gardens, Edinburgh, *Cordylina australis* has proved itself to be hardy enough to withstand the winter, when planted on rock-work, where its elevated position ensures perfect drainage, whereas in flower-borders in the same gardens our winters generally kill it.

— WE learn from the *Illustration Horticole* that a species of Gum-tree which "surpasses the *Eucalyptus globulus* in interest," is now being cultivated in Algeria. It is named *Eucalyptus colosseæ*, and, in its native Australian home, is said to attain a height of 400 feet.

— THE office of Secretary-General to the Central Horticultural Society of France, recently vacant, in consequence of the death of M. Bonchard-Huzard, has been filled by the appointment of M. A. Lavallée, a distinguished amateur, well-known on the Continent from his writings on horticultural subjects.

— A SOCIETY of Acclimatisation has recently been established at Rio Janeiro, with the object of introducing into Brazil useful animals and plants from other countries. For this purpose an extensive garden, similar to the Jardin d'Acclimatation at Paris, is in process of formation, under the superintendence of M. Glazion, the director of the public gardens at Rio.

— IN the *Official Gazette* of the United States Patent Office, of date of November 11th, 1873, we find that a Mr. John Craig has patented what he terms an "Artificial Stem for Cut Flowers," which is nothing more than the old device of winding a bit of fine annealed wire around the base of the flower, a practice which has been resorted to for years by our best florists.

— A VERY handsome variety of the common Almond (*Amygdalus communis*), with variegated leaves, has been raised by M. Aussener-Sertier, nurseryman, of Lieusaint (Seine-et-Marne). In most cases, variegation of the foliage is accompanied with a loss of vigour in the tree or plant in which it occurs, but this variety is said to preserve all the vigour of the type, while it displays a beautiful contrast of colours in its leaves, which are of a fine green, marked with snow-white streaks, and very much resemble the leaves of a variegated *Negundo*. Plants of it are offered for sale by the raiser.

— A NEW species of Pumpkin is announced from the *Jardin d'Acclimatation* at Paris, under the Spanish name of "Zapallito de tronco," or "Tree-Pumpkin." It differs from all its congeners in its mode of growth, as, instead of trailing, it forms erect tufts, with numerous fruits of a depressed spherical shape, and from 5 to 8 inches in diameter, depending from the stem. These are said to be of excellent quality and flavour. The chief merit of the plant, however, is that, from its mode of growth, it occupies very little space in cultivation, while a single plant of any other species, usually covers a large area. The seeds of the Tree-Pumpkin, here described, were obtained from Buenos Ayres.

— THE old gravel-pits and belts of Furze on the west side of Tooting Common are being cleared away, and the land is to be excavated and laid out as a public park and recreation-ground for the inhabitants of Tooting and Streatham. The work is undertaken by the Board of Works, who have purchased the manorial rights, and arranged with the commoners having pasture rights and other privileges. The other portion of the common, about which there has been expensive litigation between the lord of the manor and the commoners, is to remain intact. It is beautifully timbered, and possesses a park-like aspect, and is to be preserved in its present state.

— AT the meeting of the Linnean Society, which took place on the 5th inst., there seems to have been something like a free fight. Mr. Carruthers began by proposing that the proceedings of the previous meeting be declared null and void. This Mr. Bentham, the president, refused to put to the meeting. Mr. Carruthers persisted in his motion, and succeeded in carrying a majority of the meeting with him; whereupon Mr. Bentham left the chair, and it is said that he has declared his intention of resigning the presidentship. We hope he will think better of this; meanwhile, the temperature of the meeting rose too high to admit of the consideration of scientific questions; and, therefore, such as were to come under consideration that evening had to stand over.

— WE have lately visited Hatfield, the seat of the Marquis of Salisbury, and seen Mr. Cowan's lime-kiln heating apparatus at work. Rarely, indeed, does any novel process turn out so well at first as this has done. The village of glass-houses in the new kitchen garden there is heated by Cowan's apparatus in a thoroughly efficient manner, and at a trifling expense. Mr. Bennett, the gardener at Hatfield, assured us that he has never any trouble, day or night, in securing the efficient heating of all the houses by this means alone. The young gardeners should be well satisfied with the system, as, by its means, they are relieved from all work with fires—work often very harassing and laborious. Like all other innovations, it is, of course, capable of improvement, but no one can see the result already gained at Hat-

field without being satisfied that the Marquis and his able gardener were amply justified in adopting Cowan's system.

— WE hear that the design sent in in competition for Roundhay Park by Mr. Carson, architect, Leeds, has been selected as the best.

— TWENTY-FIVE sets of drawings have been submitted in competition, for the proposed fruit and vegetable markets in Farringdon Street, City.

— GREAT improvement is being made in the Oleander, both as regards the numerous shades of colour and forms of flowers. On the Continent they are being named and distinguished as we distinguish Roses or Dahlias.

— AT this season of the year, when St. Valentine is holding his time-honoured court, it may interest some of our readers to know that tasteful Valentines made of real flowers are now exposed for sale in Covent Garden Market. Arranged in neat boxes, and fringed with lace, these innovations ought to meet with a ready sale.

— IN a letter to the French Society of Horticulture, a chemist, M. Fremont, mentions that a good way of preserving cut flowers in a state of freshness, is to dissolve sal-ammoniac, or chlorhydrate of ammonia, with the water in which the stems are put, in the proportion of five grammes (77½ grains) per litre (1½ pint) of water. They will thus often be kept fresh for a fortnight.

— M. DECAISNE has recently published in the *Bulletin de la Société botanique de France*, descriptions of three new genera of plants gathered in China by the Abbé David. These have been named *Ostryopsis*, *Camptotheca*, and *Berneuxia*; the first belonging to the family of the *Corylaceæ*; the second to the *Nyssaceæ*, and the last to the *Diapensiaceæ*. *Ostryopsis* is a native of eastern Mongolia, and the other two were found in eastern Tibet.

— THE Torrey Botanical Club of New York has issued a Botanical Directory for North America and the West Indies, founded upon one of similar character published some years ago by the Essex Institute of Salem. This embraces the names of all persons in America known to the club as interested in botany, general and special, the names being first printed in alphabetical sequence, and then re-arranged according to the States to which they belong. Such a work as this cannot fail to be extremely useful to students, and the one in question will, doubtless, be eagerly sought after by botanists.

— LARGE quantities of Oranges, says the *Alta California*, are daily arriving at the dépôt at Los Angeles to be shipped to San Francisco. One dealer of San Gabriel sold his Orange crop for 30 dols. per thousand. His Orange grove covers five acres, and contains 500 trees. Estimating these at 1,000 Oranges each, the crop is worth 15,000 dols.; 3,000 dols. an acre in a pretty good return for their cultivation. One acre in Southern California can be made to yield as great a clear profit by semi-tropical nut and fruit culture as twenty to fifty acres in the eastern States devoted to ordinary kinds of farming.

— A PLANT of *Phalaenopsis Schilleriana* is now flowering in the gardens at Crewe Hall, Cheshire, bearing 190 fully expanded flowers on one spike. The plant has six leaves, each measuring from 12 to 14 inches in length. Last year the same plant bore two spikes, bearing in all 164 flowers, and, this year, the gardener, Mr. Whittaker, thinking that the two spikes it threw up in the autumn would exhaust the plant too much, rubbed one off, and the other has borne the above enormous quantity of flowers. The only plant, which in any way equals this, is the specimen belonging to Mr. Milne, Yewfield House, Arbroath, N.B., and which has borne about the same number of flowers on a spike. Some of the varieties of this fine winter-flowering Orchid vary greatly in the size and colour of their flowers, and one of the finest and deepest-tinted varieties we have ever seen is now blooming in Mr. Bull's establishment at Chelsea.

— THE annual general meeting of the Royal Horticultural Society was held at South Kensington on Tuesday last, when, after some rather exciting proceedings, chiefly as to the legality of the constitution of the council, their report was adopted by a majority of 231 against 225. The following new members were then elected, viz.:—Lieut.-General Hon. Sir A. H. Gordon, K.C.B., Mr. Joseph Herbert Tritton, Mr. Burnley Hume, and Mr. Henry Webb. The following officers were also elected:—President, the Right Hon. Viscount Bury, M.P., K.C.M.G.; treasurer, Mr. Bonamy Dobree; secretary, Mr. W. A. Lindsay; expenses committee-men, Sir Alfred Slade, Bart., Mr. W. A. Lindsay, and Mr. Henry Little; auditors, Mr. James Nicholson, Mr. John Gibson, and Mr. Robert Hudson, F.R.S. Notwithstanding that the society is considerably in debt, we are glad to learn from the report that increased attention is being paid to the gardens at Chiswick, and that the various instructive trials of vegetables and florists' flowers that have been carried on there, are likely to be continued. We are also glad to hear that the books and accounts of the society have been very carefully kept during the past year, which is reported, on the whole, to have been a somewhat prosperous one.

THE GARDEN IN THE HOUSE.

WINDOW GARDENS IN WINTER.

Most people—especially those who reside in the suburbs of London, or other large towns—are fond of window-gardening during the summer months, but it is rarely one sees a neat and effectively-furnished window-box or balcony in winter. In summer we can keep the window-box outside gay with Fuchsias, Hydrangeas, Pelargoniums, Asters, Stocks, and other showy annuals, but, during the cold season, we must fall back on hardy shrubs, Ivy, Yuccas, and a few winter and spring-flowering bulbs and herbaceous plants, and with tasteful arrangement these are far more attractive than spindly Geraniums or leafless Fuchsias inside the window itself. There is no occasion to keep Geraniums and Fuchsias through the winter, as they always look naked, while bushy little plants can readily be bought for a few pence in spring, when required. People should arrange their balconies or windows for the winter as soon as the bedding plants and hardy annuals are over. For this purpose, we have many

shrubs at our disposal, the best being bushy little plants of *Aucuba japonica*, green and variegated Hollies, *Enonymus japonicus*, the gold and silver variegated forms of which are very bright and beautiful. A very effective window-box may be filled with a few simple materials. Common Irish Ivy may be planted at the ends of the box, and trained over a wire hoop, forming a neat arch, which may be varied in height according to the view from the window. The box below may contain a plant of *Retinospora ericoides* or *Thuja aurea*, flanked on either side by sturdy little plants of golden-variegated *Euonymus*. These contrast admirably with the fresh green Ivy above, while the soil in the box may be covered with mossy Saxifrages, *Arabis alpina*, *A. albidula*, *A. lucida* variegata, *Aubrietia purpurea*, or the always fresh and green Stonecrop (*Sedum acre*). A few Crocuses, Hyacinths, and Snowdrops, planted in November or December, will brighten up the box during the first sunny days of spring, before it is time to remove the shrubs and insert the ordinary summer-blooming plants and seeds. The Ivy arch may be left during the summer months, and will look

pretty partially covered with golden Canary-flower (*Tropeolum peregrinum*) and purple Morning Glory (*Convolvulus major*). Both the last-named plants, as well as scarlet-flowered *Tropeolums* and many other climbers, are readily propagated from seeds sown inside in March, and planted out in the boxes after all danger from frost is past, say, in the middle of May. One of the most effective winter balcony-gardens we have seen for some time is in Portman Square. The front of the balustrades is draped with Ivy, and three or four healthy plants of *Yucca recurva*, in ornamental vases above, complete the arrangement. Nothing could be more effective than this mode of grouping, and the arrangement is allowed to remain all the year round. In summer, the fresh greenness of the Ivy may be brightened up by the addition of a few flowering plants; many are not required with such an elegant arrangement as that just described. Above all things, avoid heavy or crowded grouping, that being not only more expensive, but less artistic and attractive. Simplicity is very often synonymous with elegance, and a few common plants, if beautiful in outline and fresh in colour, will give far more satisfaction to an artistic or intelligent observer than a mass of the choicest exotics clumsily

arranged. Rare and beautiful plants and flowers look well along with suitable surroundings, as in the drawing-room or boudoir, but, for outside window-boxes in the winter months, nothing looks better than the common hardy climbers, shrubs, and herbaceous plants we have here recommended.

F. W. B.

THE INDOOR GARDEN.

A FEW MORE WINTER ORCHIDS.

IN addition to the selection of winter Orchids given last week (see p. 117) the following are of great merit, and well deserving of general cultivation for winter flowers.

ANGRÆCUMS.—In this genus we have several noted winter-flowering species, the most attractive being the curious *A. sesquipedale*, which bears drooping spikes of three or four great wax-like flowers, 6 or 8 inches across. Each flower is furnished with a tail-shaped spur, 10 to 15 inches in length, and this gives the star-shaped flowers a weird-like appearance. Good plants bear two or three spikes, but want of numbers

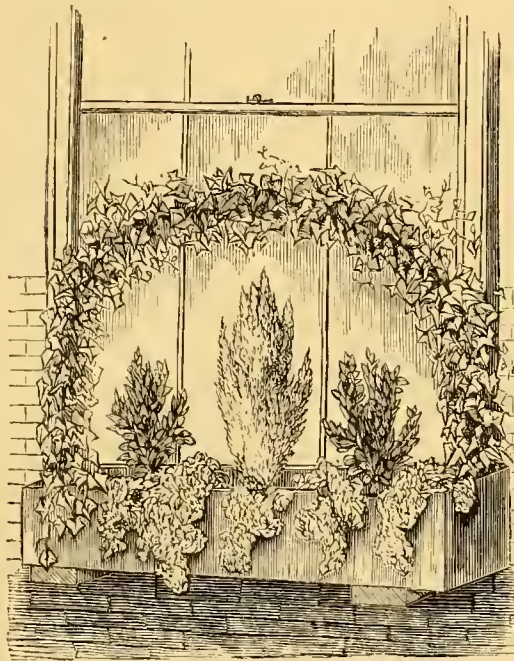
is amply made up for in size. One peculiarity about this plant is, that its flowers emit a heavy perfume at night, but their odour is scarcely perceptible during the daytime. It is a native of Madagascar, whence it was introduced to our gardeners by the late Mr. Ellis. Other species, as *A. eburneum*, and its greenish small-flowered variety *A. virens*, *A. bilobum*, *A. funale*, *A. citratum*, and the new and rare *A. Ellisi*, all bloom during our dull wintry months. The last-named species is now showing flower in Lord Lonsborough's collection, and is remarkable, inasmuch as a profile of the flower resembles a lemon-crested cockatoo. The *Angræcums* (with one exception) all require tropical treatment.

CYMBIDIUM.—At least two of the best species in this genus flower during the autumn and winter months. *C. Mastersii* and *C. eburneum* are well-known plants bearing sub-erect or nodding spikes of white wax-like flowers, amongst their bright grassy foliage. They like a warm humid temperature, and a fresh open compost.

CALANTHES.—These are very useful winter-flowering plants, although their flowers are highly susceptible

of injury during damp foggy weather, such as we have experienced at times during the past winter. *C. vestita*, and its pure white varieties, *Turnerii* and *nivalis*, produce a good supply of flowers during winter. *C. Veitchii* is noted as one of the best of all winter-flowering Orchids, bearing great spikes of its bright rosy-coloured flowers, that contrast well with its pale-tinted congeners. All the *Calanthes* are easily cultivated, the deciduous or pseudo-bulbous section being the best for their winter-blooming qualities, and they also require a more decided season of rest than their evergreen allies.

OXIDIDIUM.—This is a large genus and one that contains many species valuable for their winter flowers. One of the finest of the whole group is *O. macraurum*, a robust grower, even in a low-winter temperature, and it bears great branching flexuose spikes of sixty or seventy flowers. The sepals are of a warm brown, the petals being golden-yellow, while the small dagger-pointed lip is of a bright glossy-purple tint, and the great toothed crest is pure white. It is a native of Peru, and should be in every collection. *O. obryzatum* is another free grower and a most profuse bloomer, bearing numerous golden-yellow fragrant flowers, spotted with brown, on dense flexuose spikes 7 or 8 feet long. Its pseudo-bulbs



A window winter-garden

and leaves are of a fresh and pleasing green colour, and the plant itself grows very freely in a cool *Odontoglossum*-house, a few plants of this species should be grown in every collection, however small, as it is nearly perpetual in its habit of flowering. *O. cheiroporum* is a pretty little free-flowering species of recent introduction, having fresh green leaves and prettily speckled pseudo-bulbs. Its flowers are borne on a dense spike 10 to 12 inches long. *O. incurvum*, *O. serratum*, and *O. Papilio*, are well-known winter-blooming species, well worth growing for variety. *O. cucullatum* is one of the prettiest and most variable of the winter flowerers, and, although not yet generally distributed in collections throughout the country, deserves to be grown everywhere. Several importations have lately been received in good condition, and it promises to become common. It is dwarf and compact in habit, grows freely in a cool winter temperature, and bears spikes of five to seven, rosy-purple or white, crimson or dark purple, spotted flowers. One variety of this species, *O. Phalenopsis*, bears large white flowers spotted with bright purple, and is very attractive. *O. nubigenum* (of gardens), another form, is found on the Andes, at altitudes varying from 10,000 to 12,000 feet. Here, at this high altitude, where radiation is excessive, especially just before sunrise, the plant grows freely.

PHAJUS.—The old *P. grandifolius* is one of the best and most useful of all winter-flowering Orchids, not only for cutting, but also for conservatory decoration. It is one of the oldest and most easily-grown of all Orchids, and may be grown in any ordinary plant-stove. Good specimens bear twenty to thirty spikes, 2 to 3 feet in height, and these are very showy for general purposes of decoration. *P. Wallichii* is a stronger-growing variety, having more yellow on the lip. Both grow well in a moderately rich peaty compost, well drained; and these may be classed among the very few Orchids that are benefited by liquid-manure, or stimulants, at the root. At Chatsworth these plants are grown better than anywhere else we have seen them. *Apropos* of these plants, we may mention that *P. irroratus* (one of Mr. Dominy's hybrids, the result of a cross between *Calanthe vestita* and *P. grandifolius*), has been in bloom in Messrs. Veitch's nursery at Chelsea for the last six or eight weeks. Its flowers are white, suffused with faint rose, and the plant will undoubtedly prove a favourite.

SACCOLABIUMS.—One or two species are very valuable winter-flowering plants; the only drawback to their culture is that they require the heat of an East Indian house, or hot humid plant-stove, to do them justice. Good specimens, with fresh thick leaves, and gracefully-drooping racemes of perfumed wax-like flowers, are very effective for ordinary decorative purposes; a single spike will furnish flowers enough to scent two or three dozen bouquets, and, for button-holes, a single flower or two, mounted on wire and backed by a fresh bit of *Davallia* or *Maiden-hair*, is all that can be desired. *S. giganteum* is a noble winter-blooming species, the most robust of the whole group, bearing great pendent spikes of white flowers, spotted with rose, and having a violet-tinted lip. It may be grown either in a pot or basket, or small plants do well on a block suspended near the light.

CYPRIPEDIUMS.—One of the best of the winter-blooming *Cypripedes* is *C. villosum*, a vigorous grower, bearing great brown flowers, which shine as brightly as if varnished. *C. barbatum* sometimes bears a few odd flowers during the autumn and spring, but cannot be relied on for blooming. *C. Harrisianum*, a hybrid between the two above-mentioned species, is a valuable bloomer for all seasons, and the new *C. Sedeni* is the brightest-coloured variety in cultivation, and a most profuse bloomer during the autumn and winter months. Plants of this last have been blooming in the Royal Exotic Nursery, Chelsea, for the last four or five months, and the rosy flowers are very bright and effective among white-flowered plants of other genera. *C. longifolium* flowers all the year round, the rosy-petalled flowers being borne one at a time on a ten or twelve-flowered spike, and each flower lasts quite a month in perfection. *C. Roezlii* appears to be a strong-growing form of the last, and blooms in the same manner. Both are variable in the colouring of their flowers, and deserve a place in every collection, as, in addition to the flowers, their foliage is of the freshest description, and of an elegant drooping character. All the above grow well in a warm greenhouse

or *Cattleya*-house, where the minimum temperature does not descend below 50° in winter. A fresh, open, well-drained compost of fibrous peat and living *Sphagnum* suits them admirably, as their thick hairy roots revel in the Moss when it is alive; and as a surfacing material for Orchid pots nothing is equal to green *Sphagnum* fresh from the bogs or marshes.

LÆLIAS.—In addition to the beautiful *L. anceps* mentioned last week, we have several other species well worth general cultivation for their winter flowers. *L. alba* and its rosy-lipped variety, *L. acuminata*, *L. purpurea*, and the never-failing *L. autumnalis*, should find a place in every collection. The latter plant does well in a pot or on a block suspended near the light, and we have seen it grown and flowered to perfection in the moderately dry and airy atmosphere of a common Vinery. If there is the convenience of a *Cattleya*-house proper it will be found the best position for these beautiful plants, but if not, try them in a warm Vinery during winter, and let them take their chance; as to summer temperature, take the precaution to keep them well supplied with tepid moisture, either by immersion or by frequent syringings overhead.

PLEIONES.—These little Alpine Orchids are merely deciduous *Cœlogynes*, and, as a rule, flower late in the autumn months. *P. Wallichiana* (*P. præcox*) is the earliest species, its rosy-lilac flowers appearing about October or the beginning of November. *P. lagenaria* and the white-petalled *P. maculata* follow in quick succession; and form the grand show of the Pleione or Indian Crocus season. The rare and pretty little *P. humilis* is last, and we saw a nice little pan of this in full flower the first week in February. The culture of these delicate little Orchids is simple. They must be potted in a fresh well-drained compost of fibrous peat, chopped living *Sphagnum*, and leaf-mould as soon as they commence their growth, which is during the winter months, and generally a week or two after their flowers fade. The bulbs should be well elevated above the rim of the pot or pan, and grow best placed on a shelf in a moderately warm humid temperature near the light. A shelf in the early Vinery suits their requirements exactly, as an occasional syringing does them good and keeps down insect pests, to which their succulent and somewhat tender foliage is subject. The flowers of all the species are universal favourites, and come in very useful for bouquet work at a season when choice flowers are scarce. Pleione flowers should never be cut, but gently pulled from the inflated sheath from which they generally spring in pairs.

ZYGOPETALON MACKAYI.—This is a good old winter-flowering Orchid, and one that seldom fails to flower every winter, even when badly treated. Good specimens in pots bear numerous spikes of delicately-tinted flowers. The great flat lip is white, curiously marked with diverging lines of purple hairs. The spikes are handy for cutting, and look well in the drawing-room vase; the individual flowers are too massive for bouquet work. This plant commences to grow in January or February, and does well in the early Vinery if well supplied with tepid water, and placed near the light.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Climbers for Plant-stoves.—I grow, for the sake of their foliage, *Cissus discolor*, *Vitis gongyloides*, and *Batatas paniculata*. The *Vitis* has a novel tropical appearance, and sends out slender aerial roots from 5 to 8 feet long, which droop gracefully amongst the other vegetation. As regards flowering climbers, nothing surpasses *Stephanotis floribunda* (white), *Dipladenia amabilis* and *D. insignis* (deep rose), *Allamanda Hendersonii*, and *A. grandiflora* or *A. nobilis* (yellow). For winter, a few plants of *Tropeolum Lobbianum* be trained on wires or strings near the glass, and will flower freely. *Rondeletia speciosa* is another valuable winter-flowering stove-plant that does well treated as a climber. All these may either be grown in pots or planted out, both plans having their special drawbacks as well as advantages. In either case use a fresh open compost of peat, fibrous loam, leaf-mould, and sand.—B.

Ferns for Bouquets.—What are the best half-dozen Ferns to grow for cutting for bouquets, button-holes, and similar decorations? I already have *Adiantum cuneatum* and *Pteris serrulata*, and I wish to have as much variety in the way of form as I can.—Q. [The Ferns just named are two of the best you can employ for bouquet work. Of *A. cuneatum* there is an elegant variety, named *A. gracillimum* (elegantissimum) a kind with finer fronds than those of the species; and there is, also, a variety of *Pteris serrulata*, the divisions of which are finely crisped. Several of the *Davallias* are useful for such work and last long in good condition in a cut state, especially if dipped in water before they are used. Of these, the best are *Davallia bullata* and *D. dissecta*, but the common *Hare's-Foot* (*D. canariensis*) and *D. elata* come in very usefully for such purposes. *Adiantum Farleyense*, *A. Capillus-Veneris*, *A. tenerum*, *A. tinetum*, *A. colpodis*, and *A. assimile*, all yield good fronds for bouquet-making.—Ed.]

THE FLOWER GARDEN.

A HARDY PELARGONIUM.

THE plant which we figure below, and which is known as *Pelargonium Endlicherianum*, was first discovered in the south of Asia Minor by the German botanist Kotschy in 1842, and, for many years, was known in Europe only from the dried specimens of it which he presented to a few herbariums. In 1856, however, M. B. Balansa, during one of his frequent visits to Asia Minor, conceived the idea of introducing it into cultivation, and, on his return to France, brought with him several living plants, some of which he presented to the garden of the Muséum, and some to M. Pelé, an eminent nurseryman of Paris. The plant, thus, for the first time, brought under culture, has proved an important acquisition to our gardens, as, in addition to being the only hardy *Pelargonium* we are yet acquainted with, it is also remarkably handsome and singular in appearance. It belongs to the section of the genus *Pelargonium* known as "*Jenkinsonia*," the peculiarity of which consists in the flowers having only the two upper petals fully developed, the three lower ones being merely rudimentary, and scarcely visible. The subject of our notice grows from 12 to 20 inches high, sending out several stems from its branching rhizome, and the entire plant is covered with a light velvety pubescence. The lower leaves are of a rounded reniform shape, notched and toothed, and of a greyish-green colour; those of the stem are more or less deeply divided into from three to five lobes. The flowers, which appear from the end of June until August, are large, of a fine purplish-rose colour, each petal being marked with five longitudinal veins of a darker shade. The three lower and undeveloped petals are of a whitish hue and are only about half the length of the divisions of the calyx. As regards its culture, it requires a well-drained sandy soil (but not too light), and a warm and sheltered position. The chief care which it demands is to be preserved from damp, of which it is more impatient than of cold; an excess of moisture invariably proving fatal to it. If this one point be observed, its culture is by no means difficult. It is easily propagated either by means of cuttings, or from seed, which it yields freely. In conclusion, we may add that the plant received its specific appellation from the German botanist Fenzl, who named it in honour of his friend Endlicher, and who has described it in his '*Pugillus plantarum novarum Syriæ et Tauri occidentalis*.' It was first brought to England by Mr. Wm. Robinson, but is as yet rare. On light warm soils in the South of England it will prove a showy perennial. The illustration is a faithful portrait of the plant in its first year.

A hardy *Pelargonium*.



in the open borders at the end of April or beginning of May, but will not then flower so early.—*Tender Annuals*, a very limited class, will also vegetate in a close frame, but require more warmth to bring them to perfection than the preceding; they should, after pricking out, be transferred to a second hot-bed, and will flower most satisfactorily in the greenhouse or window.—*Hardy Perennials*, of the commoner and large-seeded kinds, may be sown in the open borders any time from March to August, but the rare and more delicate species will succeed with greater certainty if raised in a close frame, with or without bottom-heat; thus treated many will flower the first season, if sown early and planted out in the borders in May. All those with very small seeds should be sown in pots under glass. The amateur will do well to bear in mind that, though many perennial seeds vegetate as quickly as those of annuals, there are some others which usually remain dormant for weeks, or even months; to this class belong the *Gentians*, *Cyclamens*, *Paeonies*, *Fraxinella*, many

Australian *Leguminosæ*, and especially North American plants. Most of these require, in fact, to be sown in autumn as soon as gathered, and they will then vegetate the following spring. As this is not always practicable, the plan of steeping the seeds before sowing, for twenty-four hours, may be adopted with great advantage in many cases.—*Half-hardy Perennials* require the treatment of the half-hardy annuals, differing only in their need of winter protection.—*Stove Seeds* need a moist elevated temperature, such as the stove or forcing pit affords; and greenhouse seeds succeed well under the same conditions; in their absence the latter are best raised in a good hot-bed.—*Biennials* may be sown in the open ground in spring and summer, not later than June and July, the seedlings being planted in autumn, where they are intended to bloom the following season. The half-hardy plants of this class, as *Ipomopsis*, should be pricked out in pots that they may be protected in winter.—All seeds sown in frames or pits require shading with tiffany or thin calico, in bright weather during the middle of the day, especially as the spring advances. In the open ground, seeds should not be sown too early: there is great risk of failure before the end of March; where early flowers are desired of annuals, it is better to sow in autumn. For all seeds in pots, a compost of finely-pulverized leaf-mould, peat, or other vegetable soil, with one-third its bulk of sand or very sandy-loam, will answer well; sow very thinly; let the pots be well drained; cover the seed with about its own thickness of soil, and thin out crowded seedlings early. After germination has once commenced, the surface of the soil should on no account be suffered

to become dry. Very small seed, such as *Mimulus*, *Lobelia*, *Calceolaria*, &c., should not be covered with soil, but be sprinkled thinly on the soil which should be previously watered from a fine rose. Chinese *Primula* germinates best when covered with a layer of damp moss; this seed often fails to grow from being too deeply covered with soil, and many other failures are attributable to the same cause.

WM. THOMPSON.

BEDDING CALCEOLARIAS.

I AGREE with your correspondent, "R. D." (see p. 77), that mismanagement has much to do with the so-called disease in *Calceolarias*. In a garden, of which I had charge during the summer of 1872, I had no disease, while, owing to the excessive wet, assisted by unhealthy plants, few, if any, of my neighbours' *Calceolarias* escaped. In this district it is not considered judicious to put in cuttings in July or August. I never put in any till the first week in October, when nice fresh juicy cuttings may be obtained, and not

HINTS ON THE MANAGEMENT OF FLOWER SEEDS.

Hardy Annuals are best sown in the open border in light soil, from March till June for summer and autumn flowering; and in September for flowering the following spring.—*Half-hardy Annuals* require to be sown in March or April, on a gentle hot-bed, or in a close frame without bottom heat, the latter mode succeeding perfectly, unless the seeds are sown too early in the season; many of them may even be sown

flower-spikes, as must be the case earlier in the season; old potting-bench materials may do for soil, but I find light loam, leaf-mould, and river-sand, in equal parts, much better. A cold frame is most decidedly the best place in which to put them, and the sooner the cuttings are put into the soil after their removal from the plants the better. I do not agree with "R. D.'s" practice of drying them in the sun. After the frame is full and watered, put on the lights, which should be kept close and shaded with scrim for the first fortnight. Then remove the scrim, but keep them still close for another fortnight. Admit air gradually at first; then give abundance of it on every favourable day. No water will be required till the end of February, and, if the winter has been mild, the plants will have been topped several times, but, if it has been severe, protection must have been resorted to. In the first week of March I transplant into prepared frames; the soil used being light, but richer than that used before. The plants are put in, 5 inches apart, each way, watered, and kept close for two or three days; air is then admitted as usual. In the first week of April I again transplant them 9 inches apart, each way, in prepared soil, 7 or 8 inches deep. After keeping them close for a day or two, to induce them to take to their new quarters, the sashes may be removed every fine day, and nights too, if there is no frost. By the second week of May, when I generally plant them out, they are nice bushy plants, with good balls. Plants treated thus suffer but little from disease. "R. D." might have mentioned, when giving his selection of kinds, Sang's Ambassador, which is the best crimson *Calceolaria* in cultivation, while the old *Anrantiaca* is still one of the best among yellows, it is hardy, free in growth, and stands rain well.

JAMES SIMPSON.

CLASSIFIED LIST OF ALL THE KNOWN CROCUSES.

By J. G. BAKER, F.L.S., Assistant Curator of the Kew Herbarium.

THE following is a classified synonymic list of all the known Crocuses, with their native countries.

Sub-genus 1. *Holostigma*.

Style divided into three entire stigmas.

SPRING-FLOWERING SPECIES.

1. *C. chrysanthus* (Rome and Asia Minor), syns., *C. annulatus*, var. *chrysanthus*, *C. cretensis*, *C. sulphureus*.
2. *C. mesasiacus* (Banat, Greece, Asia Minor), syns., *C. vernus*, *C. luteus*, *C. floribundus*, *C. lagenaeformis*, var. *lutens*, var. *aureus*, *stellaris*, *sulphureus*, and *lacteus*.
3. *C. gargaricus* (Asia, Minor), syn. *C. Thirkeanus*.
4. *C. susianus* (Crimea), syns. *C. revolutus*, *C. reticulatus*, *C. Roegnerianus*, var. *immaculatus* (Constantinople), *Ancyrensis* (Asia Minor).
5. *C. biflorus* (south Europe), syns. *C. circumscissus*, *C. annulatus*, var. *biflorus*, var. *ragenteus* (Central and Northern Italy), *psyllus* (southern Italy), *Adami* (Caucasus and Crimea), *Weldeii* (Dalmatia), *nubigenus* (Asia Minor).
6. *C. versicolor* (south-west France), syns. *C. fragrans*, *C. cressensis*, *C. Reinwardtii* (?).
7. *C. suaveolens* (south Italy).
8. *C. minimus* (Sardinia and Corsica), syns. *C. insularis*, *C. corsicus*, *C. nanus*.
9. *C. banaticus* (Mountains of Hungary, Transylvania, and Croatia), syns. *C. Henffellii*, *C. Henffellianus*, *C. vittatus*.
10. *C. vernus* (Central and Southern Europe, from France to the Crimea), var. *albiflorus*, *obovatus*, *nivigenus*, *Tommasinianus*, *nervifolius* (?).
11. *C. Sieberi* (Greece, Crete, and Asia Minor), syns. *C. nivalis*, *C. Sieberianus*, *C. sublimis*, *C. Sibthorpianus*, var. *Atticus* (Greece), *Veluchensis* (Greece and Transylvania), *exiguus* (Transylvania).
12. *C. carpetanus* (Spain).
13. *C. reticulatus* (Caucasus, Asia Minor, Austria), syns. *C. variegatus*, *C. reticulatus*, var. *variegatus*, *C. macranthus*, var. *albicans*, *Dalmaticus* (Dalmatia), *Etruscus* (Tuscany).

AUTUMN-FLOWERING SPECIES.

14. *C. sativus* (Italy), syns. *C. Orsinii*, *C. Haussknechtii* (Kuristan), *C. intronissus* (Damascus) (?).
15. *C. Cartwrightianus* (Greece).
16. *C. Pallasii* (Crimea).
17. *C. Thomasii* (South Italy), syn. *C. Thomasianus*.
18. *C. Visianicus* (Dalmatia), syn. *C. Pallasii*, *C. hybernus* (Roumelia) (?).
19. *C. hadriaticus* (Albania and Ionian Islands).
20. *C. Cambessedesii* (Majorca), syn. *C. Cambessedesianus*.
21. *C. lazicus* (Asia Minor).
22. *C. peloponnesiacus* (Greece).

23. *C. Kotschyanus* (Mountains of Cilicia), syns. *C. zonatus*, *C. Kardnchorum* (?).

24. *C. Scharojani* (Western Caucasus, 6-7,000 feet.)

Sub-genus 2. *Odontostigma*.

Style divided into three stigmas, which are fringed or cut at the tip.

SPRING-FLOWERING SPECIES.

25. *C. Olivieri* (Greece), syns. *C. lagenaeformis*, *C. Ancheri*.
26. *C. Suterianus* (Anatolia), syn. *C. chrysanthus*.
27. *C. aleppicus* (Aleppo).
28. *C. aërius* (Mountains of Armenia, 6-7,000 feet), syn. *C. Sibthorpianus*, var. *stauricus*, var. *pulchricolor* (Bithynia).
29. *C. Imperati* (south Italy).

AUTUMN-FLOWERING SPECIES.

30. *C. longiflorus* (Sicily, Calabria), syn. *C. odoratus*, *C. serotinus*, var. *Melitensis* (Malta).
31. *C. serotinus* (Portugal) var. *Salzmanni* (Tangiers).
32. *C. caspius* (south shore of the Caspian).
33. *C. vallicola* (Mountains of Armenia), syn. *C. Suwarrowianus*.
34. *C. ochroleucus* (Palestine).
35. *C. damascenus* (Damascus), syn. *C. edulis*.

Sub-genus 3. *Schizostigma*.

Style divided into three stigmas, each of which is again slit into numerous deep, slender, spreading lobes.

SPRING-FLOWERING SPECIES.

36. *C. vitellinus* (Palestine) syn. *C. syriacus*, var. *Balsane* (Smyrna).
37. *C. syriacus* (Aleppo).
38. *C. Fleischeri* (Asia Minor), *C. Fleischerianus*, *C. smyrnensis*, *C. candidus*, *C. penicillatus*.
39. *C. hyemalis* (Palestine), var. *Gaillardotii* (Anti-Lebanon range).

AUTUMN-FLOWERING SPECIES.

40. *C. Clusii* (Portugal), syns., *C. Clusianus*, *C. autumnalis*, var. *multifidus*.
41. *C. Boryi* (Greece and Ionian Islands), syns. *C. ionicus*, *C. Veneris*, var. *levigatus* (Greece), *Tourneforti* (Greek Archipelago), and *Orphanidis* (Greece).
42. *C. cancellatus* (Ionian Isles, Greece, Asia Minor), syn. *C. nudiflorus*, *C. Schimperii*, *C. Spruneri*, *C. dianthus*, *C. Mazziaricus*, *C. pylarum*, *C. cilienis*.
43. *C. medius* (Nice, Piedmont).
44. *C. nudiflorus* (Pyrenees, Spain, Central France, and naturalised in England), syns. *C. pyrenæus*, *C. multifidus*, *C. speciosus* var. *Asturicus* (North Spain).
45. *C. speciosus* (Hungary, Transylvania, Crimea, Caucasus), syn. *C. multifidus*.
46. *C. pulehellus* (Turkey in Europe, Greece).
47. *C. byzantinus* (Banat, Transylvania, Wallachia), syns. *C. iridiflorus*, *C. banaticus*, *C. speciosus*, *C. Herbertianus*, *Crociris iridiflora*.—*Journal of the Royal Horticultural Society*.

The Virginian Stock.—This is one of the hardiest of hardy annuals, and it will grow anywhere, either on a wall or a hard gravel path. Within a short distance of where I am writing, there is a broad band of this Stock now in full flower, growing in front of a cottage, on the edge of a gravel path close up to the building. I have noticed it in the same spot when passing for the last four or five years at this season, or soon after, coming regularly into bloom, and continuing to flower beautifully all through the spring. After it has done flowering, the seeds ripen and fall, the dead roots and branches are cleared off, and the gravel made tidy with the rake; and regularly, early in the autumn, a new crop springs up. The position is warm and sheltered, otherwise it seems to have had scarcely any attention. There are many bare untidy corners—not only in front of cottages, but many buildings of a more ambitious cast, which might be beautified in this or some similar way at a very trifling expense.—E. H.

Various-flowered variety of St. Dabeoc's Heath.—Some few weeks since we met with, in the Knap Hill Nursery, a variety of St. Dabeoc's Heath (*Dabeocia polifolia varicolor*) remarkable for the dissimilarity in the colour of its flowers. The plant, which is perfectly hardy, forms a cushion-like, low, evergreen shrub, suitable from its habit, for associating with such plants as hardy Heaths. Its chief peculiarity, however, is that its flowers are sometimes purple, sometimes white, sometimes of various intermediate shades of bluish-white, pallid-purple, or pink. In the majority of cases, the spikes bear flowers uniform in colour, all purple, all bluish, or all white, but these are so mixed up on the plant, that it appears as though two or three varieties were accidentally associated in the tuft. That

they all spring from one source is, however, abundantly proved, by the fact that, from time to time, and not unfrequently, there appears a spike on which both pure purple and pure white flowers are associated, or even, sometimes, may be seen flowers in which one-half the tube is white and the other half purple. Mr. Waterer has grown it for some years, with the view of testing the permanency of its character—which does not vary in the least.—*Florist*.

THE BANNAT GLOBE THISTLE.

AMONG the taller and more vigorous-growing plants which are seen to most advantage when growing amongst kindred subjects at the back of a border, or fringing the margin of a shrubbery, or isolated in an open space, few are more effective than the hold hardy perennial to which we here devote a few lines of description and recommendation. Some of our readers, are, no doubt, familiar with it (for it is a plant of no recent introduction), but to those who are not, we may describe it as a sturdy Thistle-like plant, of stiff and slightly branching habit, growing from 2 to 3 feet high, or more, with large, deeply-cut, spiny leaves, of a dull green colour on the upper surface, and white and cottony beneath. The flowers are borne erect on the ends of the branches, and are arranged in large, symmetrical, spherical heads, as shown in the illustration. They are of a fine azure-blue colour, and their effect is heightened by the delicate amethyst tint of the involucre, the bracts, and the upper part of the flower-stalks. The culture of this plant demands no particular instructions. As in its native habitats it flourishes in the most arid, wild, and unpromising places, so does it appear quite indifferent as to what kind of soil, or what position it may meet with in our gardens, and will not only live, but thrive, without even the common attention of watering,—a hardy, self-contained plant, with an unusual amount of vitality stored up in its rugged root-stock. Insensible of neglect, it presents, with its bold port, gracefully-cut leaves, and handsome flowers, one of the finest sights our gardens can boast of from June to August. It can be readily propagated either from seed, or by means of the underground shoots or runners which are emitted in great numbers from the root-stock. Native of the Bannat Mountains, in Hungary. This plant is sometimes sold under the name of *E. Ritro*; the latter, however, is a much dwarfer species, with flowers only one-fourth as large as those of *E. Bannaticus*, and is, on the whole, a rather insignificant plant, while, as we have before stated, *E. Bannaticus* is a very ornamental one. W. M.



Echinops Bannaticus.

Gaillardia amblyodon.—The genus *Gaillardia* is well known to include some of the most popular border plants, equally valuable from their long blooming qualities, as dwarf bedders, or for furnishing cut flowers. The *G. amblyodon* has proved itself to be a very desirable and distinct addition to the older species, of the easiest culture and a most abundant bloomer. It grows to the height of 2½ feet, but commences flowering when little more than a foot high, each plant forming a dense bush, above which the flower-heads are elevated on rather long foot-stalks. The foliage does not differ

materially from that of *G. picta* and its varieties, but is more undulated and of a lighter green colour. The flower-heads are from 2 to 2½ inches across, and differ notably from those of *G. picta*, in the ray florets being more numerous, in the uniform deep cinnabar-red colour, which deepens to purplish-brown at the base, and in the scales of the involucre being narrowly linear, arranged in three or four series, with spreading leafy tips. The disk florets are of a very deep blackish-purple colour, except those of the immediate centre, which are orange-yellow. It requires only the ordinary treatment of half-hardy annuals, and succeeds in any light soil.—W. THOMPSON.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

***Dianthus saxicola*.**—Few additions have been made of late years to the list of cultivated species in this genus, so that a new one will, doubtless, be welcome to the lovers of the variety. It is a desirable and distinct plant, succeeding well in the open border. It forms vigorous tufts of linear, pointed, slightly glaucous, foliage, 6 inches in length, from which arise stems about one foot in height, bearing numerous rather large flowers of a delicate rosy-flesh colour, free from markings of any kind.—W.

***Sisyrinchium grandiflorum*.**—This charming plant with its lovely purple bells has been blooming here, in the open air, for some time. It is one of the best plants with which I am acquainted for a cool house or pit. All the *Sisyrinchium*s are interesting, many of them being very hardy, as well as beautiful. *S. odoratissimum* is delightfully fragrant. They only require to be better known to be appreciated.—J. MORLEY.

***Romneya Coulteri*.**—This interesting novelty, received direct from California, is described by the collector as having very large handsome white Argemone-like flowers, 5 inches across, slightly fragrant, the stems being about 4 feet in height, and the foliage variously divided. It belongs to the Papaveraceæ or Poppy worts, and in the "Treasury of Botany" is represented to form a connecting link between them and the Nymphaeaceæ and Sarracenaceæ. It is probably of perennial duration, and possibly hardy, but on that point experience is wanted.

***Lathyrus Sibthorpii*.**—This is remarkable among perennial Lathyruses for the early period at which it blooms, and no less so for the tender rosy-purple or deep mauve colour of its flowers. In habit it is dwarf compared with *L. latifolius* and its varieties, not often exceeding 3 feet. In very young plants the merits of this species are not so evident, but when thoroughly established in good loamy soil, it forms one of the greatest attractions of the spring border. It is a native of Greece, and was introduced thence by the illustrious Professor, whose name it bears, to the Botanic Gardens at Oxford.

***Linum Berlandieri*.**—This is a very dwarf species, not exceeding 6 or 8 inches in height, forming a tuft with numerous spreading stems, the flowers being produced in terminal corymbose racemes, with a corolla about an inch across when fully expanded, of a buffy-yellow colour, which, at the base, deepens to Orange. It blooms from July to near the close of the summer. A native of Texas. It has been treated as a half-hardy annual, but may possibly succeed if sown in open ground in sandy soil. transplantation will be facilitated

As, however, it makes very long roots, by sowing in pots.

***Solanum rostratum*.**—The species of *Solanum* now in cultivation are already numerous, but the present one is sufficiently distinct in its character to obtain for it the suffrages of many amateurs. It is an annual plant of about 2 feet in height, remarkable for having both surfaces of the leaves, as well as the stem, and calyces covered with straight yellow spines or prickles. The foliage is pinnatifid, and thickly set with greyish stellate hairs. The flowers are large, of a showy yellow, and pilose externally. It is a native of the Colorado Plains, and requires only the treatment of the other half-hardy annual species.

***Oenothera serrulata*.**—Notwithstanding the number of the species of this genus which are already cultivated in gardens, it will be admitted that there is still room for good annual species of dwarf habit, and devoid of the coarseness of foliage possessed by so many otherwise desirable plants. The *O. serrulata* combines with both these requirements large bright yellow flowers, produced throughout the season. It grows scarcely more than a foot high, and commences flowering when but little more than half that height, the plant being of bushy growth, and clothed with neat lanceolate, serrulate foliage. The flowers have the great advantage of being diurnal, and of remaining open several days. It is a native of Texas, and has been treated as a half-hardy annual, but may succeed sown in the open border with subsequent transplantation.—W. THOMPSON'S Catalogue.

THE GARDENS OF ENGLAND.

THE ABBEY GARDENS, BURY ST. EDMUNDS.

THESE attractive and really beautiful grounds consist of some 13 acres, and are usually designated the Botanic Gardens, an appellation, however, to which they are hardly entitled; for, although they contain many rare and interesting plants, no attempt would appear to have been made to effect anything like scientific arrangement. They are, however, exceedingly interesting to the horticulturist, as well as to the antiquarian, occupying, as they do, the ancient site of the Abbot's Palace and Court. The grounds throughout are interspersed with portions of the picturesque and Ivy-clad ruins of that vast monastic establishment, which was founded about the year 637 by Siegebrecht, the first Christian king of East Anglia. The principal entrance to the gardens is by the Abbey gate, on Angel Hill; and this was also in former times the chief entrance to the monastery, and opened into the great court before the Abbot's Palace. The gate-house is some 50 feet long by 40 feet wide, and is 62 feet high. It is considered to be one of the purest specimens extant of the decorated style of pointed architecture, the tracery, &c., displaying the most exquisite workmanship. Its erection was commenced during the year 1327, and was completed about 1377, and appears to have combined the strength of a fortress with the beauty of a highly ornamented gate-house. The strong hinges of the massive iron outside gate, the groove for the portcullis, and stations for archers, &c., being still to be seen; and all this precaution would appear to have been really necessary, as the former gateway, which this had replaced, was destroyed during an *émeute* of the townspeople in the year 1327. The site of the gardens is now the property of the Marquis of Bristol, and the idea of forming a garden upon the spot was first conceived by the late N. S. Hodson, Esq., an excellent practical botanist, and an enthusiastic horticulturist, who brought his valuable collection of rare plants to this place about the year 1831, where he would appear to have really contemplated the formation of a scientific or botanical establishment. But this idea he appears to have ultimately abandoned in favour of the more ornamental and fashionable style of embellishment, which was about that time coming into public favour. From the gate-house just mentioned, a broad gravel walk or promenade, 16 feet wide, extends eastward until within some 70 yards of the margin of the river Lark, and this walk is intersected by another of less width, which leads from a grassy mound on the south, which covers and protects some extensive ruins, and extends towards the northern parts of the grounds, where it branches into other walks or promenades, and, with the point of intersection of these two walks for a centre, a circle is described, and defined by a gravel walk enclosing an area of exactly an acre in extent; and this is laid out as a flower-garden in the form of a series of concentric flower-beds, separated from each other by broad belts of fine green sward, in these are grown, during the summer months, most of the finer sorts of bedding and other plants, arranged in the most tasteful manner; while in spring they are occupied by spring-flowering plants and bulbs, of which the gardens contain an extensive collection. On passing through this circular group of gay flower-beds, an extensive ruin will be observed on the right, and within a short distance of the broad walk. This is now known as the "Abbot's Parlour," and is a portion of the Abbot's Palace—probably the dining hall. The palace would appear to have occupied the entire eastern side of the great court, communicating with the conventual buildings on the south, and the various offices, dungeon, or prison of the monastery on the north. Among the crumbling ruins of the so-called "Abbot's Parlour" are several fine specimens of the common Horse Chestnut (*Aesculus Hippocastanum*), which are evidently self-sown, and of considerable age, together with several Lime-trees (*Tilia rubra*), while on the left of the broad walk, and in the line of the palace ruins, stands also a fine example of the true English Elm (*Ulmus campestris*), the noble trunk of which is enclosed by a circular seat, where, during the summer months, under the deep shade of its umbrageous boughs, visitors find an agreeable resting-place. These fine trees are all in luxuriant health although their

naked roots are, in many instances, worn and excoriated by the busy feet of children and numerous visitors. On reaching the eastern extremity of the promenade, between it and the river, will be observed a hexagonal turret or tower, near some ruined and Ivy-clad arches. This is known as the "Dove Cot," but would appear to have been a place of defence of some sort, as there are still to be seen the stations and apertures for archers, and it fully commands the south side of the Abbot's Bridge, an ancient mural structure of three arches, supposed to have been built about the year 1148. It spans the river at the northern extremity of the grounds, and appears to have been the principal means of communication between the monastery and the ancient Vineyard of the establishment, some six or more acres in extent, and lying pleasantly upon the east bank of the river Lark, which separates the same from the gardens. On the east side, the Vineyard, or the Vine-fields as they are now called, are enclosed by a strong ancient wall, which is still in a good state of preservation. There are also still to be seen distinct traces of terraces, &c., and some kinds of herbs, such as the Alexanders (*Smyrnum Olusatrum*) so much cultivated in ancient gardens, but now entirely neglected, are frequently to be seen here. It was also here that the Royal Horticultural Society of London, in 1867, held its first provincial meeting. On the banks of the river are some very fine, large, and apparently very old Willow-trees, one of which was known as the "Abbot," and was unfortunately prostrated during a gale of wind some few years since. There are also some very fine specimens of the black Italian Poplar, which were, however, so severely injured during the memorable winter of 1860, that they have not even now recovered from the effects of the frost. A little to the north of the Ivy-covered turret, now called the "Dove Cot," was formerly the "Bath," which was 20 yards square, and divided into several apartments, through which the little rivulet called the Linnet was made to flow on its way to join the Lark near the Abbot's bridge. This junction is now effected at a point some half mile to the south.

The ruins under the grassy mound just mentioned are supposed to be those of the dormitory and library, &c., of the monks, while the ruins to the south of this mound are those of the refectory, or the great dining-hall of the establishment. In this apartment sat the Parliament of 1446, presided over by King Henry VI. in person. To the west of this, on the south side of the gate-house, was the strangers' hall and almonry for the entertainment and relief of strangers and pilgrims; while to the south-east of this mound are the interesting ruins of the church of St. Edmund, which was built about the year 1395. The walls are of rubble, and of immense thickness, and the mortar has acquired great power of resistance, and almost the hardness of granite itself. They have also been cased with hewn stone, apparently from the quarries of Baruack in Northamptonshire; and in this church was preserved the sacred shrine of St. Edmund, before which kings were wont to lay aside their crowns, and to supplicate the aid of the so-called martyr. Against the Ivy-clothed ruin of one of the lofty piers are now fixed tablets recording the connection of this interesting spot with Magna Charta.

On entering the gardens by the Abbey gate, and turning to the left, a broad walk will be found running parallel with the northern boundary wall of the monastery, which is still in good preservation, although the native yellow Wallflower (*Cheiranthus fruticulosus*) finds upon its crumbling surface an appropriate and congenial home. To this wall are also trained various climbing plants, such as the *Glycine sinensis*, the *Jasminum revolutum*, *nudiflorum*, &c., while, abutting also upon it are sundry detached lean-to glass structures, which are devoted to the culture of various varieties of tender plants, and are arranged on each side of an ornamental-fronted summer-house. One of these structures is devoted to the culture of exotic Ferns, another to that of Succulents, of which a goodly collection is cultivated, and some of which are exceedingly large, and fine specimens of these curious-looking and interesting plants, the culture of which has, of late, become more fashionable than formerly. There is also a small, but good, example of "Beard's Patent Metallic Houses," devoted to the growth of flowering-plants of various sorts, for which purpose it is admirably suited, being light, elegant, and strong, together

with various other glass erections, span-roofed as well as lean-to, for the accommodation and propagation of bedding and other plants. Near to one of the glass structures, upon a border sloping towards one of the principal walks, was a creditable example of the "carpet style" of planting beds and borders; and, in this instance, the material used was composed principally of the *Echeveria secunda glauca* and *metallica*, *Sempervivum californicum*, *Sedum glaucum*, the various sorts of *Alternanthera*, and the golden Feverfew. The various clumps of ornamental trees and shrubs are all margined with hardy herbaceous plants and spring-flowering bulbs; while specimens of rare trees and shrubs are also tastefully distributed throughout the grounds, conspicuous amongst which is a fine specimen of the *Ailantus glandulosa*, or Tree of Heaven, so called on account of its lofty growth. This tree was transplanted to the spot it now occupies, when of considerable dimensions, about the year 1831, and is now some 80 feet in height, and is a finely-formed tree. It stands to the right of the promenade when entering the gardens by the Abbey gate, while on the left is a plant of the Valonia Oak (*Quercus Ægilops*), or the "Trojan Oak," as it is called here, the Acorn from which it sprung having been picked up fifty years ago on the banks of the Simois, in the breezy plains of classic Troy, by the Rev. Arthur Young, nephew of the celebrated writer on Suffolk agriculture. This species of Oak was introduced into this country from the Levant so early as the year 1731, but does not appear to have taken kindly to the soil and climate of the British Isles, and is still scarce, although, on account of the great value of its bark, attempts have been made to naturalise it, but, hitherto, these attempts have not been attended with success. The Acorn cups are shaggy, and bear a fanciful resemblance to the face of a goat, hence its specific name. They are also said to be fully as rich in tannin as the bark itself; but out of a bushel of Acorns sent to this country by Mr. Young only about eighty germinated, although they were gathered when quite ripe and falling, and were packed and transmitted to this country with great care. Still, it is quite possible, that they may, to some extent, have become heated during their transit, and their germinative power, consequently, impaired. Of the plants raised from the Acorns thus sent by Mr. Young, one was planted in the gardens here, where it continued to thrive, until the terrible winter of 1860-61, when it was so severely punished that it has not even now recovered from the effects of the same. It still, however, exists, and is regarded as a living and interesting memento, not only of a locality famed in Homeric story, but, also, of the author of the "Annals," whose writings and character were so universally esteemed. Near to this Oak is a fine plant of the curled-leaved Elm (*Ulmus crispa*), and various species of the Lime-tree, such as *Tilia heterophylla* and *parvifolia*; the cut-leaved Beech (*Fagus incisa*), and many other beautiful and interesting trees and shrubs. The soil or the situation, however, does not appear to be well suited to the growth of Conifers, although the grounds contain some good specimens of the Austrian Pine, also some thriving young plants of the *Wellingtonia gigantea*, which appear to be at home in all sorts of soils and situations. Near the northern boundary of the grounds, and contiguous to the Abbot's Bridge, before alluded to, is the residence of the present lessee of the gardens, Mr. Pettit, to whom the greatest credit is due for the admirable manner in which he keeps the gardens; and for the facility which he affords to the inhabitants of the town and neighbourhood to enjoy the same, as well as for his courtesy and attention to visitors.

P. GRIEVE.

GARDEN DESTROYERS.

MEALY BUG.

It is well that this insect is principally confined to such plants as are grown in heat, or it would render the cultivation of many things well nigh impossible. The insect will certainly live even through the winter on greenhouse plants; but here it increases so slowly and spreads so little, that it does not do much harm, further than there is always danger, when stove and greenhouse plants are mixed somewhat for decorative purposes (as they frequently are in the summer season), of the bugs getting from any infested greenhouse plants that happen to come in contact with the occupants of the stove. The worst circumstance connected with mealy bug is, that it does not alone exist upon plants, but, where it is allowed to get to a considerable head, it gets into the woodwork, under the lights, cracks and joints, in the rafters, even in the brickwork; consequently, if all the plants in a house were thoroughly cleaned or destroyed, it would be sure to make its appearance on any fresh ones that may be introduced into a house that was infested with the insect. It will also live upon almost any description of plant grown in heat in the summer season, or, even in winter where much heat is used; it increases very fast. There is one circumstance that slightly mitigates its objectionable presence; that is, the plants it feeds upon are not injured thereby to so great an extent as they are by some insects, but, if left unmolested, it increases to such an extent as to virtually smother the plants; its excrement coating over the surface of the leaves, clogging up the pores as completely, almost, as if they had received a coat of varnish.

On Vines.

On Vines it is an intolerable pest, requiring more labour to keep it under than the crop is worth. The bunches get almost as bad as if they had been smeared with treacle, and, whatever care is employed in keeping it down, the bloom and general appearance is destroyed. Where Vines are affected, as soon as the leaves are off, prune, and take them down; scrub and paint every portion of wood and iron, point and whitewash the brickwork. All the loose old bark must be removed, getting well into every crevice about the spurs. To a gallon of water add as much clay as will bring it to the consistency of paint, to which add 1 lb. of flowers of sulphur, and 4 oz. of Gishurst; stir all well together, and paint the canes all over twice, getting the mixture into every crack or interstice in the bark. This must be completed before there is any indication of the buds pushing, or they will be injured; and, if the dressing is well done, no bugs will appear the following season. In the Fig-house they are more difficult to deal with, as the young fruit are liable to drop off through the application of any dressing that will kill the insects; yet there are not so many hiding places on the bark of Figs as upon Vines. As soon as the leaves are off, give three dressings with Abyssinian mixture, using it at 4 oz. to the gallon. If this is carefully applied it will effectually destroy the bugs. The house must undergo a similar cleansing to that recommended for Vineries. Pines that are affected with mealy bug are not worth the labour of cleaning; and the best course to follow is to destroy them, thoroughly cleansing the house, and commencing afresh with a clean stock. Upon Cucumbers and Melons this insect thrives apace, and the plants will not stand any dressing sufficiently strong to kill them. It sometimes happens that plants affected cannot for a time be spared; then it becomes necessary to keep the insects as well under as possible with the sponge and syringe, using clean tepid water; but, wherever the plants can be done without, the best plan is to destroy them, giving the house a thorough cleaning before starting a fresh lot. Mealy bug is, by far, the most difficult insect to thoroughly eradicate where once it gets established; and, as I have already said, there is no possibility of its complete destruction, except persistent action until every trace of it disappears. In many places, in the winter season, its numbers are reduced so that very few can be found; but sufficient escape to furnish a breeding stock in the spring, when it begins to increase, and in a few weeks it is as plentiful as ever, entailing a repetition of all the work; whereas, if a little more perseverance had been employed, its destruction would have been complete; and

Calla palustris in Surrey.—*Calla palustris* was originally planted in North Surrey so far back as 1861, and is now quite established. I have no doubt that this is Mr. Gardener's station. It is also one of the plants recommended for naturalisation in "Alpine Flowers" (p. 102):—It is thoroughly hardy, and though often grown in water, likes a moist bog much better. In a bog, or muddy place, shaded by trees to some extent, it will grow larger in flower and leaf, though it is quite at home, even when fully exposed. Those having natural bogs, &c., would find it a very interesting plant to introduce into them, while for moist spongy spots near the rock-garden, or by the side of a rill, it is one of the best things that can be used.—R. A. PRYOR, in *Science Gossip*.

nothing less than this should be deemed sufficient. More especially as there is this incentive, that it is not, like such insects as thrips, red spider, or aphides, that are sure to make their appearance yearly; for, if once it is completely destroyed, there is no fear of its re-appearance unless it is brought in on some infected plant.

Remedies for Mealy Bug.

Where the plants in a house are infested with mealy bug, nothing but perseverance will effect its thorough destruction. No one or two dressings, however carefully applied, will reach all the insects or their eggs. Spirits of wine, turpentine, and several preparations sold for its destruction, have been recommended, applying them with a small camel's-hair brush to the axils of the leaves and other affected parts. Where only a single small plant or two are affected, these may answer; but, where it has spread over any considerable number, it takes more time than the plants would be worth. Any little plants that I get which are affected with the insect have to undergo a rigid quarantine, by placing them at one corner of a house away from everything else, until I am sure they are quite clean. When all or any considerable number of the occupants of a house are affected, the only way is to commence at one end, dipping the small stock, and thoroughly washing with the syringe every part of the larger plants, from their junction with the soil upwards. "Abyssinian Mixture," or Fowler's "Insecticide," 4 oz., or 5 oz. to the gallon, are the only preparations I have found effectual for the thorough destruction of this insect, without injuring some or other of the plants. Every plant, as it is washed, should be removed to another house until the whole are gone through. Clear out all tan, or similar plunging material; scrub all the woodwork with water, soap, and brush; stop up all cracks or open joints; give two coats of paint, getting well to the under-side of all slide-lights and ventilators; point all brickwork, especially under the wall-plates, and finish by two good coats of white-wash. Where the insect has been allowed to get to such a head as I have sometimes seen it, there is no certainty of effectually destroying it without the work is so completed as not to leave a single place such as described where it can lodge. When the house is fit for the plants, return them, and in ten days from the time of their first washing give them another dressing, going thoroughly over them as in the first. This should be repeated in all four times. Do not omit a single plant, no matter whether any insects can be found upon it or no; for there possibly may be a nest of eggs in some cracks in the bark undetectable, and, if such were the case, all the work would go for nothing. I once had this insect in five of the houses, upon everything that it would live upon, more or less. Vines included; the labour in keeping it down by the use of sponge and brush was such that I found it impossible to go on as we were, so I came to the conclusion that there was no resource but trying to destroy it altogether. We began about the end of September, when the plants were just maturing their growth and the insect not breeding so fast. Washing the plants took two men six weeks, and it was about the best spent labour I ever employed. Twice since I have caught the insect at exhibitions, from the plants coming in contact with others badly affected with it (plants in such condition should not be admitted to any exhibition), and the insect had spread over a considerable number of the occupants of a house before it was observed; three or four dressings, such as above described, effectually cleared them. It had not got possession of either wood or brickwork. Orchids, from the repeated sponging they undergo for other insects, do not often suffer much from this, except plants with ample foliage, such as *Sobralias*, *Phajus*, or *Peristerias*; with these, perseverance in use of sponge and brush is all the remedy that can be safely employed. The insect will live upon Ferns; yet, here it does not increase so fast, but the plants will not stand any dressing strong enough to kill it. Copious syringing during the growing season, and extra washings with clean water, laying the plants down on their sides, are all that can be done. In large houses, such as are devoted to Palms, they spread rapidly, and there is little chance of completely clearing them; these plants will bear large quantities of water overhead, by which means they may be kept from getting to an unmanageable head. Where

conservatory climbers are infested with the bug, it is useless to clean the general occupants of the house unless the climbers are thoroughly cleansed. When at rest they must be cut back into the hard wood, take them off the wires, and immerse them overhead for two hours in Abyssinian mixture, 8 oz. to the gallon.

T. BAINES.

THE BLACKBIRD.

I HAVE to thank your correspondent "R." (see p. 110) for drawing my attention to Tennyson's verses condemning the destruction of blackbirds for their fruit-eating propensities. Probably the poet's squares of fruit-trees are only of limited extent, and, if he lost all his fruit by the aid of his feathered friends he would possibly not feel the loss very much. With gardeners, however, the case is different, and reason has to be preferred to rhyme in their dealing with blackbirds when too numerous, so as to preserve their fruit from their ravages. It all comes to this, that some birds must be kept under when too destructive, and others protected when they are found to be insect or wild-seed eaters. I hope "R." will pardon me for my presumption in composing and inscribing the following verses to him on the blackbird:—

O! blackbird! though you whistle well,
We gardeners grudge to pay its price,
By your raids on our fruits so nice,
In number more than tongue can tell.
We're charmed to hear you in the spring,
Perch'd on some Oak, or tall Ash tree,
Pealing your notes with thrilling glee,—
To us as a peace-offering.
But when each Rasp' or Gooseberry-bush
In fruit, shows forth a ripening thut,
Then you black minstrels take the hint,
And from the "Woodlands" make a rush.
The espaliers, and the standards, all
Are rifled of their choicest fruits.
Even those on trees, with straggling shoots
Are not safe on the netted wall.
Your golden bills flash in our sight,
And give, when flush'd, an angry sound,
As much as tell us that the ground,
And plots of fruits are yours by right.
Take warning! for the steel rat-traps
Will thin your numbers day by day,
Despite what all the poets say,
And other sentimental chaps.

WILLIAM TILLERY.

Welbeck Gardens.

Ants.—Of recipes that have been published for the destruction of ants, I have found boiling water to be the most effectual, but it cannot always be applied, for not unfrequently their nests occur amongst the crocks in Orchid pots. On Saturday last I had occasion to get a square of glass put in an inside door of one of our Orchid houses, and in less than two hours I noticed that the new putty was literally brown with ants, I therefore put five or six lumps of putty in different parts of the house, and they were immediately covered with these little pests. My plan is to have a piece of putty about the size of a teacup, in a rather soft state, then to go to the lumps previously laid down and to dab it on them, a plan by which thousands may be trapped in a few minutes. Then mix the ants up in the putty, and it is ready to lay down again.—E. WHITEHEAD, *Blackburn*.

THE AMERICAN ALOE.

The American Aloe first flowered in Britain in 1774, in the gardens of Cliff House, Salcombe, South Devon, and was considered one of the greatest horticultural curiosities of the age, people being admitted to see it by ticket, and the popular belief of the day was, and, amongst many, still is, that the Aloe only blossoms when the plant is 100 years old, and then die. Almost every year Aloes bloom in the gardens around this neighbourhood, but are seldom of such magnitude and symmetry as is represented in the annexed illustration. This magnificent plant is forty-five years of age, and has been all that time on a terrace close to the sea in Lord Kingsale's beautiful seat, Ringrone, Salcombe, Kingsbridge, South Devon. The plant first showed signs of blooming in the middle of May last, and was in full flower in the middle of October, when the photograph was taken from which our engraving has been made. The flower-stem grew at first from 3 to 4 inches a day, but the rate of growth gradually became less and less as the

blossoms were developed; the number of flowering-branches is 40, and the average number of blossoms on each branch 152, making a total of about 6,000. The plant is 25 feet 6 inches high, and the average length of the leaves is 6 feet; they are armed with dangerous hooks on the sides, and a long sharp

native of Southern America what the Date Palm is to the African, or the Rice plant to the Chinese and Hindoos. From the juice they make a luscious wine called pulqué; from the leaves they extract a beautiful silk-like fibre of great length, from which they weave various articles for clothing; of the dry



An American Aloe in bloom at Lord Kingsale's, in Devon.

spike at the end, so hard that the natives of South America use them as nails. The circumference of the body of the plant is 36 feet, that of the stem 13 inches. The fact of these tropical plants growing in Devon is enough to show how very mild the climate of that county is. These Aloes are to the

stems they make the framework of their huts, which are covered and surrounded with the leaves; and the plant itself is placed thickly together round the garden or fold, to form a hedge, its very defensive armour keeping out all comers; and, when dead and dry, all parts of the plant supply fuel. LAMBERT YOUNG.

THE KITCHEN GARDEN.

THE POTATO DISEASE AND ITS PREVENTION.

By WM. TILLERY, Welbeck.

It is said that the Potato disease was prevalent both amongst the wild and cultivated varieties in South America long before it reached our shores; and, in Germany, Von Martius has described it under the name of the "moist gangrene," and as having done great injury to the crops there from 1830 to 1841. In the United States of North America, and in Canada, it was likewise detected a few years before 1845, the year when it first appeared most virulently on the continent, and in the British Islands a month or two later. A microscopic Fungus or mildew, now named *Peronospora infestans*, is known as the minute parasite attendant on the disease, but, whether it produces it, or only appears as an attendant after the mischief begins, remains yet to be discovered. From the experiments of De Bary, it is stated that he has produced the disease by placing the spores of the Fungus on the leaves of healthy-growing Potatoes; and, if this is found to be correct by other experimentalists, there can be no doubt as to the cause. At the present time, however, we only know that it generally appears in wet summers, about the middle of July, all through August, and in the beginning of September; and that, in a certain stage of the Potato's growth—namely, about the ripening period—any experienced grower of Potatoes, who has studied the disease for any length of time, can tell to a few days when his crops will be stricken by it. This always occurs in very wet weather with a high temperature; and, if thunder-storms prevail during the time, with the atmosphere close and sultry, the black specks on the leaves and haulm will spread more rapidly, but that electricity is the principle cause of it, it is, I think, "not yet proven."

Rest Fungus Spores.

Some experiments were made in 1846 by me in fumigating the sound and diseased Potatoes, on purpose to destroy the rest-spores of the Fungus; the results, however, were not encouraging. A large close Mushroom-house in the garden was fitted up with shallow shelves, and the apparently sound and diseased tubers were placed on them in thin layers. The fumigation of them was done with chlorine gas and sulphur, in the following way, namely, 2 lbs. of the black oxide of manganese and 4 lbs. of common salt were mixed together, and put into saucers, and 8 lbs. of sulphuric acid poured over the mixture to evolve the gas, which was kept close in the house for a few days. Afterwards, 3 lbs. of flowers of sulphur was ignited, and the fumes of it kept close in the house for three hours, making a sufficiently strong dose to destroy the spores of any Fungus it could reach. All the tubers which had been fumigated, and were fit for planting in the spring of 1847 were planted in a field of fresh soil prepared on purpose for them, but, at lifting time, the crop was found as diseased as the others not operated upon in another field. The cost of preparing the chlorine gas and sulphur was as follows, namely:—2 lbs. of black oxide of manganese, at 4d. per lb., 8d.; 8 lbs. of sulphuric acid, at 4d. per lb., 2s. 8d.; 3 lbs. of sulphur, at 4d. per lb., 1s.; 4 lbs. of common salt, at 1d. per lb., 4d.—total, 4s. 8d. A new parasitic mildew, the *Oidium Tuckeri*, has of late years attacked the cultivated Grape Vine, but gardeners can now conquer it by dusting flowers of sulphur on the foliage and young bunches of the Grapes when it first appears on them, and by paying proper attention to the ventilation of their Vineries. With the Potato plant, however, it is quite different, for if the rest-spores of the Fungus are deposited in the inside cells of the tubers, no dusting, dipping, or fumigation will reach to destroy them. In 1848 when the late Lord Howard De Walden was our ambassador at Lisbon, he sent from Portugal three tons of a red Kidney Potato, a variety which was warranted never to have had the disease there. They were all kept for setting, and planted in the spring of 1849 in a field of newly broken up light forest soil. In the same field were planted some of a strong-growing kind, named the Farmer's Profits, and at lifting time they showed less of the disease than the Portuguese variety. Now, if these red Kidneys never had the disease in Portugal, there could have been no rest-spores in the tubers, nor in the soil, for the field had never grown Potatoes before. To show that the infection did not proceed from being planted in the same field with the other variety, some of the Portuguese Potatoes were planted in a plot by themselves, and not near any other sort, and they proved quite as diseased as the others at raising time. Under shelter of a glass-covered wall here of great length, and used principally for growing orchard-house fruit trees, some experiments have been tried by me in growing Potatoes of both early and late varieties, to see if the disease would appear on them when grown under glass. In 1872, when the trials first commenced, no disease appeared on any of the early kinds grown in pots, and which ripened in May and June, but in the end of July a row of

Rivers's Ashleaf planted out in the border showed slightly some specks of the mildew on the leaves, but when the tubers were lifted, they were not in the least infected with it. Some Tomatoes fruiting at the same time in this erection were likewise attacked in the fruit with the black specks of the disease, but not on the foliage. A row of Dalmahoy Regents was planted late in May in the border of the same house to see if the disease would appear on them in September or October, but they were lifted quite sound in November. This year, in the same structure, some more experiments were tried by me in growing both very early and late Potatoes in a very moist state by frequently syringing them, as well as watering their roots with liquid manure made from horse-droppings, and full of ammonia. The earliest kinds were planted in the border in the beginning of February, and were frequently syringed on the tops and watered at the roots with this liquid manure to see if the disease would appear on them at the ripening period in May. I suppose, however, that the temperature was not high enough for its development, for they kept all quite sound till lifted. Another row was planted in April to ripen about the period of the earliest planted in the open air in July, and a still later row to ripen in August and September. They were all grown in the very rich soil of the border, and kept well watered with the liquid manure at times, but no rain ever reached them all the time of their growth, and on lifting them no diseased tubers were found in any of the rows.

Dry Seasons v. the Disease.

From the above experiments it would seem that if we could keep our Potato crops free from rain in very wet summers, and from other atmospheric influences during their ripening period, they would be safe from the disease. As this, however, cannot be done, the next palliative is to plant them in the driest and best soils, and to give them more space in the rows for the circulation of the air to keep the haulm and foliage drier in wet weather. That the influence of wet and dry summers has a great effect on the Potato disease is now sufficiently known to all growers of them. In 1845, the year in which the disease first appeared in the British Islands to any extent, the months of June, July, and August were excessively wet, the rainfall here being nearly 12½ inches. In August alone the rainfall was 6½ inches, with a high temperature at times during the month, and, had the peculiar signs of the disease been known then as now, there is no doubt but that it would have been detected sooner than it was. By the end of September the crops in the fields were all dead on the tops, and on taking up here the produce of a field of nine acres on 9th of October the tubers were found to be quite one-half diseased. In 1846, the year of the Potato famine in Ireland, the month of August was again very wet, 4½ inches of rain having fallen here during its course, with frequent thunder-storms, and the temperature high when they occurred. The disease again appeared virulently by the end of August and beginning of September, and there was a great loss in the crops at lifting time. In 1848 there was a rainfall here of 35 inches (the average annual rainfall being about 25 inches), the months of August, September, and October being very wet. In August there were twenty-one rainy days, and from the 21st till the end of the month frequent thunder-storms occurring, with an accompanying high temperature. In the beginning of September the disease appeared in its worst form amongst the late varieties of Potatoes in the fields. In 1852, another very wet year was registered here, but the rainfalls in July and August were much below the average, and the mean temperature being rather low, the disease was not so general nor so virulent as in other wet years. In October, November, and December, however, the rainfall was excessive here, nearly 12 inches having fallen, and the usual quantity of winter Wheat could not be sown on strong soils. The result was, therefore, a most deficient Wheat crop in 1853. In 1860, when the next very wet summer occurred, the rainfall here, in July, August, and September, was above 11 inches, of which more than 5 inches fell in August. The temperature, however, in these months was much below the average, with no thunder-storms or sultry weather, and the disease was, therefore, not so general as usual in wet years. In 1861 and 1862 the disease was again very general and bad, and in the very wet autumn of 1867 there was a great loss sustained by all growers, from its attacking their field Potatoes later than usual, and from supertuberation from a second growth. Perhaps the disease was never more general and virulent than in 1872, for it appeared early in July amongst the early kinds of Potatoes, and all the late crops were hopelessly stricken by it before the middle of August. From the 9th until the 14th of July there were thunder-storms with heavy rain every day, with the temperature nearly tropical, and, therefore, suitable for the development of the disease amongst the unlifted early and second early crops, and they were found a mass of rotteness when raised. The rainfall here in 1872 was 38 inches 25 being the largest quantity I have ever registered in the thirty-six

years of my keeping the register. In the present year the rainfall has been below the average, January and August being the rainiest months. In the spring both the early and late varieties of Potatoes were planted under favourable circumstances as regards the weather, and I never recollect in any year seeing better and sounder crops of the early kinds lifted. At all the local vegetable shows in this district it was remarked by the judges, that better samples never came before them, being very large, clear in the skins, and disease of tubers at a minimum. In the latter portion of July and the first half of August the weather was very dry and warm, and suitable for ripening all the early and second early kinds, and all intended for seed were stored free from disease. In the last portion of August, however, a succession of rainy days, with thunder-storms, occurred, and the disease attacked the late crops on wet soils and in low situations, but it is to be hoped that the loss will not be so great as in 1872 as the general crop is so good.

Early and second-early varieties best.

In the intervening years between the above-stated wet ones, the disease did little injury to the general crops of Potatoes, and in the particularly dry and warm summers and autumns of 1868 and 1870, it was only seen in a few damp and low localities; but it is particularly worthy of notice that it has appeared more or less every year since 1845. There is not the least doubt but that some of our best keeping early and second early varieties of Potatoes can be thoroughly ripened in July, before the disease can attack them so as to cause much loss in the crops. This I have proved since 1846, by growing large quantities for consumption and for keeping; and in letters that year to the leading journals and the *Economist*, I promulgated this practice as the safest way of growing our Potato crops for the future. It is said by many growers that the early-ripened sorts will not keep good or long enough to supply the markets with the mealy and good flavoured varieties of the Lapstone and Regent sections. This may not be the case at present, but new seedlings of first-rate properties as to keeping qualities, flavour, and early ripening, will soon be selected by nurserymen and other growers to sell to their customers. The following is a list of early and second early varieties of the Kidney kind, which I have proved to be excellent croppers and keepers, namely:—Mona's Pride, Myatt's Prolific, Veitch's and Rivers's Ashleaf, and a new sort, sent out by the Messrs. Lee, of Hammersmith, under the name of the Hammer-smith Early Kidney. Of the round or pebble-shaped section of the early and second early kinds, the best I have tried are the following:—Coldstream Early, Harbinger, The Clipper, and Champion (all three seedlings of Bell & Thorpe's); Styffe Castle Seedling, Headley's Early Nonpareil, Barfitt's Seedling, Daintree's Early, and Yorkshire Hero. Some other seedlings, raised by Messrs. Fenn and Dean, have been certificated by the Royal Horticultural Society, and they will doubtless meet the demand for good early keeping kinds when they send them out for sale. The American new sorts of Potato, which have lately been introduced into this country, are a very distinct race in their foliage and dwarf habit, and some of them are very early ripeners, such as the Early Rose, Prolific, and King of the Earlys. They are all good croppers, but some of them have a peculiar earthy flavour when grown on strong soils, and they are all as much subject to the disease as our own varieties in wet seasons. They evidently do best in warm dry summers, for this year, with me, Climax, Peerless, and Prolific have been excellent in flavour and very productive, and free from the disease. They will, doubtless, be very useful for crossing with some of our best sorts for raising seedlings of a dwarf habit and early ripening properties. All our best flavoured mealy sorts are very subject to the disease, such as the Flukes, Lapstones, and Regents, and seedlings crossed between them and the American varieties might have a better constitution. I have no great faith in resorting to any of the wild varieties of Potatoes of South America for raising seedlings from, for in 1848 I raised some plants from Peruvian seeds, and when their tubers got large enough for use, I found them of bad flavour, and the disease attacked them in the same way as our native sorts. They were something like in the foliage, and had the dull red skins and white flowers of the American varieties lately sent out. Although no kind of Potatoes may be said to be quite free from the disease in bad seasons, yet some are so little affected by it that a sound crop may always be reckoned on, and they all belong to the very late ripening varieties, with red leathery skins, and strong woody haulm. Last year, when the disease was so prevalent, I grew here good crops of the Red-skinned Fleur-de-ball, Wood's Scarlet Prolific, and Millett's Manifold, and the stems kept green and growing till cut down by the frost. The qualities of these varieties, however, are not very good as regards flavour, being better roasted than boiled, but they keep well in the spring without sprouting, and are well adapted for feeding pigs or cattle, which is a recommendation.

Desirability of raising Seedlings.

Before the Potato disease appeared in this country, some favourite old varieties, which had been some years in cultivation, gradually wore out and disappeared, and new seedlings took their places. Some forty years ago I can remember, for field cultivation, the red and white Dons and the Perthshire Rough Reds, so much run upon in the London markets, the Breadfruits likewise (the progenitors of the Regent section), and Taylor's Fortyfold, were favourite kinds; but they have all now nearly disappeared from the nurserymen's lists. In some seasons, then, there was a disease named the dry rot, or gangrene, which attacked the tubers, but it did not affect the general crop, nor cause any great alarm amongst growers of Potatoes when it did appear. At that time some of the varieties grew such immense crops of seed-plants, that cartloads could have been gathered in the fields at lifting time; but we seldom now see any of the kinds seed so freely as they did then, unless in exceptionally warm summers. The Potato plant being an exotic, there is no doubt but that our changeable and wet climate has an effect on its constitution, and makes the raising of seedling varieties a necessity, as they seldom continue longer in cultivation than from ten to twelve years. Some of our best kinds, such as the Lapstones, Flukes, Regents, and the second-early Kidneys, reproduce seedlings of the same type, so that there is no fear of any degeneration in them. A few years ago, the late Mr. Paterson, of Dundee, raised some seedling varieties of great merit, and which are still cultivated in quantities for the market; but they will gradually have to succumb to newer and better sorts.

Storing Seed Potatoes.

The keeping and preparing Potatoes for setting is a great point, and the best results have been recorded of early kinds, where the tubers have been "greened" in the open air before being stored for the winter. If they are packed in shallow boxes, with the eye-ends upwards, a great quantity can be put together in a small space; and, being allowed to sprout slowly by keeping them in cool places safe from frost, the shoots become stiff and hardy at planting-out time. No hurry is then required in the spring months for planting them out, until the weather and soil are favourable for that operation. These hardy-sprouted tubers, when set whole, and their shoots appear above ground, will withstand the spring frosts better, and come in earlier, than those planted in the autumn or in the early spring months. Of course it is not possible for extensive growers of late varieties to adopt this plan; but their Potatoes intended for setting might be placed thinly on the floors of outbuildings or sheds, and frequently turned to keep them from sprouting too much. Temporary sheds might likewise be erected for this purpose, the walls being made with thick sods, and lined with dry Fern or straw, and the roof thatched with any waste materials to keep out the rain and frost. Doors should be made at each end, to be opened for ventilation in mild weather, to prevent the tubers from sprouting too much.

Planting and Manuring.

Some recommend autumn planting, and it may answer in light soils, if the precaution is taken to plant the sets deeper than they usually are, so as to be out of the reach of severe frosts. On strong undrained soils, however, I have often seen the sets rot in the ground, from grubs eating into them, and the crop suffered in consequence. Autumn-planted Potatoes, therefore, run more risks than the spring-planted, and they do not, as a rule, come in any earlier; so that the advantage of the system is not greater for warding off the disease. Very late planting in the spring is another panacea recommended by some enthusiastic growers of Potatoes, who say that, if they are not ripe enough in August and September, the disease will not attack them to cause any loss in the crop. Last year I planted some rows of Myatt's Prolific in the middle of June on purpose to see if they would escape; but, on lifting them in October, they showed more diseased tubers than any I have yet raised. Some more rows of late varieties were planted at the same time as the Prolifics, and were showing sturdy growth until the frosts, on the mornings of the 29th and 30th of September, blackened all their tops, and the tubers were so small that they were not worth the lifting. That the manures used for growing Potatoes have a great influence on the disease is now well known to all cultivators of them. For the late crops, perhaps, stable or farm-yard manure, if well decomposed when used, is as safe as any. When ten tons of this manure is applied per acre at planting-time to land in good condition, and a top-dressing of 3 cwt. of best guano mixed with the same quantity of wood or coal-ashes, put on in showery weather in April, it will make an excellent stimulant for forcing on the crop. The cost per acre for this manure will be about £4 13s., viz.: 10 tons best decomposed farm manure, at 6s. per ton, £3; 3 cwt. best guano, at 11s. per cwt., £1 13s.—total, £4 13s. Another good manure for strong soils, if they are rich in organic matter, is about

30 bushels of soot, and 12 cwt. of salt mixed together, and put into the drills at planting time; this quantity will do for an acre, and the cost will be about, for 30 bushels of soot, at 7d. per bushel, 17s. 6d. for 12 cwt. of salt, at 1s. 6d. per cwt., 18s.—total, £1 15s. 6d. Guano, if of the best quality, is highly stimulating, and, when used in the drills, should be mixed with wood, peat, or coal-ashes, at the rate of 4 cwt. of guano and 2 tons of ashes to manure an acre, at the cost of £3 4s., viz.: 4 cwt. best guano, at 11s. per cwt., £2 4s.; 2 tons best charcoal-dust or peat, at 10s. per ton, £1—total, £3 4s. If coal-ashes are used the manure will be cheaper. For light sandy soils salt is an excellent fertiliser, and it likewise forms a crust on the surface of the drills and keeps the high winds from levelling them. If used in the drills at the rate of 20 cwt. of salt and 12 bushels of soot per acre the cost will be about £1 17s., viz.: 20 cwt. of salt at 1s. 6d. per cwt., £1 10s.; 12 bushels of soot, at 7d. per bushel, 7s.—total, £1 17s. I have used the sulphates of soda and magnesia mixed with the nitrate of potash as a top-dressing in the following proportions, and at the cost of about £2 9s. 6d. per acre, viz.: 1 cwt. of the sulphate of soda, at 18s. per cwt., 18s.; 1 cwt. of the sulphate of magnesia, at 18s. per cwt., 18s.; $\frac{1}{2}$ cwt. of the nitrate of potash, at £1 7s. 0d. per cwt., 13s. 6d.—total, £2 9s. 6d.* When this mixture was put on the drills in showery weather in April or May it promoted the growth of an excellent crop of Potatoes, quite free from the disease, on very rich soil that formerly produced a very diseased crop. In growing the early and second early varieties in gardens or fields where the soil has frequently been heavily manured, and, therefore, still retains quantities of organic matter, simple manures such as charred rubbish, decayed tan, or sawdust, will grow good crops of Potatoes at little expense and free from the disease. I always, however, find that whenever coal-ashes is used by itself or mixed, it has a great tendency to make the tubers have rough scabby skins, it ought, therefore, not to be used unless in small quantities. A new manure, under the name of Phospho-Silicon, has lately been introduced by the Rev. H. Moule, and is said by him to be effectual in curing the disease. It will, no doubt, be extensively used this year in experiments by growers of Potatoes, and duly reported on by them. In years when the Potato crops show much of the disease great care must be taken in picking out the diseased tubers, and only storing those which are sound or least infected by it. This can be done best by placing them on the floors of sheds or outbuildings, where they can be frequently examined and picked over, and afterwards covered with litter to keep them from the air and frosts till stored. Where a great quantity has to be stored this can only be managed by pitting them in ridges in the open air. When this is done, I have found layers of quicklime or charcoal-dust and sifted coal-ashes, when put into the ridges amongst the tubers, to be effectual in keeping them sound. The diseased tubers do not infect the sound ones, but they rot and bring dampness and heating into the pits which the lime and charcoal dust dries up. The ridges must not be more than 3 or 4 feet wide at the base; nor more than about 3 feet 6 inches high, in order that heating may not be generated in them, should the tubers be put in damp at storing time. It is a bad practice to put too much straw on the top of the tubers in the ridges when earthing them up, as it rots and gives them a bad flavour.

Our future Potato crops.

As to the future of our Potato crops and the wearing-out theory, the question has often been mooted, whether we should not give over cultivating the noble tuber to the extent hitherto done, and find other substitutes for it. There is, however, no more reason in giving over growing the Potato plant than in not growing the cereals or any other crop of our food crops, for they are all subject to failures in bad seasons. After such a season of disease amongst Potatoes as we had last year, the same land has been planted again this year with sets taken, in many instances, from diseased tubers, and the result is one of the best crops ever lifted of the early and second early kinds. Unfortunately, owing to the wet weather prevailing in the latter portion of August, the late planted varieties have been infected by the disease in low situations, but the crops of them being good the loss will not be seriously felt as in some years. That the plant is wearing out from being more diseased than formerly, or from the exhaustion of the soil affecting its vitality, is not warranted by experience, for I have known gardens where it has been grown every year on the same plot, or border, for more than a quarter of a century, and yet produced good crops in favourable seasons. This, however, would not be good practice for extensive growers to follow, such as farmers, with plenty of land for a rotation of crops, and who could find fresh soil to plant their Potatoes in every year. Sub-soil-ploughing strong undrained soils, or digging

them deep, would be another help to ward off the disease, for it relieves such soils of their super-abundant moisture. Giving more space in the rows than what is usually done, or growing such low plants as Carrots or Kohl Rabbi, in alternate rows, between the Potatoes, would lessen the danger from the disease. Cottagers should only plant the early and second early kinds of Potatoes in their garden ground, leaving as much room between each row as to be able to plant in May and June Savoys, Broccoli, Brussels Sprouts, and Scotch-kale, the best and most profitable of all hardy vegetables for standing the severe frosts in winter. The Potatoes will gradually be lifted for use, and the last lot will be ripe enough to save for seed by the middle of July, when the vegetables can be all earthed up. There is a great risk in cottagers planting the late sorts of Potatoes in the rich soil of their gardens, for they are in general shaded much with fruit-trees, and in wet summers the disease runs riot, and destroys all their crops. The farmers in the neighbourhood are often willing to let cottagers and others plant a few rows of late Potatoes on their fallows for the sake of the manure they put on the land. This manure is generally made from horse-droppings and road-scrappings, mixed with house-ashes, and raises excellent crops of Wheat the year after. Owing to the present favourable season, and the good crops of early planted Potatoes, the outcry about the disease will subside for a time, as it has done in former years. Another wet summer, however, will again show it as virulent as ever, and we ought to be prepared to make the loss as little felt as possible. As I have before stated, this I am convinced can best be done by planting for the main crops, as early as the season will permit, the earliest-ripening varieties of good keeping kinds. Every year's experience, since 1845, whether the summers have been wet or dry, has only confirmed this practice in my case, and I believe many growers are now of opinion that the system is the safest. Should men of science and practice conjointly discover that the parasitic Fungus *Peronospora infestans* is the cause of the disease, then it will have to be found out how the rest-spores of the Fungus are preserved for continuing the life of the species in a new season. We may then be able to find a cure for it by steeping or dressing the sets intended for planting, or if in the soil, use manures likely to destroy its development. If the conditions, however, out of which it originates are atmospherical, of which there can be little doubt, we will then have to depend upon the seasons for the only cure.

Lord Cathcart's Prize.

In the competition for Lord Cathcart's prize on the Potato disease, none of the essayists were successful, and the judges' report says, "As regards the botanical part of the subject, it must be confessed that all the essayists appear to be in the arrear of the present state of scientific knowledge." From this it appears that none of the essayists were regarded by the judges as good botanists; but that botany will have much to do with the discovery of the cause of the disease is doubtful, and the present state of scientific knowledge has added as yet very little to our knowledge concerning it. The judges, however, recommend the council to apply the £100 prize to some competent mycologist, so as to induce him to undertake the life-history of the Potato Fungus, and if this is done, it is not likely to lead to any great result. The life histories of the mildews which attack the Pea and the Turnip crops in dry warm autumns, and the Vine in spring and summer, must be known to mycologists before this, but no applied care prevents these mildews from regularly appearing in years when the weather is favourable for their development. Another recommendation of the judges to the council is to award valuable prizes for the best disease-proof early and late Potatoes. These prizes are not to be awarded till after a three years' trial of their resistance to the disease, and besides, they must have good cropping, keeping, and cooking qualities. From a quarter of a century's experience with early and second early varieties, I have found that none of them are disease-proof, being only so when ripened in July and beginning of August before the disease appears. As to the late sorts, it is only a few that have thick leathery red skins and strong woody haulm which resist the disease, and I believe as much is known about them already as will transpire after the three years' trial. New seedling varieties, however, of this section, with better cooking qualities, would be worthy of prizes.

Change of Seed.

The changing of Potatoes, for setting, from one description of soil to another has a marked effect on their cropping and other qualities. I have found that a good change is made by setting those grown on a peat or boggy soil on light sandy ones, and *vice versa*; and likewise in setting those grown on light soils on strong loamy ones. This year I planted a quantity of a red menly variety, free from disease, and grown in Prussia. The crop turned out excellent, and when lifted in September, not a diseased tuber was found among them.

* The cost of these chemical manures will be less if purchased in larger quantities.

THE ARBORETUM.

HARDY TREES AND SHRUBS.

By GEORGE GORDON, A.L.S.

THE SYCAMORE, OR FALSE PLANE (*ACER PSEUDO-PLATANUS*).

THIS forms a large tree 60 feet high, usually clear of branches for a considerable height. It is common all over Europe, particularly in Switzerland, Germany, Austria, and Italy, and is well suited for planting near the seashore for shelter, as it grows quickly, and resists the spray better than most other trees. The leaves are large, smooth, and cordate at the base, with five acuminate unequally-toothed lobes, and long foot-stalks. The flowers are yellowish-green, and produced in long, dense, drooping catkin-like racemes in May and June. The keys or fruit are smooth, with rather spreading and ample wings. There are several varieties of the common Sycamore, of which the following are the most striking and distinct:—

1. **THE PURPLE-LEAVED SYCAMORE** (*Acer Pseudo-Platanus purpureum*).—The leaves of this variety are of a beautiful violet-purple on the under-side, and in summer and autumn, when they are slightly ruffled by the wind, give the tree the appearance of being alternately clothed in purple and pale green. It originated in the nursery of Mr. Saunders, of Jersey, in 1828.

2. **THE WHITE VARIEGATED-LEAVED SYCAMORE** (*Acer Pseudo-Platanus albo variegatum*).—The leaves of this variety are finely blotched and striped with white. It is the oldest and most common of the variegated Sycamores, and, although a handsome variety, is inferior to either of the following.

3. **THE YELLOW VARIEGATED-LEAVED SYCAMORE OR CORSTORPHINE PLANE** (*Acer Pseudo-Platanus flavo variegatum*).—This is a handsome variety, of Scotch origin, the leaves of which are amply blotched and striped with yellow, particularly in the case of full-grown trees.

4. **THE NEW BELGIAN VARIEGATED SYCAMORE** (*Acer Pseudo-Platanus Leopoldi*).—The leaves of this variety are almost wholly of a pale yellow colour, frequently more or less tinted with red, and, owing to their having but very little green colour in them, they appear, at a short distance, about as ornamental as flowers. It is of Belgian origin, and is decidedly the most beautiful of all the variegated varieties of *Acer* in cultivation.

5. **THE LONG-LEAVED SYCAMORE** (*Acer Pseudo-Platanus longifolium*).—The leaves of this variety are deeply and acutely lobed, and are set on very long foot-stalks. It originated in the nursery of Messrs. Booth, of Hamburg, and forms a very striking variety.

The Golden Osier or Willow.—The Golden-branched Willow (*Salix vitellina*) is a low deciduous tree, and its long taper-shoots are especially useful to gardeners for many purposes, especially for tying wall trees, espaliers, Raspberries, or, in fact, anything that requires a strong ligature. Although Willows of all kinds grow more luxuriantly in damp situations, such as the margins of ponds or streams, still I have frequently planted them in poor sandy soil, and they will, in fact, grow in any soil or situation in sufficient quantities for the gardener; and I should recommend every gardener to procure a few cuttings of the Golden variety, and plant in any corner where there is room, so as to secure a few bundles of pliable twigs

for tying purposes. In addition to its utility as stated above, the Yellow Willow has a very ornamental appearance when planted in groups in large shrubberies. Their masses of waving golden branches in winter, when the leaves are off, have a pretty appearance in the rear of masses of evergreens, especially when associated with masses of the Red Dog-wood (*Cornus sanguinea*), another low-growing deciduous shrub that might be advantageously used for giving life and colour to masses of dark-leaved shrubs in winter, in ornamental game coverts or large shrubberies. Referring again to the Golden Willow, after all the pliable twigs that are required for use have been taken off, the remainder, in the spring, just before growth commences, should be cut well back. This keeps them dwarf, and stimulates the further production of plenty of young clean shoots. Cuttings of strong shoots, about 15 inches long, planted firmly in the ground, about two-thirds of their length, will soon make good plants.—E. H.

Tan for Hedge-growing.—Whoever has travelled on the high road to Eutin—a road which passes through some of the most charming scenery in East Holstein—cannot fail to have been struck by the excellence of the hedges right and left. They were grown, many of them, according to the plan recommended by Mr. Bruhns (an inspector of highways), the peculiarity of his mode of culture being the employment of tan; i.e., tanner's spent bark. His usual method of proceeding is as follows:

He raises a bank of earth a little over 12 inches in height by 24 inches in width, and plants the young Thorns on the same at intervals of 12 inches. The variety selected for the purpose is *Cratægus monogyna*, the one-styled Hawthorn. Immediately after the planting, which takes place in spring, the whole surface of the bank is covered with tan. Mr. Bruhns' experience with this material having shown that its application is beneficial in two ways, firstly, in destroying (without injury to the Thorn sets) those worst enemies of a young hedge, the weeds; and, secondly, in causing the soil to remain constantly moist and open, and, therefore, in a state favourable to the growth of the plants. The development of the latter should be further encouraged in very dry summers by watering the tan from time to time, especially in the case of small strips of hedge, enclosures of gardens, &c., where this can be done without great expenditure of labour. In a year from the planting, all the shoots but two well-matching ones on each Thorn are cut close off; the remaining couple being bent so as to cross one another. The two continue in most instances



Leaf of *Acer Pseudo-Platanus*.

in the position given them without being tied; sometimes, however, the grower is compelled to make choice of somewhat unfavourably-situated shoots, which require to be twisted into the line of fence, and he then fastens them with bast. During the next twelve months the hedge needs no further attention beyond keeping it clear of weeds, and moving the tan occasionally to ensure the surface remaining light and open. In the following spring the pruning and training are repeated; all superfluous shoots and branches growing out of the line of fence being removed, and the hedge cut down to a uniform height of 2 feet. The young Thorns will continue to shoot up vigorously during the second year, and in the third spring from the planting, must be bent and cut down to 38 inches. If a higher fence than this be needed, say one of 4 feet or over, the plants will have made more than the necessary growth by the fourth spring, and can then be reduced to the size desired. By following the above instructions, a neat and impassable hedge is thus created within four years, the crossed branches having become firmly attached and fixed in the direction given them. Should the grower desire to raise his own young plants, he must bear in mind that under ordinary circumstances the seeds will not germinate the first season. To avoid loss of time he will find it a good plan to put them, in the autumn, in a barrel containing a mixture of earth and quicklime. Seed so prepared, and sown in the spring, will at once vegetate. Q.

ON THE DIFFUSION OF GASES IN LEAVES.

The phenomena of thermo-diffusion (studied recently by M. Feddersen), which occur when a difference of temperature is maintained between the two sides of a porous partition separating two portions of gas, and those phenomena of simple diffusion, which M. Dufour has observed between masses of air which differ hygrometrically, may also be observed in plant-organisms, where the circumstances are evidently favourable to their production. The subject has lately been studied by M. Merget, and he has communicated to the Paris Academy an account of his experiments and results, which presents various points of interest. Aquatic plants show the phenomena most distinctly, and it was *Nelumbium speciosum* that M. Merget chose for his investigations. To Raffeaneau-Delille we owe our knowledge of the fact that, if the central concavity of a leaf of *Nelumbium* be covered with water, bubbles of gas will, on exposure of the limb to the sun, be liberated from the moistened surfaces, either by the stomates or by openings made artificially. This observer found, also, that the liberation of gas may also be produced by wounds made on the petiole, that it ceases with complete immersion of the limb, and that, when it occurs, it is atmospheric air that is given off. He concluded that each leaf of *Nelumbium* is provided with a complete respiratory system, the velvety surface being absorbent, and the stomates exhalant. From numerous analyses, M. Merget has verified the assertion, that the gas issuing from the leaves is atmospheric air (with some quite unimportant variations). He infers, that the phenomenon is quite different from chlorophyllian respiration, and produced exclusively by the solar heat-rays. So he thought to reproduce it by substituting an obscure heat source for the action of the sun. This may be readily done (he says) by using a circular sheet-iron plate, heated somewhat under red heat. It is, then, simply the difference of temperature between the parts of the limb directly exposed to the heat-radiation, and those parts which are protected by the layer of water, that causes the escape of gas included in the latter; and, for this gas to escape, in spite of the hydrostatic pressure, there must necessarily be an impulsive action proceeding from the neighbouring heated air. Accepting this explanation as plausible, it follows that the water in the centre of the leaf, having simply the effect of guarding the subjacent tissues from the calorific action, a replacement of this by water hot enough to render uniform the temperature of the limb should stop the emission of gas by the moistened surfaces. This was tested and found to be the case. And there was more than this merely negative evidence; for, in some instances, when bubbles, being slowly liberated in the cold water, appeared to be held by a sort of gaseous pedicel, which kept them in communication with the mass of interior air, it was found, that on gradually adding hot water, the bubbles progressively disappeared, as if absorbed by the tissues again. On uniformly heating, at all its points, the upper surface of a leaf of *Nelumbium*, the air of its passages would thus be put uniformly throughout in a state of tension. To demonstrate this increase of pressure, M. Merget, having cut off a leaf, connected its petioles, by means of a caoutchouc tube, with a water-manometer. Then, exposing the limb to calorific radiations of various nature and intensity, he obtained a descent in the manometer of 1 to 3 decimetres. On detaching the manometer, the air of the lacunæ was set in motion, and, the petiole section being immersed in water, bubbles escaped from it abundantly. Thus, some leaves exposed to the sun gave a quarter of a litre of air per minute; others, exposed to a bright charcoal fire, one litre per minute, which is hundreds or thousands of times the volume of the leaf per hour; and this proceeded several hours without interruption, sometimes entire days. To maintain this expenditure, there must evidently have entered by the limb each instant a volume of air equal to that which left by the petiole, and M. Merget assured himself that this entrance was by the stomates, for the closure of these immediately arrested the liberation of gas. Atmospheric air is not the only gas which may be thermodynamically diffused through the limb of a leaf of *Nelumbium*; the author got similar results with oxygen, nitrogen, hydrogen, carbonic acid, carbonous oxide, and protoxide of nitrogen. The phenomena are thus to be regarded as determined by conditions of a purely physical order. From other experiments which he made, M. Merget thinks he is warranted in affirming that all plants show this thermo-diffusive power that is so remarkably developed in *Nelumbium*. As the heating of the leaf in the ordinary state is far from being produced uniformly in the parts struck by the solar rays, the interior air, by virtue of the excess of tension it acquires, presses upon that of the cold parts, forcing it to escape by the corresponding epidermic stomates, while the exterior air flows in by the stomates of the solarised surfaces. There is thus a real circulatory gaseous current from those green parts, which respire, to those which do not respire, with a double circulative movement of inspiration by the former and of expiration by the latter. In the aquatic plants, this

respiratory circulation has greater extent and depth than in terrestrial plants; for, instead of being circumscribed in the narrow network of passages in the foliar parenchyma, it is prolonged into that of the entire lacunar system. A. B. M.

A new Sea-side Plant (*Medicago arborea*).—Attempts are being made at Brighton to find some shrubs sufficiently hardy and well adapted to bear the exposed spray and winds of the new Undercliff Road, but, as yet, only two (the *Enonymus* and *Tamarisk*) have been found to stand the variations of heat and cold of that spot. Some years back I suggested to Mr. Spary, of the Graperies, Brighton, that the *Medicago arborea*, being entirely a sea-side plant, though a southern one, would be likely to stand the climate of Brighton, and he, in consequence, procured some seeds and raised several plants, which are now grown to large shrubs, and which may be seen in his garden, green all the year round, and for the greater part of that time bearing pretty yellow flowers; it is a remarkably handsome and very bushy shrub, and, being a sea-side plant, and growing so luxuriantly near the sea, it would, in all probability, thrive on the Undercliff Road, not only as a standard, but particularly also if trained up against the cliff wall: it may be seen growing 8 ft. high against the southern aspect of Mr. Balchin's cottage in his garden at Hove, as also against the north wall opposite; at Florence it forms beautiful hedges close to the sea. I trust that this notice may induce the authorities of Brighton, who are expending large sums in planting all over the town, especially on the Undercliff, where nearly all the trees so lately planted are dead, to try the *Medicago* there, which, if it succeeds, as I verily believe it will, cannot fail to be an attractive object and a most desirable addition to the shrubs of Brighton.—*Science Gossip*. [Have any of our correspondents noticed this shrub growing near the sea at Brighton or elsewhere?—Ed.]

Beech Blight.—Let your correspondents, who complain of the destruction of their trees by Beech blight, try, as a remedy, a mixture of common lime with water, in the proportion of three or four handfuls of lime to a bucket of water. This should be applied thoroughly over all parts of the tree affected, and, if the matter has not been neglected too long, and the disease allowed too great a hold, a cure is, I think, certain on a second application at most. I have for some years noticed this blight on the Beech, not only all over the United Kingdom, as I believe I may say, but on the continent as well. It is the excrement of an insect, and seems to be deposited on the Beech tree at almost all stages of growth. I do not think it is infectious, as I have noticed a diseased tree standing amongst others, which were perfectly free from the blight. Doubtless, however, there is usually some defect in the constitution of the tree attacked, or it would not be selected. Want of proper drainage in the soil is, I think, often the cause. A very fine Weymouth Pine, near the house here, was attacked some years ago with this disease, or something similar to it. The branches were, I think, principally attacked, and the tree was at one time nearly dead. I had it thoroughly cleaned with the lime-water mixture, and it has been wonderfully healthy and making large growth ever since. Many of my Beech trees I have treated in the same way, and, no doubt, their lives have, in some instances, been saved in consequence.—G. F. M.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Introduction of the Wellingtonia.—An expression appeared in last week's GARDEN (see p. 129), which might lead some to suppose that this Conifer was introduced by Messrs. Lawson, whereas, as is well known, it was introduced by Messrs. Veitch, through their collector, Mr. William Lobb.

Weeping Elms.—Can you give me the names of one or two of the most ornamental of these?—R. [The Weeping Wych Elm and the Camperdown, *Ulmus suberosa pendula*, *rugosa pendula*, *glabra pendula*, and *microphylla pendula*, are all ornamental kinds.—Ed.]

Tamarix plumosa.—Of this plant, M. Carrière writes as follows in the *Revue Horticole*.—Nothing can be finer or more graceful than this species, which is still so rare, in spite of the readiness with which it can be propagated. Its numerous, slender branchlets, of a glaucous green hue, bear a certain resemblance to the curled plumes of the ostrich (or the white stork) whence its popular name of "Marabout." It flowers in August, about the same time as *T. indica*. The flowers, which are disposed in dense erect panicles, have an airy lightness, which adds much to the elegance of the foliage. Isolated on a lawn, or in a large park, *T. plumosa* forms a compact mass of the most pleasing appearance. It is quite as hardy as *T. indica*, and is propagated and treated in precisely the same manner.

Chimonanthus fragrans from Cuttings.—In THE GARDEN of January 3rd (p. 18), it is stated that this has never been struck from cuttings. I beg to say that a few years ago I raised two plants of it from cuttings. They were taken during the summer, when the leaves had arrived at full growth, planted in light soil in pots, and placed in the shade in a Vinery. They were kept in a cool greenhouse all winter, and next spring, they pushed forth fresh leaves; one I gave away, the other I planted against a south wall, and it is now about 3 feet high, and in bloom. I have also a plant of it raised from seed, which ripened here in the open air, about three years ago, but has not flowered up to the present.—MARY FREEMAN, Ryton on Dunsmore.

THE FRUIT GARDEN.

RASPBERRY CULTURE.

MR. TAYLOR says (see p. 123) that a plantation of Raspberries is only just coming into bearing at five years old, and that he should expect it to continue in good condition for twenty years at least. It has been too much the custom to look upon a plantation of Raspberries in the same light as one regards an orchard of fruit trees, viz., that it should be planted only once in a lifetime. I contend, however, that most of the permanent crops in a kitchen-garden, such as Raspberries, Globe Artichokes, Rhubarb, &c., would not only be much benefited by being more frequently transplanted, but that the operation would also liberate more land for the rotation of other crops, and I need not say how desirable it is to have a fresh piece of land for Potatoes, for instance. If good strong Raspberry canes are planted, they ought to bear a good crop the second year, and in the third year they will be at their best; but if weakly canes from an exhausted plantation have been used, then, I grant, several years must elapse before they will bear well; but this only illustrates one of the evils to be apprehended from the system of not making a new plantation till the old one fails. Of course, I don't desire to tie anyone down to any hard or fast line, as local circumstances may, and probably will, have great influence in determining how long a plantation shall remain on the same spot. I simply recorded my own practice, and, if anyone likes to follow it, I am sure that they won't regret it. In condemning late summer and autumn Raspberries, Mr. Taylor, I think, looks at the subject only from a market-gardener's point of view, while in a private garden a man's success or failure depends, more frequently, upon his ability to produce a steady and continuous supply, rather than a large quantity at any one time. Of course, under any circumstances, where Raspberries are grown largely, the largest quantity of fruit will be ripe for preserving in July; but it is quite as important, in many establishments, to provide a succession of fruit from that time onwards till October. I readily admit that, as the sun declines in power, Raspberries will be less sweet; yet, notwithstanding this, there is always an agreeable freshness and piquancy about the flavour of Raspberries which renders them especially useful and much sought after for tarts, puddings, ices, &c., and also for being eaten with cream and sugar, the same as Strawberries, whenever obtainable. I have never known Raspberry canes to be seriously injured by frost in winter; nor is it likely to happen if the young canes are strong and well matured, which they will be if managed according to the mode of culture I recommended. Spring frosts in May may sometimes injure the young growths; but, even then, any serious injury to the crop from such sources is not a common occurrence. I quite agree with Mr. Taylor that heavy clay-land is not the best land for Raspberries, although they may even be grown on such soils successfully. Burnt earth and old mortar-rubbish make a capital dressing for such land, and are especially suitable for Raspberries. E. HOBDAY.

Barchard's Seedling Apple.—This, says the *Florist and Pomologist*, is neither a new nor very old variety. It was raised by Miss Barchard, of Putney, some forty or fifty years ago, and has been frequently brought under notice in one way or another, but has never yet taken that prominent position to which its merits so fully entitle it. Mr. Thompson mentions it in the Catalogue of Fruits of the Royal Horticultural Society. It was awarded a certificate by the Pomological Society some years ago, and now, at last, it has received the same honour from the Fruit Committee of the Royal Horticultural Society. We have specially to thank Mr. F. Dancer, of Little Sutton, Chiswick, for showing us the full merits of this thoroughly excellent Apple. Near Gunnersbury Station may be seen a group of some forty or fifty good-sized trees of this variety, which every autumn presents a most beautiful picture, laden as they are with bright, shining, resy-checked fruit. The trees themselves are of a fine free style of growth, and form objects of quite an ornamental character. The fruit is of medium size, of the Neuesuch shape, flattened at each end. The eye is open, set in a deep plaited basin; the stalk is about an inch long, and rather deeply set. The skin is of a clear greenish-yellow on the shaded side, very much suffused and streaked with red and bright scarlet on the exposed parts, this high colouring giving it, especially when hanging on the tree, a

very beautiful appearance. The flesh is firm, of a pleasant sub-acid flavour, tolerably good for dessert, but more valued for cooking purposes. It is in season from October to Christmas, is an almost certain and most abundant cropper, and is greatly to be recommended as a standard orchard fruit.

Seedling Apple Lady Henniker.—This valuable addition to our list of Apples was deservedly awarded a first-class certificate at the autumn show of the Royal Horticultural Society last year. Its great merits will certainly commend it to a place in every collection, and it only requires to be brought before the public to become a leading standard variety. As a kitchen Apple, it is one of the very best and largest with which I am acquainted, and it keeps in good condition from October until March. As a dessert Apple, too, it is very valuable, and, being of a rich waxy-yellow, streaked with crimson, it has a fine appearance, especially under artificial light. It is a selected seedling from several hundreds raised about thirty years ago, at Thornton Hall, Suffolk, the seat of Lord Henniker. Mr. Jno. Perkins, the present gardener there, informs me that it has for years past been their most favourite Apple for culinary purposes. It has not, therefore, been hastily brought forward, but has rather, as it were, put itself forward by the best of all recommendations—its own merits.—J. GROOM, *Henham Gardens, Wangford.*

Woollen Refuse or Shoddy as Bottoming for Vine-Borders.—This is one of the best materials with which I am acquainted for covering rubble in the bottoms of Vine borders, especially when it can be had long in texture, and before the oil is pressed out of it. When such is the case, it is almost indestructible, and when pressed down by the superincumbent soil, it becomes like a piece of felt, preventing the smallest particle of soil from passing through it; besides, if the borders are watered with liquid-manure, it acts as a filter. On widening a Vine-border, the rubble bottom of which had been covered over with this material to a depth of 2 inches, I found the fibrous roots of the Vines so thickly interwoven with the woollen refuse, that they would of themselves have prevented any soil from passing through them. I used the same material for covering my Pine-pits and Melon-house (which is exactly such a house as that described by Mr. Simpson, the other day, in *THE GARDEN*), and I am surprised that it is not more extensively used than it is, especially in counties where it can be had so abundantly. I have known Heather or Ling used for bottoming borders. Any material that allows air and water to percolate freely through the soil to the rubble-bed beneath, is, in my opinion, better than slates; indeed, a small thin soft-burnt tile is preferable to them.—J. T.

Hybrid Apples.—The introduction of the Siberian Crab is destined to work a great revolution in the Apple kingdom, by crossing with the common Apple. The Crab seedling appears to hold well to its parental hardness, be the cross what it may, and the tree an Apple in all its parts, with fruit enlarged without the tincture of Crab. It is but a small percentage of Crab seedlings that show tenderness from the cross, and in fruit they enlarge at a rapid ratio, with occasional bounds to an extreme at once, as in case of the Wealthy Apple from Crab seed—Apple in tree but hardy as a Crab—fruit large and unsurpassed in beauty and flavour. Similar results have attended the planting of seeds from Cherry Crab—a fair-sized, perfect Apple, without tincture of Crab; while on the other hand, we have grown Crab fruit from Duchess and Wealthy seed, and occasionally a perfect Crab tree from the seed of each. In appearance, we have perfect Blue Pearmain trees from Crab seed, not yet fruited, but enough of the hybrids have fruited to determine pretty closely what the fruit will be. The seedlings on which we most rely are not yet in bearing; only about thirty have borne, with near 2,000 to come in yet—the smallest being best, most favourably situated for a good cross, and of the results we have no fear. Our motto is:—Seeds from the most perfect tree, crossed with the very best in fruit—the most hardy preferred, if good in size and quality.—*Cultivator.*

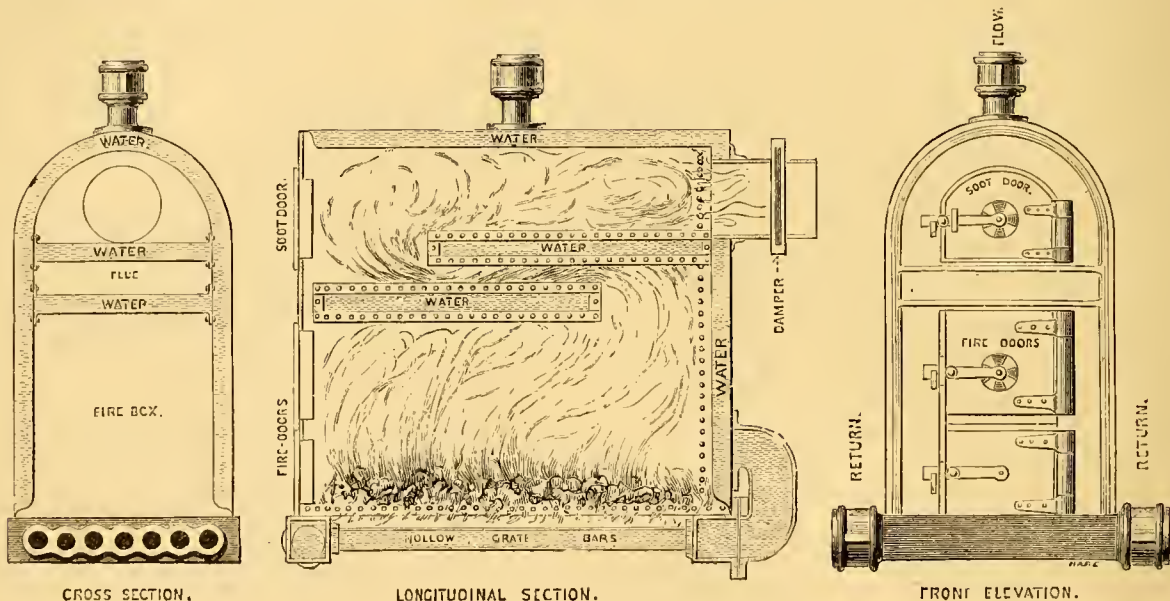
NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Chickasaw Plum.—The Chickasaw Plum, or *Prunus Chickasaw* of botanists is a distinct species, growing wild in the South-Western States. It generally reaches a height of from 8 to 15 feet, although on the sandy plains it merely forms a dwarf round bush. The fruit is small, roundish, red, and of a pleasant flavour with a rather acid juice. We do not know of any first-class, or even really good, varieties from it; still, like most other species, we presume it is liable to sport into many forms, some of which may produce better fruit than the parent.—*Tribune.*

Dimorphism in the Apple.—The following communication on this subject from M. Chas. Baltet, of Trévies, appears in the *Revue Horticole*:—"For the last three years a Boston Russet here, trained as a two-branched horizontal cordon, has borne, on one branch, fruit of the red and grey colour proper to that variety of Apple, while the fruit on the other branch are entirely green, without the least tinge of red. In winter, when the fruit is getting ripe, the skin of the latter changes to a golden-yellow, while those on the other branch retain their red colour, the grey ground changing to golden-yellow. The flavour of the red-skinned fruit is, also, somewhat more acid than that of the others."

GREEN'S WROUGHT-IRON BOILER.

THIS boiler has been tried by the Royal Horticultural Society, both at South Kensington and at Chiswick, and has given entire satisfaction. At Chiswick, it heats two ranges of plant-pits, containing 780 feet of 4-inch piping, with remarkably little fuel, and it requires no more attention than the old "Saddle" boiler. One of a large size fixed at South Kensington for heating the great conservatory, has attached to it 6,264 feet of 4-inch piping and 375 feet of 6-inch piping, all of which it heats most effectually. The quantity of fuel required is from nine to twelve sacks of coke every twenty-four hours, according to the weather. The principle on which these boilers are constructed will be seen at once by a glance at the accompanying sections. The fuel rests on the hollow water-tubes, which form the fire-bars, and these bars are connected with the water-space of the boiler by a double elbow-pipe at the back of it. The heat and smoke pass forward and play against the water-space at the back and on the shelves, which are now made bull-nose in shape, so that, where the greatest volume of water rests, the heat acts directly upon it, and passing between the shelves to the arch or water-space at the top of it, is almost completely exhausted before it enters the flue. The flow is from the top, and any number can be put on, while the returns come in on each side of the framework of the bars in front. The doors slide open from the centre or middle of the front to each hand, which is a great advantage. They are opposite the spaces between the shelves, so that the boilers can be easily cleaned. One of these



Green's Patent Wrought-iron Boiler.

boilers is doing good work at the present time at Messrs. E. G. Henderson's, where the fuel used for it is small coal and clay mixed. An advantage belonging to these boilers is, they do not require setting in brickwork, and can be set to work at a mere nominal cost. They are made entirely of wrought-iron plates of a uniform thickness, well rivetted together; consequently, the expansion and contraction are regular and equal throughout, and hence their superiority over welded or cast-iron boilers, which vary in thickness, as well as in expansion and contraction. They require little room, and can be put in places where other boilers could not be fixed. The chimney may be made of cast-iron, and can be taken inside and up, either through the roof at once, or converted into a flue, according to the situation in which the boiler is fixed. J. M.

Cowan's Lime-kiln Boiler.—With reference to Mr. Bennett's article on the "Gold Medal Boiler," published in your issue of the 27th of December, Mr. Bennett appears to have stated that the boiler used by him at present over the lime-kiln is the Gold Medal Boiler. This is a mistake, as the boiler in use there over the kiln is my own special invention, used by me in connection with my patent apparatus. I have written to Mr. Bennett on the subject, and he states the error to be yours. I therefore hope that you will kindly set the matter right, as my boiler is pronounced by all who have used it to be a very efficient one.—JOHN COWAN.

THE LIBRARY.

A MANUAL OF BOTANY.*

THE value of this manual is sufficiently attested by the fact that the whole of the second edition was sold in a little over two years after its publication. In the present edition the text has been thoroughly revised, several new wood-cuts have been added, the type has been enlarged, the size of the page somewhat increased, and much new matter has been introduced; yet, by judicious curtailments in some unimportant particulars, the bulk of the volume is somewhat less than in the previous editions. The work is divided into three books, the first of which treats very fully of the structure and morphology of plants; in the second book, the various systems of classification are detailed, and an arrangement is given of plants in their natural orders (based on the system of De Candolle). This part of the work is particularly valuable on account of the excellent notes appended to the descriptions of each order, and explaining the economic, or medicinal properties and uses of every important species. The third book gives an outline of the physiology of vegetation—a subject too extensive to be properly treated of in the concluding pages of an already tolerably large volume. In a future edition, however, Mr. Bentley may amplify this part of the work and make it the subject of a second volume, which might also include a treatise on descriptive botany and a glossary of botanical terms. Of the 1,138 wood-cuts in the present edition, we regret to observe that many

have lost their original clearness and sharpness of outline, and look somewhat "used up."

FOODS.†

THE main design of this work is to present to its readers a carefully executed comparative analysis of the nutritive and other special properties of the various solids and liquids which are every day called into requisition for the support or comfort of the human frame. The dyspeptic will find it, in this sense, a "Minister of the Interior," inasmuch as it points out very distinctly the precise proportions, in all kinds of food, of gluten, starch, albumen, essential oils, &c., any of which may have been his proper bane; and so, correlating himself with the deductions of Dr. Smith's experience, he may safely venture on the question of "what to eat, drink, and avoid." The work, throughout, is essentially analytical, and bears testimony to the careful investigation of the author, as well as to the love of his subject, which in any writer is, more or less, a guarantee of his faithfulness. Commencing with the higher order (as they are commonly considered) of articles of food, Dr. Smith successively tabulates the constituents of all the meats, fishes, and vegetables which, in various shapes and guises,

* "A Manual of Botany, including the Structure, Functions, Classification, Properties, and Uses of Plants." By Robert Bentley, F.L.S. Third Edition. London: J. & A. Churchill. 1873.

† "Foods." By Edward Smith, M.D., LL.B., F.R.S. Second Edition. London: Henry S. King & Co., 65, Cornhill; and 12, Paternoster Row. 1873.

make their daily appearance at the family table. Thence he passes on to an elaborate consideration of the good or evil effects of alcoholic liquids. As an example of the manner in which Dr. Smith handles his various subjects, we subjoin the following short extract:—

Potatoes.

"The relative value of Potatoes is determined in a general manner by their specific gravity, just as a similar estimation is made of an Apple or an Orange by weighing it in the hand, for, the heavier in relation to bulk is any given Potato, so is the greater amount of starch. If several Potatoes be thrown into a solution of salt, and water be added until some of them sink and others swim, the specific gravity of the saline solution will be that of the Potatoes as a whole. J. J. Pohl found the following relation between the specific gravity and the proportion of starch:—

Sp. Gr.	Starch in 100 parts.	Sp. Gr.	Starch in 100 parts.
1.090	16.38	1.107	20.45
1.093	17.11	1.110	21.32
1.099	18.43	1.123	24.14
1.101	18.98		

"The quantity of ash or saline materials present in 100 parts of the fresh Potato, varies with the kind, as shown by T. J. Herespath. Thus:—Fortyfold, 0.88; Prince's Beauty, 1.06; Maggie, 1.09; Axbridge Kidney, 1.27; White Apple, 1.30. The proportion of potash in the salts of Potato is very large, and does not vary much in the several specimens examined, the limits being 53.03 per cent. in the Fortyfold, and 55.73 per cent. in the Maggie. Potatoes are deficient in mineral matter, so that they are unfit to be a sole food, but that defect is supplied by the addition of hard water, milk, and other elements of food. There are 760 grains of carbon and twenty-four grains of nitrogen in 1 lb.; so that more than 2½ lbs. of Potato are required to equal 1 lb. of bread in carbon, and more than 3½ lbs. in nitrogen. Hence, when Potatoes are 1d. per lb., and bread 1½d. per lb., the former are two to three times dearer than the latter, but the former are valuable for their juices in addition to their nutritive elements. New and waxy are said to be less digestible than old and mealy Potatoes, but the time required for digestion may be regarded as nearly the same as for bread, viz., from two-and-a-half to three-and-a-half hours. Ten grains of Potato consumed in the body produce heat sufficient to raise 2.6 lbs. of water, 1° F., or to lift 1,977 lbs. 1 foot high. The water in which Potatoes have been boiled is not used as food, for it is not only nearly destitute of nutritive matter, but is said to contain substances which are deleterious to health. In my experiments, the effect of eating good Potatoes, whether new or old, was less than that of rice. In two experiments, 8 oz. increased the carbonic acid evolved in the respiration by 1.27 grains per minute, and the quantity inspired by 52 cubic inches per minute. The rate of pulsation and respiration was slightly lowered."

HEDGES.

APART from their general utility, there are few things that add more to the appearance of a garden than good hedges. With garden hedges there is generally a twofold object to be kept in view—their utility and their appearance. Numbers of plants are, and have been employed for garden hedges, such as Holly, Yew, Beech, Privet, Thorn, Laurel, Arbor-vitæ, Rose, &c.; or a mixture of some of these, such as Beech and Privet, Holly and Thorn. For general utility, however, combining strength, duration, adaptability to most soils, and price, Thorn has no equal; but, for appearance, nothing excels the Holly, its price only being a serious consideration where required in quantity, as, in planting for hedge purposes it is necessary to use the Hollies in a much older state than would be necessary in the case of most other plants. The common Yew makes a noble hedge, but it has the fault that in some soils it dies, if it is kept cut in to the size that some other plants will bear without injury, and, if it is required in quantity, it becomes expensive. In dry situations, such as when it is planted on the top of a dry bank, it also, sometimes, suffers severely in very dry summers. Another very important consideration is that the Yew is poisonous to cattle, consequently it should never be employed except where there is no likelihood of cattle coming near it.

Holly Hedges, and Preparation of the Ground for them.

The Holly, then, is the plant for a garden hedge where appearance and use are both essential objects. It is so far an accommodating plant, that it will grow on soils the most different in character—on such as are extremely open and sandy, and also on those of a much heavier nature—the first essential being that they are sufficiently dry; anything approaching stagnant water the Holly cannot bear; consequently, where the situation is too wet, draining must be the first operation. In draining, preparatory to the planting of any hedge, more than ordinary care should be taken that the work is so carried out that it will not only be effectual from the first, but so

constructed that there will be some likelihood of its continued efficiency. In the size of pipe used we must be ruled by the distance to be drained, and the volume of water to be carried off. In most situations a 4-inch pipe will be sufficient, and a depth of 3 feet to 3 feet 6 inches will be generally found to be the best. To prevent the roots of the hedge plants choking up the drain, over the pipes should be laid 6 inches of rubble. The Holly is a manure-loving plant, and there is nothing with which I am acquainted that will better repay a liberal application of good rotten farmyard dung. Previous to planting any hedge, the ground should always be thoroughly well dug 2 feet deep, if the soil is sufficient in depth to admit of such a depth. After this, 6 inches of manure, 3 feet wide, should be laid on, and well worked in, a foot deep. The size of the plants to be used will be regulated by the object in view; it is simply a question of cost. If the extent to be planted is limited, and immediate effect—such as shutting out anything of an objectionable nature—is desirable, the plants employed may be 6 feet or even more in height. For ordinary work 12 to 18 inches may be considered the most useful size, but whatever sized plants are used, care should be taken in the selection that they are such as have been periodically transplanted, so as to be in a condition to move well. This is of more importance than absolute size. The necessity for allowing no more time to elapse than is unavoidable betwixt their being taken up and re-planted is of importance with Hollies, as with all other evergreen plants; as also the desirability of keeping their roots from exposure. This will be obvious when we recollect that the roots of an evergreen plant are taxed by the evaporation continually going on through the leaves, even when no active growth is in progress.

When to Plant, and After-management.

The time for planting is of the greatest importance. If, in the circle of the year we can select a time when there is no growth going on—when the leaves and wood are matured, and of such consistency as to considerably reduce loss by evaporation, and also when the roots are in such a state as at once to commence growing after re-planting, and so repair the balance destroyed in the operation of removal—that, of all others, must be the time to remove all evergreen plants. It is in September and October that we find these necessary conditions to exist; hence these months are much to be preferred to all other times in the year for the removal of all evergreens, although some say Hollies should be planted in spring. At the time of planting, when about half the soil is filled in over the roots, give a thorough soaking with water, so as to moisten all the surrounding earth; after that they will not require more, for the autumn rains will, from that time, supply all that will be wanted. If the work is carried out in this way, the plants will commence growing at their wonted season in the spring, with losses of not more than one in fifty, as compared with spring-moved plants. In April put a mulching of two or three inches of dung over their roots, and keep them quite clear from weeds. They will, during this season, make a few inches of growth; but, if all goes well, the summer following they will push their leading shoots a foot or more; they will require little use of the shears or switching-hook (the latter being the better tool of the two), for two or three years, except shortening the leading shoots, and any side-branches that may push away too strongly; the great thing is to keep them quite free from weeds, and to give them every spring a good mulching of dung, until the hedge is as high as it is required to be. After four years' growth it should be kept in proper shape by means of the switch-hook. Round-topped, or, still worse, heavy square-topped hedges, as wide, or wider at top than at bottom, are wrong from every point of view; they are heavy, unmeaning-looking distortions, representative of a style of gardening happily all but extinct. No matter what plant is used for hedge purposes, the shape in which to keep it, whether for appearance or the well-being of the hedge, is that known as hog-maned, which, as is generally known, is the widest at the bottom, getting gradually narrower, very slightly rounded, until it comes almost to a point at the top. For most purposes, in a garden as a screen, or break, or for use as a fence, 4 feet wide at bottom, and 6 feet 6 inches or 7 feet will be found a useful height. The yearly cutting necessary to keep such a hedge within the required size should be done about the beginning of April; and, if ever allowed to get too large, necessitating a considerable reduction, it should be carried out about the same time; if done late in autumn, or in winter, if a very severe frost occurs, it sometimes kills the wood back several inches; but no hedge should be allowed to get larger than the object for which it is intended requires.

Yew, Beech, and other Hedge Plants.

The common Yew is also well adapted for hedge purposes, where it may grow naturally without a trace of the pruning-hook; it spreads horizontally, much more than Holly, covering more ground, but it is better adapted for a wide hedge than for forming a narrow

screen. If ever it is allowed to get too large, and has to be cut hard back into the strong wood, it is liable to die; consequently, wherever Yew is used it should never be allowed to increase much yearly. Where a high screen is required, or shelter hedges for nursery stock in exposed situations, Beech is often used, and is very effectual from its disposition, when kept cut, to retain its old leaves through the winter. This latter disposition is an objection near dressed ground in a private establishment, owing to the litter it makes in spring. The old variety of Privet used to be often mixed with Beech in planting; the Beech giving strength to the weak-growing Privet. For a screen fence in a garden, where small expense, combined with speedy effect is a consideration, nothing surpasses the new oval-leaved Privet. This is an exceedingly vigorous-growing plant, strong enough for a fence without mixing with Thorn, Beech, or any other plant to give it support. On good well-prepared soil, it is a most rapid grower, making shoots almost as thick as the little finger, 3 feet long. I have a screen fence of it, planted four years ago, now 6 feet 6 inches high, densely feathered down to the ground, and it is as large and perfect in every respect as can be desired. *Arbor-vitæ*, both the American and the Chinese varieties, are sometimes used for screen hedges; the latter is much the best, being neat in appearance. Where immediate effect is required, it can be had at once by the use of these plants, but where anything more than a mere screen is required they are useless, as their weak upright habit of growth renders them of no use as protecting fences; they can be pushed aside, and walked through at pleasure. The Irish Yew makes a nice screen, costs much more than the *Arbor-vitæ*, but it is superior in appearance. Where this plant is used, care should be taken to select those that have been confined to one leading shoot, as, if left to itself, it forms a number of leaders of equal strength, and, when the plant gets large, it is liable to be split in all directions by the wind or heavy snow-storms. Where a more compact hedge is wanted for a break not too high, the Rose is a most suitable plant, and not near so much used as it deserves to be. The bluish and crimson Chinese make a beautiful light hedge, and are lovely when in flower. Very severe frosts are liable to kill them down to the ground, but they push up again from below the surface quickly, almost re-establishing themselves in a season. Any of the strong-growing perennials are even more suitable for this purpose than the Roses. I could not imagine a more beautiful sight than a hedge of Glory of Waltham laden with its magnificent crimson flowers.

Planting and Management of Thorn Hedges.

For orchards, vegetable ground, or anything connected with the garden, requiring a cattle-proof fence, there is nothing equal to Chinese Quick, and in such situations it is worth while to bestow a little extra labour on the preparation and planting, so as to obtain a fence that will be a protection in every sense of the word. With a thorough preparation of the ground, and good Quick, well planted at the proper season, and well cared for afterwards, in a few years a fence will be in existence more formidable to either biped or quadruped than any ordinary wall. Let us first consider the nature of the plant of which we are treating. First, it must have a dry bed in which to grow; it is perfectly useless to plant it where there is anything approaching stagnant water in the soil; consequently, if the land is not dry enough, it must be made so, either by an open ditch or covered drain. Next, it is a plant that will bear any reasonable quantity of manure. If the soil is shallow and wet, I should recommend a ditch to be formed on the outside of the hedge. It should be made 3 feet wide, sloped out to nothing, and 1 foot deep at the side next the hedge; the soil taken out goes to raise the bed on which the hedge is planted, elevating it in a way that precludes its suffering from stagnant water. The ground should be trenched 18 inches deep, and 4 feet wide, with 6 inches of rotten dung well worked into it; this work should be done in autumn, if possible, before the land gets saturated with rain; it will thus be in a much better state for planting than if deferred until late in the winter. Planting should never be delayed, as is often done, until the buds have begun to swell; the sooner after Christmas it is completed the better. In selecting Quick, mere size should never be the first consideration; on the contrary, choose robust stocky plants, that have been twice transplanted, and the last time not too long before the final planting. Large old Quicks, that have stood for years without being moved, are all very well to tempt the inexperienced planter, but he afterwards finds out that they are some time before they make much progress, smaller plants, in proper condition for planting, far outstripping them. For such situations as those under consideration, I should recommend a double row of Quick, 1 foot apart in the row, and a similar distance betwixt the rows. In planting, angle the plants thus The practice of heading down to about 6 inches from the collar, at the time of planting, is still carried out by some, but it is a bad practice; plants so treated make wretched growth the first year, and correspondingly little root progress, to enable them to make more than half the

growth they should do even the second year. Heading the plants down to within 6 inches of the ground is a most essential operation, but they should never be so treated until they have had a year's growth after planting, and then it should be done in the winter, before the buds begin to push, using a good sharp pruning-knife for the purpose, always cutting upwards, so as to leave the stools smooth and clean. This cutting back is to cause each plant to break a number of shoots, instead of running away with one leader, leaving the hedge thin at the bottom. To the non-initiated it often seems a pity to cut them back in this way, and appears a waste of time; but the omission is fatal to the hedge ever acquiring the first essential—a thick close bottom. When headed down as described, this double-row fence will break back so thickly as to be almost fowl-proof, and, by the autumn of the second year after planting, will be at least half a season's growth ahead of the fence that was beheaded at the time of planting. In the autumn of the second season after planting, any time after the leaves have fallen, the growth should be cut back to within a foot of where they were headed back to the previous winter, always using the switch-hook in preference to the shears. If all goes on well, the fence will each season make rapid progress, branching out and getting strong. Every autumn go over it with the hook, cutting back to within a foot of the preceding year's cutting, always preserving the hedge widest at the bottom, gradually tapering up to a point at the top. No other form of cutting will keep a fence full and thick at the bottom, which this does by counteracting the natural tendency of the plants to run too much to a head. Local circumstances will regulate the height. A 6-foot fence for such situations as those under consideration is a good height; but there is no objection to one even higher than this. But it must be borne in mind that, the higher the fence is allowed to grow, the wider it must be at the bottom; otherwise it will there get weak and thin. A hedge 7 feet high must not be under 4 feet 3 inches wide at the base. When full size has been attained, it must, at every pruning, be cut right back as near as possible to where the hook went at the preceding cutting; otherwise it will soon get too large, which would require its being cut back into the old wood, giving it for some time an unsightly appearance. I have, as yet, said nothing about the usual paling to protect the young growing fence from cattle. When it is situated where it will be liable to injury from this cause, the paling must be put up before the Quicks are planted. One of the principal things to be kept in view is to get the young hedge on so that it will be a sufficient fence before the paling is worn out and requires renewal. Neither have I alluded to the all-important matter of keeping the young Quicks perfectly free from weeds, especially during the first two years; but, where this is not attended to, it is useless to expect them to thrive. If, after the second year, the hedge does not make satisfactory progress, being at all weak, in spring, before growth commences, give it a good top-dressing of farm-yard manure; this, unless there is something wrong in the soil, through its being too wet, or other local cause, will push it on.

Renewing Worn-out Hedges.

We often hear it said that Quicks will not grow in the same soil from which an old hedge has been removed; and, if the old hedge has simply been grubbed up, and the young Quicks planted without further preparation, it will certainly not thrive any more than any other crop would under such conditions. No, when an old hedge is removed, it must be done thoroughly, not leaving quantities of old roots in the soil to decay and breed *Fungus* to attack the roots of the newly-planted fence. The ground must be properly trenched, working into it plenty of manure as far as the roots of the new Quicks are likely for some time to extend. Select, plant, and, above all, keep the young fence perfectly clean from weeds, and mulch the surface with a little manure every spring, until the hedge gets up. In short, give it similar attention, with a little more manure than would be considered necessary for any fence newly planted, where none other had previously existed; and there need be no misgivings as to the result. This re-planting exactly on ground previously occupied by old hedges more particularly applies to boundary fences, where there can be little or no deviation from the old line. Where divisional fences are worn out, it is often practicable to prepare for and plant the new fence on the opposite side of the ditch, or even further to deviate from the old line, which frequently presents other advantages, in addition to new soil for the Quicks. We frequently hear it said that this making new fences, with the railing required to protect them until grown to the required size, is an expensive job. True, it is; but where hedges that cannot be altogether dispensed with are worn out, there is no resource but either to keep on expending labour and material in a way that produces the most unsatisfactory results, or set to work and do the thing in the way that will be the cheapest and most satisfactory in the long run.

Mention was made in THE GARDEN last week of tan being employed for mulching newly-planted Quicks in Holstein. In the north of

England this is often done. It effectually prevents the growth of annual weeds without injuring the Thorns, unless put on too thickly; about 2 inches is the proper quantity to use, and a second application is necessary the second year.—*Field*.

THE HOUSEHOLD.

B R E A D.

The ultimate chemical composition of English bread, made from good seconds flour, is, besides oxygen and hydrogen, per cent.:—C, 28.5; N, 1.29. The proximate elements in 100 parts are:—Water, 37; albuminous and allied substances, 8.1; starch, 47.4; sugar, 3.6; fat, 1.6; salts, 2.3. The quantity of nitrogen and carbon in 1 lb. of bread, baked in the ordinary English manner, is 92 and 1,968 grains. The time required for the digestion of bread is 3½ to 4 hours. Ten grains of dryish bread, when burnt in the body, produce sufficient heat to raise 5.52 lbs. of water 1° F., which is equal to lifting 1,263 lbs. 1 foot high. The effect of eating 4 oz. of white home-made wheaten bread was to give maxima of increase in the quantity of carbonic acid evolved of 1.48 grain and 2.4 grains per minute on different persons. The quantity of air inspired was increased by 60 cubic inches per minute. The influence was very enduring. The law of this country inflicts penalties for the adulteration of bread, and prescribes that when ordinary bread is sold over the counter it shall be sold by weight, so that a quarter loaf shall weigh 4 lbs, and half a quarter loaf 2 lbs.; and the price of the loaf varies only with the price of flour. This subject has always attracted the attention of Governments, so that in the reign of Edward IV. we find it stated that the Lord Mayor "did sharpe correction upon bakers for making bread otherwise than of floure, and light of weight, and caused divers of them to be put in the pillory." At a later period the assize of bread by the Court of Mayor and Aldermen of London prescribed the weight and price of bread, as shown in the following precept, copied from a bill of mortality, No. 28, London, Tuesday, the 27th day of June, 1775:—

"WILKES, Mayor.

The Assize of Bread, set forth this 13th day of June, 1775, by order of the Court of Mayor and Aldermen of the said city, to commence and take place on Thursday next, and to be observed and kept until the further order of the Lord Mayor of the said city, or the said Court of Mayor and Aldermen, by all persons who shall make, or bake for sale, any bread within the jurisdiction of the said Court of Mayor and Aldermen, that is to say,

	lb. oz. dr.	
The penny loaf, or two half-penny loaves, to weigh.....	{ Wheaten 0 8 11	
	{ Household ... 0 11 9	
The two-penny loaf	{ Wheaten 1 1 6	
	{ Household 1 7 3	
The three-penny loaf.....	{ Wheaten 1 10 1	
	{ Household... 2 2 12	

"To be sold for—

	lb. oz. dr.	s. d. f.	
The peck loaf, to weigh }	17 6 0	{ Wheaten 2 8 0	
		{ Household 2 0 0	
The half-peck loaf ... }	8 11 0	{ Wheaten 1 4 0	
		{ Household 1 0 0	
The quarter loaf ... }	4 5 8	{ Wheaten 0 8 0	
		{ Household 0 6 0	

"NOTE.—All loaves, if complained of, must be weighed before a magistrate within twenty-four hours after baking, or exposing thereof to sale, and must be according to the respective weights in the above table. Sixteen drachms make an ounce, and sixteen ounces a pound.

"ITEM.—It is hereby ordered and appointed that no person within the jurisdiction aforesaid shall, after Wednesday next, until the further order of the Lord Mayor, or of the said Court of Mayor and Aldermen, make, or bake for sale, or sell, or expose to or for sale within the jurisdiction aforesaid, any half-quarter loaves. And the better to distinguish and ascertain the two sorts of bread hereby ordered to be made, one from the other, there is to be imprinted and marked on every loaf of bread which shall be made, sold, carried out, or exposed to or for sale within the jurisdiction aforesaid as wheaten bread, a large Roman W; and on every loaf of bread which shall be made, sold, carried out, or exposed to or for sale within the jurisdiction aforesaid, as household bread, a large Roman H. And the penalty for every omission is twenty shillings. R. I. X.

"The price of salt, set by order of the Court of Lord Mayor and Aldermen, dated the 21st of October, 1735, is five shillings the bushel, 56 lbs. to the bushel, and so in proportion for any lesser quantity; and whoever shall sell at a higher price, or shall refuse to sell at the price aforesaid, forfeits five pounds."—*Dr. Smith on Foods*.

WORK FOR THE WEEK.

PRIVATE GARDENS.

Conservatories.—Between forced plants and such as bloom naturally at this season, conservatories are now well furnished with flowers. In addition to Hyacinths and other bulbous plants, these also contain blooming plants of Camellias, Azaleas, Chinese Primroses, Cinerarias, Salvias, some Zonal Pelargoniums, Daphnes of different kinds, Cytisus, Zieria Smithii, several Acacias, Heaths, Epacris, Boronia serrulata, Libonia floribunda, Tremandra verticillata, Correa cardinalis and Brilliant, Monochaetum sericeum multiflorum and ensiferum, Lachenalias, Roella ciliata, Oldenburgia Depiana, Pyrethrum uliginosum, Leneopogon lanceolatus, and Lenculia gratissima. Amongst climbing plants, Hibbertias, Kennedias, Hardenbergias, Brachysemas, &c., are now coming beautifully into flower. Amongst dwarf climbers, nothing is prettier at present than nice plants of Myrsiphyllum asparagoides, loaded as they are with a profusion of little reflexed white flowers, having orange-coloured conspicuous anthers. This is a plant that may be readily raised from seeds sown in a hot-bed, pricked or potted off singly when up, and kept growing in moderate heat or in a cool house; either will do, only when a little warmth is employed good plants are sooner obtained than by cool treatment. Pot such roots as remain of Primula cortusoides in a compost of good loam two parts and leaf-mould one part, with a little sand. Those previously potted and beginning to grow, keep on a shelf as near the glass as possible. Give a final shift to herbaceous Calceolarias, and also to some of the shrubby ones intended for conservatory decoration. Cinerarias required for late blooming should have plenty of root-room and water, and be kept in a cool, airy house. The least confinement of the roots is sure to cause the plants to flower prematurely. A few Balsams and Cockscombs for early flowering should be sown in a hot-bed, and pricked off before they become spindly. Of Amaranthus salicifolius a few seeds should likewise be sown for conservatory ornamentation, as well as for flower-garden decoration. To succulents starting into growth water should occasionally be given, so as to keep the soil moderately and uniformly moist. The general potting of greenhouse plants should now be proceeded with. Begin with those that have commenced to grow, and which are most forward, having the ball moderately dry, and the soil used in potting in a similar condition. Do not give water after potting to such plants as have been at rest or kept comparatively dry during the winter, until they show that they need it. From Cinerarias, Calceolarias, &c., water must not, however, be withheld. In potting, make the new soil as firm as the old, otherwise it only forms a channel for the water to run through without penetrating the old soil, thus greatly impairing the health of the plants.

Indoor Fruit and Forcing Department.—For Pines, prepare a good stock for potting, and lay it under cover for some time prior to using it. Water the plants but sparingly, avoiding too much drought, or, on the other hand, a soddened condition of the soil. For stock plants a night temperature of 70° and a bottom-heat of 80°; 10° lower temperature will be quite enough for succession plants, which should not be excited till the end of the month. No Vines should be allowed to carry any of last year's fruit till now, and, if any bunches are still hanging on them, they should be cut off at once, with pieces of the wood attached to them, inserted in bottles of water, and kept in the fruit-room; this allows the Vines to be properly pruned, and to be got in readiness for starting into growth at any time when required. Give some manure-water to pot Vines that are swelling fruit, and keep them in a brisk moist temperature; 65°, with a dry atmosphere and a little air, are necessary for such as are in bloom. Syringe daily Peaches and Neetaries that have set their fruit, and attend to disbudbing and watering, whether the plants are in pots or borders. Keep Figs in pots in a bottom-heat of from 75° to 80°; if maintained by means of fermenting material so much the better. Syringe daily, and supply water moderately. Keep those for late work in sheds or turned on their sides under stages, quite dry. Prepare hot-beds for Cucumbers, placing a little mound of good soil in the middle of the bed over the manure, and letting it rise to within 6 inches of the glass; one mound under each light is sufficient; shift seedling Cucumbers into larger pots, and a day or two afterwards pinch out the top of the leading shoot. Maintain a night temperature of 70° both in pits and frames, both for Cucumbers and newly-planted-out Melons. Keep up a succession of Strawberry plants; early Peach-houses or Vineries will be good positions for the earliest batch; succession fruit-houses for the next earliest crop, and frames for a late supply. Mushroom-beds, if at a temperature of 60°, may now be spawned. Continue the forcing of Asparagus, Seakale, and salading. Sow some seeds of vegetables for very early crops on slight hot-beds.

Kitchen Garden.—Continue to get into moderate heat in suc-

cession, strong plants of Asparagus; let the bottom-heat be moderate and genial, in order to give it plenty of time to put forth strong robust buds and shoots. Regulate the interior of the frame or pit by methodical airing. If the Asparagus is intended to be of a good flavour and eatable, allow it to colour well, by means of sun and air. Cover the roots lightly at first, then put on three or four inches of well-decayed tan, leaf-mould, or light earth. Water early in the afternoon with tepid water, and shut up and keep the frames dark by litter and mats if intended to be bleached white. No glass need be used; shutters will do for cover, or it may be placed in a cellar or Mushroom-shed. Keep a sharp eye on Broccoli that is coming on, and protect against frost by doubling the leaves down. Put a wisp of short straw over the heads. Of Broad Beans plant this month a full general crop, such as Dwarf Gem, Marshall's Dwarf, Early Long-pod, Broad Windsor, or any other good variety. Surface-stir on fine days, and dredge with dry dust against severe frosty nights. Those raised in frames and houses may be hardened off and transplanted in warm borders. Draw some earth to those above ground. Surface-stir and make up all gaps and deficiencies amongst Cabbages. Make another planting from reserved transplanted beds, and sow a small quantity in pans or on a warm border. Prick out those sown last month into shallow boxes as soon as they can be handled. Place in shelter, harden off gradually, and prick on warm borders as soon as the season permits. For real usefulness, the small sweet kinds are the most profitable and best appreciated; large, coarse kinds being only fit for cattle. Sow some Red Cabbage towards the end of the month. Sow small portions of Cauliflowers in succession, prick out those up in boxes and pans, and surface-stir. Plant out now some of the strongest autumn-sown plants that have been nursed and hardened in pots or frames on to warm borders. Surface-stir, clear dead leaves, and harden off succession plants. Those nursed under hand-lights, encourage by surface-stirrings, drawing up all round a little earth in order to raise the glasses and form a basin in the centre for the application of manure-water. Early varieties of Carrots, such as Horn and Dutch, sow on well-prepared, healthy, warm borders, in drills; and drill Radishes thinly between them for the last time this season. Shelter with straw or evergreen boughs for a time. Choose dry weather for applying earth to bleach late crops of Celery. Sow a pinch in gentle heat, and prick out early, into shallow boxes or pans, that sown last month to grow on in succession in frames, for early spring use. Sow Capsicums and Chillies in strong heat, and prick off as soon as up, an inch apart, in pots. Chervil.—Sow curled sort in small quantities in warm corners. Chives.—Divide the roots, and transplant them, about 9 inches apart. Lettuce.—Make good all winter crop blanks, and plant out in succession strong plants. Prick off and protect with dry dust small seedlings. Sow in gentle heat, and put a pinch on a healthy warm border, of summer Cos and Cabbage kinds. Beware of birds and mice. Dill and Fennel.—Sow some seeds of these towards the end of the month. Onions.—Transplant the autumn-sown on well-prepared ground, a foot apart, row from row, and 6 inches in the row, in order to have every other one pulled for early use. Sow in a box or frame, on a slight heat, Spanish, Tripoli, or any favourite variety, in order to have strong plants ready to put out the end of March or beginning of April. Sow thickly on a warm border and protect with a little straw the two-bladed union, for early drawing and "bulbing;" what is left will be of a beautiful size, shape, and colour for pickling. Plant out Potato Onions on firm ground; if on loose soil they are apt to canker, mildew, and rot. This also holds good in the case of Shallots, which should now, also, be planted above ground, that is, just pressed into firm soil. Garlic, also, plant now. Remove all old-keeping Onions into the coldest, draughty, dry place that can be found, in order to subdue growth and prevent exhaustion. Potatoes now growing in pits, frames, or houses, under hoops, or other shelter, should have plenty of air to maintain sturdiness. Surface-stir those lately planted. Earth with moderately moist, lightish, healthy soil. Be careful about the application of water; never apply it overhead, but only to the soil. Never water early Potatoes in the afternoon and shut them up directly, except you wish to produce disease, if, by any accident, they are caught in a shower when exposed to the air, leave them night air on and a space back and front of the lights for the moisture to have room to evaporate without settling on the foliage. A full crop of Potatoes should now be planted. Let them consist of early and middle early kinds, which have a better chance of escaping disease than late sorts. Sow some Tomatoes on hot-beds, or propagate them by means of cuttings; prick out, pot off into stiffish poor soil, and harden off in due season, those intended for out-of-doors. Sow the best curled Parsley in drills, 1 foot apart. Weed out, from old beds or rows intended for seed, every plant that is not fully up to the mark as regards curled quality. Sow now some of the best varieties of Peas of second crop kinds, both dwarf and tall, such as Advancer, Auvergne, Green

Marrow, Climax, Harrison's Glory, Perfection, Napoleon, Noupareil, Veitch's Perfection, Champion of England, the Prince, &c. Shelter with sticks and a few green boughs in the cold windward side, and dredge with dry dust, on dry evenings, against frost, those now up and growing. Peas should now be sown on open quarters, 10, 12, or 14 feet apart, thus inducing them to produce as much again as thickly-sown crops. Planted or sown between the rows may be drills of early Turnips, Spinach, and Radishes, spring-sown young Cabbage, Cauliflowers, early Potatoes, &c., all of which will be off and out of the way by midsummer, or sooner, rendering the ground available for Celery. After the Peas are cleared off, the space will be available for successions of Lettuce and Endive, young Coleworts, &c., all of which will be again off before the soil is required for earthing the Celery. Sow the first portion of Brussels Sprouts, Borecole, Buda Kale, after the middle of the month, in order to have some strong plants, fit to produce a heavy autumn and winter crop. Early varieties of Turnips, such as American Pink, Stone, Dutch, &c., should now be sown on well-prepared warm borders. Sow Spinach in single drills between Peas, and stir the surface soil about winter Spinach, which must be kept in a growing condition.

Specimen and Exhibition Plants.—Large Heaths, Chorozemas, Boronias, Dracophyllums, Genetyllises, Aphelandras, and similar plants should now be staked and tied into such shapes as it may be desired they should assume. A position near the glass is best, and especially one in which all sides of the plants may be subjected to an equal degree of light. In training plants of Dracophyllum, unless the long shoots are twined round the base of the plant, and only the points of last year's shoots allowed to grow upwards, a symmetrical or handsomely-grown specimen cannot be obtained. Many train the old wood of these plants over a trellis and allow the blooming points to project outwards a little, but the result of such a method is not satisfactory. From specimen Heaths, whose roots were reduced last summer when re-potted, no flowers can be expected during the ensuing summer, and any blossoms that do appear should be removed so as to promote free growth. Heaths, whose roots are so reduced, generally take two years to recover their former vigour, but, the second year after the operation, if they have been judiciously treated, a magnificent amount of bloom may be expected. Show and fancy Pelargoniums keep in a cool well-aired house and in close proximity to the glass. If the stages do not permit of them being near enough to the glass, raise them upon inverted pots, blocks of wood, bricks, &c. Although wirework for training purposes was refixed when the plants were cut back, no attempt should be made to tie down any of the shoots yet; on the contrary, a slow and stocky growth should be encouraged, which is the most productive of flowers; no fire-heat should, therefore, be employed for these plants in winter beyond what is necessary to expel frost. If required for early shows, a little fire-heat may be applied after February. Allamandas may be re-potted, cut well back, and allowed to break freely; they should be kept moderately dry for a time. Dipladenias will now be producing their young wood, which should be trained to fine string run across the rafters inside the stove. If the pots in which they grow are plunged, or even partially so, in a moderate bottom-heat, it greatly assists their growth; and, if the wood is produced early without check, and by free exposure to light, made firm, abundance of flowers will, doubtless, be the result. If not already done bring down the shoots of Clerodendron Balfourii and splendens, and train them around the trellises fixed on the pots. As Clerodendrons produce their flowers from the old wood, none of it should be removed at present; but, after they have done blooming, they may be pruned, re-potted, and encouraged by bottom-heat and a high temperature, to produce their young growths, which should be trained along the inside of the glass on threads, as recommended for Dipladenias, with the exception of the difference of season, viz., Dipladenias from the middle of January until they begin to come into bloom, and Clerodendrons from the time they have done blooming until they form and thoroughly mature their young shoots, which will be the blooming ones of next season. Stephanotis may now be unfastened from the cords on which they have been supported and trained around their trellises; if required early, raise the temperature of the house, or transfer the specimens to a warm moist stove. A too high temperature in winter is, however, more injurious than beneficial, as it deprives them of their proper rest; but it must not be allowed to fall under 55°.

The Journal of the Society of Arts says: It may be new to most readers that a bronze halfpenny is exactly an inch broad, and therefore gives us a very convenient measure. Laid on an Ordnance map of the inch scale the halfpenny covers just 500 acres. Now, also, that the third of an ounce is a postal unit, it is well to remember, that a penny is precisely that weight.

THE GARDEN.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

BIRDS IN GARDENS.

By T. BAINES, Southgate.

THOSE who recommend the indiscriminate destruction of small birds can never have taken the trouble to study the habits of the different species that inhabit our island—a difference, so far as the gardener is concerned, that is not always determinable by the individual species of bird, for some will attack particular crops in one part of the kingdom that escape injury in others. There is, also, a difference in the stage of growth in which a particular crop may be when it is attacked by some species of birds in different localities. Sparrows, for instance, in some parts of the country, begin their work of destruction upon Peas the moment they appear above ground, nipping the points of the shoots; but, if kept from them until the Peas get fairly above ground, no further molestation will be experienced until the crop is ready for gathering; in other places, they never cease their attacks from the time the Peas are up until they are removed from the ground. Here, with us, they keep at them all through the season, nipping out the leading points, and, as soon as the flowers are formed, picking them out from the leaves with which they are enclosed; and, if means were not taken to prevent them, we should never have a Pea to gather. In the Cheshire market-gardens, and in the neighbourhood of Manchester, they will frequently make an attack on the Onion crop as soon as it appears above ground, pulling the young plants up, simply through, to all appearance, a disposition to do mischief, for they leave the young plant, seed and all, lying on the ground entire, while in no other part of the country have I seen them molest Onions. Here, winter Lettuces are often attacked about the beginning of March, and, if not made unpalatable by a dressing of soot, they destroy the whole crop. Crocuses they never allow to open, as they attack the flowers as soon as they show colour, pulling the petals to pieces so as to get at the pollen, for which they seem to have a particular liking. Gooseberry and Currant buds suffer as much in this neighbourhood from sparrows as they do in some localities from bullfinches. Cotton, such as is used for dip-candlewicks, unravelled out singly, and strung loosely so as to be moved by the wind over anything they molest, I have always found sufficient to scarce them off; even after the Peas are sticked, I find it necessary to use this. Chaffinches and greenfinches take indiscriminately the seeds of all the Brassica family. At one time I used netting to protect these seeds until they were sufficiently large to be out of danger, but it is a troublesome job, as nothing you can do will deter them, and, if there is a possibility of getting under the net or through it, you generally have the mortification of seeing your young crop destroyed. I have, for a good many years, coated the whole of the seeds of this description with red lead, and never since have I lost a crop. I have heard, however, that some, who have tried this, have found it to be ineffectual, but I suspect that the lead was not properly applied. The seed should be damped, but not made too wet, and thoroughly coated with dry powdered lead, which should be allowed to dry on before the seed is sown, when it will stick so fast that, if any of the seed lies on the surface of the ground, the rain will not wash it off. In this matter of small birds, gardeners are placed in a somewhat difficult position. Taken as a class, I maintain that they are about the last who would be guilty of wanton cruelty; neither are they devoid of a correct knowledge as to the whole or partial uses of some species of the feathered race in the garden, as some writers have insinuated. If a gardener admits that he destroys sparrows and finches, or kills a few blackbirds or other songsters, when swarming by hundreds upon fruit crops, for the saving of which he is held responsible, he is denounced as a monster, who has not the common sense to distinguish between his friends and

his foes. Those who decry the destruction of all birds, on the score that every species does more good than harm in a garden, very much weaken their case by the misstatements they make. They tell us that the fruit-buds attacked by the birds contained the larvæ of insects, which would have destroyed the whole crop had it not been for the birds. I have frequently proved the fallacy of this, by netting the half of a tree and leaving the other half unprotected; the difference being that, in the case of bush Currants and Gooseberries so treated, the protected halves of the trees bore full crops, whilst, on the portions left unprotected, there was not half a dozen fruit. We are also told of the thousands of aphides that sparrows destroy, and of the condition in which our bush fruits would be were it not for them. I am aware that sparrows will sometimes eat a few aphides, and so will a dog eat grass; but I never heard of any one's hay-rick being smaller for the quantity of grass his dogs eat, no matter how many he kept; and the quantity of aphides that sparrows will eat stands in about the same proportion. If there is any time in which these birds will destroy insects, it is when feeding their young. I have frequently killed and opened the crops of young sparrows at different ages before they left the nest; but I never found a single aphid in them. Their food is generally made up of small green seeds, the young leaves of Peas, and soft broken corn that had unmistakably passed through the stomach of horses. I have also confined sparrows and finches in a room, leaving them small caterpillars and aphides, but nothing in the shape of corn or seed, and they never touched a single grub; and, at the end of twenty-four hours, the aphides remained on the Currant-leaves as they were put in. I removed these and substituted some corn, which they devoured as soon as left to themselves. Hard-billed birds will no more subsist upon insects, than soft-billed birds will live upon grain. The Act for the Preservation of Small Birds bore evidence of ignorance on the subject on the part of those who drew it up; they managed to leave unprotected some of the most harmless, as well as most useful, of all birds that we possess. The house sparrow and the finches, are all but an unmixed evil in gardens; all the small soft-billed birds should be encouraged as much as possible, the larger species—blackbirds and thrushes—notwithstanding the quantities of snails, and other pests, they destroy, require to be kept within reasonable limits, or the production of fruit, where it is required in quantities, without incurring expense in nets, and other protecting material, equal to the value of the fruit, is an impossibility. Those who advocate the protection of all small birds forget that kestrels, merlins, sparrow-hawks, jays, and magpies—Nature's instruments for maintaining the wanted balance in the smaller feathered tribes—are all but exterminated; hence, the necessity for reasonable reduction in their numbers by other means.

Mutilation of a Favourite Myrtle.—It is not often the judge of a small debt court has to assert a sentimental grievance. Less seldom does he allow any but purely commercial considerations to influence his decision. A case, however, came before Sheriff Hallard, of Edinburgh, a day or two ago, in which he allowed costs to one of the parties to a suit by way of *solatium* for wounded feelings. Nearly fifty years ago a sprig of Myrtle selected from a bridal bouquet was planted in the garden of a house in Duncan Street, Newington. In time, the house and "pertinents thereto belonging," became the property of the bride's daughter, by whom they were let to a clergyman named Wemyss. Before entering into possession, Mr. Wemyss was strictly enjoined not to harm the Myrtle, now become a stately plant. But the reverend gentleman, finding it interfered with other plants in the conservatory, which had been erected for its own special protection, ruthlessly pruned and mutilated it. Thereupon he had to answer an action against him for £10. In court it was proved by a competent person that the intrinsic worth of the tree was £2 10s., and the sheriff was thus called on to decide between the sentimental and botanical side of the dispute. This difficult task was performed with satisfaction to all concerned, except, perhaps, to the defendant. Declaring his opinion that, "in the rough alembic of lawyers, feelings which went in at one side came out at the other in pounds, shillings, and pence," he allowed the plaintiff £5 5s., with £2 2s. as costs and the ordinary court expenses. We are happy to learn from a local journal that the Myrtle itself has not been "irretrievably damaged." There is now hope that the reverend woodman will spare the tree for the future.

NOTES OF THE WEEK.

— MR. MARNOCK has been consulted by the corporation of Sheffield as to the laying out of the park given to that town by the late Miss Harrison. Mr. Marnock, it will be remembered by many, formed the Botanic Gardens in Sheffield many years ago, and it is, like the garden in the Regent's Park, very tastefully laid out.

— THERE are now in bloom in Mr. Barr's bulb grounds *Galanthus plicatus* and *G. Imperati*, the latter a great advance on *plicatus*. It has the same broad foliage as that *Snowdrop*, but the flowers are twice as large as those of *plicatus*. It may, therefore, be imagined what a gain it will prove for our gardens.

— FOR the last five or six years, the Society of Industrial Sciences at Lyons have been carefully investigating the capabilities of the common Broom (*Sarothamnus scoparius*) as a textile plant. From a recent report, we learn that the fibre makes an excellent coarse cloth, suitable for domestic purposes, and especially as a packing material, and that a more elaborate preparation of it yields a material not inferior to the best Hemp in strength and fineness.

— MESSRS. SUTTON & SONS, of Reading, have just issued a "Geological Map of England and Wales, whereby a farmer, or landowner, may be enabled to ascertain the geological strata in which his farm is situate." The map, of which we have received a copy, appears to be very carefully projected, and is presented to purchasers of Messrs. Suttons' "Farmer's Year Book and Grazier's Manual." It will, also, doubtless, prove useful to gardeners.

— THE recently appointed Committee on Planting and Decorating the Grounds for the Great Centennial Exhibition, at Philadelphia, is composed of the following well-known and perfectly competent members:—Wm. Saunders, R. M. Copeland, Frederick Law Olmsted, Josiah Hoopes, and Charles U. Miller. From what we saw of the work of some of these gentlemen in American parks and public gardens, we look forward to something very good, indeed, at Philadelphia in 1876.

— AS an instance of "dichroism," or diversity of colour in the flowers of the same plant, M. Carrière mentions a case which has recently come under his observation. For some years past he has grown some specimens of *Gynierum elegans*, of the variety which bears broad loose panicles, and which he has characterised by the popular name of "Chapeau chinois," or the "Chinaman's Hat." Hitherto, these have always borne their customary bright yellow silken panicles; but, last year, M. Carrière was surprised to observe that one of the plants bore two panicles, one of which was of the usual yellow colour, while the other was rose-coloured. M. Carrière's long experience does not supply him with a solution of this anomaly, an explanation of which he asks for by a laconic "Why?"

— SPEAKING of the Royal Horticultural Gardens, at South Kensington, the London Correspondent of the *Manchester Guardian* says the ticket-holders are nursing their wrath at the prospect of another year's overflow into their sacred precincts of the visitors of the International Exhibition, which has now taken root as a London perennial. The gardens, as such, are a very dismal failure, it must be confessed. The *coup d'œil* is that of a cemetery vainly trying to look cheerful. Stained brickwork, masonry, and stucco-tazzas reign supreme; turf, shrubs, and flowers are at the most genial season quite subordinate features; but it is a safe and convenient place for the subscribers' children, with their *bonnes* and governesses. To still the contention, some say, "Try a friendly Chancery suit." Others say, "Look at the great Alabama case; try arbitration." So the matter stands.

— AT a meeting, the other day, of the Leeds Town Council, Mr. Alderman Shepherd moved—"That the council award the premiums for designs for laying out Roundhay Park estate as follows:—1st prize, 200 guineas, Mr. G. Corson, architect, Leeds; 2nd, 100 guineas, Messrs. G. Hornblower & Son, Liverpool; 3rd, 50 guineas, Messrs. Perkin & Sons, Leeds." Mr. Alderman Kelsall seconded the motion, which was adopted. Mr. Alderman Shepherd then moved the confirmation of the minutes of the corporate property committee. Mr. Smith, however, objected to their confirmation. He declared that the purchase of the park was a mistake, and that a great deal too much money had already been spent upon it. He was satisfied that if the purchase of the park estate were proposed now—when the people had come to their senses—it would not be agreed to. As much money had been thrown away on the park as would buy four recreation grounds in various parts of the borough.—(A voice: Ten.)—Mr. Scarr also opposed the confirmation of the proceedings of the committee, on the ground that he disapproved altogether of the principle of obtaining prize plans for the laying out of the park. After some further discussion, the resolution was carried. It was stated in the course of the discussion that to carry out Mr. Corson's plan would render necessary an expenditure of £30,699 for roads and paths inside the park, and

£36,829 for roads and sewerage works outside the park, a total of £67,528.

— IN the month of January, 1873, the value of Potatoes imported was £282,303, and in the same month this year only £83,329.

— ON the night of the 10th-11th of February, the thermometer at Berne fell to 8 degrees below zero of Fahrenheit.

— WE are to have a Japanese garden at Alexandra Park. Some Japanese workmen are already employed in erecting the houses.

— MR. BURBIDGE's book on cool Orchids has just been published by Mr. Hardwicke; it is likely to prove very useful to cultivators of this beautiful class of plants, and is embellished by four coloured plates and a number of useful wood engravings.

— UPWARDS of 3,000 dozen of Broccoli are weekly consigned from Cornwall to the London markets for sale, and, during the last four months, it is computed that 50,000 dozen heads of Cornish Broccoli have been received, sold, and consumed in the metropolis as Cauliflower.

— THE *Irish Gardeners' Record*, which seems growing in interest and prosperity, appears in a much better dress this week than usual, and it is printed from new and excellent type. A country so well adapted for gardening as Ireland is can scarcely fail to benefit by a journal specially devoted to this and allied subjects.

— AT the approaching great International Horticultural Exhibition, which will be held at Florence from the 11th to the 25th of next May, a novelty will be introduced in the offering of six prizes for the most artistic and faithful representations of flowers, fruits, and plants, executed in (1) pencil-drawing, (2) photographs, (3) water-colours, (4) chromolithographs, (5) painting in distemper, and (6) oil-painting.

— UNDER the name of "*Jaquinia smaragdina*," M. André describes, in a recent number of the *Illustration Horticole*, a plant grown in M. Linden's nursery at Brussels, with blackish-green foliage, and large, handsome, emerald-green, rosaceous flowers. M. André speaks of it as a most effective plant, possessing a more modest beauty than even that of the Violet ("*une beauté plus modeste encore que celle de la Violette*").

— WE have received from Mr. Wortham, of Cannes, a photograph of *Chamaerops excelsa*, which shows how well the climate of that part of France suits this Palm tree. It is about twenty years of age; its height to the extreme ends of the leaves is 12 feet 10 inches; circumference of trunk, 2 feet 8 inches; and the number of seeds which it produces annually is about 25,000. This Palm grows out of doors in this country, even as far north as York, but we have never heard of its bearing seeds in England.

— AT a sale of Orchids, which took place at Stevens' the other day, lots of the rare and beautiful *Dendrobium Jamesianum*, each consisting of two strong plants, fetched from 20s. to 50s. per lot. *Ceologyne Reichenbachiana*, described as decidedly the best of the *Pleione* group of that genus, realised from 10s. to 20s. a plant, while lots of three and four bulbs of *Odontoglossum Roezlii* fetched from two to five guineas each. Altogether the sale, which was a somewhat miscellaneous one, realised about £700 for 502 lots.

— M. GODRON, Professor of Botany at Nancy, has recently published a pamphlet "On the Origin of our Cultivated Pears and their numerous varieties," in which he contends that they are derived, not, as has been commonly supposed, from the European wild Pear (*Pirus communis*), but, through long-continued hybridisation, from an original Asiatic type, introduced into Europe at a remote period. M. Godron's arguments in support of this view are very ingenious, but are given at such length that we must leave our readers to form their own deductions from a perusal of his interesting treatise.

— THE current number of the *Revue Horticole* contains a coloured plate of the fruit and foliage of a new kind of *Diospyros*, which M. Carrière has named "*D. Mazeli*." It appears to be quite distinct from *D. costata*, which attracted so much attention two or three years since. The fruit is about as large as a medium-sized Apple, of a depressed spherical shape, and, when fully ripe, of a fine deep orange colour. The interior is filled with a very soft pulp, the flavour of which is said to resemble that of Apricot marmalade. The plant was received, amongst others, from Japan, in 1866, by M. Mazel, of Anduze (Gard), after whom it has been named.

— M. H. J. VAN HULLE, writes to us as follows:—"On the night of the 12th-13th inst., the neighbourhood of Gand was visited by a sharp frost of—10° Cent. (= 13° Fahr.). This will prove most fortunate for our fruit-crops; for, as the Peaches and Apricots on south walls were commencing to open their buds, and even those of the Pear trees were beginning to swell, we should have had little chance of fruit this year, had not this timely frost supervened. In consequence of the seasonable check which it has given to vegetation, we have now some hope of a good harvest; at present, at least, appearances are most favourable in every way."

THE FLOWER GARDEN.

HARDY KINDS OF HIBISCUS.

THE genus *Hibiscus*—one of the richest and most varied in species of the whole vegetable kingdom—has contributed some of the finest ornaments of our hothouses, conservatories, and gardens. The greater number of the species are natives of tropical regions, a few only being found in temperate latitudes, and, consequently, few are available for open-air culture in this country. One of the finest of these, *H. speciosus*, is the subject of our illustration. This plant is a native of South Carolina, whence it was introduced in 1778 by J. Fothergill. It is an herbaceous perennial, growing from 2 to 8 or 9 feet high, with numerous branches, and smooth, palmate, five-parted leaves, the divisions of which are long, narrow, and pointed. The flowers, which appear in August and September, are very large, spreading, and of a fine scarlet colour, and, under favourable conditions, are produced in such abundance that the plant is quite covered with them, and presents a splendid appearance. The following is the mode of treatment pursued by M. Dommage, of Montrouge, whose garden some time since contained remarkably fine specimens of this plant:—During the winter he kept the plants in a temperate house, and, in February, transferred them to a warm house, in which they remained until June. By this means vegetation was vigorously pushed on. About the middle of June, he planted them out in the open air, in a warm and sheltered position. By this course of treatment, M. Dommage obtained specimens over 9 feet high, with a dense bushy habit, and producing flowers in great profusion for two months. The soil proper for this species is a compost of free loam and heath-soil. The plants should be kept dry during the winter, but require a copious supply of water during the season of growth.

In addition to the foregoing species, we may here mention a few other hardy kinds of *Hibiscus*, viz., *H. militaris*; 3 to 4 feet high; flowers, purplish-rose, with a darker centre. Native of Louisiana, Pennsylvania, and Carolina. *H. Moscheutos*; 3 to 5 feet high; flowers, light rose-colour, sometimes nearly white, with a crimson centre, as large as those of the common Hollyhock. New York to Carolina, in swamps and salt marshes. *H. palustris*; 3 to 5 feet high; flowers, large, purple, on long axillary stalks. This species has often been confounded with *H. Moscheutos*, but is quite distinct. Canada to Virginia. *H. roseus*; 4 to 6 ft. high; flowers, showy rose-colour, 4 inches across. A very handsome plant. France, on the banks of the Adour. We shall conclude our list with the dwarf annual, *H.*

Trionum, also known as the Bladder Ketmia. This plant grows from 6 to 18 inches high, and bears (from June to September) cream-coloured flowers with a dark purple centre; the calyx is membranaceous, inflated or bladdery, and full of nerves. Italy, Carniola, and New Zealand. All the species here mentioned may be propagated either from seed or by division. W. M.

NEW VARIETIES OF CANNA.

In a recent number of the *Journal de la Société centrale d'Horticulture de France*, M. Nardy, of Hyères, describes the following as the best of the new varieties of *Canna* raised since 1867:—

Compactum (Nardy).—Stems, numerous, from 4 feet 10 inches to 6 feet high; leaves, broad, light green; flowers, numerous, yellow dotted with red.

Daniel Hooibrenk (J. Sisley).—Stem, about 6 feet high; leaves, lance-shaped, green; flowers, numerous, large, salmon-coloured.

Edward Morren (J. Sisley).—Stems, about 5 feet high; leaves, lance-shaped, green; flowers, in numerous spikes, large, yellow dotted with bright nasturtium red.

Gloire de Lyon (Crozy).—Stems, numerous, about 6½ feet high; leaves, lance-shaped, purple; flowers, large, salmon-coloured.

Gaboniensis (Crozy).—Stems, very numerous, from 6 to 6½ feet high; leaves, lance-shaped, glaucous green; flowers, very numerous, rosy-carmine.

Henry Vilmorin (Huber & Co., Hyères).—Stems, numerous and strong, from 4 feet 10 inches to 6½ feet high; leaves, broad, deep green, very firm; flowers, large, of a nasturtium orange-colour. One of the most ornamental varieties in foliage.

Jacques Plantier (Nardy).—Stems, from 5½ to 6½ feet high; leaves, lance-shaped, purplish-green; flowers, unusually large, salmon-coloured.

Jean Bart (Denis).—Stems, thick, from 4 feet 10 inches to 6 feet high; leaves, lance-shaped, bronzy-green; flowers, very large, of a wine-red colour.

Jean Sisley (Huber & Co., Hyères).—Stems, numerous and thick, over 9½ feet high; leaves, large, light green; flowers, bright red.

Jean Vandael (J. Sisley).

—Stems, about 4 feet 10 inches high; leaves, lance-shaped, green; flowers, numerous, large, of a wine-red colour.

Madame Cellier (Chrétien).—Stems, about 4 feet 10 inches high; leaves, lance-shaped, light green; flowers in numerous spikes, large, cherry-red. A seedling of *C. Bihorelii*.

Madame Schmitt (Nardy).—Stems, numerous, from 6 to 6½ feet high; leaves, lance-shaped, green; flowers, large, numerous, cherry-red.

Prince Imperial (Chrétien).—Stems, numerous, about 3 feet 3 inches high; leaves, numerous, light green; flowers in many spikes, of a bright red colour. A seedling of *C. Bihorelii*.

Tricolor (Henderson).—Stems, numerous, from 2 feet 4 inches to 2 feet 8 inches high; leaves, numerous, green, striped with white and a little rose-colour; flowers, bright red.



A Hardy Hibiscus (*Hibiscus speciosus*).

Paneratium maritimum.—In the "Life of Mrs. Somerville," p. 308, it is stated that "at Viareggio the loose sand is drifted by the wind into low hillocks, and bound together by coarse Grass, thickly coated with silex. Among this and other plants a lovely *Amaryllis*, the *Paneratium maritimum*, with a sweet and powerful perfume, springs up. We often tried to get the bulb, but it lay too deep under the sand." Is *P. maritimum* the same as *P. fragrans*?—ALPHA. [*Paneratium maritimum* and *ilyricum* are the only kinds found in the south of Europe, and they are tolerably distinct and hardy when planted in a warm border. The *Paneratium fragrans* of Loddige's "Botanical Cabinet," plate 834, is a tender West Indian kind, and the same as *Hymenocallis fragrans* of Herbert's *Amaryllidaceæ*. All of them are very fragrant, particularly in the evening.—ED.]

The best races of China Asters.—I have grown a complete collection of Asters to ascertain the merits of recent introductions, and have discarded the Humboldt, the Shakespeare, and the Bismarck Sections, as having no fixed character, and, therefore, worthless for English gardens. For large beds, the Hamburg Prize, Peony Perfection, the Victoria, the Cockade, and the Hedgehog, are the most desirable. For medium-sized beds, ribbons, &c., the Dwarf Chrysanthemum, the Dwarf Victoria, and the Schiller Dwarf Pyramidal are the finest, being compact, and of even growth, bearing their flowers conspicuously above the foliage. To cut for bouquets, the Imbriqué Pompon, and the Dwarf Bouquet *Elegantissima*, are of the most exquisite colours, and perfect models in shape, ranging from the most miniature to the size of a Pompon Chrysanthemum. For a continuous succession of bloom, seed should be sown at intervals, from the beginning of March to the end of May; the first sowings under glass, the latter sowings may be made where the plants are intended to flower.—P. BARR.

Zauschneria Californica.—This, though now seldom seen in our flower gardens, is, nevertheless, worth attention under certain circumstances. The year before last with us it was too leafy and late in coming into flower; but having been left in the ground through the winter, it pushed freely in the spring, and threw up ground shoots or suckers all round. It soon covered the bed in which it was planted, and was in full flower early in August. Though unsuited for early bloom, and the colour (an orange-scarlet) not so striking as that of many other bedding plants, still those who appreciate variety of habit as well as colour, will find a distinctness of character in a bed of this plant, when in good condition, that must recommend it to their favourable notice. Its position in the flower garden would seem to be some intermediate place between beds which, having stronger colours, are better adapted for contrast, and more effective at a distance, or, perhaps, as a detached bed, which comes in for a close inspection, and to show off the flowers to the best advantage. Gales of wind, which play sad havoc with many other plants in gardens, leave this unharmed.—E., *Thetford*.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Dwarf Ageratums.—These are splendid bedding plants, blooming continuously till destroyed by frost. Cultivated in pots, all the varieties are useful under glass. To cut for furnishing vases, the flowers are most valuable, the blue changing to a rich mauve by candle light. The Tom Thumb and Imperial Dwarf varieties are most valuable additions to our bedding plants.—P. B.

Saxifraga Burseriana.—I have a charming little Saxifrage, one of the prettiest with which I am acquainted, belonging to the Juniperina section, and which is now covered with large pure white flowers. It is *S. Burseriana*. I see it spoken of as being in bloom with Mr. Atkins, who had it from here last season. It comes from Switzerland.—T. S. WARE, *Hale Farm, Tottenham*.

Plants in Bloom.—I have in flower a curious little Cape bulb, viz., *Hessea spiralis* (white), *Primula erosa*, *Primula verticillata*, *Ruta albiflora*, *Schizostylis coccinea* in a frame, as well as abundance of *Cyclamens*. *C. coum album* is now exceedingly pretty. Out-of-doors there are but few things in flower; among the most notable are *Cercus bitorus*, *C. Aucheri*, *Primula altaica*, *Hepaticas*, *Sisyrinchium grandiflorum*, and one or two of the *Megaseas*.—A. J. PERRY.

Opuntia Rafinesquiana.—In a recent number of the *Illustration Horticole*, M. E. André disputes the claim of this plant to be considered a distinct species, and further reduces eighteen hitherto-received species and sub-species of North American *Opuntias* to mere varieties of *O. vulgaris*, resulting from differences of soil, climate, altitude, &c. As a corroboration of his opinion, he states that, some time since, M. Verlot planted, in the garden of the Muséum, a specimen of *O. vulgaris* by the side of one of *O. Rafinesquiana*, and that the former has since lost its tropical aspect, and assumed, in a marked degree, the hardy northern appearance, the almost creeping habit, and the wrinkled joints of the latter.

Calochortus Gunnisonii.—The genus *Calochortus* comprises, as is well known, some of the gayest bulbs of the Californian flora, and all the species have, from their earliest introduction, been highly prized. The *C. Gunnisonii* appears to be closely allied to *C. venustus* and *C. Nuttallii*, and has, in fact, been considered as synonymous with the latter species. Further examination of flowering specimens is necessary to determine these points. The flowers when fully expanded are from 2 to 3 inches across. The plant grows in Utah, where the bulbs are said to occur at a depth of from 6 to 10 inches. Seedlings are not difficult to raise, but as they do not attain any size the first season of their growth, the amateur must be cautioned against allowing the soil of the pot containing them to become dust dry after the annual growth is completed, and the foliage withered, which would result in the destruction of the bulbs. On the other hand, an excess of moisture is equally to be avoided.—T.

THE INDOOR GARDEN.

ADIANTUM FORMOSUM.

THIS, when well-grown, is one of the most distinct, and, as its specific name implies, beautiful of Ferns. It grows well in a warm greenhouse and is quite at home in a close Wardian case, but, if large specimens of it are required for exhibition, they may be quickly obtained by keeping them either in an ordinary plant-stove or tropical Fernery, where the atmosphere is warm and charged with humidity. Good strong plants of this species produce fronds from 2 to 2½ feet in length, and about a third more in breadth. The fronds are of a fresh green colour and are well adapted either for grouping along with choice exotics in bouquets and wreaths, or for using along with flowers in the drawing-room vase. Our illustration, taken from an original sketch, shows the general habit of the plant and the form of its drooping fronds. Like all Maiden-hair Ferns, it grows rapidly in a fresh open fibrous compost of turfy peat, sand, and about one-fifth of good fibrous loam—that from an



Adiantum formosum.

upland pasture or from the face of sandstone rocks being best. The pot in which it is grown must be well drained, and the plant requires liberal supplies of tepid water at the root during the summer months. B.

TREE-FERNS.

(Continued from p. 9.)

Alsophila.

THE species of this genus, to which I shall allude in the following remarks, are all extremely beautiful. They belong to the Cyatheaceæ, and, indeed, are very nearly allied to the genus *Cyathea*, the chief point of distinction being that the sori in *Cyathea* are enclosed in a scaly cup-shaped involucre, while those of *Alsophila* are quite naked; the species belonging to *Alsophila* are widely distributed over the tropical and temperate regions of the globe, although no member of the genus belongs to our European flora. As a genus, *Alsophila* is characterised by its arborescent stems, by its large bi-tripinnatifid fronds, simple or forked free veins, and naked sori, which characters, apart from the arborescent growth, leave few distinguishing points between *Alsophila* and *Polypodium*, to which genus, indeed, early authors usually assigned it. The species from the East Indies (few of which, however, are, unfortunately, in cultivation) and also those from South America and the West Indian Islands have mostly slender stems, which are developed somewhat rapidly, and are, more or less profusely, armed with stout sharp spines; whilst those from more temperate

regions have usually much stouter stems, which they build up much more slowly, and have the spines reduced to mere small rough points. In a cultural point of view, the tropical kinds require an abundant supply of both heat and moisture, and although I strongly advocate the use of the syringe for moistening their stems, I consider the less it is brought into play on the fronds the better. As a compost for these plants, in a young state, I prefer using two-parts peat, one-part loam, and one of sand; but as they attain size, or, for re-potting old plants, peat and loam in equal parts will be found preferable. The drainage must always be in good working order, and over-potting must be avoided. It is my firm opinion that there are many sheltered glens throughout the country where several of the Australian kinds would thrive admirably in the open air, and I would strongly urge upon the fortunate possessors of such spots, the advisability of trying the experiment.

TEMPERATE HOUSE SPECIES.

A. AUSTRALIS.—This species, at one time thought to be rare, would seem to be found, at times, in tolerable abundance. When mature, its stems are said to attain a height of some 20 and even 30 feet, and to measure from 2 to 3 feet in circumference; the beautiful head of fronds which crowns its summit, extending from 10 to 13 feet from the centre. In this country, the stems rise from 3 to 10 feet in height; they are of various degrees of stoutness, and are easily recognised by the bases of the old fronds which clothe them, and which are thickly studded with short obtuse prickles; the fronds are somewhat ovate-lanceolate in outline, bipinnate; pinnules, linear-lanceolate and deeply pinnatifid, deep green on the upper side, paler below, the base of the stipes and crown of the plant being clothed with large dark chestnut-brown chaffy scales. Native of New South Wales, Tasmania, and other places.

A. EXCELSA.—Although a well-known plant in our Ferneries, this species would appear to be little understood, for, in very many instances, I find it grown under the name of *A. australis*, from which, however, it wholly differs. Others, again, call it *A. Cooperi*, whilst we have even seen the name of *Cyathea excelsa* made to do duty as one of its synonyms. The plant in question is a rapid grower, and forms a stem very quickly, for which reason it is not so well adapted, as some others, for those with whom space is an object, although few species, either in a young or mature state, can surpass it in beauty of outline. The fronds are broad and spreading, bipinnate; the stipes pale-coloured, slightly muricate, and, together with the crown of the plant, densely clothed with large light-coloured chaffy scales, intermixed with wool, which at once distinguish it from the previously-described species; indeed, in the absence of stems, these chaffy scales or hairs, which, almost invariably, are to be found clothing the crowns or base of the stipes of Tree-Ferns, form excellent characters by which to determine species, and should always accompany specimens intended for the herbarium. In Norfolk Island, *A. excelsa* is said to attain a height of from 40 to 50 and even 80 feet.

A. COOPERI.—In the form of herbarium specimens, this is, undoubtedly, difficult to separate from *A. excelsa*, but, in the shape of living plants, the two are distinct enough. *A. Cooperi*, as far as is known to me, produces a somewhat slender stem, and does not develop it so rapidly as *A. excelsa*; the fronds are bipinnate, the segments being pinnatifid, bright green on the upper side, inclining to glaucous beneath; the crown and stipes being clothed with dark brown chaffy scales, intermixed with hairs. It is a native of Queensland.

A. LEICHARDTIANA.—Amongst Tree-Ferns this is truly a gem. Its stem is very slender, attaining a height of 20 feet, or even more, the fronds forming a beautiful arched crown of plume-like leaves upon the apex; they are from 5 to 10 or 12 feet in length, bipinnate; the pinnules being deeply pinnatifid, and bright green in colour; the base of the stipes and the main rachis are furnished with numerous dark brown spines. It is a remarkable fact that, although this species is so thoroughly different from all others, it has no fewer than three names, having been called *A. Macarthuri*, by Sir W. Hooker; *A. Moorei*, by Mr. John Smith; and *A. Leichardtiana*, by Dr., now Baron, Müller, director of the Botanic Gardens, Melbourne. This beautiful species is a native of Queensland.

A. CAPENSIS.—This species is frequently included in the genus *Hemitelia*, being placed there on account of the scales,

which are scattered over the under-side of the pinnae, presenting, somewhat, the appearance of the half-cup-shaped indusium peculiar to those plants. I have not been able, after repeated examinations, to convince myself that these scales have anything in common with an involucre, and so, in this enumeration, I retain it in the genus *Alsophila*. The stem attains a height of from 6 to 10 or 12 feet, is somewhat slender, hard, and black-looking; the fronds are tripinnate, from 3 to 4 or 5 feet in length, with the edges of the segments serrate; they are ovate-lanceolate in outline, and deep green in colour. A remarkable feature in this species is the production of abortive pinnae upon the lower base of the stipes; these are short, much divided, and linear, and, as seen growing upon the plant, have the appearance of an epiphytal Filmy Fern, in a barren state; indeed, they were described by Kaulfuss under the name of *Trichomanes* (?) *cormophyllum*. It is a handsome plant; but, nevertheless, it is not found as a common inmate of our Ferneries. It is a native of mountain ravines in the country about the Cape of Good Hope.

STOVE SPECIES.

A. GLAUCA.—In this fine species we have one of the few East Indian Tree-Ferns which, at present, exist in our Fern-houses. The stem attains a considerable height, and bears a splendid crown of large arching fronds, which vary from 6 to 12 feet in length; they are bipinnate and coriaceous in texture; pinnules, deeply pinnatifid, the upper surface being bright shining green, the under-side glaucous; stipes and main rachis, muricate, the stipes and crown of the plant being furnished with a profusion of large white chaffy scales. Native of Penang, Java, and the Philippines.

A. GIGANTEA.—This would appear to be both widely distributed and extremely variable. When favourably situated and fully developed, it is said to attain a height of upwards of 50 feet. The fronds are bi-tripinnate, but the pinnae and pinnules are extremely variable upon different plants, both in length and breadth. They are thin in texture and bright green in colour. This species is extremely rare in cultivation. Native of Nepaul, Sylhet, Java, Ceylon, Penang, &c.

A. ARMATA.—A slender-stemmed species of great beauty, and, also, of great rarity. It produces tripinnate fronds, which vary from 3 to 6 or 8 feet in length, are light green in colour, coriaceous in texture, and sparingly clothed on the under-side with fulvous spreading hairs. The stipes are profusely armed with short, stout, light-coloured spines, whilst the crown of the plant, and the stipes as well, are clothed with large white and fulvous-coloured chaffy scales. Native of Jamaica, and various parts of South America.

A. PROCERA.—I have never seen large stems of this species, but, nevertheless, it is very handsome, even in a young state. The stipes appear to be sparingly furnished with short spines; the fronds are bipinnate, the pinnules being broad and scarcely pinnatifid, and very rich green in colour; the crown and base of the stipes are clothed with brown chaffy scales. I have found this species, which is a native of various parts of Brazil, far more common in German gardens than in this country.

A. RADENS.—A fine species, but little known in cultivation. Its fronds are some 6 or 8 feet in length, and bipinnate; pinnae from 12 to 18 inches in length; pinnules, pinnatifid; segments, oblong, obtuse, and bright green; stipes and main rachis, aculeate, and very pale. Native of Brazil.

A. INFESTA.—This is a widely-distributed Fern, and, like all plants circumstanced in that way, it varies considerably in appearance in different localities; all forms of it, however, are extremely beautiful. The fronds are bipinnate; pinnules, pinnatifid, broad, and membranaceous in texture, and deep green in colour; the crown of the plant is clothed with chaffy scales, whilst the base of the stipes is armed with some sharp spines. It seems to be common in various provinces of South Brazil, Peru, British Guiana, and some of the West Indian Islands, but I have never seen it recorded from Mexico.

A. ASPERA.—This magnificent species has an extremely slender stem, which, nevertheless, attains the height of some 20 feet, or even more. It bears a magnificent crown of broad bipinnate coriaceous fronds, the pinnae of which frequently measure from 20 to 30 inches in length, and are rich deep green in colour; the base of the stipes is armed with short stout spines, whilst the main and partial rachis are clothed

with long rough hairs. It is common in several of the West Indian Islands.

A. BEYRICHIANA.—This species I have seen thrive well in a conservatory during the summer months, but it is not wise to risk it in such a position during winter. Its stem is slender, and it bears a fine crown of long arching fronds; the crown of the plant and base of the stipes are clothed with long brown or cinnamon-coloured chaffy scales, the latter being also armed with spines; the fronds are ample, bipinnate, dark green on the upper side, but paler beneath. It is frequently placed amongst the *Cyatheas*, but I have never been able to discover any involucre, the presence of which only would entitle it to a place in that genus. Native of Brazil.

A. PALEOLATA.—Of this species I am only acquainted with young plants, but these bid fair to produce grand specimens. In general appearance, it would seem to approach *A. ferox*, but this latter plant would seem to be involved in some mystery, judging from the different forms which I have seen bearing that name. The fronds of *A. paleolata* are bipinnate, clothed on both sides with downy hairs, more dense beneath than above. The stipes are aculeate, and the rachis somewhat hispid; pinnae serrate, and deep green. It is a Brazilian plant, somewhat scarce in English gardens.

A. SURINAMENSIS.—This species has only come under my notice in a young state, or, perhaps, it would be better to say that the stems of such plants as I have seen of it were young, and I have not seen them imported in a large state. The stem is slender, and bears a beautiful crown of fronds, which are bipinnate, with the pinnules pinnatifid, and deep green. The crown of the plant is furnished with large brown chaffy scales; the stipes are aculeate, whilst the costae and main rachis are slightly pubescent below. Native of Guiana and Martinique.

A. VILLOSA.—This is an extremely rare and beautiful species, with the size of the full-grown stem of which I am unacquainted. The stipes are unarmed; fronds tripinnate, the pinnae having a peculiar habit of pointing forward instead of spreading horizontally; they are dark green on the upper side and smooth, but below they are clothed with dull-coloured woolly hairs. Owing to its beauty and distinctiveness, this species should receive more extended cultivation than it has hitherto been accorded. It is a native of Brazil, Caraccas, and elsewhere.

A. FEROX.—The stem of this is slender, and, being clothed with the somewhat persistent bases of the aculeate stipes, it presents a formidable appearance. The fronds are broad and ample, bipinnate, the segments being finely and elegantly divided, which gives it a beautiful feathery appearance; they are dull deep green above, and slightly paler below, where they are furnished with a few bullate scales. It is a very handsome Brazilian Tree-Fern, and one which deserves a place in every stove Fernery. With the above enumeration, I shall leave this genus for the present, not because of paucity of material, but because several have recently come to us with new names, the value of which I am anxious to prove.

Lophosoria.

L. PRUNIATA.—There would seem, according to the majority of authors, to be no reasons for separating this plant from the genus *Alsophila*; nevertheless, I cannot help entirely concurring with Mr. J. Smith, when he says, "Setting aside the arborescent character of the stem, this genus is more naturally related to the *Desmopodium* section of *Phegopteris* than to *Alsophila*." This, however, in a cultural point of view, will not affect us. It has an erect stout stem, like an *Alsophila* or *Cibotium*, with the fructification of a *Polypodium*. The largest stems which have come under my notice were between 3 and 4 feet in height, the crown and base of the stipes being densely clothed with tawny hairs; the fronds are from 3 to 5 feet long, three times divided; the pinnules deeply toothed at the edges, deep bright green on the upper side, but silvery-white beneath. It is a truly beautiful stove species, deserving the attention of all lovers of Ferns. It is a native of various parts of South America and elsewhere.

Trichopteris.

T. EXCELSA.—With some, this plant is retained in the genus *Alsophila*; but, to me, it seems to have so many points of distinction, that I must, perforce, adopt the system of those

who separate it from that genus. It is a beautiful plant, rising upon a rather slender stem, the base of the stipes and crown of the plant being enveloped with large dark reddish-brown chaffy scales. As a point of distinction, I may here observe that the stipes are articulated with the axis, and the pinnules are articulated with the rachis. It is important not to neglect to water this species, for its pinnae never recover from drought, like those which are sessile, but fall out at the joint, and leave only bare sticks in place of beautiful foliage. The fronds are bipinnate, from 3 to 6 feet in length; pinnules, lanceolate, entire, and about 2 inches long; they are coriaceous in texture, smooth, and dark shining green on the upper side, slightly paler below, where the peculiar bearded sori form a continuous line midway between the costae and margin. This rare and handsome species requires stove temperature. It may, perhaps, be better known to some of our readers by the name of *Alsophila Tænitis*. Native of various parts of Brazil. G.

Epiphyllums as Basket Plants.—These are excellent plants either for large or small baskets. When large wire baskets are employed these plants may, if grafted near the base of the stock, be planted between the meshes of the wire, where they grow and bloom freely, and, even when out of flower, the shoots are always fresh and green. They may, likewise, be planted and tastefully intermixed with other flowering plants in such baskets, and, in this way, owing to their pendent habit, greatly relieve any prevailing stiffness. Chatsworth conservatory is famous for its suspending baskets furnished with *Epiphyllums*, and with which their whole surface and base are decorated, and when, as at Chatsworth, they have the advantage of a little artificial heat, they bloom from the end of October till after Christmas. At Dalhousie, I observed, the other day, an ingenious method of exhibiting these plants to advantage. Mr. Dickson, the gardener there, having some nice plants with well furnished drooping heads, grafted from 8 to 12 inches high, and growing in 48-sized pots, wished to use them as basket plants in the conservatory. As he had no baskets, however, he tied some Moss neatly around the pots, so as to entirely hide them, and, with some wire, suspended them as required. The effect is excellent, and, as the plants were grown in a cool greenhouse, they did not begin flowering till Christmas, and even now (February 13) they are as thickly laden with beautiful fresh blossoms as one might expect them to be in December.—W. F.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Pitcher Plants (*Sarracenia flava*).—Those who have seen the fine specimens of this very curious plant at our great shows, may be interested to learn that in North Carolina and Virginia, it sometimes grows in immense quantities in the wet ditches on each side of the railway track.—R.

Odontoglossum Pescatorei.—A small plant of this beautiful Orchid has just flowered at Drumlanrig, bearing fifty-five flowers on a spike, and, in addition to this, it bore a smaller spike from the apex at the pseudo-bulb. This plant was grown in a four-inch pot, and is a grand illustration of the profuse-flowering character of this fine winter-blooming *Odontoglossum*, one of the best we have in cultivation.—B. W. F.

Tuberose.—When is the time to buy and plant Tuberose; and do they require much heat?—G. [Obtain good strong bulbs now, and plant them in light sandy soil. A warm greenhouse or Vinery suits them as regards temperature. They grow freely in Southern Europe and America planted out in warm moist soils. Much of your success depends on the bulbs you purchase being sound and thoroughly well ripened.—En.]

Bonvardia Culture.—Are Bonvardias grown in cool-houses or hot-houses?—G. [Bonvardias are generally grown in slightly heated pits or frames, the lights being removed during the summer months, except in dull wet weather. In some warm soils and sheltered situations they will succeed planted out-of-doors like bedding-plants. They like a light sandy compost, one-third of which should be well-rotted manure. During winter they should have a temperature of 55°.—En.]

Mulching Pots and Tubs with Sphagnum.—In the Royal Botanic Gardens, Edinburgh, Mr. McNab mulches the soil in the large tubs and pots containing Palms, Ferns, and other plants, with common Sphagnum, and he considers this to be of material benefit to the plants, especially in the case of such as are newly-potted. The mulching prevents hasty evaporation in bright sunny weather, and thus saves a great deal of watering; it also assists in maintaining the soil in such a condition as to enable water to readily percolate equally throughout the whole mass. The stems of delicate or newly-shifted Tree-Ferns, too, are likewise wrapped in Sphagnum in order to encourage fresh roots.—W.

Rope-refuse for Mulching and Hot-beds.—This material, usually called "pob" may be obtained in large quantities from rope manufactories. In the Lawson Nurseries it is used for hot-beds. After being soaked with water, fermentation soon commences, and, when once warm, it retains its heat for at least twelve months. Owing to its chaffy character, it could not, of itself, be built into a hot-bed above ground, but in pits, and indoors it forms a good substitute for tan and becomes a valuable fertiliser when soaked with liquid-manure, or mixed with dung, and, in this respect, it is more useful than tan, which in any form but that of ashes, is valueless as manure. "Pob" is also used as a mulching for plants both in and out-of-doors, and for this purpose, it is quite as valuable as Cocoa-nut fibre.—F.

THE DATE PALM IN EGYPT.

(PHŒNIX DACTYLIFERA.)

AMONG the numerous kinds of Palms to be found in tropical and semi-tropical countries, the Date Palm is one of the most useful to the swarthy Arabs of Northern Africa and to the bronzed children of Southern Europe. To the inhabitants of the Arabian and African deserts it is second only to bread. Although the Date Palm is found in cultivation more or less from Southern Europe to Hong Kong, probably in no country is it to be met with in greater abundance than in Egypt, a country from which hundreds of tons of Dates are annually exported in a dry and pressed state. There are two varieties of the Date Palm in Egypt, one having a large brownish-red fruit, and the other a golden-yellow one. The former is chiefly used when fresh gathered, and that variety is not so much in cultivation as the yellow kind. In travelling in Egypt, when the tops of the Date Palm come into view it is always the signal that a village or town is at hand. In the neighbourhood of Alexandria, there are some splendid groves of the Date Palm, which also surround every town and village in the Nile Delta, where it is extensively cultivated. The district of Fiumee, which is about 100 miles above Cairo, is, however, most celebrated for its Dates, and likewise for its Grapes. It is watered by an immense canal cut from the Nile, and known by the name of "Bahr el Yussef" (Joseph's River), which has been the means of bringing into cultivation a large and fertile district which otherwise would have been a desert.

The Date Palms of Egypt are very sturdy in their growth, rarely rising higher than from 40 to 50 feet. One solitary Palm, however, growing near the Pacha's palace at Abdeen, in Cairo, measures about 80 feet in height, and has a thin and graceful stem; this has probably arisen from its growing in a shaded court, but as seen from the front entrance of the palace it has a most picturesque appearance, backed up, as its feathery foliage is, by the minarets and towers of the neighbouring mosques. Every wealthy Arab has a garden adjoining his residence, containing Roses and Myrtles, Date Palms, Figs, Vines, Peaches, Apricots, Plums, and Pomegranates, all mingled together in a kind of wild disorder. Such is the bountiful nature of the soil and climate of Egypt that, if irrigation is only attended to, crops of every kind are produced in quantities that would astonish English cultivators. The Arab loves his garden, and it is only in it that he and his family throw off that stiff dignity for which they are so celebrated—roaming about in careless freedom, and sitting on mats under the trees eating whatever fruit may please their fancy.

The Date Palm is a great source of revenue to the Egyptian Government, each individual tree being heavily taxed. Like the Cocoa Nut Palm, every portion of it is applied to some useful purpose. When the lower fronds ripen and become useless to the tree, they are cut off, converted into bedsteads or couches for the poorer classes, or are made into baskets and bird-cages; and the net-like fibre that occurs at the base of the fronds, termed by the Arabs "lif," is made into coarse rope cables for the Nile boats. The usual mode of propagating the Date Palm is by means of suckers severed from the foot of the older trees. In forming plantations, it is necessary to plant a certain number of male plants, other-

wise the fruit-bearing Palm would be sterile; one male for every ten female trees is generally found to be sufficient. In cases in which the male plants have died, it is not unusual to cut male flower-spathes, and to tie them to the fruit-bearing trees, fertilisation being simply left to the action of the winds. Few sights are more pleasing than a Date Palm grove while in flower—i.e., when the bursting spathes display the half-green and golden colouring of the inflorescence. One Date Palm often produces a bushel of Dates.

PETER WALLACE.

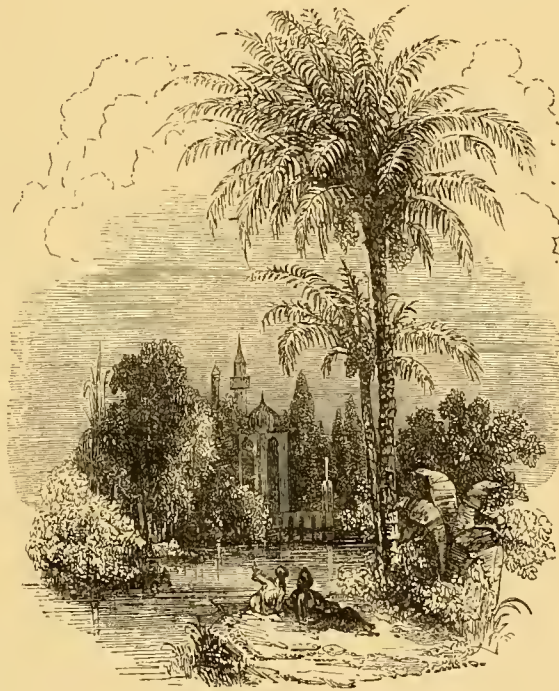
A POISONED LAND.

WARRINGTON is a busy centre surrounded by a belt of spoiled or partially wasted land. One cannot leave the town without having to go through one of these scathed and blighted districts that fill one with melancholy. There is the river, once a source of fertility and beauty, some hundred years ago abounding with salmon, and even twenty years ago furnishing a constant supply of some kinds of delicate fish, but now a great disgusting ditch. The river is innocent and pure compared with Sankey Brook, and the Sankey Canal, whose fetor

poisons for some half-mile on either side, and whose poison has turned that once smiling valley, through which they flow, into a dismal swamp. It is questionable whether there be a tiny water-course, within miles of the town, that is not polluted and spoiled; ceasing to be the source of beauty, fertility, and health that nature intended, and becoming instead a loathsome eyesore. Then, how miserable it is to see healthy vegetation disappearing all around. The fine trees in Arpley Meadows, that delighted every lover of the beautiful, are one by one dying, and, if still surviving in a few instances, they only look unspeakably wretched. If, in this melancholy zone around us, fruit trees anywhere are left, they are become fruitless and useless, wrecks of what they were a few years ago. The very hedgerows look wasted and melancholy beyond description, the ghosts of their former selves. And no wonder vegetation cannot endure the injurious influences that are poured into the air around us, for, if anyone has been unfortunate enough to have to cross the trail of one of the worst of the destroyers, especially at night, his smarting eyes and burning throat testify to something very deadly, being sent abroad and sometimes the evil thing is much more potent even than this.

Such is the picture drawn by the *Warrington Guardian* of the country around. Now, it would be great folly and injustice to cast the blame of all we decry on this or that offender, or plume ourselves that we had nothing to do with it. Every man who burns a fire, unless he also consumes his smoke, contributes in a degree, though, perhaps an infinitesimally small one, to the ruin and desolation we are deploring. But we mainly owe this terrible state of things to the manufactures that have enriched us. And is this necessary? Is the destructive and deforming influence inseparable from our manufacturing processes? Science on all hands declares that these hurtful results are not only needless and wasteful. Science declares that the man who poisons the fields and the trees with his smoke, in just the same proportion wastes his own fuel; that the man who sends acids up his chimney to fall in a scorching blight on every living thing around, also at the same time wastes chemical products it would pay him far better to condense and utilise.

A PEASANT at Lauzerte (Tarn-et-Garonne) is said to have recently discovered a Grey Truffle, as large as a Pumpkin. The weight of this treasure was not, however, proportioned to its size, for deep in its fragrant recesses was found the ancestral home of a family of field-mice.



The Date Palm.

GARDEN DESTROYERS.

THE WOODLOUSE.

(ONISCUS ASELLUS.)

THE little creature figured in the accompanying cut (known in many districts by the name of "Slater," probably from being found in numbers under slates and in similar localities) is not an insect. It looks like one, but it crosses the border and belongs to the class of Crustaceans, of which lobsters and crabs are the most honoured members. Its proper function is that of a scavenger, but, as the human scavenger sometimes exceeds his duty in sweeping up things which are not yet past use or which may be of value, so the Oniscus does not content itself with feeding on the detritus and decaying vegetable matters, which it is its proper business to consume, but, when it finds its way into a hothouse, takes a fancy to costly living plants, more especially Orchids, and occasionally does them a good deal of harm. In the open border they also attack herbaceous plants. It is no uncommon thing to see some of these which spread themselves over the ground, and so furnish a fine shelter to insects, grow sickly and, on examination, it will then be found that there is a crowd of young Onisci beneath, which have been eating the collar or neck of the plant just above the ground until they have nearly entirely removed the outer ring, and so destroyed the plant. When they get into an Orchid-house it is difficult to dislodge them, for they establish themselves among, and make galleries through, the Sphagnum in the baskets, or where the Orchids are growing. The gardener may be surprised at seeing his plants bitten and fading. He may turn over every bit of slate, tile, broken pot, wood, bark, or anything else that might serve as a hiding-place, and see nothing—and unless he watch during the night, and catch the culprits at work (for they are nocturnal animals)—never find out that it is these Onisci that have done the mischief, and that their hiding place is about the plant itself. There are several species—some grey, others nearly black, all paler beneath. Their life is longer than that of most insects, as they live, and seem to increase in size, for several years. They have the faculty of rolling themselves up like a Pea, in the same manner as the hedgehog, whence their French name "cloporte," as we should say "one who closes the port or door." No wholesale mode of destroying them is known. They must be cut off in detail, and the same sort of contrivances which are had recourse to to entrap earwigs and surface larvæ must be used against them. Scooped out Potatoes placed like little domes, up into which they can creep, and little heaps of decaying plants, turfs, &c., may be left, and the under-side examined every morning, and by degrees, with care and attention, they may be thus thinned out until the garden is freed from them.

A. M.

THE RED-BELTED CLEARWING.

(Sesia myopæformis.)

THE caterpillars of the Sesia, the most interesting family amongst British moths, are viewed, perhaps, with greater satisfaction by the entomologist than by the gardener; but, being, with one or two exceptions, far from numerous in their occurrence, they seldom do any very material injury to the gardener, whilst their occasional discovery gives to the naturalist very considerable satisfaction. Many also confine themselves to forest trees, only feeding in the Oak (*Quercus robur*), Elm (*Ulmus campestris*), and one species has been known to do much damage amongst the Osiers (*Salix viminalis*). Perhaps the commonest and most mischievous in the gardens is the Currant Clearwing (*Sesia tipuliformis*), which eats away into the stems of Currant trees, causing them to die off when attacked. The Sesia may be said, with truth, to be the most beautiful of the moths, their wings being of such a transparent appearance and such a delicate gauzy texture, their bodies of such frail construction and their movements so capricious and lively, dancing, as they do, in the air in the broad daylight, and exhibiting their graceful evolutions in the brightest sunshine. The caterpillars cannot be said to have quite such a charming appearance, those which are known being for the most part dirty white and maggot-like.

The Red-belted Clearwing (*Sesia myopæformis*), of which I am now treating, is of a dirty white or yellowish colour, with a few light hairs, and four black spots arranged in a square on each segment; the second, third, and fourth segments are darker than the remainder of the body; the head is brown, with a brown plate behind it, and the hind part of the thirteenth segment is brown also. The moth appears on the wing during the summer months, and has rather the appearance of a bee, a fly, or a gnat, than of a moth; so much so, that anyone unacquainted with its characteristics would be much surprised to find that it belonged to the latter sub-order of insects, the clear wasp-like wings being so totally different from those soft mealy-looking ones which most people expect to see in a moth; the body is black, with a red ring round it, from which it takes its name. The caterpillar feeds on the solid wood of Pear and Apple trees, sometimes a great number being found in close proximity, and has been observed principally in the southern parts of England; the specimen before me was sent from Sheerness.

OWEN WILSON.

BLACKBIRDS.

My thanks are due to your correspondents for their advice, and the means they recommend for ridding my garden of these pests. "J. T.'s" advice to hang up a hat would, I fear, prove of no use here, the blackbirds being far too bold and knowing to be scared by that means. Like him I am also robbed of my Peas to a great extent by the titmouse, but I do not find its depredations extend to other vegetables or fruit. Three years ago I tried "J. L. H. S.'s" plan of having hawks in my garden. They were kestrels, and greedily devoured any small dead birds thrown to them, but were quite useless for driving away the live ones, their wings being necessarily clipped. I have also tried, and with some success, the following plan to protect my Strawberries:—Parallel with a border in which they grow I strained a long wire to two posts, one at each end of the bed, driven into the gravel walk; upon this wire was a running ring and a short string and collar, to which a cat was attached; he could thus walk the length of the wire, and though he spent much time asleep in a box provided as a refuge from rain, his presence certainly kept the birds away from the Strawberries. Of course this plan could only be adopted on an open walk, and not among bushes. Mr. Tillery's baited rat-traps I shall certainly try if I can discover his particular kind, with which I am unacquainted. "R.'s" quotation from Mr. Tennyson is very pretty, still I do not agree with him that the blackbird is a glorious singer. He is as inferior in note to the thrush as he exceeds him in numbers and mischief, and I only regret the Laureat's poem was not addressed to the latter bird instead of to the most voracious, and, as far as my experience goes, the worst of the many pests of the garden.

BAD SHOT.

The Water Rat (*Arvicola amphibius*) in Gardens.—One day in August last I noticed a large heap of freshly turned-up earth among growing Potatoes in our garden, and thinking a mole to be the cause, a trap was procured, and next morning the culprit was secured. At the first glance I took it to be a common brown rat, but looking at it more closely found it was a water rat or vole and the man from whom the trap was procured declared that these aquatics burrow quite as much as the mole itself. This I do not dispute, seeing the effect of its industry around, but what I consider very strange, is the fact of this lover of water being located in a walled-in garden at a great distance from its more congenial haunts. In Letter 28 of White's "Selborne," a somewhat similar instance is related, the rev. gentleman being apparently as much puzzled as myself to account for such a deviation from regular habits. In that case, the animal was turned up by the plough in a chalky field at a distance from water, and was snugly ensconced in an "hybernaculum," well provisioned with Potatoes.—*Science Gossip*.

NOTES AND QUESTIONS ON GARDEN DESTROYERS.

Pitcher Plants and Ants.—The pitchers of these plants entrap ants and drown them in the liquid. The large pitchers on Mr. Baines's well-grown plants contain myriads of dead ants. The fringe of down-pointing spines round the lid prevents their escape.—R.

Mealy Bug and the Chelsea Blight Composition.—The mealy bug having attacked our Vines, when they were at rest, after being pruned, and without being scraped, they were well dressed with the "Chelsea Blight Composition," care being taken that it did not touch the eyes, and also that it was well rubbed in all crevices. It was used pure as it came in the bottle. This was done three years ago and we have not seen a bug since. The Vines were not harmed in any way from the dressing.—JOHN TAYLOR.

THE KITCHEN GARDEN.

CAULIFLOWERS.

ACCORDING to nurserymen's catalogues, there are a great many kinds of Cauliflower, all of which are highly eulogised; nevertheless, old and tried kinds should not be discarded. Indeed, the Walcheren is, perhaps, the best of all for general purposes, and some even confine their supply throughout the season to the produce of this one kind. Of late years, however, Veitch's new Solid Late is a true solid white-curd sort, and a valuable and good improvement on the Walcheren for a late supply. The Early Cauliflower, or Early London White, as it is sometimes called, is another good sort, and the one generally used for the earliest spring crop. Large Asiatic is a stronger-growing variety of the Early London, producing a fine large, compact curd, and, if sown at the same time as the Early London, it will form a fine succession to it. Snow's Winter White is an excellent kind, and pretty hardy. In the market-gardens round London this is the kind used for affording a supply from the latter end of October till January. Severe frost, however, will prove detrimental to it as well as to other kinds; but, as a rule, it is the hardiest and most suitable for late work, and its quality is first-rate. With these four sorts, rightly treated, no garden should be without a good supply of Cauliflowers from April to Christmas.

Sowing and Transplanting.

Some sow the winter crop, to be protected under hand-lights and in frames, broadcast, in 4 feet beds, about the 20th or 25th of August in the south of England, and in the northern districts from the 1st to the 12th, according to the inclemency, or otherwise, of the locality; if a cold one, sow early, but if a warm one, sow late. Sowing in the open ground is generally preferred, and the 25th of August is the best time, as a rule, for warm parts of England, and the 12th for Scotland. The soil for the seed-beds should be a good friable well-worked loam, which, if manured, for the previous crop, should not be again manured for the seedling Cauliflowers. In case of failure, a few seeds may be sown a week afterwards. As soon as the plants have fairly come up, thin them out to 3 inches apart, and with a short-handled 2-inch hoe loosen the surface soil; this will promote a nice stocky habit in the plants. As soon as there is any likelihood of severe weather, a cold frame should be prepared for them, and a layer of sweet, open, and well-pulverised soil should be placed therein, about 8 or 10 inches from the sashes. Into this the plants should be transplanted, 6 inches apart if space can be spared; if not, at the very least, they should be 4 inches apart each way. For a few days after being transferred to their new quarters, the sashes should be kept on, and a little shading placed over them. This, however, should be discontinued as soon as possible; and the plants, as soon as they take to the soil, should be well exposed, the sashes being entirely removed from off them throughout the day, and also at night, unless the weather is very frosty or unsettled. It is sometimes necessary to cover the sashes over with litter, in order to exclude hard frosts; this covering should be removed every morning, and the sashes tilted up a little. Mildew frequently finds its way amongst the plants, but it may easily be extirpated by scattering dry wood-ashes amongst them occasionally. I have found that they winter best in frames, if the surface of the soil therein is covered over with a thin coating of finely-sifted old lime-rubbish. In February, the plants should be transplanted to the open ground, by lifting them carefully with a good ball, and placing them out in clumps of three (♂♂), 9 inches from plant to plant, and 2 feet clump from clump, under a hand-light, in a well-manured, deeply-worked, thoroughly-drained, and not too stiff soil. These clumps should be in rows about 4 feet apart, so as to have plenty of room to cover the lights with litter at night and in cold weather. In order to have Cauliflowers in April, it is necessary to place a good layer of litter around the base of the hand-lights, so as to keep the soil moderately warm, and to exclude the cold and piercing winds of early spring. Air is freely admitted by moving the upper half of these portable protections. In the evenings of February and the earlier parts of March, the litter should also be shaken over the whole,

and removed in the morning. The plants will soon become rather tall for their quarters; then a brick can be placed below each of the four corners of the hand-lights, and a little earth drawn around, which, along with the litter, will make the base air-pro-f. Occasional applications of manure-water in the latter end of March and in April will greatly improve their condition.

Under Hand-lights and Matted Hoops.

Another way of wintering Cauliflowers, is to sow at the time previously recommended, but, instead of pricking off into frames, the young plants are placed, at once, under hand-lights. In this instance, nine, instead of three, are left, and as they become too close, some are lifted and planted out under other lights, until only three or four remain under each cover. Planted thus, they require much the same care as the others, a constant watch, and protection with litter, and a little manure-water in spring, being necessary. In some places they are, also, planted out from the seed-bed in the end of October to other beds, keeping the plants 4 inches apart each way. In these beds they are protected in winter by means of mats supported by hoops, and, in very severe weather, some litter is also shaken over the mats. This is an unwise practice, however, for, should the weather be severe for any considerable length of time, they must be kept dark, consequently they become weak and spindly, and are apt to suffer in a proportionate degree.

Sowing in Frames and Potting.

Where time and convenience can be commanded, the following is a certain method by which success may be attained:—viz., sow the seed in a frame in October, the frame being very gently heated by means of half-decayed leaves and decomposed frame linings mixed together and formed into a basis, 18 or 20 inches deep, for the frame. As soon as the plants come up and have attained a little strength, they should be thinned out and either transplanted into another similarly-prepared frame, 4 inches by 6 inches apart, or potted singly. In potting, use 3-inch pots and good loamy soil and sand; plunge the pots near the glass in frames, until severe frosty weather has arrived, when they could be taken and placed near the glass in Vineries or Peach-houses at rest, but from which frost is excluded, or they may be left in the frames and protected with litter. In the latter end of January shift them into larger pots, using a richer compost than before, and by the end of February, or 1st of March they will be fine plants for planting out in three under hand-lights, or to shift into larger pots to be placed in late Vineries or Peach-houses, or under any old spare lights in turfpits. I have found the Scakale pots—as soon as out of use—turned upside down, and filled with good rich soil, famous for getting in the first early Cauliflowers under shelter.

Wintering on Warm Borders.

Cauliflowers are not quite so tender as is sometimes thought, and good produce may be had by wintering the plants out-of-doors. This is by no means confined to the southern and warmer districts of England and Ireland, but is successfully practised in Scotland. For this purpose, sow at the usual time, and prepare a S.E., S., or S.W. wall border, say about 2 feet wide from the base of the wall. Into this, prick off the plants about 4 inches apart each way in October, and allow them to remain there till February or March. If they are well sheltered, they do not require any care or protection, further than to keep them clear of the tree-leaves that will naturally collect amongst them, which, if allowed to remain, will bleach and weaken them—but, if convenient, a few sprigs of Broom or Spruce stuck in front of them will be of material benefit to them. In spring, they may be planted out like those already referred to, but for planting out in rich sheltered borders, and unprotected, they are much more suitable than any of those more carefully wintered. The practicability of this method may be understood from the fact that it is almost the only one practised along the coast of the Moray Firth and for four miles inward.

Distance apart, and Intermediate Crops.

When there is room, Cauliflowers reared under hand-lights should have at least 3 feet clump from clump, and 4 feet row from row. The lines planted out without the assistance of

bell-glasses or hand-lights, and from which the second crop is obtained, should be 3 feet apart, and 2 feet plant from plant. Some may think such a large space extravagant, but it is not so. In the case of the first, the room is required in winter and in February for conveniently attending to the protecting material, and on the 1st of March two lines of Lettuces can be planted along the central space, and a plant or two between each clump. These Lettuces will be fit for use before the Cauliflowers are, and so can be removed, thus allowing the Cauliflowers greater room for perfecting themselves. A pinch of Cauliflower seed should be sown every fortnight from the 1st of January until the first week in July, for planting out in succession throughout the summer, on the dampest coldest aspects, between the rows of late high-growing Peas, that is, planted in lines 10 or 12 feet apart, purposely to afford partial shade for summer Cauliflowers, or a few rows of Turnips, or for Celery to succeed summer Spinach, all of which are fond of such a position during the hot summer months. The Cauliflowers sown in June and July, and planted out in succession as fast as the plants are large enough, afford a good autumn and winter supply. I always took care to have a large portion coming in on borders in the months of November and December, in order to pull up just as they were beginning to form their flower-heads, and hung them up with their leaves and roots entire in bunches, each containing from four to six heads, to the rafters and beams of thatched sheds, and this I have found an invaluable practice for affording a good supply up to March. Those sown on gentle heat close to the glass in the middle of October, and pricked off, as fast as they could be handled, into small pots, and plunged immediately close to the glass, either in frames or pits, and shifted on as they grew, some into Seakale pots, or large flower-pots as before advised, will produce fine flower-heads about the end of March. Others planted out under hand-glasses in February, in good rich soil, with slight protection when the weather requires it, and an occasional supply of tepid manure-water, will produce fine flower-heads in April. Thus we may never be a month without this useful vegetable. Cauliflowers sown in August and September should be sown in an exposed situation, on poor, but well pulverized, soil, and when fit, they should be pricked into the same sort of soil, and, the same should be attended to as regards pricking them into frames, or they are too apt to get too large and soft, and, when subject to winter checks, they will start prematurely, and prove useless when planted out.

JAMES BARNES.

Duration of the Germinating Power of Seeds.—A correspondent of the *Revue Horticole*, in sending the following notes to that journal, states that they were communicated to him by a friend who had ample opportunities for making trustworthy observations on the subject. The figures indicate the number of years in each case, in which the seeds may be depended upon as preserving their vitality or power of growth; although, in most cases, they must not be considered a minimum of limitation. They represent the periods of time after which the various seeds mentioned have been found perfectly good, and may be of some use as a guide to those who are uncertain whether to throw away or sow old packets of seeds:—Seed of Artichoke (Globe) lasts good for 5 years; Asparagus, 4; Basella, 3; Basil, 6; Beans (garden), 6; Beans (French), 2 to 3; Beet, 5; Burnet, 2; Cabbage, 5; Cardoon, 7; Carrot, 4; Cauliflower, 5; Celery, 7; Chervil, 2; Chicory, 8; Corn-Salad, 4; Cress (garden), 5; Cress (Water), 4; Cucumber, 5; Dandelion, 1; Egg-plant, 7; Endive, 8; Fennel, 6; Gourds, 5; Leeks, 2; Lettuce, 5; Maize, 2; Melon, 5; Mustard, 5; Nasturtium, 5; Onions, 2 to 3; Onions (Welsh), 2; Orache, 1; Parsnip, 1; Parsley, 3; Peas, 4 to 5; Pepper (long), 4; Potatoes, 3; Purslane, 8; Radish, 5; Rampion, 5; Rhubarb, 3; Salsify, 2; Savory, 3; Scorzoneria, 2; Sorrel, 2; Spinach, 5; Spinach (New Zealand), 5; Strawberry, 8; Thyme, 2 to 3; Tomato, 5; and Turnip, 5.

Peas and Lettuces.—Would you kindly inform me what kind of Pea the London growers use for their best, or early, general crop; also, what White Cos Lettuce they grow?—A SMALL GROWER. [The London market-gardeners grow two sorts of Cos Lettuces, the Green Paris Cos, and the London White Cos, the latter being a select variety of the White Paris Cos. Both kinds are used for a first crop, but after May, the London White Cos is depended on solely till winter sets in. Market-gardeners always save their own seeds, and if one of them is short of seed of any particular variety, he gets it from his neighbours. As to Peas, Mr. Myatt, of Deptford, grows Beck's Little Gem for his first crop, sown in lines 2 ft. apart, and Alpha for his second, in lines 2½ ft. apart. To neither sort does he apply any stakes; of the two, he considers the latter the best.—ED.]

THE ARBORETUM.

THE WEEPING OAK AT KING'S ACRE.

MR. CRANSTON'S nurseries at King's Acre, famous throughout the land for their large stock of superbly-grown Roses, contain also many objects of much interest to lovers of trees and plants. Among the trees, perhaps, the most striking is a fine specimen of the Weeping Oak—that is to say, of the weeping form of the common Oak. Being much struck by the appearance of the tree, when at Hereford last summer, Mr. Cranston had a photograph taken of it at our request, and from this the accompanying illustration has been engraved. It will be seen that it is a noble tree of its kind, and that its branches are gracefully pendulous. It was planted by the present Mr. Cranston's grandfather, when the nursery was established, in the year 1755. It was grafted about 3 feet from the ground, and, though scarcely perceptible in our illustration, there is a slight increase in the size of the trunk, at the point of union between the graft and the stock. It bears quantities of Acorns every year, but none of the seedlings raised from them has shown the least disposition to droop. The height of the tree in question is 64 feet, and the distance between the ground and the lowest branches is 18 feet. The girth of the trunk, at 4 feet from the ground, is 8 feet, and the width through the branches 58 feet. We may add that the aspect of this tree reminded us of that of some of the Oaks of the plains and foothills of California, belonging to species not yet to be seen in our grounds. These trees, like Mr. Cranston's Oak, show no sign of the pendulous tendency at the top, but weep, in a very picturesque manner, from the outer parts of the lower branchlets. This peculiarity of form among our weeping trees is a precious one, inasmuch as the contrast between the rigid upper portion of the tree and the pendulous outer and lower parts forms a very striking and attractive feature, quite distinct from the aspects usually presented by any other kind of weeping trees.

W. R.

ARBORICULTURAL NOTES FROM PERTH.

By JAMES M'NAB.

THE nursery grounds of Messrs. Dickson & Turnbull, at Perth, have long been well known to cultivators. They were established in the year 1766, and from them have emanated many new and useful plants. Amongst flowering plants may be mentioned the first set of double Scotch Roses, which were so much in fashion about forty years ago, but which are now, I regret to find, scarcely ever asked for. The original stools of these Roses still exist, and are capable of producing many thousand plants again should they ever be required. These Roses were admirably adapted for the climate of Scotland, and if they were again taken in hand by our southern friends, and received a little of the attention paid to other garden varieties by hybridisation, a new breed might be procured suitable for this country. The original superb scarlet-flowering Thorn was likewise raised in this nursery. This establishment was also the seed-bed of the first Swedish Turnips ever sent to Britain, seeds of which were sent by Linnæus to this firm about the year 1772, and now this hardy vegetable is spread over all the temperate quarters of the globe. Mr. Robert Brown, one of the early partners of the firm (formerly Dickson & Brown), was the first discoverer in Scotland of *Menziesia cerulea*, specimens of which still exist in this establishment, being sub-divisions of the original plants found by Mr. Brown on the Sow of Athole, in Perthshire. For many years the bog, or dwarf American plants, indeed, all kinds requiring peat soil, have been cultivated in this establishment with success, and few nurseries in the kingdom contain a greater variety of these interesting plants. The various species of *Ammyrsine*, *Andromeda*, *Azalea*, *Bryanthus*, *Cassiope*, *Fothergilla*, *Gaultheria*, *Ledum*, *Daboecia*, *Menziesia*, *Rhodora*, *Vaccinium*; also hardy Heaths and dwarf *Rhododendrons*, with numerous others, are cultivated here to an extent which is not often seen. These choice plants have not been receiving of late years that attention from cultivators which they did in former times; nevertheless, none are more attractive than



THE WEEPING OAK IN THE KING'S ACRE NURSERIES, HEREFORD.

they are for rock-garden or for ornamental-clump cultivation, few even surpassing them for general interest.

Conifers.

The Perth Nurseries have long been noted for their extensive collection of Coniferous plants. They contain no fewer than 300 species and varieties of all the leading sorts. The variegated forms now constitute one of the chief features of this establishment, and, during the winter months, give an effect to Coniferous collections such as they would not otherwise possess. The variety among variegated Yews is of itself remarkable, to say nothing of the gold and silver colouring of some of the species of the genera *Cupressus*, *Biota*, *Chamaecyparis*, *Juniperus*, *Retinospora*, *Sciadopitys*, *Thuja*, and *Wellingtonia*. Here, also, is a large collection of *Podocarpus Koraiana* or *japonica*, all stem-pruned, which makes them assume the character of gigantic Irish Yews. By the pruning treatment, this *Podocarpus* forms an admirable plant, hardy, and well worthy of being cultivated in ornamental grounds. One of the great advantages belonging to the Perth Nursery is its collection of specimen Conifers, the different kinds of which, being arranged side by side, afford great assistance to purchasers, who can see at a glance matured specimens from which to select what they require. The ornamental forest-tree department is also well represented, no fewer than 470 species and varieties being cultivated in stock. The varieties of Ash, Beech, Birch, Elm, Hornbeam, Plane, Lime, Maple, Oak, Poplar, Walnut, and Chestnut are now very numerous; the Oaks, both evergreen and deciduous, particularly so. No fewer than sixty-six species and varieties of this genus alone are under cultivation. Of late years the rage for Coniferæ has rather had a tendency to retard the planting of what are commonly called evergreen and deciduous hard-wood forest trees, but I trust the time is not far distant when a return to these well-known hardy and majestic forest ornaments must again take place. With a few exceptions, including the well-known species of *Abies*, *Cedrus*, *Picea*, and *Pinus*, most of the recently-introduced Coniferæ are very well up to a certain size, but when they become of tree growth, unless in partially sheltered situations and particular soils, they are often disfigured by wind and snow. Besides, after many years' trial how few of the new Conifers do we find assuming a proper tree growth, so as to take the place of, or even cope with, the old kinds now existing, and thoroughly free from the attacks of insects-pests, which, in one shape or another, have proved very detrimental to many Coniferous trees throughout the country. The spread of these, I fear, will rather increase than diminish—depending on the mildness or severity of the winter months. Many of the Conifers are mere shrubs, and, as such, they are beautiful, and for this quality they should be more widely cultivated; but a general feeling seems to prevail amongst their admirers that they must become forest trees, and for this end they are extensively planted. Perhaps the most attractive of the recently-introduced Conifers, and one which may in time be likely to assume a proper tree growth, is the *Cedrus atlantica*, or African Cedar. It is a kind which I strongly recommend to be grown as ancestral trees. For avenue purposes, no evergreen tree of recent introduction, as far as has yet been tested, seems better adapted to the climate of Scotland, provided that it is carefully attended to during its early growth by stem pruning, so as to secure straight stems and proper leaders. I have never seen it injured by judicious and timely pruning. The *Taxodium sempervirens* is another Conifer of comparatively recent introduction, and one which may be planted for avenue purposes in many sheltered situations in Scotland, but, like the African Cedar, must be early stem-pruned and branch-pointed. It, however, is, perhaps, better adapted for the climate of England, where it grows well, but is frequently unshapely, from the want of pruning. The Douglas Fir, in some districts of the country, is beginning to prove itself a useful tree, but whether these trees were produced by cuttings from original specimens, or raised from imported seed, remains to be proved. The first trees raised from British-ripened seed have certainly not turned out in every quarter as was expected. The *Picea Nordmanniana* may, in time, afford useful timber, but, like other trees I have mentioned, it must be prepared for this end at an early stage of its growth. As generally seen in nursery establish-

ments, the spread of its branches is often considerably more than the height, and, when they once get into this condition, it is difficult to get them out of it, without a very free use of the knife, which, at an advanced state of their growth, may do more harm than good. With early branch-pointing or pruning, the *Picea Nordmanniana* suffers no injury, and starts admirably into a tree habit after the operation. I am also much impressed by the Lawson Cypress—*Cupressus Lawsoniana*. Judging from the time it has been in the country, and its appearance in certain soils and situations, I feel satisfied that it is a Conifer likely, some day or other, to become a useful timber tree, but not if left in a bush form, as it is generally seen in cultivation. If stem-pruned at an early stage of its growth, it takes on an upright habit; on this account many trees may be grown on a limited space. In its natural condition it attains to the height of 100 feet, and the timber is said to be good. An upright form of this Cypress, and one which originated in the Perth nursery, is likely to become a useful tree if planted in suitable soil. It has naturally only one stem, instead of ten or twenty, which is not unusual in the ordinary unpruned bush-formed specimens. The Lawson Cypress is, without exception, one of the hardiest of the recently-introduced Conifers, and will succeed in any soil or situation. It stands the smoke, and is, therefore, well adapted for town gardens. It can be increased to any extent by cuttings or seeds, of which many are now produced in Britain. When propagated by cuttings, a portion of the bare cutting stalk should be kept above the surface of the soil, which enables them to take on an upright habit immediately after being rooted. I also find that the *Wellingtonia*, in very exposed places, when early stem-pruned, say at three or four years old, assumes a compact tree form, stands the wind well, and is less liable to have dead or brown points than those specimens which have been planted in sheltered situations without any pruning whatever.

Ornamental Deciduous Trees.

Although I have a strong feeling for growing Coniferæ, it is doubtful if there are many of the recently-introduced species that will ever take the place of the ornamental evergreen and deciduous forest trees which are frequently to be seen throughout the country, and which, I regret to say, are not increasing to the extent they are justly entitled to, standing, as they do, all weathers, wind and snow, and remaining as monuments to their planters. Many of these old ornamental hard-wood trees are of great interest, and I confess that I have infinitely more pleasure in looking at them, than on any Coniferous tree in this country, excepting, however, the Scotch and Silver Fir; also, the majestic Cedars of Lebanon, as seen in many English parks. In the Perth nurseries, two well-balanced specimens of the Lucombe Oak exist, one 8 feet in circumference, and the other 8 feet 9 inches, and averaging about 70 feet in height. A large purple Beech is also a noble specimen; it stands about 60 feet high, with a stem 10 feet in circumference. A large Tulip-tree, in a neighbouring garden, is 8 feet 6 inches in circumference. Surely such specimens as these, which stand every blast with impunity, ought to be planted in preference to many of the Coniferous trees. They become stately with age, and we know that they will make trees, and ultimately prove an ornament to the landscape, and a credit to their planters; while, with many of the Coniferæ, we are planting only in hopes that they may, perhaps, succeed. After all that has been done for the Coniferæ, we find that it is only in some exceptional places that they can ever assume their true tree character, and these exceptional places cannot be got on every property. Spots for deciduous trees are everywhere to be met with, and I should like to see them again taking the place which they held before the great Coniferæ fever set in about twenty-five or thirty years ago. The finest specimen of a Coniferous tree, in the Perth Nurseries, is the *Abies Douglasii*, which was planted on the 28th of June, 1838. The circumference of the stem is now 6 feet; spread of branches, 36 feet; and the height about 65 feet. It is certainly a beautiful tree, but I have great doubts if it will go on improving for many years longer, and, even if it does, it never will have the appearance, nor yet the duration of the noble Lucombe Oaks, just alluded to. It is absolutely neces-

sary that all fine or exceptional trees should be attended to, by having fresh soil occasionally laid on the surface of the ground over their roots. The ground under such trees is often hard, by being much trodden on by visitors. The two Lucombe Oaks, at Perth, are apparently of the same age, and were probably planted at the same time, and by the same hands. One specimen is 9 inches more in circumference than the other, and the difference is evidently owing to the harder nature of the surface ground round the smaller tree. The surface-dressing of the ground over the roots of exceptional trees is a most important subject, and one which ought to be more generally attended to all over the country than it now is. Weeping and pyramidal ornamental forest trees are also extensively cultivated here. Nearly all the genera furnish us with weeping or pendent varieties, as well as variegated forms. Variegated varieties ought to be more grown than they now are, for they are equally hardy with the typical sorts; and the landscape effect produced by these varieties against the green sorts is, as yet, comparatively little known and practised.

Tree Knowledge, especially as to Soils, wanted.

One of the great drawbacks to the more general planting of ornamental hard-wood forest trees rests very much with the nurserymen themselves. In very few firms, with the exception of the ordinary or old-established ones, which are generally very well managed, are collections of both new and old sorts carried out with the same spirit as they were in the days of London. It requires nurserymen to be thoroughly read up in the subject of new and rare trees, and their nature, as regards soil and climate, to induce gentlemen to invest in them. There are many landed proprietors throughout the country anxious to take an interest in the preservation of arboricultural subjects, apart from Coniferae, but, unless assisted by the practical and sound advice of nurserymen, they feel unwilling to enter into them to any extent. About half a century ago, such arboricultural knowledge, with reference to deciduous trees, was much more diffused over the country than it now is. Good practical instruction on all the new and rare Coniferae, and ornamental flowering trees, is everywhere to be found, but sound advice on deciduous forest trees is a rarer article now than in the olden times. Hamburgh used to be the great school for all the new arboricultural products, and now such establishments are freely scattered over the continent of Europe. Although large establishments exist in Britain for ornamental forest trees, they lack the zeal of some of our continental neighbours. There are large tracts of country in Great Britain yet to be planted, and, by a little effort on the part of nurserymen, many gentlemen might be induced to invest largely in certain kinds, instead of taking one or two on trial, which may get injured by accident, and are then set down as unworthy of cultivation. In some districts of Scotland, certain species of forest trees succeed well, which in others (having soil and situation apparently similar) are comparatively scarce, such as the Cedar of Lebanon, Silver Fir, Norway Maple, Plane-tree, Walnuts, Chestnuts, &c. On some estates Chestnut-trees are seen of giant form, and of centuries standing, while on others they are unworthy of observation; whether from soil or climate, or both, requires to be proved. Soil and situation have much to do in the planting and grouping of many of our rare trees, and this information can only be obtained from nurserymen who have paid strict attention to such matters, and even with them it is sometimes impossible to get a judicious off-hand answer as to what ought to be planted, even when furnished with information as to exposure, elevation, and the general nature of the soil. A conference amongst nurserymen, from various parts of the country, would be of great service in communicating such information, each possessing, in some parts of his nursery, soils suitable for certain species of trees, but often quite different from each other. Such a conference would have a tendency to bring about a more widely-spread cultivation of many species of forest trees, different from those now under general culture. It is well known that certain kinds will not succeed on all soils and situations; many species, therefore, may be set down as unworthy of cultivation. By some it may be said that the *Picea cephalonica* and *P. pinsapo*, are not worth growing; in many places they are not, but, if

planted in a limestone district, they become highly ornamental trees. The same remark holds good with the *Abies Meuziesii*, *A. Albertiana*, and *A. excelsa*, when grown in any soil, save that naturally of a peaty description. The effect of soils on the growth of certain trees, shrubs, and plants, is of more importance than we are generally aware of. What is in the soil in the neighbourhood of Aberdeen which causes the fruit of the Strawberry to be carried with safety to the Glasgow markets, while that grown nearer the city is often destroyed in the course of transit? It is not from any nicety in packing, but from some quality which the fruit itself must derive from the soil, and we find this to be the case, also, with many trees. In certain soils the timber of one species of forest tree is found to be more durable than in others. These are points which a conference of nurserymen and foresters can alone bring out. Much has been done for the analysis of soils for agricultural purposes, but its full influence has not been brought to bear on all horticultural products, and much is still wanted in the science of arboriculture. It is well-known that certain plants, in a state of nature, are only found in peat soils, more or less mixed with sand, and any attempt to cultivate them in other mixtures fails; leaf-mould and sand does, however, suit some of the peat plants. Who would ever think of planting Cape Heaths or *Epacris* in leaf-mould, or manured loam, although other species of plants thrive freely in such mixtures? This fact, alone, shows that there is something in the composition of certain soils only suitable for the roots of a certain class of plants. In most nursery establishments, it is the common practice to have a piece of ground made up entirely with peat earth, to accommodate a large section of plants which naturally grow in such soils, and these are procured from all the temperate quarters of the globe. Many of the so-called American, or peat plants, are frequently planted in other soils and mixtures. If they do live, they rarely ever assume the vigorous form and colour of those grown in the natural peat, or in sandy loam, mixed with one-half its bulk of peat. If lime happens to be accidentally put into the soil where *Rhododendrons* or other plants are placed, they are certain to sicken and die. It is, perhaps, not generally known, although several amateur cultivators have experienced it to their cost, that, when laying in a stock of peat turf, they not unfrequently mix with it some fresh lime, in order to decompose it more rapidly, and render it fit for immediate use, as is occasionally done for the surface-dressing of land. When peat is so mixed up, and placed into beds for *Rhododendrons*, *Azaleas*, *Kalmias*, *Heaths*, &c., the plants are certain to become yellow, and ultimately die out. This fact shows that certain forms of vegetation will not succeed in soils where others freely thrive, because composed of certain ingredients unsuited for their constitution. It is remarkable, however, that there is no class of plants, whether evergreen or deciduous trees and shrubs, Alpine or herbaceous plants, epiphytal or terrestrial, from all climates, and procured from all soils, that refuse to grow in earth having a certain proportion of peat in its composition. An occasional visit to country nurseries is often conducive of much good. I first visited the Perth establishment nearly forty years ago, and I still find that, at the present day, it maintains its pre-eminence as a nursery. It was here that I first interested myself in the dwarf American plants, and I am glad to find that it still maintains its superiority in that special department.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Cotoneaster thymifolia as a Standard—This, though a creeping rock-shrub, makes a good standard. In the Lawson Nurseries I observed, the other day, several nice examples in this way grafted from 3 to 6 feet high on *C. affinis*, which makes a suitable stock, either for this or for other kinds of *Cotoneaster*.—W. F.

Trees for Lawns.—The following is a select list of twelve small hardy trees for lawns of limited extent, by G. Ellwanger, of the celebrated Mount Hope Nurseries, Rochester, U.S.A.:—Imperial cut-leaved Alder, cut-leaved Beech, large double-flowering Cherry, Californian Buckeye, white-leaved Linden, Magnolia Soulangiana, Wier's cut-leaved Maple, Oak-leaved Mountain Ash, Paul's Double Scarlet Thorn, *Virgilia lutea*, cut-leaved Birch, and Kilmarnock Willow.

Chimonanthus fragrans.—This useful wall shrub is now flowering freely in many gardens around London. Its blossoms are not showy, but they emit a delicious fragrance like that of Cloves. The plant itself is deciduous and blooms before the foliage appears. It may interest some to know that there are at least two forms of it, one bearing flowers nearly twice the size of the other. This is known as *C. fragrans grandiflorus*, and will be found much handsomer than the common form, and equally odorous.—B.

THE GARDEN IN THE HOUSE.

PRINTING FERN-FRONDS.

I HAVE read with very great interest the directions on Fern-leaf printing, as given at page 124, and, as the process which I have practised with good results is somewhat similar, perhaps a few remarks may not be out of place. The materials I use are—A grainer's comb, a common tooth-brush, a cake of lamp-black, an old plate to mix it on, and a few sheets of blotting-paper. Almost any kind of card-board answers admirably to begin to print on, and it may be cut into any shape the operator thinks proper, and can then be made into very pretty work-baskets, &c., edged with blue, green, or pink ribbon, according to taste, these being most useful for small presents, for Christmas-trees, and bazaars. All leaves or fronds for printing should be carefully pressed between blotting-paper, or what will answer equally as well, in an old book. The fronds about to be printed should be carefully and neatly pinned to the card-board, as has been recommended. Having your lamp-black or ink already mixed, dip your tooth-brush into the ink, holding the comb in the left hand, then draw your brush over your comb till shaded according to taste. The brush should be shaken almost dry before using, for the smaller the spots the more delicate the tints which will be obtained. When the prints become dry, replace the Ferns between blotting-paper till required again. After being used a few times, they become brittle, and are then of little use for printing purposes. By following these directions, with a little practice, it is almost impossible to fail. Varieties of the following make beautiful prints:—*Adiantum*, *Asplenium*, *Athyrium*, *Davallia*, *Lastrea*, *Lomaria*, *Polypodium*, *Polystichum*, and many others. I send you a specimen done by the above process to show you of what this system of Fern-printing is capable.

THOS. BEAUCHAMP.

[The specimen sent was a beautiful portrait of *Adiantum formosum*, and other foliage in pure white on a delicately-tinted ground.—Ed.]

The Creeping Myrtle (*Myrsiphyllum asparagoides*).—

Mr. J. Vick, than whom there is no better authority, gives the following directions for the household culture of this plant, now so much used in floral decorations, for twining in the hair, and for trimming party dresses:—"With a little care it can be grown successfully as a house plant. The seeds should be sown in a box or in pots in the house, and should be kept moist till the young plants appear. The seed being rather slow to germinate, you must not think it had if it does not make its appearance in two weeks. The young plants should be potted off into 3-inch pots as soon as they are 3 or 4 inches high. Once a year the bulbs should be allowed to dry off and rest. They will start into growth again in about six weeks. The plant does not require the full sun, but will grow well in a partially-shaded situation. It can be trained on a small thread across the window or around pictures. It is a climber, and will attach itself to a string in just about the right condition to use for wreaths, &c., or, when required for lighter work, the branches which become entangled can be separated." This plant, perhaps the most universally employed of all by the American florists, and generally most tastefully used, seems to make slow progress with us. It is of easy culture in the greenhouse.—DELTA.

Griselinia macrophylla as a Window Plant.—This is an evergreen shrub, of only moderate growth, and one which has thick, bright green, succulent-like leaves, wherein consists its chief beauty. It is partial to a good loamy soil and some decayed manure, but almost any good soil will suit it, and it has no objection to peat or leaf-soil. It requires no special care nor more warmth than that afforded by a dwelling-house window, and, if hardily nursed, will bear a slight frost with impunity. It is one of the best window plants that can be grown. In a cottage near Glasgow, the other day, I saw two plants of it in a 6-in. pot; the owner had obtained them three years ago, and, since he first possessed them, he has not re-potted or top-dressed them, but has kept them within a window in a room where gas is nightly burned. During the summer time he occasionally places them out of doors to get the rain or a "wash," as he terms it, and sometimes he lays them on their sides and pours water over them through a watering-pot rose, an operation which answers as well as syringing. He waters them when they are dry, giving more in late spring and summer than he does in winter. They are not very subject to the attacks of insects, damp, or any diseases, and dust can easily be sponged off their leaves. These plants, although well attended to, have been grown under circumstances by no means favourable for the past three years, yet they retain their leaves and colour well, and are bright and cheerful in appearance.—F.

THE FRUIT GARDEN.

CORDON PEAR WALL AT HOLME LACY.

WHEN at Holme Lacy last summer, we were pleasantly surprised to see a wall covered with Pear-trees, trained as single cordons, and in the finest bearing condition. We learnt from Sir H. Scudamore Stanhope that he had taken some interest in their mode of culture some years ago in France, and made several experiments, this plantation of winter Pears being one of them. He has kindly furnished us with the photograph from which our sketch was engraved, and the following account of the trees:—

"Allow me to furnish you with an illustration of my Cordon Pear wall, one-half of which, planted in December, 1861, bore fruit in 1864; another half, planted in March, 1865, bore fruit in 1868. From the time these trees began fruit-bearing up to the present date, they have been, and are now, perfectly healthy, and have yielded large crops every year, with the exception of two or three trees, perhaps, which may miss bearing each year; as to the superiority of the fruit, in size, appearance, and flavour, over fruit grown in my garden on pyramids and espaliers, there can be no question. In hot summers it was found necessary to mulch, and even to water them, owing to the Quince stock, on which all are grafted, having more fibres and rooting nearer the surface than the Pear stock. They are trained on a south wall, which, however, is somewhat shaded by large Oaks, and, although this circumstance renders the wall unfavourable for Peaches, I do not consider it has been against these Quince-grafted Pears, as, but for the shade, they would probably have suffered more in hot summers than they have done. I do not, therefore, think a south wall, by any means, a necessity, for the successful culture of cordon Pears in the south and west of England. As to the pruning, my late gardener writes as follows:—"My experience in pinching has never been what I was led to expect; never, but in one solitary instance, have I found the fruit-bud to be the result of that practice, and even that one being so far from home, so to speak, would have to be cut off in order to keep the spur short. But that was not all, for I have found that what was once a decided fruit-bud would lengthen and grow into wood before the growing season closed." I myself certainly think that the pinching cannot be carried out in our climate to the same extent as in France. The result with us was to produce too many wood-shoots. Whether this is the result of a richer soil and a moister climate or not, I cannot say. The merit of the successful results of the cordon-wall is due to my late gardener, Mr. Wells, now at Osborne Park Nurseries, Potter's Bar. The following are the weights of some of the cordon-grown Pears, produced by trees which have always been allowed to bear freely, viz.:—*Glou Morceau*, 13½ oz.; *Beurré Bosc*, 12½ oz.; *Beurré Superfin*, 14 oz.; *Van Mons*, 15 oz.; *Easter Beurré*, 16 oz.; *Beurré Diel*, 15 oz.; *Josphirin Grégoire*, 11½ oz.; *Triomphe de Jodoigne*, 14 oz.; *Josphine de Malines*, 11 oz.; *Doyenné d'Alençon*, 13¼ oz.; *Duchesse d'Hiver*, 18½ oz.; *Bergamotte d'Esperen*, 11½ oz.; *Conseiller de la Cour*, 14 oz.; and fruit from *Doyenné Boussoch*, *Beurré Hardy*, *Madame Millet*, *Williams's Bon Chrétien*, *Figue d'Alençon*, and *Beurré Sterckmans* have weighed equal to these, as have also *Duchesse d'Angoulême*, and many others."

Among the many interesting features of Holme Lacy, there is none more worthy of being seen by gardeners and fruit-growers than this wall of Pear trees, of the beauty of which our engraving gives but a very imperfect notion.

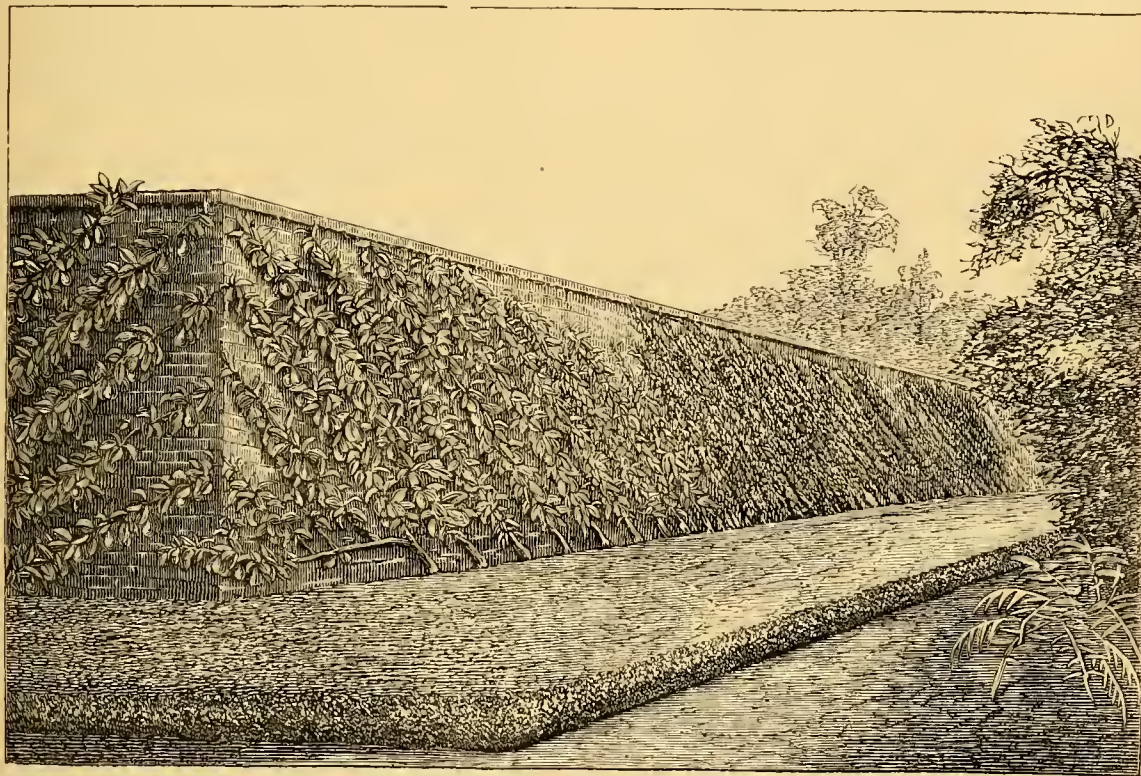
RASPBERRY CULTURE.

I do not agree with Mr. Hobday when he says (see p. 149) that Raspberries are at their best in the third year of their growth. They may certainly produce good fruit then, but, nevertheless, it does not follow that they will not produce a much heavier crop when they are three or four times as large. The second year, if one good cane has been planted, we may expect from two to three canes, but oftener two than three. These will bear a good crop, but not equal to that obtainable from three to four canes in the third year, or from six good canes in the fifth year. To allow all the young canes to remain the first two or three years tends to induce premature exhaus-

tion. What does it matter how many years the plants have been in the same position if we get sound well-ripened canes that produce fruit as good as that from plants of three or four years' standing? Raspberries cannot be compared, as regards treatment, with many other fruit trees, because they produce young wood every year; without it they will bear no fruit, and, as long as we can get it good, it is all we desire. I have in my eye a plantation of Raspberries, of from twenty to thirty years' standing, that cannot be easily beaten now. I thoroughly appreciate rotation, but for its sake, alone, I would not destroy a good standing crop. Late Raspberries are at times, in dry autumns, highly appreciated, and are very useful; but servants, as well as employers, look more to an early crop than a late one. I have sent late Raspberries to table often, and have well nigh as often found them, some days afterwards, thrown away in a mouldy state. Have late Raspberries by all means; but do not encourage the plants that bear the principal crop to produce them. Mr. Hobday must have a good climate not to have seen Rasp-

A CURIOUS FACT IN POT-VINE CULTURE.

WE have a Vinery here 60 feet by 13 feet, lean-to, with a partition in the middle for growing pot-Vines, and it may be thought strange that we force both ends at the same time, but the reason is that Grapes in May are in such demand with us that one house cannot supply us with them. The varieties chiefly consist of Black Hamburgs and Sweetwater, with a few other sorts for trial. The Vines stand in two rows, plunged in leaves in a bed in the middle of the house, and I am happy to say are looking well. But here comes the singular part of the matter. In consequence of the fire being at one end, of course that compartment is always from $2\frac{1}{2}$ to 3 degrees higher in temperature than the other, and, strange as it may appear, the Grapes in the coldest end are ready for the scissors while those in the hottest end are barely in flower. Both myself and my foreman stand and look at each other in reference to the matter in amazement, but can form no idea as to the cause of such an anomaly. Moreover, we grow French Beans along the front, and with the same results, those in the cold end beating the



Cordon Fruit-wall at Holme Lacy, Herefordshire.

berries killed by frost. I had a row of a new sort killed two years ago, and I have seen whole quarters destroyed in different places. I will give Mr. Hobday a nut to crack. Some years ago, when under a good practical gardener, we planted some four or five rows of Raspberries, I think 6 feet by 3 feet. They grew immensely for the first two or three years, producing canes like Bamboos, with an eye in a foot, little wood being in the canes, but plenty of pith. They were not killed whilst I was there; but, if a hard winter had occurred, there would have been no hope for them. Strange to say, these canes bore but little fruit; the gardener came to the conclusion that another row planted between them would have the desired effect, and, sure enough, as soon as they got established, the others began to bear prodigiously. That was in the fourth or fifth year after being planted. The gardener good-naturedly told me that fruitfulness in this case was brought about by the planting the other rows between them. Though young, my ideas were different; and, after exchanging opinions, he confessed that I had the better of him. What was the reason?

J. TAYLOR.

others by fully a week. This leads me to say a few words on bottom-heat for pot-Vines. Many fancy that bottom-heat makes them break with more regularity than they otherwise would do, and also sooner than those to which it has not been given. Never was a greater mistake, as the following fact will show. We grow a dozen Vines for the table; these were placed on the curbstone in the house just adverted to, and they broke equally strong and early as those subjected to bottom-heat, while in former years they swelled off their fruit equally well.

"Say, why is this, and wherefore, and what shall we do?"—*Hamlet*.

Burghley, Stamford.

R. GILBERT.

Peaches Shedding their Buds.—What is the cause of buds falling off Peach trees in the Peach-house?—G. [Drought at the root, and irregular temperature often cause Peach trees to shed their flower-buds.—Ed.]

Shading Vineries.—Do you advise shading the glass in Vineries where sunshine is very powerful? They are glazed with 21 oz. glass.—G. [No; that is if provision has been made, which, in all such cases, there should be, for ample ventilation.—Ed.]

THE DAISY, ITS HISTORY, POETRY, AND BOTANY.*

By the Rev. H. N. ELLACOMBE.

I do not apologise for the lowliness and humbleness of my subject, but, with "no delay of preface" (Milton), I take you at once to it. In speaking of the Daisy, I mean to confine myself to the Daisy, commonly so called, merely reminding you that there are also the Great or Ox-eye, or Moon Daisy (*Chrysanthemum leucanthemum*), the Michaelmas Daisy (*Aster*), and the Blue Daisy of the South of Europe (*Globularia*). The name has been also given to a few other plants, but none of them are true Daisies. I begin with its name. Of this there can be little doubt; it is the "Day's-eye," the bright little eye that only opens by day, and goes to sleep at night. This, whether the true derivation or not, is no modern fancy. It is, at least, as old as Chaucer, and probably much older. Here are Chaucer's well-known words—

Well, by reason, men it call may,
The Daisie, or else the Eye of the Day,
The Emprise, and floure of floures all.

There is, however, another derivation. Dr. Prior says "Skinner derives it from dais or canopy, and Gavin Douglas seems to have understood it in the sense of a small canopy in the line—

The Daisie did unhraid her crounall small.

"Had we not the A. S. *dæg-es-æye*, we could hardly refuse to admit that this last is a far more obvious and probable explanation of the word than the pretty poetical thought conveyed in *Day's-eye*." This was Dr. Prior's opinion in his first edition of his valuable "Popular names of British Plants," but it is withdrawn in his second edition, and he now is content with the *Day's-eye* derivation. Dr. Prior has kindly informed me that he rejected it because he can find no old authority for Skinner's derivation, and because it is doubtful whether the Daisy in Gavin Douglas's line does not mean a Marigold, and not what we call a Daisy. The other derivation, however, seemed worth a passing notice. Its other English names are Dog-daisy, to distinguish it from the large Ox-eyed Daisy, Banwort, "because it helpeth bones to knyrt agayne" (Turner); Bruisewort, for the same reason; herb Margaret from its French name; and in the north Bairnwort, from its associations with childhood. As to its other names, the plant seems to have been unknown to the Greeks, and has no Greek name, but is fortunate in having as pretty a name in Latin as it has in English. Its modern botanical name is *Bellis*, and it has had the name from the time of Pliny. *Bellis* must certainly come from *bellus* (pretty), and so it is at once stamped as the pretty one even by botanists—though another derivation has been given to the name, of which I will speak soon. The French call it *Marguerite*, no doubt for its pearly look, or *Pasquerette*, to mark it as the spring flower. As Pliny is the first that mentions the plant, his account is worth quoting. "As touching a Daisy," he says (I quote from Holland's translation, 1601), "A yellow cup it hath also, and the same is crowned, as it were, with a garland, consisting of five and fifty little leaves, set round about it in manner of fine pales. These be flowers of the meadow, and most of such are of no use at all, no marvile, therefore, if they be namelesse; howbeit, some give them one tearme and some another."—Book xxi., cap. 8. And, again, "There is a hearbe growing commonly in meadows, called the Daisie, with a white floure, and partly inclining to red, which, if it is joined with Mugwort in an ointment, is thought to make the medicine farre more effectual for the King's evil."—Book xxvi., cap. 5.

We have no less than three legends of the origin of the flower. In one legend, not older, I believe, than the fourteenth century (the legend is given at full length by Chaucer in his "Legende of Goode Women"), Alceste was turned into a Daisy. Another legend records that "this plant is called *Bellis*, because it owes its origin to Belides, a grand-daughter to Danaus, and one of the nymphs called Dryads, that presided over the meadows and pastures in ancient times. Belides is said to have encouraged the suit of Ephigeus, but whilst dancing on the Grass with this rural deity she attracted the admiration of Vertumnus, who, just as he was about to seize her in his embrace, saw her transformed into the humble plant that now bears her name." This legend I have only seen in Phillips's "Flora Historica." I need scarcely tell you that neither Belides or Ephigeus are classical names—they are mediæval inventions. The next legend is a Celtic one; I find it recorded both by Lady Wilkinson and Mrs. Lankester. I should like to know its origin, but with that grand contempt for giving authorities which lady-authors too often show, neither of these ladies tells us whence she got the legend. The legend tells that "the virgins of Morven, to soothe grief of Malvina, who had lost her infant son, sang to her, 'We have seen, O! Malvina, we have seen the infant you regret, reclining on a light mist; it approached us, and shed on our fields a harvest of new flowers. Look, O! Malvina.' Among these flowers we distinguish one with a

golden disk surrounded by silver leaves; a sweet tinge of crimson adorns its delicate rays; waved by a gentle wind, we might call it a little infant playing in a green meadow; and the flower of thy bosom has given a new flower to the hills of Cromla." Since that day the daughters of Morven have consecrated the Daisy to infancy. "It is," said they, "the flower of innocence, the flower of the newborn." Besides these legends, the Daisy is also connected with the legendary history of S. Margaret. The legend is given by Chaucer, but I will tell it to you in the words of a more modern poet:—

There is a double flouret, white and rede,
That our lasses call Herb Margaret
In honour of Cortona's penitent;
Whose contrite soul with red remorse was rent.
While on her penitence kind Heaven did throwe
The white of puritie surpassing snowe;
So white and rede in this fair floure entwine,
Which maids are wont to scatter on her shrine.
(*"Catholic Florist," Feb. 22, S. Margaret's Day.*)

Yet, in spite of the general association of Daisies with S. Margaret, Mrs. Jameson says that she has seen one, and only one, picture of S. Margaret with Daisies.

The poetry or poetical history of the Daisy is very curious. It begins with Chaucer, whose love of the flower might almost be called an idolatry. But, as it begins with Chaucer, so it almost ends with him. Spenser, Shakespeare, and Milton scarcely mention it. It holds almost no place in the poetry of the seventeenth and eighteenth centuries; but, at last in the nineteenth century, it has the good luck to be uprooted by Burns's plough, and he at once sings its dirge and its beauties; and then the flower at once becomes a celebrity. Wordsworth sings of it in many a beautiful verse; and I think it is scarcely too much to say that since his time not an English poet has failed to pay his homage to the humble beauty of the Daisy. I do not purpose to take you through all these poets—time and knowledge would fail me to introduce you to them all. I shall but select some of those which I consider best worth selection. I begin, of course, with Chaucer, and even with him I must content myself with a selection:—

Of all the floures in the mede,
Then love I most those floures white and redde;
Such that men callen Daisies in our town.
To them I have so great affection,
As I said erst when comen is the Maye,
That in my hedde there dawneth me no daie,
That I n'am up and walking in the mede
To see this floure against the sunnè sprede.
When it upriseth early by the morrow,
That blessed sight softenth all my sorrow.
So glad am I, when that I have presence
Of it, to done it all reverence—
As she that is of all floures the floure,
Fulfilled of all virtue and honoure;
And ever ylike fair and fresh of hue,
And ever I love it, and ever ylike new,
And ever shall, till that mine heart die,
Allswear I not, of this I will not lye.
There loved no wight hotter in his life,
And when that it is eve, I run blithe,
As soon as ever the sun gaineth west,
To see this floure, how it will go to rest.
For fear of night, so hateth she darkness.
Her cheer is plainly spread in the brightness
Of the sunne, for there it will uncloze;
Alas, that I ne had English rhyme or prose
Suffisaunt this floure to praise aright.

I could give you several other quotations from Chaucer, but I will content myself with this, for I think unbounded admiration of a flower can scarcely go further than the lines I have read to you.

Stepheu Hawes, who lived in the time of Henry VII., wrote a poem called the "Temple of glass." In that temple he tells us—

I saw depycted upon a wall,
From est to west, fol many a fayre image
Of sturdy lovers.

And among these lovers

And Alder next was the freshe queene,
I mean Aleeste, the noble true wife,
And for Admete howe she lost her life,
And for her trouthe, if I shall not lye,
How she was turned into a Dayseye.

We next come to Spenser. In the "*Muiopotmos*," he gives a list of flowers that the butterfly frequents, with most descriptive epithets to each flower most happily chosen. Among the flowers are

The Roses reigning in the pride of May,
Sharp Isop good for Greene woundes remedies,
Faire Marigolds, and bees-alluring Thyme,
Sweet Marjoram, and Daisies decking prime.

* Read at a meeting of the Bath Naturalists' Field Club.

By "decking prime" he means they are the ornament of the morning. Again he introduces the Daisy in a stanza of much beauty, that commences the Juno eclogue of the shepherd's calendar.

Lo! Colin here the place whose pleasant syte
From other shades hath weand my wandering minde.
Tell me, what wants me here to work delyte?
The simple ayre, the gentle warbling winde,
So calm, so cool, as no where else I finde,
The Grassie ground with daintie Daisies dight;
The Bramble bush, where byrdes of every kinde,
To the waters' fall their tunes attemper dight.

From Spencer we come to Shakespeare, and, when we remember the vast acquaintance with flowers of every kind that he shows, and especially when we remember how often he almost seems to go out of his way to tell of the simple wild flowers of England, it is surprising that the Daisy is almost passed over entirely by him. Here are the passages in which he names the flowers. First, in the poem of the "Rape of Lucrece," he has a very pretty picture of Lucrece as she lay asleep—

Without the bed her other faire hand was
On the green coverlet, whose perfect white
Showed like an April Daisy on the Grass.

In "Love's Labour Lost," is the song of Spring, beginning—

When Daisies pied, and Violets blue,
And lady-smocks all silver-white,
And Cuckoo buds of yellow hue
Do paint the meadows with delight.

In "Hamlet," Daisies are twice mentioned in connection with Ophelia in her madness. "There's a Daisy!" she said, as she distributed her flowers; but she made no comment on the Daisy as she did on her other flowers. And, in the description of her death, the queen tells us that—

Fantastick garlands she did make
Of Crow-flowers, Nettles, Daisies, and Long Purples.

And in "Cymbeline" the General Lucius gives directions for the burial of Cloten—

Let us
Find out the prettiest Daisied plot we can,
And make him with our pikes and partisans
A grave.

These are the only four places in which the Daisy is mentioned in Shakespeare's plays, and it is a little startling to find that of these four the first is in a song for very absurd clowns, and the second and third are in the hands of the poor mad princess. I hope that you will not use Shakespeare's authority against me, that to talk of Daisies is fit only for clowns and madmen. I am not so much surprised to find that Milton barely mentions the Daisy. His knowledge of plants was very small compared to Shakespeare's, and seems to have been, for the most part, derived from books. His descriptions of plants all savour more of the study than the open air. I only know of two places in which he mentions the Daisy. In the "P'Allegro" he speaks of "Meadows trim with Daisies pied," and, in another place, he speaks of "Daisies trim." But I am surprised to find the Daisy overlooked by two such poets as Robert Herrick and George Herbert. Herrick sang of flowers most sweetly; few, if any, English poets have sung of them more sweetly, but he has little to say of the Daisy. He has one poem, indeed, addressed specially to a Daisy, but he simply uses the little flower, and not very successfully, as a peg on which to hang the praises of his mistress. He uses it more happily in describing the pleasures of a country life—

Come live with me and thou shalt see
The pleasures I'll prepare for thee,
What sweets the country can afford,
Shall bless thy bed and bless thy board.
Thou shalt eat
The paste of Filberts for thy bread,
With cream of Cowslips buttered;
Thy feasting tables shall be hills,
With Daisies spread and Daffodils.

And again—

Young men and maids meet,
To exercise their dancing feet,
Tripping the comely country round,
With Daffodils and Daisies crowned.

George Herbert had a deep love for flowers, and a still deeper love for finding good Christian lessons in the commonest things about him. He delights in being able to say

Yet can I mark how herbs below
Grow green and gay.

But I believe he never mentions the Daisy. I must not, and I need not, dwell on the other poets of the seventeenth century. In most of them a casual allusion to the Daisy may be found, but little more.

Nor need I dwell at all on the poets of the eighteenth century. In the so-called Augustan age of poetry, the Daisy could not hope to attract any attention. It was the correct thing if they had to speak of the country to speak of the "Daisied" or "Daisy-spangled" meads, but they could not condescend to any nearer approach to the little flower. If they had, they would have found that they had chosen their epithet very badly. I never yet saw a "Daisy-spangled" meadow. The flowers may be there, but the long Grasses effectually hide them. And so I come *per saltum* to the end of the eighteenth century, and at once to Burns, who brought the Daisy into notice. He thus regrets the uprooting of the Daisy by his plough.

Wee, modest, crimson-tipp'd flower,
Thou'st met me in an evil hour;
For I must crush amongst the stour
Thy slender stem.
To spare thee now is past my power,
Thou bonny gem.

Cold blew the bitter, biting north,
Upon thy humble birth,
Yet cheerfully thou ventur'est forth
Amid the storm,
Scarce reared above the Parent-earth
Thy tender form.

The flaunting flowers our gardens yield
High sheltering woods and walks must shield;
But thou, between the random field
Of clod or stone,
Adorn'st the rugged stubble field,
Unseen, alone.

There, in thy scanty mantle clad,
Thy snowy bosom suward spread,
Thou lift'st thy unassuming head
In humble guise;
But now the share uprears thy bed,
And low thou lies!

With Burns we may well join Clare, another peasant poet from Northamptonshire, whose poems are not so much known as they deserve to be. His allusions to wild flowers always mark his real observation of them, and his allusions to the Daisy are frequent; thus:—

Smiling on the sunny plain
The lovely Daisies blow,
Unconscious of the careless feet
That lay their beauties low.

Again, alluding to his own obscurity—

Green turf's allowed forgotten heap
Is all that I shall have,
Save that the little Daisies creep
To deck my humble grave.

Again, in his description of evening, he does not omit to notice the closing of the Daisy at sunset—

Now the blue fog creeps along,
And the birds forget their song;
Flowers now sleep within their hoods,
Daisies button into buds.

And so we come to Wordsworth, whose love of the Daisy almost equalled Chaucer's. His allusions and addresses to the Daisy are numerous, but I have only space for a small selection. First, are two stanzas from a long poem specially to the Daisy—

When soothed awhile by milder airs,
Thee Winter in the garland wears,
That thinly shades his few gray hairs,
Spring cannot shun thee.
While summer fields are thine by right,
And autumn, melancholy wight,
Doth in thy crimson head delight
When rains are on thee.

Child of the year that round dost run
Thy course, bold lover of the sun,
And cheerful when thy day's begun
As morning leveret.

Thy long-lost praise thou shalt regain,
Dear shalt thou be to future men,
As in old time, thou not in vain
Art nature's favourite.

The other poem from Wordsworth that I shall read to you is one that has received the highest praise from all readers, and by Ruskin (no mean critic, and certainly not always given to praises) is described as "two delicious stanzas, followed by one of heavenly imagination." The poem is "An Address to the Daisy"—

A nun demure—of holy port;
A sprightly maiden—of love's court,
In thy simplicity the sport
Of all temptations.

A queen in crown of rubies drest,
A starveling in a scanty vest,
Are all, as seems to suit thee best,
Thy appellations.

I see thee glittering from afar,
And then thou art a pretty star,
Not quite so fair as many are
In Heaven above thee.
Yet like a star with glittering crest,
Self-poised in air thou seem'st to rest;
Let peace come never to his rest
Who shall reprove thee.

Sweet flower, for by that name at last,
When all my reveries are past,
I call thee, and to that cleave fast.
Sweet silent creature,
That breath'st with me in sun and air;
Do thou, as thou art wont, repair
My heart with gladness, and a share
Of thy meek nature.

With these beautiful lines I might well conclude my notices of the poetical history of the Daisy, but, to bring it down more closely to our own times, I will remind you of a poem by Tennyson, entitled "The Daisy." It is a pleasant description of a southern tour brought to his memory by finding a dried Daisy in a book. He says:—

We took our last adieu,
And up the snowy Splügen drew,
But ere we reached the highest summit,
I plucked a Daisy, I gave it you,
It told of England then to me,
And now it tells of Italy.

Thus I have picked several pretty flowers of poetry for you from the time of Chancer to our own. I could have made the posy fifty-fold larger, but I could, probably, have found none more beautiful, nor more curious, than these few.

I now come to the botany of the Daisy. The Daisy belongs to the immense family of the Compositæ, a family which contains one-tenth of the flowering plants of the world, and of which nearly 10,000 species are recorded. In England the order is very familiar, as it contains three of our commonest kinds, the Daisy, the Dandelion, and the Groundsel. It may give some idea of the large range of the family when we find that there are some 600 recorded species of the Groundsel alone, of which eleven are in England. I shall not weary you with a strictly scientific description of the Daisy, but I will give you instead Rousseau's well-known description. It is fairly accurate, though not strictly scientific (in Lindley's "Lady's Botany," Vol. I., p. 199). But Rousseau does not mention one point which I wish to describe to you, as I know few points in botany more beautiful than the arrangement by which the flower is fertilised. In the centre of each little flower is the style surrounded closely by the anthers. The end of the style is divided, but, as long as it remains below among the anthers, the two lips are closed. The anthers are covered, more or less, with pollen; the style has its outside surface bristling with stiff hairs. In this condition it would be impossible for the pollen to reach the interior (stigmatic) surfaces of the divided style, but the style rises, and as it rises, it brushes off the pollen from the anthers around it. Its lips are closed till it has risen well above the whole flower, and left the anthers below; then it opens, showing its broad stigmatic surface to receive pollen from other flowers, and distribute the pollen it has brushed off, not to itself (which it could not do), but to other flowers around it. By this provision no flower fertilises itself, and those of you who are acquainted with Darwin's writings will know how necessary this provision is in perpetuating flowers. The Daisy not only produces double flowers, but also the curious proliferous flower called Hen and Chickens, or Childing Daisies, or Jackanapes on Horseback. These are botanically very interesting flowers, and though I, on another occasion, drew your attention to the peculiarity, I cannot pass it over in a paper specially devoted to the Daisy. The botanical interest is this:—It is a well-known fact in botany, that all the parts of a plant—root, stem, flowers, and their parts, thorns, fruits, and even the seeds, are only different forms of leaves, and are all interchangeable, and the Hen and Chickens Daisy is a good proof of it. Underneath the flower-head of the Daisy is a green cushion, composed of bracts; in the Hen and Chickens Daisy, some of these bracts assume the form of flowers, and are the chickens. If the plant is neglected, or does not like its soil, the chickens again become bracts. The only other point in the botany of the Daisy that occurs to me is its geographical range. The old books are not far wrong when they say "it groweth everywhere." It does not, however, grow in the tropics. In Europe it is everywhere, from Iceland to the extreme south, though not abundant in the south-easterly parts. It is found in North America very sparingly, and not at all in the United States. It is also by no means fastidious in its choice of position—by the river-side, or on

the mountain-top, it seems equally at home, though it somewhat varies according to its situation, but its most chosen habitat seems to be a well-kept lawn. There it luxuriates, and defies the scythe and the mowing machine. It has been asserted that it disappears when the ground is fed by sheep, and again appears when the sheep are removed, but this requires confirmation. Yet it does not lend itself readily to gardening purposes. It is one of those

Flowers worthy of Paradise, which not nice art
In beds and curious knots, but Nature's boon
Pour'd forth profuse on hill and dale, and plain,
Both where the morning sun first warmly smote
The open field, and where the unpierc'd shade
Imbrown'd the noontide bowers.—"Par. Lost," iv., 240.

Under cultivation it becomes capricious; the sorts degenerate and require much care to keep them true. As to its time of flowering, it is commonly considered a spring and summer flower; but I think one of its chief charms is that there is scarcely a day in the whole year in which you might not find a Daisy in flower.

I have now gone through something of the history, poetry, and botany of the Daisy, but there are still some few points which I could not well range under either of these three heads, yet which must not be passed over. In painting, the Daisy was a favourite with the early Italian and Flemish painters, its bright star coming in very effectively in their foregrounds. Some of you will recollect that it is largely used in the foreground of Van Eyck's grand picture of the "Adoration of the Lamb," now at S. Bavon's, in Ghent. In sculpture it was not so much used, its small size making it unfit for that purpose. Yet you will sometimes see it, both in the stone and wood carvings of our old churches. In heraldry it is not unknown. A family named Daisy bear three Daisies on their coat of arms. In an old picture of Chancer, a Daisy takes the place in the corner usually allotted to the coat of arms in mediæval paintings. It was assumed as an heraldic cognisance by St. Louis of France in honour of his wife Margaret; by the good Margaret of Valois, Queen of Navarre; by Margaret of Anjou, the unfortunate wife of our King Henry VI.; while our Margaret, Countess of Richmond, mother of our Henry VII., and dear to Oxford and Cambridge as the foundress of the Margaret Professorships, and of Christ College in Cambridge, bore three Daisies on a green turf.

In medicine, I am afraid, the Daisy has so lost its virtues that it has no place in the modern pharmacopœia; but in old days it was not so. Gerard says, "the Daisies do mitigate all kinds of paines, especially in the joints, and gout proceeding from a hot or dry humore, if they be stamped with new butter, unsalted, and applied upon the pained place." Nor was this all. In those days, doctors prescribed according to the so-called "doctrine of signatures," i.e., it was supposed that Nature had shown, by special marks, for what special disease each plant was useful. Thus, a heart-shaped plant was sure to cure heart-disease; a bright-eyed flower was good for the eyes; a foot-shaped flower, or a leaf badly formed, at once proclaimed its fitness for the gout; and so the little low-growing Daisy must have its uses, and here they are. "It is said that the roots thereof being boyled in milk, and given to little puppies, will not suffer them to grow great" (Cole's "Adam in Eden"). It is said that "for pleasant dreams Dazy roots should be put under the pillow."

On the English language, the Daisy has had little influence, though some have derived "lackadaisy" and "lackadaisical" from the Daisy, but there is, certainly, no connection between the words. Daisy, however, was (and, perhaps, still is) a provincial adjective in the eastern counties. A writer in *Notes and Queries* (2nd Series, ix. 261) says that:—Samuel Parkis, in a letter to George Chalmers, dated Feb. 16, 1799, notices the following provincialisms: "Daisy: remarkable, extraordinary excellent, as 'She's a Daisy lass to work,' i.e., 'She is a good working girl.' 'I'm a Daisy body for pudding,' i.e., 'I eat a great deal of pudding.'"

And I must not leave the Daisy without noticing one special charm, that it is peculiarly the flower of childhood. The Daisy is one of the few flowers of which the child may pick any quantity without fear of scolding from the surliest gardener. It is to the child the herald of spring, when it can set its little foot on six at once, and it readily lends itself to the delightful manufacture of Daisy chains.

In the spring and play-time of the year,
... the little ones, a sportive team,
Gather king-cups in the yellow mead,
And prank their hair with Daisies.—*Cowper*.

It is then the special flower of childhood, but we cannot entirely give it up to our children. And I have tried to show you that the humble Daisy has been the delight of many noble minds, and may be a fit subject of study even for those children of a larger growth who form the Bath Field Club.

THE SELF-SOWN OAK WOODS OF SUSSEX.*

By R. W. CLUTTON.

IN this paper I propose to inquire into the following matters connected with the growth and management of self-sown Oak woods. Oak will grow in almost any description of clay, from the poorest and stiffest to a good deep loam. As the Oak, in its earliest stages of growth, has a long tap-root, a deep soil, free to a certain depth from rock, is necessary to its rapid development. Oak will grow with considerable luxuriance in a gravelly soil, but, on arriving at a size fit to be called timber, it becomes what is termed shaky, and it will be found on felling to be little more than a bundle of laths, utterly unsuitable for the uses to which Oak timber is generally put.

The Position of Oak Woods as Affecting their Growth.

There is no tree grown in England more sensitive of exposure to wind than the Oak, and the best and fastest growing woods are those in sheltered positions, well inland. There is a tract of country in the south-east of Sussex, lying between Battle and Hailsham, the soil of which is well adapted to the growth of Oak, but which, from its nearness to the sea—about ten miles as the crow flies—fails to produce, except in very deep narrow gills, other than short stumpy trees with bushy boughs, evidently thrown out as a protection against the south-west wind. These trees produce knotty and unsaleable timber. About thirty or thirty-five years ago, the planting in St. Leonard's Forest was begun with Larch and Oak, the proportion being about five of Larch to one of Oak. Since the Larch were seven or eight years old, they have been gradually thinned out, and, though in no case, have they thoroughly disappeared, the land is fairly planted with straight-grown silver-rinded Tellars, which bid fair, in due time, to become a fine Oak forest. This land is ordinary forest land.

Effect of the Periodical Cutting of Underwood.

The periodical cutting of underwood affects the growth of trees, as it affords the only opportunity of thinning woods; thus the thinnings are at longer intervals than, perhaps, is best for the growth of Oak timber. The custom in the Wealds of Surrey, Sussex, and Kent, is, to cut the underwood at intervals of from eight to twelve years. Underwood is usually sold by auction in November, and in the following spring the Oak trees are inspected, and such thinning as is required is then done. If the timber only was considered, a shorter interval of, say, five or six years, would be better, but as the underwood is an important portion of the profits, it is impossible to make the most of it until it becomes large enough for conversion into Hop-poles, hoops, &c. As to the age at which the timber causes injury to underwood, supposing there is a full plant of Tellars at any given fall, for the next two cuttings (say, for twenty years), there will be little difference found in the value of the underwood, which averages from £8 to £10 per acre. The next three cuttings will be reduced, on an average, about one-half, and, afterwards, the periodical cutting will be sold for a very small sum, viz., £1 to £1 10s. per acre, which will not pay for rates, fencing, and ditching.

Pruning Oak Woods.

Not only is pruning unnecessary—for, if thinning is done gradually, allowing the Oak trees to draw each other up to such height as may be required, the lower branches will of themselves drop off—but it is actually injurious, as every timber merchant or village carpenter knows. And the boughing of Oak trees materially affects the value of the timber when felled, though the tree, when pruned, may be only twenty or thirty years, and, when cut, 150 years old. When the boughs are thrown off by nature, as they are most perfectly under careful management, the bark gradually closes over the part from which the bough dropped, and it becomes impossible to define the former position of the bough, nor would any sign of it be found when the tree is cut; but, should the tree be pruned, an unsound knot, or a sore in the tree, is at once formed, allowing the water to penetrate the trunk where the branch was cut off. This will rot, and a black dead piece of wood will be found in the centre of the tree when it is cut. The bark will, no doubt, usually close over the wound made; but this will take some years, and, before it is closed, the mischief will be done; and, in old trees, it not unfrequently happens that the perfect closing over the wound by young wood causes a species of dry rot.

Thinning and Clearing.

As I stated above, the time for thinning woods is when the underwood is cut. The greater part of the timber of the weald in question is grown with underwood. The underwood is cut, on an average, once in ten years. At each cutting, trees which have attained a good size, and show symptoms of diminished growth, are felled, and

open spaces are thus obtained for a fresh crop. The same opportunity is taken for thinning the young Tellars, and of saving such further young plants as have come up since the last cutting of the underwood, that is, ten years previously. In thinning Tellars and young trees, it is of the utmost importance that the leading trees should be left, and the inferior ones cut. For the ultimate crop the trees should stand from 20 to 30 feet apart. The great aim of every forester should be to keep the trees thick enough to draw each other up to the height required, so as to have a clear stem of from 20 to 40 feet, as the case may be, and so to gradually thin them as not to abruptly admit the wind, and thus cause them to be checked in growth. Any checking of growth is speedily detected by the throwing out of a quantity of "rushy" boughs, as they are called. We have now carried our wood up to the age of from seventy to eighty years. If the trees have been properly managed, little further thinning will be required until their clearing, unless the timber is left for a longer period than 100 years for large shipbuildings. After a wood has been cleared of a natural crop of Oak, and the underwood has grown for a period of ten years, it will generally be found, at the next cutting, that a good crop of self-sown Oak Tellars is fairly scattered over the ground. The Tellars are usually marked with paint, and are excepted from sale. At this first cutting the young Oak trees will be about the same height as the underwood; and, if the underwood is fairly good, the chances are that it will be unnecessary to thin the Tellars at all, more than by a woodman going round and chopping down with a hatchet any inferior trees. During the next five or six cuttings the real work of thinning must be executed.

Profits.

I now come to the question of profit, whether timber or underwood pays best, taking a certain period of time, say, 100 years. Assume an acre of underwood of a fair average description in Kent, Surrey, or Sussex, no Oak trees being allowed to be grown upon it, but kept entirely for underwood. I will suppose that it has a good set of stems upon it. This underwood is worth, to sell, upon an average of £10 per acre at ten years' growth; and it may be assumed, for the purpose of rental value, that underwood selling for £10 or £12 per acre, is worth the same number of shillings rent; this will be found a close approximation if worked out. This acre of woodland will therefore produce a rent of 10s. per annum, and go on producing the same description of underwood for the 100 years with occasional filling up. Take, secondly, an acre of woodland under similar conditions with regard to underwood, but allow Tellars to grow upon it; there will be found little or no difference in the value of the underwood for the first twenty years. During the next forty years the underwood will have diminished in value; but we may fairly calculate that the trees which have been cut in the course of thinning, after twenty years, will have made up any loss in the value of the underwood in this period. In fact, the produce is much more than enough to make up the loss of profit from underwood. For the remainder of the 100 years, the underwood will pay very little, and the thinnings will not produce more than enough to pay expenses. In the foregoing observations, I have assumed that underwood sold at £10 per acre is worth a rental of 10s., and that for sixty years the underwood and Tellar thinnings together will produce fully 10s. per acre. From the latter period and up to 100 years, when I assume the timber will be fit for felling, little or no revenue will be derived. The rental of 10s. per annum accumulated for forty years at 4 per cent., gives, in round figures, £50 per acre. The following is an instance of a wood of 4 acres near Reigate, which was planted in 1830 with Oak and other trees. I have no record of any thinnings prior to 1866. In April, 1866, twenty-eight Oak trees, containing 111 feet, and 208 Tellars, were cut and sold for £42. In April, 1872, thirty-nine Oak trees, containing 216 feet, were cut and sold for £21. In 1873, seventy Oak trees were cut which were valued at £40. This wood was sold, and the timber on it valued very accurately, in 1873. There were 375 Oak trees, containing 2,600 feet of timber, and a few other trees, valued together at £247; being at the rate of £60 per acre. The above sum of £60 per acre gives a rental of 11s. per acre at 4 per cent., and beyond that, of course, is the sum of money received for the thinnings. The trees in this wood will not require much more thinning. It is, I think, apparent that the Oak-growing districts, in which underwood and timber are grown together, produce a much larger profit on an average of 100 years, than it is possible for Oak plantations alone to produce, as, during the earlier periods of growth, underwood pays an income when the land planted with Oak pays nothing.

Parchment Labels—Labels for plants, that have to be packed in any moist material, should never be written on parchment, as the moist heat frequently renders them illegible.

* An abstract of a paper read at an Ordinary General Meeting of the Institution of Surveyors, February 16th, 1874.

WORK FOR THE WEEK.

PRIVATE GARDENS.

The Flower Garden.—Owing to the open weather which we have had, this department is, just now, unusually gay. Of Primroses and other early spring flowers, exclusive of bulbous plants, the variety in bloom is considerable. Snowdrops and Crocuses are blooming freely in borders and on lawns, a fitting place for them, and where they will be succeeded by Dog's-tooth Violets and Scillas, so that all will be past before Grass-cutting recommences. The replenishment of flower-beds from the reserve stock must now occupy attention; all spring-flowering plants may be transplanted with impunity according to convenience. Several of the autumn-sown annuals, too, may be transplanted from their winter-beds to where they are required for blooming, and to fill up vacancies between perennials. Hollyhocks and Foxgloves from last year's sowings should now be transplanted permanently in good rich soil; indeed, a spadeful or two of well-decayed manure mixed with the soil in each hole is an important addition. Ivy, Jasmines, Clematises, Honeysuckles, Roses, Cratægus, Magnolias, and similar plants on walls should be thinned or pruned, if necessary, and neatly trained. Form edgings of the variegated Queen of the Meadow, Arabis, Cress, Polemonium, Grasses, Daisies, Golden Feverfew, Eranthis radicans, Santolinas, &c. Some of these, such as the Golden Feverfew and Cress, are only fit for spring gardening when saved from the previous year's sowings, and should be replaced again in April or May from spring-sown plants, which do not so readily run to seed during the summer and autumn months. Various kinds of flower-seeds should now be sown for early blooming; but the main crop of hardy annuals is best sown in the first week of April.

Sub-tropical Plants.—Sow seeds of *Acacia lophantha* on a brisk hot-bed, and prick off and pot singly the young seedlings as soon as fit to handle. Prune back old plants, and permit them to start slowly in a pit or greenhouse. These have a fine effect in the sub-tropical or flower garden mixed with flowering-plants or used in clumps in the centres of beds. Sow Solanums, Wigandias, Ferdinandas, Abutilons, Sonchuses, &c., in pots of sandy soil in brisk hot-beds, afterwards to be pricked off and potted as they require it. Old plants of the same that were saved from last year's collection should be forced in a pit or hot-bed in order to induce young growths for cuttings. Sow Castor-oil plants, Tobacco plants, Hemp, Uhdeas, Chilian Beet, Amarantuses, variegated Maize, and a few others in brisk heat, and attend to them as regards timely thinning, pricking off, potting, and watering; grow them on in a warm temperature for a time, and, towards the end of April, or in May, gradually harden them off prior to planting, which should be done in June. Erythras may now be started gently, and, if required, the young shoots may be used as cuttings; these will make nice little plants by May or June, and next year they will bloom well. Propagate *Aralia papyrifera* by means of root cuttings, but do not start the old plants into growth until next month. Plants of *Aralia japonica* raised from seeds last year will make fine plants for bedding-out next summer, provided they are grown on slowly, as, for instance, in an intermediate house. Sow a few more seeds in a sandy peat or loamy soil, in gentle heat, and propagate by means of cuttings obtained from the old plants, inasmuch as a stock of this sort cannot be obtained from roots, as in the case of *A. papyrifera*. *A. spinosa*, a showy and pretty plant, is hardy, and only requires pruning back to a plump eye in March or April. In the case of frosty weather, however, the ground containing the roots should be mulched, and the stems encircled with straw or hay-bands. Cannas may be started into growth like Dahlias; and, when they begin to grow, they may be divided into as many pieces as there are shoots, on each of which a piece of the old root should be retained. Canna seeds may be sown in a hot-bed or pit; and, if they are steeped for a night in tepid water, putting them into it when it is at a temperature of 140°, they will germinate sooner than they otherwise would do. If the stock of *Caladium esculentum* is short, start some roots, and propagate every offset as a cutting. Propagate *Ficus elastica*, by means of cuttings or eyes, with a leaf attached to each, and held upright by means of a wooden peg. Cuttings of *Melanthus major*, struck now, make fine plants for next summer's use. New Zealand Flax, both green and variegated, may be divided, and each division potted separately in a loamy soil, and plunged in a gentle bottom-heat. Plunged or planted in flower-beds, they are very effective, and old specimens are most in place isolated on lawns or as centres to beds. The general stock of Cycads, Palms, Musas, Bamboos, Ficuses, Dracenas, and other perennial tender sub-tropical plants, will now be starting into fresh growth; therefore, such as require fresh potting should be attended to in that respect, so that the plants may form a good supply of fresh roots before summer sets in. Hard forcing should not be practised in the case of those not potted, a slow and hardy growth being best.

Plants for Carpet-bedding.—As carpet-bedding continues to be so fashionable, some forethought must be exercised as to the quantity of plants of the various kinds that are likely to be wanted. Foremost among these will be *Alternantheras*, which will be required to be now subjected to a strong moist temperature to cause them to grow, when abundance of cuttings that strike freely may be obtained. Highly-coloured shoots do not strike so freely as green ones, which, afterwards, become coloured; seeds of Golden Feverfew should now be sown in a hot-bed; last year's saved plants are sure to "run" during the summer, therefore, this plant is always best treated as an annual. Sow seeds of *Lobelia pumila*; and, also, propagate it by means of cuttings; its compact habit and bright blue flowers make it very valuable for carpet-bedding. The variegated *Mesembryanthemum* should be increased by means of cuttings; this plant, although harder than most greenhouse plants, thrives well, and does not lose its compact character, in a stove. *Ajuga reptans sanguinea*, a good dwarf plant, furnishes a dark bronzy colour, and may be propagated in cold frames or out-of-doors by means of offsets; but more readily in heat. All dwarf *Echeverias* are useful for this purpose, and may be kept in boxes in a cool-house or frame, and near the light, rather dry at present, and perfectly free from all decaying matter. The young plants raised from seeds, offsets, or leaves, are best grown in a gentle heat, in order that they may be strong by bedding-out time. Various kinds of *Sempervivums* and *Sedums*, both tender and hardy, may be treated in the same way as the *Echeverias*, but in the case of the hardy ones, unless increase of stock is necessary, they are best wintered out-of-doors. *Coleuses* and *Iresines* are, also, useful for forming central masses to the beds, and if a few old plants were saved to produce cuttings, these should be started into growth at once, and their propagation proceeded with, because well hardened off young plants are much more desirable than old ones. *Centaureas* have a fine effect used with dark-leaved plants, therefore, have a stock of them for that purpose, either raised from cuttings in the autumn, or from seeds or cuttings now. Keep old plants pretty dry, and in cool airy pits. The variegated *Thymes* make fine edgings or carpets, and can now be raised freely from cuttings, or by means of division. The *Santolinas*, too, may be readily propagated by the same means, and, as they submit to severe clipping in summer, they are very useful for this kind of work. They may, also, be increased freely by means of division in the open border. An old white variegated *Pelargonium*, called Dandy, is of such dwarf habit as to be very suitable for this purpose; but, although it strikes freely from cuttings, these are twelve months old before they make much show. There are many hardy plants that can be used for this purpose, such as the Mossy Saxifragas, the Creeping Veronicas, *Pyrethrum Tchitchewi*, the variegated *Arabis albida*, and several others, besides a few such as *Polemonium carneum variegatum*, that form nice specimens when studded here and there in the carpet.

Roses.—Roses on pillars, walls, or trellises should have any dead wood about them removed, the very long living shoots shortened, and the whole neatly re-tied to their supports. A few Roses in beds and borders may be pruned to induce early blooming; but the general pruning had better be deferred for a short time yet. The pruning of hardy Roses, particularly those on the Manetti stock, however, may be done now, as they begin to grow early. Suckers and gross growths should be removed from all sorts, and stakes applied to such as require them.

Making Hot-beds.—These must now be made at once for the propagation of bedding plants, starting stove and greenhouse plants into growth, and for producing a few early salads and vegetables. Stable-manure that is moist throughout, and which has been turned once or twice, may be used alone, but in this case the heat is violent, and only of moderate duration. Stable-manure mixed with a fourth of cow-manure makes a good hot-bed, and one that retains its heat longer than one which consists wholly of stable-dung. The latter mixed with tree leaves—Oak leaves, if obtainable—makes excellent hot-beds. Even damp tree leaves alone, once or twice turned, form a good bed, and one that retains a moderate and steady heat for a long time, but a greater bulk of material must be used in this case than when litter is mixed with the leaves. Tan, spent Hops, and rope refuse, too, make good hot-beds, but they must be used in pits, either out-of-doors or indoors, or they will not hold together. In making a hot-bed, form a foundation about 2 or 3 feet wider than the dimensions of the frame to be set on it. This will give a good space for linings outside the frame. All hot-beds, particularly those of large size and depth, made above ground, should have a foundation of rough open material, such as a layer of brushwood; over that may be put Asparagus, Bean, and Pea haulm, and then the fermenting material, the whole being firmly put together. The size of the beds will differ according to the heat they are required to produce, and the plants to be forced on them. As to the time when they should be put up, that depends

upon what they are intended for. The beds, though firmly built, will sink considerably, consequently some spare material must be preserved for making up the linings, so that the proper temperature may be maintained. For some weeks after being put up, a vigilant watch must be kept to see that the beds do not become over-heated, and thus burn both roots and seeds placed in them. The temperature of such beds may easily be determined by means of sticks thrust into them in various places, and kept there, drawing them out occasionally, and feeling them with the hand; or thermometers may be employed for the purpose.

Orchids.—Of *Odontoglossums*, *Sophranitis*, *Lælia anceps*, and some others there is now a fine display, and, if kept at the coolest end of the house, their beauty will be retained longer than it otherwise would be. A general overhauling and re-potting of the several species should now take place. Before potting, however, withhold water for a few days, in order that the roots may be more easily freed from the old soil. *Miltonias*, *Dendrobiums*, *Bletias*, *Brassias*, *Cyrtopodiums*, &c., should be potted as they begin to grow; while *Cattleyas*, *Angraecums*, *Saccolabiums*, *Vandas*, and *Aërides* should be potted before they start into growth. *Calanthes*, when they fairly show signs of growth, should be re-potted. For epiphytal Orchids, the pots or pans used should have a small pot inverted over the hole in the bottom, and then they should be filled up with broken crocks and charcoal to within 3 inches of the top; terrestrial Orchids require less drainage. The former require only a spongy material, or compost consisting of fibrous peat and Sphagnum, which should not be pressed too hard. The latter require soil of a more nutritious character, such as turfy loam, leaf-mould, or peat, and rotten horse or cow-dung. Water must be carefully or rather sparingly given at first. Some will require fresh blocks, and those found to do better on blocks than in pots should be supplied with them. Orchids in general seem fond of non-resinous woods; therefore, Cork, Apple, Pear, Plum, and Maple blocks are more suitable than those of Deal or Pine wood. Some kinds grow best in baskets, a supply of which must also be got in readiness for them. Place some roughly-broken crocks in the bottom, with rough peat and Sphagnum on the surface, to firm the plants. Over such Orchids as *Phalænopsis*, that have lost their crowns, place a small board supported on pegs so as to prevent drips from falling on the plants and rotting them.

Hardy Fruit Garden.—All standard fruit-trees should be pruned before this time, and their trunks and main branches cleared of Moss and Lichens. Prune and nail wall fruit-trees, if not already accomplished; and, with glass or wooden coping, Frigi Domo, canvas, or fishing or woollen nets, protect Peach and Apricot blooms, when expanded, from frost. Whatever protection, other than a coping, is used should be affixed so that it may be easily lifted and let down as required. Young trees may yet be planted, and any old ones intended for transplanting next autumn should have their roots cut now, by which means they do not suffer nearly so much in removal as they otherwise would do. Prune back to 15 inches above ground stocks on which grafts are to be put. Mulch the roots of lately-planted trees, and affix strong stakes to all that require support; see, also, that espaliers are sufficiently staked and tied. Have all trees on walls properly pruned and nailed, as the flower-buds are more than usually forward this spring. A good syringing with sulphur and water well mixed will be found very beneficial to wall-trees. Make new Strawberry plantations, and fill up empty spaces in old ones; remove all runners, dig between the rows, and apply a good mulching of litter between the rows on the surface of the soil. Collect all prunings and other rubbish and burn them, saving the ashes and likewise the charcoal resulting from the operation for manurial purposes. The prunings may be advantageously used in burning clay for applying to stiff soils, in order to lighten it and to render it porous.

Irrigation a Danger.—Irrigation is, no doubt, a most desirable thing for India; but it would appear to be quite possible to have too much of it in particular places, judging from a resolution recently published by the Government of Madras on the prevalence of fever in the Godavery Delta. The Governor in Council observes in this document that the deplorable condition of the district, as sketched in a report presented to him by two civil officers specially deputed to inquire, is mainly due to "the utterly inadequate means of drainage in a country whose swampy nature has been aggravated by the great system of irrigation works." He directs accordingly that the subject be forthwith earnestly taken into the consideration of the Public Works Department, and arrangements be made with the least possible delay for "remedying this most crying evil, whereby at present the gift of financial prosperity bestowed upon the district is coupled with the curse of disease."

THE HOUSEHOLD.

AMERICAN CRANBERRIES.

THROUGH the kindness of Messrs. Carter & Co., of High Holborn, we have received a box of American Cranberries from the New Jersey Cranberry Growers' Association, accompanied with a request that we would report on their culinary value, and state the condition in which they arrived in this country. The Cranberries are much larger and finer than those we are accustomed to see, being the produce of the *Oxycoccus macrocarpus*, and not the species indigenous to Europe, namely, the *Oxycoccus palustris*. They were sent in small boxes containing about six or seven pounds each, and were not bruised or damaged by the transit. The production of Cranberries in the United States, although necessarily confined to limited areas—as they grow in turfy soil, and the cultivation is attended with heavy expense—has increased within the last few years to a surprising extent, as has also the taste and demand for them. About twenty-five years since, the earlier cultivators were thought to be making rash experiments, and it was feared that a crop of one hundred barrels would overstock the market; but now a capital of millions of dollars is successfully employed in their growth, and the annual yield is estimated to be about one hundred thousand barrels—a large part of this amount being produced in Southern New Jersey. In the United States they are regarded as supplying a place that can be filled by no other fruit, as they keep well if stored in a cool dry room, and can be prepared for use in a short time and with little trouble. The great American Cranberry dish is Cranberry sauce, which is used as a preserve with bread or in pastry, or as an adjunct to meat, game, and poultry, as we employ Currant jelly. It is made in less than ten minutes, by stewing the berries with sugar and a little water. Sometimes the berries are strained after boiling, to remove the skins and seed before the sugar is added. As prepared in either of these modes, the American Cranberries have a piquant acid flavour, perfectly *sui generis*, the recollection of which makes us regret the fact that, at the present time, they are not to be obtained in England. We also tested the fruit in pies and tarts made after the English fashion, and found it most excellent. The Americans have a household method of sealing up their preserves in air-tight glass jars, which are not to be obtained in this country; therefore, we tried the Cranberries in the form of jam; but the amount of boiling necessary to reduce the fruit to a solidity fit for keeping dissipated the flavour to a considerable extent. The strained juice furnishes a very admirable jelly, of an exceedingly rich colour, and perfectly transparent. We had not an opportunity of trying all the American recipes with which we were furnished; but, from the experience we have had, we feel confident that the New Jersey Cranberries only require to be known in this country to be very highly appreciated.—*Field*.

Quinces as an Addition to Apple Tarts.—Lady Llanover directs as follows:—Cut the Quinces in quarters. To 5 lbs. of fruit put 3 lbs. of sugar, and half a quarter of a pint of water. Put them in pint jars; put plates or saucers over the jars, and let them simmer very gently for three hours, placed in boiling water: put the peels in with them, and take them out when done; the overplus of syrup may be bottled, and also used to flavour tarts. It will prevent waste of sugar if the peels are stewed the first hour without sugar, then take out the peels and add the sugar, and simmer for two hours longer.

NOTES AND QUESTIONS ON THE HOUSEHOLD.

Indian Corn in England.—I observe you say that we should have no trouble in raising plenty of this in a green state for cookery. You are right; on warm soils, everywhere in the south of England, it ripens well; it used to ripen regularly in the herbaceous ground at Kew, and from Kew-grown seeds.—T. S.

Worcester Sauce.—Allow me to furnish your correspondent (see p. 102), with a recipe for making this sauce. I do not offer it as Len & Perrins, but I do say that it is equal, if not superior to it, in my opinion. It is not a recipe copied out of a book, but one I have known a long time. Half-a-pound Shallots, 1 oz. Pimento powdered, ½ oz. Mace powdered, ½ oz. cayenne, half a Nutmeg powdered, ½ lb. anchovy fish, 1 oz. salt, 3 pints of vinegar, 6 oz. soy. Chop or bruise the Shallots, beat up the anchovy fish, mix all together, stand for a month or two, and lastly strain through a coarse sieve.—C. I. B.

Bamboo Grain as food.—Those who like Bamboos for their graceful appearance, may be interested to know that they, like so many of the Grasses, are food-givers. Mr. Blechynden, in a letter published in the *Journal of the Agricultural Society of India*, gives particulars of the service rendered by this grain after failure of the Rice crops in Orissa in 1812, when a general famine was apprehended:—"The grain obtained from the Bamboo was most plentiful, and gave sustenance to thousands; indeed, the poorer, and therefore the greater, portion of the inhabitants subsisted for some time solely on this food. So great was the natural anxiety that was evinced to obtain the grain, that hundreds of people were on the watch day and night, and cloths were spread under every clump to secure the seeds as they fell from the branches."

SOCIETIES, EXHIBITIONS, &c.

ROYAL HORTICULTURAL SOCIETY.

FEBRUARY 18TH, 1874.

At this meeting, Orchids were well represented, and some choice kinds were staged; Cyclamens were finer than we ever remember to have seen them in small pots, and other winter-flowering decorative plants were, also, shown in fine condition. Messrs. J. Standish & Co., Ascot, furnished an interesting collection of forced shrubs, Lily of the Valley, Cyclamens, and other decorative plants, well grown and profusely flowered. Amongst these were some well-grown Bouvardias and half-a-dozen plants of the white-blossomed Abutilon Beule de Neige; this last furnishes quantities of snowy bell-shaped flowers during winter, and, together with the smooth glossy-leaved Clematis indivisa, deserves general cultivation for the purpose of yielding cut flowers; this Clematis bears white star-shaped flowers, about the size of a crown-piece, and, judging from the small specimens of it exhibited, it is a profuse-flowering species. One of the most useful plants shown in this group was the green feathery Asparagus decumbens, sprays of which are useful either for wreaths or bouquets; it grows well in small pots, or it may be planted out and trained up a trellis. From Mr. R. Dean, of Ealing, came a splendid group of seedling hardy Primroses, amongst which were some very bright and showy varieties; these are well suited for early spring bedding, or for growing in pots for greenhouse or cool conservatory decoration. When grown in cold frames, their flowers and foliage come much brighter and better in every way than when exposed, and they well deserve the extra protection, although they do not absolutely require it. Some seedlings, the result of a cross between *P. altaica* and *P. vulgaris arniculiflora*, showed a marked improvement, their flowers varying in colour from rich mauve to deep violet purple. The same exhibitor also staged a small collection of Violets, including Lee's new variety, Victoria Regina, an evident improvement on the Czar, and, like that variety, it bears large purple flowers, very sweetly perfumed. Mr. H. B. Smith, Ealing Dean Nursery, contributed a very even collection of double Chinese Primulas, of vigorous habit, bearing stont trusses of rosy salmon-tinted flowers. Mr. C. Turner, Slough, staged a collection of scarlet, salmon, and rose-flowered Zonal Pelargoniums, and an excellent collection of standard Auchenbas remarkably well fruited. The last named are especially adapted for the winter decoration of cool conservatories, or even ordinary apartments, and should be more generally cultivated in private gardens for these purposes than they are. Clusters of the bright scarlet berries and handsomely mottled foliage come in very usefully for church or domestic decorations of all kinds. From Messrs. Veitch & Sons came the best plants of Cyclamen persicum in 48-sized pots that have been shown this season. They are vigorous and well-flowered, each plant producing from four to six dozen blossoms, the colours being bright and distinct. The same firm also exhibited a collection of Amaryllis, among which the following varieties are specially worthy of cultivation; *A. Ackermanni pulcherrima*, a fine flower, of the most vivid velvety-crimson; *Le Zouave* bright reddish-crimson, mottled with white; Spotted Gem, white, speckled with vermilion; Ariadne, white, heavily streaked with deep crimson; Leopold, a very fine widely-expanded flower of a creamy-white, the lower portion of each segment being of a rich maroon-crimson. In the same collection we noted a well-flowered specimen of *Toxicophlœa spectabilis*, a white-flowered shrub, from the Cape. The bark of this plant is very poisonous, and is sometimes used by the natives for poisoning fish. From Messrs. W. Paul and Sons came a fine collection of Camellia blooms, very prettily staged in boxes of fresh Moss, in the same way as Roses are shown. The best reds were—Bealii, Eximia, Reine des Fleurs, Sarah Frost, Jeffersoni, and Imbricata; amongst the whites Fimbriata, Monteron, Candour, and Alba elegantissima were specially noticeable. The same exhibitors also staged a box of their new Chinese Primula—Waltham White. It is of stont habit, and bears large white flowers of good substance; the foliage, however, lacks the fresh greenness so essential to this plant, and the purity of the flower itself is marred by a greenish-yellow eye; still, for hybridising purposes, it is invaluable. Mr. W. Bull furnished some striking novelties, several of which obtained first-class certificates. Among these we noted *Hippeastrum picturatum* (*Amaryllis vittata* var.), with long flowers something like the new *Lilium Phillipse* in form, of a creamy-white colour heavily streaked with crimson. It bears seven or eight flowers on a spike, and is so distinct in form and colour as to merit general cultivation. Another variety *A. Saltana*—bears crimson-striped flowers on scapes 2 to 3 feet high. A considerable number of Orchids were exhibited, and contributed much to the interest of the exhibition, especially as several novelties made their appearance for the first time. One of the most striking plants staged was a seedling

Dendrobe (*D. Ainsworthii*), raised by Mr. W. Mitchell, gardener to Dr. Ainsworth, of Lower Broughton, near Manchester. This is the result of a cross between *D. nobile* and *D. heterocarpum*, and combines the habit and general characteristics of both species. Mr. J. Child, gardener to Mr. Torr, Garbrand Hall, Surrey, staged a fine plant of *Cœlogyne cristata*, rather past its best, and was awarded a cultural commendation. Mr. B. S. Williams staged a small plant of *Renanthera coccinea* in flower. This is one of the most beautiful of Orchids, but one of the most difficult to bloom regularly. The plant shown had been grown in a Cattleya-house, and had made very stont and vigorous growth. The same exhibitor also staged *Vanda tricolor*, *Cœlogyne cristata*, *Masdevallia Tovarensis*, *Oncidium cucullatum*, and a good variety of *Dendrobium nobile* in fine condition. Messrs. Veitch contributed a nice bank of these plants, including good examples of *Ada aurantiaca*, bearing rich orange-tinted flowers; *Angraecum citratum*, bearing a gracefully-arched spike of creamy-white flowers; a new species of *Dendrobium*, intermediate between *D. crassinode* and *D. crystallinum*, in growth and flower; and some very beautiful and distinct varieties of *Odontoglossum Alexandræ* and *Lycaste Skinneri*. Mr. E. Bennett, of Hatfield, furnished half-a-dozen dishes of Apples and Pears, in fair condition; and four remarkably well-grown Smooth Cayenne Pines came from Her Majesty's gardens at Frogmore. Vegetables were limited in quantity, the most important being a collection of ten varieties of Potatoes. These were mostly of American origin and growth, and were staged by Messrs. Carter & Co., of High Holborn.

First-class Certificates were awarded to the following:—

Seedling Primrose *Violacea* (R. Dean), robust habit, fine fresh green foliage, and a profuse bloomer, colour rich violet-purple.

Primula Prince Arthur (F. Perkins), a vigorous sturdy-habited variety, bearing trusses of double flowers of a rosy-vermilion tint.

Toxicophlœa spectabilis (Veitch) a useful flowering greenhouse shrub, bearing dense clusters of pure white Jasmine-like flowers in dense axillary clusters.

Angraecum citratum, a rare and beautiful Orchid, bearing spikes of creamy-white flowers nicely perfumed.

Hippeastrum picturatum (*vittatum*) (Bull), a beautiful free-flowering stove bulb, having white flowers striped with reddish-crimson.

Rapata pandanoides (Bull), a curious plant allied to the genus *Juncus*. It has peculiar sheathing bases to its strap-shaped foliage, and deserves cultivation as a novelty.

Alsophila elegantissima, a very graceful stove Tree-Fern having very elegant shining divisions to its fronds.

Pleocnemia Leuziana, a beautiful stove Fern, having finely-divided broad and spreading fronds.

Dendrobium Ainsworthii (Mr. W. Mitchell), a new hybrid Orchid, the result of a cross between the old *Dendrobium nobile* and the violet-scented *D. heterocarpum* (aureum). It is distinct from either parent, although partaking somewhat of the character of both. Sepals and petals, creamy-white; lips, fully expanded, white, with a vinous purple or claret-colour blotch.

BOTANICAL SOCIETY OF EDINBURGH.

At a meeting of this society, which took place the other day, Mr. McNab communicated a notice of the Lochwood Oaks in Annandale, Dumfriesshire. These Oaks were probably not less than 500 years old; their stems were from 9 to 14 feet in circumference, and the trees were from 30 to 50 feet in height, with an average spread of branches of 60 feet. All the trees were in a decayed or decaying condition, and were covered with evergreen Ferns, which gave the wood in winter a wonderfully beautiful appearance. In his report of the open air vegetation in the Royal Botanic Garden, Mr. McNab stated, that owing to the mildness of the season, the number of species of selected plants in flower greatly exceeded those noticed at any previous February meeting of the society. Since January 8th, the thermometer had been fourteen times at or below the freezing point. During the early part of February, flowering specimens of 132 species and varieties of trees, shrubs, and herbaceous plants were picked in the open air—all of which were shown to the society. Of these, 76 might be considered as summer and autumn plants, while the remaining 56 might be looked upon as winter and spring-flowering varieties. The first experienced since the 9th—the lowest being on the night of the 14th, when the mercury stood at 15° below the freezing point—had injured a large proportion of the premature flowers. This frost will be much against the blossom of many fruit trees, particularly the Pear, which is now in a very advanced state.

The obituary of the *Times* of last Monday contained a notice of the death of the daughter of the once well-known Dr. Darwin, philosopher, and author of "The Botanical Garden." She died in her ninety-first year, and was probably the last link between us and a society of provincial celebrities to whom the progress of British industry has been enormously indebted. Her father was a prominent member of the well-known "Lunar Society," so called because of the day of meeting, that of the full moon, to enable the visitors to see their way the more clearly home in the evening. Among its members were Watt and Boulton, of steam-engine celebrity; Wedgwood, the father of British pottery; Priestley, the chemist, and many others of little less note. The lady just deceased had made tea in her youth for all these celebrities, and her memory of past times remained wonderfully clear. Her own grandmother, with whom she lived as a girl on most affectionate terms, was born in the year that Queen Anne died.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

FIGS.

By J. R. PEARSON, Chilwell.

THOSE who know what a delicious fruit a really ripe Fig is are often astonished that Figs are not more grown in this country than they are. Here is a fruit-tree which will produce two, and, indeed, sometimes three, crops in a season of such wholesome fruit that persons who are subject to gout can eat them without injury; and yet we hardly ever see them fit to eat. How is it? I think it is because few persons know what a good Fig is. I have never grown Figs as I could grow them, and yet have given fruit to people, who have just said they did not like them—(indeed, some have used stronger language, and said they hated them)—and heard them say, "Oh, the Figs I have tasted before were not at all like these!" How is it likely fruit produced on a back wall of a Vinery, shaded, as they must be by the Vines, can be good; and yet any place, where nothing else would grow, has been thought good enough for Figs. Then, again, many of the best Figs are almost unknown. The Royal Horticultural Society did great good lately in growing an immense number of Figs in pots; and, under the clever management of their talented gardener, Mr. Barron, these were so good that a just opinion of their merits could be formed. It is much to be regretted that a most injurious kind of small scale insect, very difficult to kill, was introduced from the Continent, which put a stop to this interesting work. Still, a great deal of useful knowledge was obtained. But, to grow Figs as they can be grown, the plan adopted by Mr. D. Thomson, of Drumlaugh, must be followed, and the trees trained under glass, like Vines; then, with the full advantage of sunshine, people will know what Figs really are. I am so sure that Fig culture is only beginning, and must extend to a degree of which few persons have an idea, that for some years I have been trying all the kinds I could procure, to see which were really worth growing, and have now a house a hundred feet long furnished with bearing-trees. I shall certainly discard many kinds I often hear praised, and keep only the best varieties. As it is useful to all fruit-growers to know which are the best, I will say that up to the present time no kind I have fruited is at all equal to Bourjassotte Grise, a good grower, great bearer, and producing large fruit; it has one peculiarity, it is always good. Now, almost any Fig, when at its best, that is, when fully ripened, and with a drop of honey hanging from its eye, is good, but this variety is always good, and, when at its best, better than any other kind ever is. This kind was introduced by the Royal Horticultural Society, as new, a few years since, and is as great a favourite with Mr. Barron as it is with me; but, under another name, it has been long grown at Clumber, where a large old tree is, or was, lately covering a great space on a back wall of a Vinery. Even in this unfavourable situation its good qualities were recognised by Mr. Moffat, who gave cuttings to his friends. This will account for my having plants 8 or 10 feet high, whilst in Mr. Rivers's catalogue it is placed amongst the unproved kinds. Thinking so highly of it, I sent it to Chiswick, and Mr. Barron sent me, in exchange, what had proved the best variety in his collection, and we then found they were the same kind, when both produced fruit. There is another kind which is generally described as a nice, but not highly-flavoured, Fig, which my experience places amongst the very best when well grown, and that is La Madeleine or Angélique, for it has two names—indeed, several. Dr. Hogg says when well ripened it is of good quality. I venture to say when better ripened he will find it exquisite; with me it has been almost transparent, and quite golden in colour. When I have proved all the varieties I have, I intend, if I live, to plant a house on Mr. Thomson's plan, having planted my new seedling Vines in my present Fig-house. I intend to discard the following kinds:—Castle Kennedy, as a bad bearer; Datte, because it drops its fruit so much before coming to perfection like the last named; Early Violette, too small; Œil de Perdrix, too small; Panachée, not rich, too late, and not a good bearer.

THE SECRETARY OF THE ROYAL AGRICULTURAL SOCIETY ON THE RECENT ESSAYS AND PRIZES.

SINCE the publication of the decision of the judges appointed by the Council of the Royal Agricultural Society of England, to examine and report upon the essays sent in to compete for Lord Cathcart's prize of £100 for the best essay on the "Potato Disease and its Prevention," several letters and articles on the subject have appeared in the agricultural and horticultural newspapers, some of them referring also to the subsequent action of the council. While the matter was still under the consideration of the council, I refrained from making any statement in reference to the questions at issue; but now that the council have decided upon their course of action, I should like to be allowed to explain the reasons which influenced the judges in recommending the council to take the course which eventually was adopted. Amongst the ninety-four essays which came before the judges, there were several, the writers of which averred that the only way to prevent the Potato disease was to plant certain sorts (named or described in each case), which the writers of the essays had found, by experience, to be successful in this respect—that the disease did not attack them. These Potatoes were, in fact, asserted to be "disease-proof," although all the writers did not use precisely that expression. Now the judges had no reason to doubt the good faith of the essayists who made these statements; but, at the same time, it was impossible to award the prize on the mere belief in the good faith of the essayists, and on the probable truth of their assertions, so far as their experience had gone. Then, as there were several kinds of Potatoes put forward by different essayists as possessing the disease-resisting property, it was impossible for the judges to decide between them without trial, even if they had been thoroughly convinced by means of indisputable evidence that these varieties of the Potato had been proved to resist disease for a sufficient number of years in succession, and in a sufficient number of different districts having the requisite variations of soil and climate. They, therefore, recommended the council to give the possessors of the various kinds of Potatoes, said to have the property of resisting the disease, the opportunity of getting them and their produce tried for three years in succession in twenty different districts of the United Kingdom; and to give a prize of £100 to the early and late variety respectively, which should not be attacked by the disease in any one year on any one experimental plot, and which (if more than one fulfilled this condition) should have the best cropping, keeping, and cooking qualities. The council have not only agreed to do this, but they placed an additional £100 at the disposal of the judges to divide amongst those who may be second, or second and third, in the race, in either class, provided that the essential requirement of resisting disease is complied with. It is not, however, to be inferred that a variety of Potato which might gain the prize would necessarily be absolutely disease-proof for all time; but such a variety, after having been found to resist disease for three years, in twenty different localities each year, ought to be made widely known as the one which should be most generally cultivated. The point is this: either some one or more of the essayists to whom I have referred were right, and their statements were facts, or they were all wrong. In either case the judges thought that the society should sift the matter to the bottom, alike in the interests of the essayists, of Potato-growers, and of the public at large. This is exactly what the council have undertaken to do, if the possessors of these varieties of the Potato have sufficient faith in them to enter them for a fair and extensive competition. The scientific aspect of the Potato disease also received the careful attention of the judges of the essays; and, in their report to the council, they expressed their regret that no essayist appeared to be acquainted with the most recent discoveries in that field of inquiry. They, therefore, recommended the council to grant a sum of money for the purpose of inducing a competent mycologist to undertake a special investigation into the life-history of the Potato-fungus. The council have adopted this course also; and it is most gratifying to be able to announce that Professor de Bary, of Strasburg, the highest living authority on the fungi of our farm crops, and especially on the Potato-fungus, has undertaken this important investigation. I have thought it desirable to ask you to give publicity to this statement, not only with the view of making the action of the council of the Royal Agricultural Society more widely known; but, also, for the purpose of showing that Lord Cathcart's generous offer, although not productive of precisely the result which his lordship hoped, has already led to one investigation of national importance, towards the expenses of which he has devoted the money which he had destined for a prize essay, and which would have been most gladly accorded by the judges to any essay which exhibited a satisfactory solution of the question. It is perhaps remarkable that none of the essays sent in displayed much botanical acquaintance with either the root or its malady. H. M. JENKINS.

12, Hanover Square, W., Feb. 11, 1874.

NOTES OF THE WEEK.

— WE are glad to see that Solomon's Seal (*Polygonatum multiflorum*) is now offered for sale among the forced flowers in Covent Garden. Among native plants there is none more graceful or interesting than this, and none more easily grown.

— WE have received from Messrs. Hooper & Co., of Covent Garden, some tubers of the new American Potato called Snowflake. It is a white-skinned, flattish, shallow-eyed Potato very solid, and finely formed, and looks as if it would prove a welcome addition to our stock of garden Potatoes.

— MESSRS. POWELL, of Bayswater, writes to the papers suggesting that a great improvement would result if the roadway of Portland Place were lined with trees or belts of shrubbery. There are other London thoroughfares to which the same advice applies, and even some of those planted are, like Westbourne Terrace, so wretchedly done that they require re-planting.

— AMONG the more remarkable Orchids now in flower in Mr. Wrigley's valuable collection at Bridge Hall, Bury, Lancashire, are *Calanthe nivalis*, three kinds of Lady's Slipper, many varieties of *Cattleya Trianae*, *Celogyno cristata*, seven kinds of *Dendrobium*, *Epidendrum macrochilum*, various plants of *Lycaste Skinneri* with 256 spikes, *Laelia anceps*, *Miltonia canescens*, nine kinds of *Odontoglossums*, and *Oncidium cheiroporum* and *Cavendishii*.

— ON Wednesday evening last Mr. S. Hibberd lectured at the Society of Arts on a "New System of Cultivating the Potato; with a view to augment production and prevent disease." His plan mainly consists in placing large arched tiles under the sets, laid in ridges 4 feet apart, at a cost of over £66 an acre. The lecturer did not claim that the system was likely to be useful in well-drained and naturally warm soils. The plan may be worthy of some attention from the curious amateur, or Potato fancier, wishing to grow a few Potatoes in a wet and undrained garden.

— WE have received the first number of the English edition of the *Illustration Horticole*, which contains coloured plates of the following plants:—*Oncidium fuscum* (*Miltonia Warszewiczii*), *Ceroxylon andicola*, and *Camellia japonica*, var. *Don Pedro*. The pages of the new issue are of a much larger size than those of the French edition to which we have been so long accustomed, are neatly printed, and, in other respects, well brought up to the present requirements of Horticultural journalism, which has made such marked progress during the last two or three years.

— AT last the Duke of Bedford has determined to cover in Covent Garden market. An extraordinary general meeting of the Market Gardeners, Nurserymen, and Farmers' Association was lately held at the Bedford Head Hotel, Covent Garden, to take into consideration the model of the proposed covering. Several of the members were of opinion that the proposed erection was not high enough, and that the 4 feet left open on either side was very objectionable. The openings at the side and the low roof were stated to be for the convenience of those persons who occupy the upper rooms over the shops in the centre row. So far as we could judge from the model exhibited, the improvement contemplated will be slight indeed to what is required.

— MESSRS. LAWES & GILBERT have published an exhaustive report of experiments on the growth of Barley for twenty years in succession on the same land. The main results are the same as those previously obtained by the same gentlemen in the case of Wheat; viz., that when the same crop is grown consecutively on the same ground for a series of years, mineral manures alone fail to enable the plant to obtain sufficient nitrogen and carbon to yield even a fair crop; that nitrogenous manures alone increase it very considerably; but that the largest crops are obtained when nitrogen and mineral manures are applied together. In the case of Barley, these combined manures gave, for twenty years in succession on the same land, rather more of both Corn and straw than farm-yard manure did, and considerably more than the average Barley crop of the country grown under a system of rotation of crops.

— WE are requested to state that the trials of flowers to be undertaken at Chiswick this season are the following:—New Pelargoniums, for bedding purposes; Pelargoniums of the pink and rose-coloured sections, as pot plants; Fuchsias, as pot plants, grown to larger size than heretofore; Pentstemons, of which some very fine sorts bloomed late last year; and flowering Begonias of the boliviensis strain, now becoming so numerous. A collection of bedding Violas and Pansies is also being got together. Those who possess novelties which they desire to have tested, as well as those who are willing to render aid in making up the collections of these flowers, are invited to send their plants to Mr. Barron, the gardener-in-chief at Chiswick, as soon as they conveniently can. It may be mentioned, as an inducement to raisers of novelties to send their own productions

direct to Chiswick, that it has recently been decided, on the recommendation of the Board of Directors, to issue certificate cards in the case of all subjects certificated at the gardens, and which will, of necessity, be made out in the name of the donors. This has not hitherto been done, as the announcement has been reserved for the report, but, from the frequent delays which occur in the issue of the latter, it has been thought desirable to issue the certificates immediately after each of the Chiswick meetings.

— SOME fifty-nine lots of the pale blue Vanda (*V. cærulea*) were sold at Stevens' the other day. They realised from 10s. to 60s. per lot, each consisting of one plant. This valuable winter-flowering species is now scarce in its native habitats.

— THE anniversary festival of the Gardeners' Royal Benevolent Institution is to take place, this year, on Thursday, the 2nd of July; that is, the day after the great Rose show at South Kensington, and, we are informed, that many who will show Roses on that occasion have promised to send their plants from the Exhibition to the London Tavern, to assist in decorating the rooms. We, may, therefore, expect a grand floral display.

— IT is expected that the new Alexandra Palace will be ready for opening in June next. Great progress has been already made in the work of restoration, which is being pushed on vigorously. In addition to many improvements in its interior arrangements, as compared with those of its predecessor, the new structure will be furnished on the outside with four lofty contiguous water-towers, which will supply ample means of extinguishing any possible future conflagration.

— M. ALEGATIERE, the well-known Pelargonium-grower, has issued his catalogus of novelties for 1874, among which we notice the following double-flowered zonals, raised by M. Jean Sisley, viz.:—*Georges Sand*; flowers, large, white, if kept indoors, and assuming a slight rosy flesh-colour when exposed to the sun. *François Pertusati*; flowers, large, yellow, margined with white. *Carl Vogt*; flowers of medium size, of an orange-salmon colour, quite a new shade. All the foregoing are very free-flowering varieties.

— THE distinguished American statesman, whom Dickens so graphically describes as forwarding a pamphlet of his high eloquence to Queen Victoria, has been quite outdone by the Cranberry Growers' Association of New Jersey. The *New York Tribune* states that this society has immortalised itself by sending to that Royal lady two whole packages of Cranberries, and also divers recipes for the preparation of the same after the American methods.

— A SPECIAL general meeting of the Linnean Society is to be held on Thursday, March 5, at 8 p.m., "to consider alterations in the bye-laws of the society;" when it is expected a full explanation will be given of the reasons which induced the council to make the alterations recently adopted by the society, which met with so much opposition. It is understood that Mr. Bentham, who has occupied the chair of the Linnean Society for the past eleven years, will not offer himself for re-election. The custom of the society requires that the next president shall be a Zoologist, but students of both branches of Biology will be glad to learn that Professor Allman has allowed himself to be nominated. Few naturalists would bring to the office a wider, and none a more sympathetic knowledge.

— ACCORDING to Mr. Moule, chalk, mixed with anthracite for warmth, and mixed with lignite for lighting purposes, is to deposite coal and its relative gas altogether, and the public is to save at least 50 per cent. by the change. The extraction of the carbonic acid from the chalk, and its immediate application to kitchen and other fires, and to furnaces of every description, can be, Mr. Moule asserts, shown not only to be no impossibility, but to be perfectly feasible, requiring very little alteration in the present arrangement of grates and furnaces. When thus extracted and applied to anthracite, it produces a strong flame and heat, and at so slow a rate of combustion that a good fire was maintained for twenty-nine hours, in the furnace which heats Mr. Moule's church, with only half a hundred-weight of anthracite and an equal quantity of chalk mixed with it during that time. Through the aid of this remarkable property of chalk, the lignite known as shale may be used for the production of an illuminating gas to an extent which will appear incredible. Even the coarsest clay of this singular formation is full of gas; and Mr. Moule's experiments, though imperfect, satisfy him that one ton of this substance, with which Dorset and Norfolk abound, together with a due proportion of chalk, will yield as large an amount of gas as eight tons of ordinary coal. From these experiments, Mr. Moule argues that London might be warmed and lighted at a 50 per cent. cheaper rate than it now is; that the smoke, dust, and ashes nuisance might be abolished; and every good-sized country house and every village might be lighted with gas, while the kitchen-fire, with some slight alteration in the grate, might supply the house with light. Finally, lignite and anthracite beds would become valuable property, and chalk would be exported as coal is now. The prospect seems almost too good to be true.

THE FLOWER GARDEN.

SELECT HERONS' BILLS (ERODIUM).

ERODIUM MACRADENUM.—A valuable and pretty Pyrenean species, with leaves 4 to 6 inches long, twice divided, having a tendency to become recurved, which gives the plant a graceful appearance. The flowers are produced on stalks, 6 to 10 inches high, each bearing from four to eight flowers, the ground colour of which is a sort of French-white, delicately tinged with purple, and veined with purplish-rose; the lower petals are larger than the others; the two upper ones have each a dark-coloured spot, which at once distinguishes this species from the other *Erodiums*. The best position for this plant is in a crevice, tightly placed between two rocks, exposed to the hottest sun, where the roots can penetrate into dry sandy or stony soil to the depth of at least a yard. When grown in this way, this *Erodium* is an extremely pretty object, the leaves, by the dryness of the situation, are kept in a dwarf state, nestling to the rock, and the flowers are produced in great abundance during the summer months. When grown in pots, I find it best to place the plant between two stones—either lime-stone or sand-stone will do; the crown of the plant should be raised one inch, at least, above the rim of the pot, which prevents it from damping off at the "neck" in winter. The plant has somewhat of an aromatic fragrance.

E. PETRÆUM.—Another interesting and useful kind, dwarfer, and having larger flowers than the preceding species. Leaves, 2 to 4 inches high, much divided, soft and velvety to the touch; flowers, purplish-rose, from three to five on each of the stalks, which are 4 to 6 inches high. The leaves and flower-stalks are densely clothed with minute hairs. It thrives best when planted in deep sandy or gravelly soil, in warm positions, amongst the dwarfer kinds of Alpine plants. The accompanying illustration is an excellent portrait of this plant.

E. MANESCIVI.—A strong and vigorous herbaceous plant, and by far the handsomest and showiest species of *Erodium* I am acquainted with. It grows from 1 to 1½ feet high, and throws up strong flower-stalks, which rise above the foliage, each bearing from seven to fifteen showy purplish flowers from 1 to 1½ inches across. Leaves, pinnate; leaflets, deeply toothed, opposite, and of a lively and pleasing green. The plant is not at all fastidious as to soil or situation. I have seen it growing in very stiff soil, almost clay, though in such positions it is liable to damp off in the winter months. The best position for its successful cultivation is in dry hard soil, fully exposed to the sun. If the soil be too rich, the plant produces its leaves in such abundance that the flowers are hidden by them. It is a very fine plant for pot culture. Propagated by seed, or by carefully cutting up the crowns in early spring.

E. HYMENODES.—This is a rather coarse-growing kind when grown in the ordinary border, and scarcely worthy of being cultivated excepting in the semi-wild garden on a dry

bank, or it might be tried on an old wall. It produces its flowers during the summer and autumn months; they are pale pink. In foliage and habit it is somewhat similar to *Geranium sanguineum*.

E. REICHARDI.—A miniature member of the vegetable kingdom, growing only about 2 to 3 inches high when in flower; the leaves are small, heart-shaped, and lie close upon the ground, forming little tufts, from which arise slender stalks, each bearing a solitary white flower, marked with delicate pink veins. It often continues in flower for many weeks. This *Erodium* should be grown amongst the dwarfest and choicest Alpines, such as the *Androsaces*, *Gentians*, &c., in gritty peat mixed with a small portion of loam. R. P. York.

[To the foregoing may be added:—*E. carnifolium*, a plant from 6 to 10 inches high, with gracefully-cut pinnate leaves, the underside of which is covered with soft, white, downy hairs; flowers, red, about ½ inch in diameter, and borne in umbels of nine or ten blossoms. *E. alpinum*, which resembles *E. Manescavi*, but is much dwarfer, growing 6 to 8 inches high, and flowering continuously from spring to autumn: flowers of a handsome

violet-red or carmine, about an inch across, in umbels of six to ten blossoms each. *E. romanum*, allied to the British *E. cicutarium*, but with larger flowers; grows 6 to 9 inches high; flowers, purplish, appearing in spring and early summer. *E. trichomanefolium*, a very pretty dwarf kind, 4 to 6 inches high, with leaves so deeply cut as to resemble a Fern; flowers, flesh-coloured, marked with darker veins. All the preceding, with the exception of *E. Manescavi* and *E. hymenodes*, are admirably suited for rock-work or borders, in light sandy or calcareous loam. *E. Manescavi* should, perhaps, be confined to the border, as it is somewhat too tall and space-filling a subject for the rock-work; while *E. hymenodes*, as observed above, finds its most fitting place



Erodium petraeum.

in rough semi-wild parts of the garden or pleasure-ground.—Ed.]

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Phloxes.—The best of those grown at Chiswick last year were Carl Klein (F. & A. Smith), rosy-lilac with crimson eye; Dame Blanche (Henderson), white with pale rosy eye, pips large; Lady Hulse (Parker), bright rosy-purple; Le Léon (Downie & Co.), lilac with crimson around the eye, the later flowers striped and tipped with crimson; Mons W. Bull (ditto), lilac, with white blotches at the base of each segment forming a radiating white eye; Roi des Roses (ditto), bright rosy-crimson with carmine eye; and Mons. Tadlard (Veitch), bright rosy-salmon with dark eye, brighter than Lothair.

Abronia fragrans.—This fine species, though less amenable to treatment than *A. umbellata* and *A. arenaria*, is, unquestionably, the most remarkable of the genus. It differs from the species just named, in being usually more or less erect in habit, forming rather large branching tufts, from 12 to 16 inches in height, and covering, when the root is strong, 2 or 3 square feet of ground, the stems being decumbent at the base. The flowers are produced in umbels at the extremity of each lateral, and when fully expanded are pure white, diffusing a vanilla-like fragrance for some distance. During the earlier part of the day, the limb of the corolla is folded inwards, exhibiting only the greenish-white tint of the exterior, but about 4 o'clock the expansion commences, and speedily results in a transformation which is almost startling. The flowers, which are larger than in *A. umbellata*, are produced till very late in the season. It succeeds best in friable or light soils. The plant has been introduced by Mr. Wm. Thompson, of Ipswich, who this year offers seed of it.

THE INDOOR GARDEN.

VARIEGATED ORCHIDS.

(ANÆCTOCHILUS AND GOODYERAS.)

WE have many Orchids with variegated foliage; and, as they are not less beautiful in their way than those whose only attraction is their flowers, they are well worthy of consideration. Several of our British species, as *Orchis mascula*, *O. pyramidalis*, and others, have bright glossy leaves, profusely blotched with purple, and, when closely examined, are found to be extremely beautiful. Many tropical Lady's-Slippers, as *Cypripedium venustum*, *C. concolor*, *C. barbatum*, and *C. Hookeriæ*, are well-known examples of leaf-beauty, the foliage being blotched or barred irregularly with dark green and light green ground colour. We have recently seen some variegated sports on *Dendrobium nobile*, *D. japonicum*, and a pair of variegated plants of *Odontoglossum crispum* were sold at Stevens's Rooms some time ago. These were very prettily striped with creamy-white, and served to create a variety among the ordinary green-leaved kinds. There are also other Orchids more or less variegated; but the best of all are the *Anæctochilus* and *Goodyeras*, and to these we shall now direct attention.

ANÆCTOCHILUS ARGYRONEUROS.—A very pretty little plant, especially when examined closely with a lens or magnifying-glass, which is the best way of looking at these brilliantly tinted gems. It grows about 3 inches in height, having dark green leaves, suffused here and there with a lighter tint, the whole surface of the leaf being most beautifully reticulated, or netted, with bright silvery veins. This plant grows very freely. A native of Java.

A. DOMINI.—One of the best, and one which possesses additional interest, inasmuch as it is a garden hybrid, raised by Mr. Dominy, between *A. xanthophyllus* and the well-known winter-blooming *Goodyera discolor*. Its foliage, which is robust, is of a deep velvety-green, marked with silvery lines or veins, the central streak being of a pale copper colour. This singular hybrid has a good constitution; but is, as yet, rather rare.

A. INTERMEDIUS.—This is an extremely pretty species, and one which possesses a better constitution than many others. It grows freely, and has leaves of a rich olive-green, marked with golden veins, the whole plant being 2 or 3 inches in height.

A. JAVANICUS.—This appears to be rather uncommon in collections, but is of free habit and well worth growing. The ground colour of its foliage is of a dark olive tint blotched distinctly with light green. I have found this plant rather liable to damp off if grown under a shade or in a close case. It does well, however, in an ordinary stove temperature, if potted in light fibrous material, and carefully watered. When the plant is fully exposed it may be syringed freely, always taking care to use tepid water only.

A. LOWII.—This is the strongest of the whole genus, and is, at the same time, one of the best for general cultivation. The whole plant varies from 5 to 8 inches in height, each leaf being 4 or 5 inches in length, and about one-third less in width. The foliage is of a deep velvety-green, the youngest leaves being shaded with warm yellowish-brown, and the whole surface covered with longitudinal and transverse markings of a bright copper colour or golden hue. Of this plant there is a variety with lighter-tinged foliage and brighter golden markings than this species. The finest plants of it I ever saw were grown by Mr. Diamant, gardener to Lieut.-Colonel Holdsworth, Green Royd, Halifax. These were growing in a case similar to one which I shall hereafter describe, and were the picture of health and beauty; some of the plants were 8 inches high and as much through, and were grown in small pots plunged in living *Sphagnum*. When well managed this species is one of the finest of all dwarf-growing foliage plants. It is a native of Borneo, whence it was introduced by Mr. Hugh Low.

A. (MACODES) PETOLA.—This is smaller than the last-named species, but grows very freely under the same cultural conditions, and is equally easy to multiply by means of cuttings made of the rhizome. Its leaves are from 2 to 3 inches long, and of a light velvety-green, profusely banded and veined with gold. This beautiful species should be one of the first

selected by beginners, as it seldom disappoints the cultivator, and is invariably admired for its rich velvety texture and golden illuminations.

A. SETACEUS.—An old inmate of our gardens, and an elegant plant when well grown. Its leaves are about 2 inches long, and of a bright velvety-green, charmingly netted with gold. Of this very variable plant three or four tolerably distinct forms are in cultivation, each differing from the other in the shape of the leaf and in the breadth and density of its markings.

A. VEITCHII.—This is nearly as robust in habit as *A. Lowii*, which it somewhat resembles. Its leaves are about 3 inches in length, of a beautiful pale green colour, veined and barred with a still lighter tint. It is a kind which should be in every collection on account of its robust habit, but it nevertheless seems to be somewhat uncommon in private gardens.

A. XANTHOPHYLLUS.—This, though an old species, is one of the best in cultivation. It grows, freely treated, like its congener, and, when well grown, is a very beautiful foliage-plant. Its leaves are about two inches in length, of a rich green colour, and soft velvet-like texture. Each leaf is striped down the centre with broad masses of orange, and the whole of the leaf is covered with an intricate golden network of the greatest brilliancy.

GOODYERA DISCOLOR.—This well-known plant is not only valued for the beauty of its foliage, but is worth growing for its spikes of milk-white flowers, which are produced so profusely on strong specimens during the winter months. All the *Goodyeras* grow well, treated like *Anæctochilus*, but they do not, as a rule, require so much heat, and can be grown in any ordinary plant stove. The leaves of *G. discolor*, which is a Brazilian species, are of a dark green above and bright reddish-purple beneath.

G. DAWSONIANA.—This is a much larger-growing species than the last, each leaf being about 3 inches in length, of a deep and rich velvet-like green, traversed with copper-coloured lines. This plant flowers freely, and bears spikes of white flowers, a foot in height, exactly like the last. It comes from the Malayau Archipelago.

There are several other species of *Goodyera* in cultivation, but these are two of the best for general culture.

The compost best suited for the growth of both *Anæctochilus* and *Goodyeras*, is one composed of fresh fibrous peat, chopped living *Sphagnum* Moss, and sufficient coarse well-washed sand to keep the whole open and porous. It is highly essential that the drainage be perfect, as nothing tends to prevent these plants from developing themselves as stagnant moisture, especially at the root. When making their growth during the summer months the free use of tepid water is beneficial, and they must never be allowed to get thoroughly dry. *Anæctochilus* are not difficult of propagation, as every joint of the rhizome is furnished with a latent bud, which seldom fails to push into growth when the top is removed, and the top itself may be treated as a cutting, or, if possible, remove it with a few roots. These plants are generally grown in flat pans, and covered either with an inverted bell-glass or a glass-case. The finest plants of *A. Lowii*, *A. setaceus*, *A. Veitchii*, *A. intermedia*, and some others, were growing in a case about 4 feet long and 3 feet wide. This case had a glass top, the sides and ends being covered with perforated sheets of zinc. It was placed on the slate bench of a warm plant-stove, and effectually protected the plants from cold draughts, while, at the same time, it allowed a free circulation of warm air around the plants. This is especially necessary to the vigorous growth of these delicate plants, for they are most impatient of stagnant moisture either at the root or overhead, and, if covered with bell-glasses, it is essential to wipe the latter quite dry, every morning, or the condensed moisture often induces the leaves to spot and decay. A plant-case, similar to the one above described, is very useful, not only for these plants, but for many other stove foliage plants equally tender, or for propagating purposes, since nothing is more common, than for delicate seedlings to damp off in the close cases generally employed.

The foregoing species are those best worth growing for their foliage, and will add interest to the most select collection of Epiphytes.

F. W. B.

A FUCHSIA CHANDELIER.

THE accompanying illustration shows one of the many ways in which Fuchsias may be trained so as to suit particular purposes. It represents a Fuchsia Corallina hanging down, chandelier-fashion, from the roof of the conservatory at Chiswick House. A branch was trained downwards from a plant that was planted, about seven years ago, against one of the supports of the dome of the conservatory. This shoot was stopped, three or four buds broke, and when these had grown a year or so they were trained somewhat in the shape of an umbrella. The branch in question has grown to its present size in three years, and is now a really pretty and interesting object, flowering as freely as the branches do that are growing more naturally. Its growth, as may be seen by the annexed



A Fuchsia Chandelier.

sketch, is at right angles with its support, and it often surprises me that the sap should so freely descend, as it does, under such disadvantageous circumstances.

C. EDMONDS.

HARDY WINTER CONSERVATORY PLANTS.

DEUTZIA GRACILIS.—I consider this the most beautiful and graceful of all shrubs for the decoration of the conservatory in winter, and all will agree with me that little trouble is required to induce it to produce its white flowers in profusion at that season. In many places, where this *Deutzia* has finished flowering, it is stowed away behind stages, or in any out-of-the-way place, until a suitable time has arrived to turn it out of the pot, in which it has been grown in, and to plant it in some out-of-the-way border, to prolong its existence until required for forcing again. The following mode of culture I have, however, found to be the best:—Last spring we had two dozen of two-year-old plants in 7-inch pots, which, when they had finished flowering, were removed to a Vinery with a temperature of 60°, where they finished their growth; afterwards they were removed to a cool frame, until they had begun to grow again, when they were set on pieces of slate behind a north wall and there left to the mercy of the weather. On the first of the following September, they were shaken out of their pots, root pruned, and potted in the same pots they previously occupied, and returned to the frame, where they remained dry until the 5th of November; after which, eight of them were put into a Cucumber-house, and by Christmas they were in full flower and in the conservatory; another eight

succeeded them four weeks afterwards; and the third eight is still in the frame, with no appearance of starting. No water is given to them until the buds begin to swell, and even then it is only applied in limited quantities, until both top and root are fairly in action.

THE HAWTHORN (*Crataegus crenulata*).—This should be largely cultivated as a winter or early spring plant for the conservatory. The white variety seems more willing to flower than the red or pink kinds, but all are worthy of attention, as they produce a grand effect among other plants during the dull season of the year. On the 1st of September we lifted six plants from a thicket, which had been planted two or three years ago, potted them in 10-inch pots, using a stiff clayey loam, with a good mixture of sand in it, and placed them behind a north wall, where they remained with no further attention until the 5th of November, when they were started in a Vinery, and they are now (especially the white sort) in a perfect sheet of blossom.

THE LABURNUM (*Cytisus Laburnum*).—Although the Laburnum blooms early out of doors, a few plants of it a couple of months earlier in the conservatory are not objectionable. We grow two sorts of *Cytisus* here, viz., the purple and yellow. The yellow sort is on its own roots, and, although not yet in flower, it promises to be a mass of golden tresses. Both are grown in 10-inch pots, and, being rather tall, they do well for background plants. In summer they are set out of doors, watered occasionally, and allowed to grow unchecked. They are dried off a month before those in the shrubbery begin to throw off their leaves in order to give them a long rest prior to forcing. The soil we use for them is a light sandy loam, with a good mixture of peat in it, and when in growth they can scarcely be over-watered, and they are greatly benefited, too, by giving them an occasional application of liquid-manure. The points of the young shoots may be pinched off, but as few as possible of the shoots themselves should be entirely cut off, as these produce the following year's flowers. The purple *Cytisus* does best whip-grafted on the yellow stock, as the shoots grow stronger, and the buds become more plump when thus treated. The treatment suitable for the yellow kind answers for the purple, only the latter ripens its wood better and goes off to rest sooner than the yellow-flowered sort.

THE PERSIAN LILAC.—This, as usually managed, seldom flowers well when forced. It is a common plan to lift plants of it from a back shrubbery, cram them into a large-sized pot, and at once place them in a temperature of 60° or 65°. Even under such management I have seen flowers produced in November or December, but so miserable have they been as to be scarcely worthy of notice, and the shoots produced under such circumstances resembled knitting-pins more than healthy wood. We select stubby well-ripened plants, and lift them in November, root-pruning them to suit the pots into which they are to be put, leaving room for an inch or more of good sandy loam, which must be pressed in rather firmly with a blunt-pointed stick. This done, they are placed in an airy open situation, and are allowed to grow at will during the spring and summer, never permitting them to become dry, and encouraging them, now and then, with a little manure-water. Towards the end of August they are put under cover, and, when at rest, another shift, with a handful of half-inch bones placed over the crocks, is given them. About the 1st of October forcing begins, rather slowly at first, the plants being kept as near the glass as possible to prevent them from becoming spindly. Under this treatment excellent heads of bloom are obtained by the end of December.

LILY OF THE VALLEY.—The Lily of the Valley may be had in flower, in pots, during four months of the year, viz., from the 1st of November until the end of February. I have seen it stand in a temperature of 60° for two months without the least sign of starting. For pot culture, we do not plant out the roots at all, but grow them always in pots, shaking them out and potting afresh before starting them, which is done in a dung-frame, from which light is wholly excluded until the buds have burst, after which the plants are gradually introduced to light. Care is taken not to let them become blanched in the frame, as, in that case, they start too fast. Thus managed, fine potfuls of this favourite little Lily may be obtained.

Wotton Gardens, Aylesbury.

JAMES MORRISON.

A Cool Fern Grotto.—In the Botanic Gardens at Glasgow, there is a small Fern grotto sunk a few feet into the ground and covered with green-painted glass. The walls are steep, and in the form of rugged banks, or rock-work, entirely covered with cryptogamic vegetation, which thrives apace. The crevices between the stones being filled with turfy peat, all is kept moist, and frost is excluded by covering the roof, when necessary, with mats. Thus situated, specimens of *Todea superba* looked remarkably healthy, some of their fronds being 2 feet in length, and proportionally wide; *T. pellucida* was, also, equally vigorous. Some time since, Mr. Bullen, the curator, received a plant of *Todea Wilkesiana* (of which an illustration is given at p. 181, Vol. III. of THE GARDEN) from Messrs. Veitch, of Chelsea; when it arrived, he placed it in a Fernery in which intermediate temperature was maintained, but it never attempted to grow. By way of experiment it was transferred to this grotto a few months ago, and, since then, it has formed a well-developed frond, and others promise to succeed it. *Hymenophyllum Tunbridgensis*, *Wilsoni*, and others, seem quite at home in the peat here, creeping over the stones as if in their native habitats; and there are large masses of the Killarney Fern growing in pouches on the rock-work, and in clumps at its base. One of the prettiest objects, however, in this Fernery, is *Lycopodium clavatum*; this grows luxuriantly, creeping over the surface of both rock and turf, and forming a pleasing contrast with its truly interesting associates. This *Lycopodium*, which is sold in Covent Garden Market under the name of "Stag's-horn" Fern, is a suitable plant for a cool moist rock-work. On rocks bordering the Caledonian canal, and on other mountainous and rocky portions of Ross and Inverness, I have seen this *Lycopodium* carpeting the ground, and creeping hither and thither in all directions between the stalks of Heather and Cranberries, as well as over the ledges of the rock. It, however, likes moist land best. If the plants become dry overhead during the daytime, they are sure to be bathed with dew at night, both naturally and by evaporation arising from the dampness of the ground.—W. F.

A Remarkable Date Palm.—In the *Revue Horticole*, M. Nardy describes a singular variety of Date Palm at present growing in the garden of M. Denis, at Hyères (Var). It is one of twenty young Date Palms which were planted in two parallel lines in 1845, and which now form a shady summer retreat. The young plants grew with various degrees of vigour, and now present a great diversity in the length of their trunks, which vary from 8 to nearly 20 feet. The subject under notice, however, differs from all the others in the remarkable arrangement of its leaves, which are gracefully disposed in a spiral manner round the stem, like the leaves of a *Pandanus*, in consequence of which M. Nardy has given it the name of *Phoenix dactylifera spiralis*. This tree has borne an abundance of very large fruit, from which seedlings have been raised, and M. Nardy is not without hope that some of these will reproduce the very interesting and pleasing peculiarity of their parent.

Forcing Lily of the Valley in Holland.—In order to grow strong clumps of Lily of the Valley, in January or February, dig up single crowns and tie them up in bundles of ten or twelve together; plant them in a soft loamy soil, well manured with cow dung, at a distance of 10 or 12 inches between the bundles. The position should be a shady one, and the plants should not be disturbed for three years, when they will be found to have formed good clumps. Plants, thus treated, are remarkably well adapted for forcing. For this purpose, plant them in pots of suitable size, covering the crowns with an inch or two of soil, and then plunge the pots, for a fortnight or so, in Cocoa-nut fibre. By that time they will be well-rooted. The pots may then be placed on the benches of a hot-house, or plunged in a hot-house in Cocoa-nut fibre, which should cover them to the depth of 5 or 6 inches. They should be left there until the plants appear above the surface of the fibre, when the pots should be taken out and put, for a few days, in a warm and shady place, after which they may be removed into a well-lighted house. This is the mode of treatment commonly practised in Holland, and, from experience, I can pronounce it a most satisfactory one.—C. J. L. VAN DER MEER, 2, Cheshunt Terrace, Tottenham.

Tree and Pyramidal Mignonette.—Although I find it easy to grow Mignonette in the form of pyramids and standards, yet few grow it successfully in either of these ways. If I wish to have standards, I sow in July or August in 32-sized pots, and as soon as the plants are large enough, they are thinned out to one plant in each pot. As growth progresses I train this plant in an upright manner until it reaches the desired height, say 3 feet. The side shoots must be removed from the stem, but in such a way as not to injure the foliage with which the stems should be furnished, and which, in my opinion, improves their appearance. The head may be trained upon umbrella-shaped wire, and the flowers must be nipped out until the desired size is attained, when the stopping should be discontinued, and, in four or five weeks, the plants will be ready either

for exhibition or house decoration according to the time of year. Pyramids are, however, my favourites, they bloom more profusely, and have spikes of a finer quality than standards, and they likewise last longer. These may be trained in a stiff and formal way on wires, but trained to sticks is much more natural, and looks best. I find about 2½ feet in height, and as much in diameter at base, to be better than having a greater height. In October, when they ought to have filled their pots with roots, I shift them into their flowering pots, as I know of no plant that dislikes disturbance at the root more than Mignonette. I have tried it in various soils, but I have come to the conclusion that three-parts stiff loam, such as that which a good Melon-grower might choose, dry and well-decayed cow-dung, with a good sprinkling of soot mixed, suits it best. Chop all this up roughly, crock well, and pot moderately firm; place them in a cool house, from which frost is excluded, and attend to tying and similar work. Never allow the plants to become dry, and water alternately with liquid-manure and pure water.—D. GILLET, Court Garden, Great Marlow.

Orchid Culture in New Jersey.—We had here a very fine variety of *Lycaste Skinneri*, with two flowers on a stem, last autumn; also, about forty stems of *Cypripedium* insigne with two flowers on each; one plant had five stems with two flowers on each. I may add, however, that these plants were very showy, and that both the single flowers and pairs were extra large and fine. From a batch of plants covering a space of 12 feet by 4 feet, I cut nearly four hundred flowers during Christmas week of *Cypripedium Roezlii*. We have a plant which commenced to flower from two stems in the summer, the one stem had but four or five flowers, which were comparatively soon over, but the second stem has at the present time (January 27) the ninth flower expanded, and each flower lasts on the average three weeks. Thus you will see that the plant has already been in flower about six months, and there are other buds to open, which will probably make up a dozen on one stem; usually a second flower opens a day or two before the preceding one drops off, but, of course, there are only the two flowers open at once, and that only for a short time. I consider this species to be one of the finest of the *Cypripediums*, both on account of its beautiful rosy colour and peculiar twisted tails, as well as on account of its beautiful pale green recurved foliage. The leaves of one large plant here measure more than 2 feet in length, and 2 inches in breadth. *Cattleya Trianae*, I do not think, has been thoroughly appreciated in Europe, for I recollect some time ago complaints being made that it lasted but a few days in flower; even if that was true, however, it would be worth growing, but I have plants of it with flowers in full beauty, which were open on the 1st of the month, and which appear likely to last another week. It is thus clear that they are good for four weeks when subjected to the ordinary treatment of the *Cattleya*-house, and to the bright sunshine which we get in this country. Of course, care is taken to keep water from the flowers. Out of a dozen plants in blossom at once, no two were exactly alike in colour, but all were lovely. The gems among the varieties of *Trianae* were some pure white flowers with deep yellow throats; these were far superior to the best variety of *Warszewiczii* delicate, which was in flower at the same time. I consider the white *Trianae* to be the most lovely *Cattleya* I have seen, and can be only compared in purity with *Cologne cristata*.—JAMES TAPLIN, South Amboy, U.S.A.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Asplenium fragrans.—I saw some nice specimens of this pretty little Fern a few days ago at the nurseries of Messrs. J. & R. Thynne, at Glasgow. Its fronds are from 9 to 15 in. long, and deliciously scented. Messrs. Thynne's foreman found it near the Falls of Niagara, in which neighbourhood it grows thickly. People living in the vicinity of the falls, I was told, often gather the fronds, and use them, when dried in the sun, for stuffing beds.—W. F.

The Crested Adiantum (*Adiantum cristatum*).—I have just seen a nice specimen of this rare and beautiful Maiden-hair Fern in Messrs. Rolleston's Nurseries, at Tooting, and think it one of the most interesting of the whole group. It has a sturdy habit of growth, something resembling a small plant of *A. villosum* in general appearance, but easily distinguished by the peculiar manner in which the sori or spore-cases are arranged on the margins of the pinnules, so that they are seen when looking on the upper surface of the fronds, as well as from below. It is one of the rarest species in cultivation, and deserves general cultivation.—B.

Darlingtonia californica.—I have a small plant of this, and wish to know how to be successful in treating it, as it does not grow much, and seems to have declined in health since I bought it. It is now in a plant-stove.—J. FRASER. [This plant is a native of California, where we have seen it growing amongst Grasses, Sedges, and Moss, in moist situations. You should gradually inure your plant to a cool and moist temperature, such as that of a frame or cool pit, protected from actual frost. It should be potted in a compost of fibrous peat and living Sphagnum, and, if plentifully supplied with water at the root, it ought to do well. It should never be rested or allowed to become quite dry. It is nearly, if not quite, hardy, and a plant in Messrs. Backhouse's Nursery, at York, has withstood one or two sharp winters planted out along with the Huntsman's Cap (*Sarracenia purpurea*) in their interesting bog-garden. It ought to grow luxuriantly in Devonshire and Cornwall, planted out in peat and living Sphagnum, in a marsh or artificial bog-garden.—ED.]

THE ARBORETUM.

THE HARDIER KINDS OF VIBURNUM.

Deciduous Varieties.

1. THE LARGE-HEADED GUELDER ROSE (*Viburnum macrocephalum*).—This forms a large bush or low tree, covered all over with coarse, starry, scurfy hairs. It is a native of the north of China, and was introduced in 1844 by Mr. Fortune who speaks of it thus:—"This noble species is found in all the gardens of the rich in the north of China, and there is a tree of it growing in a garden on the Island of Chusan, at least 20 feet high, which, in the month of May every year, is covered with its snow-white blossoms." He also adds that when it is grafted on the wild form of the species, it blossoms on small plants in pots, and is then not unlike a white Hydrangea, by which name it is known among the Chinese. Its leaves are exactly ovate, very blunt, slightly toothed on the edges, quite flat, on short foot-stalks, and about 3 inches long; the flower-heads are terminal, and appear along with the young foliage in April and May. The flowers are pure white, and produced in large compound cymes, which, in the sterile-flowered or cultivated form, are as much as 8 inches in diameter, not, however, globular, like those of the Guelder Rose, but rather pyramidal, each flower being fully $1\frac{3}{8}$ inch in diameter, and lasting in perfection for a considerable time. The wild form of the species upon which the Chinese graft the beautiful garden variety, displays none of the grand and striking appearance of the sterile-flowered one, which is one of the very finest hardy deciduous shrubs that we possess at the present time.

2. THE PLAIED-LEAVED GUELDER ROSE (*V. plicatum*).—This fine hardy shrub grows from 4 to 10 feet in height, and has glabrous reddish-brown branches. It is found in the north of China and Japan, and was first introduced in 1844 by Mr. Fortune, who says that it is found cultivated in all the gardens of the rich, and forms a bush from 8 to 10 feet high, which, in May, is loaded with its globular heads of snow-white flowers, which are about the size of those of the common Guelder Rose. Dr. Siebold says it grows from 4 to 6 feet in the woods of Japan, and is seen cultivated in nearly every garden in Japan. Its leaves are broadly ovate, abruptly pointed, tapering to the base, coarsely serrated on the edges, crimped or plicate, and dark green above, veiny and tomentose beneath, and about 3 inches long. The flower-heads are terminal, and produced in great profusion on the lateral branchlets in April and May, just as the young leaves are unfolding, the flowers are in globular heads, snow-white at first, but just before they fade,

usually assume a purplish tint. In the wild state this kind has some of the flowers radiant and sterile, and others small and pentandrous, and is generally known under the name of *Viburnum tomentosum*. Its Japanese names are Sije, Adsai, and Satsuma-Temari, or Globe flower. This *Viburnum* is quite hardy and a most beautiful shrub when in flower in May.

3. THE COMMON GUELDER ROSE (*V. Opulus*).—This forms a large bush or low tree, from 10 to 15 feet high. It is a native of Britain and throughout Europe, in hedges and thickets, in damp and swampy places. Its leaves are broad, three-lobed, acuminate, unequally serrated, veiny, and quite glabrous in every part, with the petioles beset with glands towards the top, and several oblong leafy appendages lower down. The leaves

are bright green in summer, but in the autumn they assume a beautiful crimson line. The flowers are white, and produced in pedunculate cymes with linear bractees, and with several of the marginal flowers dilated, flat, radiant, and sterile. The berries are elliptical, bright red, and, when ripe, in September, very ornamental. Of this there are the following varieties:—

THE SNOWBALL TREE (*V. Opulus sterile*).—This only differs from the wild form in having nearly the whole of the flowers sterile, and collected into a compact, round, globular ball or head. It is sometimes named *V. Opulus roseum*, not from the colour, which is pure white, but from the shape of the head of flowers resembling a double Rose.

THE VARIEGATED-LEAVED GUELDER ROSE (*V. O. variegatum*).—This variety only differs from the species in having the leaves variegated white and yellow.

THE DWARF GUELDER ROSE (*V. O. nanum*).—This forms a singular dense little bush, rarely exceeding 1 foot in height, and which never produces any flowers. It originated in the nursery of Messrs. Lee, of Hammer-smith, and frequently bears the name of *V. pygmaeum*. The kinds known as *Viburnum edule*, *Oxycoccus*, and *molle* are only slight American forms of the common European *Viburnum Opulus*.

4. THE MAPLE-LEAVED GUELDER ROSE (*V. acerifolium*).—This grows from 4 to 6 feet high, and has

pilose branchlets. It is a native of North America, from New England to Canada, and of Newfoundland, in rocky mountainous situations. It was introduced in 1736. Its leaves are ovate, cordate, usually three-lobed, acuminate, sharply and loosely serrated on the edges, downy beneath; petioles, glandless, when young, stipulaceous at the base, and rather tomentose. The flowers are white, in terminal pedunculate corymbs, which are not radiant, and are produced in May and June. The berries are oval, compressed, and black when ripe in September.

5. THE WAYFARING TREE (*V. Lantana*).—This small tree or large bush grows from 6 to 15 feet high, and has copious,



Large Guelder Rose (*Viburnum macrocephalum*).

opposite, round, pliant, mealy branches. It is a native throughout Europe, and is common in Britain, in woods and hedges, especially on chalky or limestone soil. Its leaves are rather large, cordate, rounded, finely serrated on the edges, veiny, and thickly clothed beneath, but more sparingly so on the upper side, with starry mealy pubescens, like that on the branches and petioles, and in the autumn, just before they fall off, turn to a dark red colour. The flowers are white, and produced in broad, flat, crowded, pedunculate cymes in May and June; bracteas, small, numerous, and acute; berries, compressed, and, in the young state, red on the outside, and yellow on the inner one, but when ripe, black, with a little mealy astringent pulp; seeds, large, flat, and furrowed. Of this kind there is a variety which has the leaves variegated with white and yellow.

6. THE AMERICAN WAYFARING TREE (*V. Lantanoides*).—This forms a robust-growing bush from 6 to 10 feet high, with the branches thickly covered with a powdery tomentum. It is a native of North America, from Canada to Carolina, particularly in the forests about Quebec and Lake Huron, where it is called the Hobble bush; it was introduced in 1820. It leaves are large, broad, roundish-cordate, abruptly pointed, unequally serrated on the edges, and clothed with a powdery tomentum on the nerves and petioles. The flowers are white, and produced in nearly sessile, large, terminal corymbs, with the outer flowers abortive and radiant; the fruit is oval, and, when young, red, but when ripe in September, quite black. Its synonyms are *Viburnum Lantana grandifolia*, *V. L. canadense*, and *V. L. latifolium*.

7. THE INDIAN WAYFARING TREE (*V. cotinifolium*).—This robust shrub, or low tree, grows from 10 to 20 feet in height, and has grey branches, thickly clothed with stellate tomentum. It is a native of the Valley of Nepal, Kanaon, and the Himalaya Mountains, at an elevation of from 5,000 to 7,000 feet, and was introduced in 1832. It leaves are roundish-ovate, cordate, entire, or slightly dentately serrated on the edges, densely clothed with stellate down on both surfaces when young, but when fully matured nearly glabrous above, grey beneath, and 4 inches long, and $2\frac{1}{2}$ broad. The flowers are white, tinged with pink when young, obconical in shape, and rather large, they are produced in rather large terminal, nearly sessile, compound, spreading, woolly corymbs in April and May; the fruit is oval, bright scarlet, and said to be eaten by the people in Nepal. This kind is rather tender, and requires protection in winter, or to be planted against a south wall, where it makes a fine display, when in flower, in May. Its synonyms are *Viburnum stellulatum*, *Mullaha polycarpum*, and *nervosum*; the Nepalese name for it is Phec-laroo, or the Eagle's bush.

8. THE DAHURIAN VIBURNUM (*V. Dahuricum*).—This forms a somewhat spreading bush from 6 to 8 feet high, and has grey downy branches. It is a native of the Dahurian mountains, and was introduced in 1785. Its leaves are ovate, somewhat cordate at the base, crenately serrated on the edges, not very large and beset with stellate down on both surfaces. The flowers are yellowish-white, tubular, somewhat funnel-shaped, bluntly five-toothed, and produced in forked, terminal, few-flowered corymbs in July and August. The fruit is oval-oblong, five-seeded, at first red, but finally, when ripe, in September, black and rather sweet-tasted.

9. THE DILATED VIBURNUM (*V. dilatatum*).—This small hardy shrub grows from 3 to 4 feet high, with greyish branches and shoots, when young, furnished with a few rough hairs. It is a native of China, at Teintung, near Ning-po, and was introduced in 1846, by Mr. Fortune. Its leaves are ovate or obovate, pointed, regularly and coarsely toothed on the edges, plaited and bright green above, pale beneath, and with a few rough hairs on both surfaces. The flowers are white, and produced in May and June, in small, spreading cymes, destitute of any tenderness to become radiant; fruit, small, and nearly black. It is one of the least ornamental of all the species, as the flower-heads are small and not showy. Its synonym is *V. erosum*.

10. THE TOOTHED-LEAVED VIBURNUM (*V. dentatum*).—This forms a rather slender shrub, from 4 to 6 feet high, with smooth shoots. It is a native of North America, from New York to Carolina, in mountainous woods and was introduced in 1761. The leaves are ovate, or nearly orbicular plaited, coarsely and dentately serrated, glabrous on both surfaces, with

the nerves thick and feathered. The flowers are white and produced in June and July, in pedunculate corymbs or cymes. The fruit is small, nearly globose, dark blue and crowned with the calyx. There is a nice variegated-leaved variety. Its synonyms are *Viburnum dentatum*, *lucidum*, *montanum*, and *dentatum glabellum*. In America this shrub is known by the name of Arrow-wood.

11. THE DOWNY VIBURNUM (*V. pubescens*).—This assumes the form of a small slender shrub, seldom exceeding 3 feet in height, with downy shoots, particularly when young. It is a native of North America, in the lower parts of Virginia and Carolina, and also of Canada about Lake Winnipeg. The leaves are ovate, acuminate, on short petioles, slightly serrately toothed, villose beneath, with the nerves feathered and prominent. The flowers are white, and produced in June and July, in rather small pedunculate corymbs. Fruit, small, ovate, and dark blue. Its synonyms are *V. villosum*, *V. dentatum pubescens*, *V. Rafinesquianum*, *V. longifolium*, and *V. acuminatum*.

12. THE PLIANT-BRANCHED VIBURNUM (*V. Lentago*).—This forms a large bush or low tree from 10 to 12 feet high; it has a spreading head, and when trained to a single stem, makes a fine subject for planting singly on the lawn. It is a native of North America, from New England to Carolina, among hedges and on the borders of woods; it is also found throughout Canada, and was introduced in 1761. The leaves are broadly-ovate, pointed, sharply serrated on the edges, quite glabrous, and of a shining deep green on the upper surface in summer, but in the autumn, just before they fall, change either to a purple, red, or yellow colour. The flowers are white, and produced freely in terminal sessile corymbs in July. The berries are oval, black when ripe, in September, and produced in great abundance.

13. THE PLUM-LEAVED VIBURNUM (*V. prunifolium*).—This kind forms a large spreading bush, from 6 to 8 feet high, and has rather slender branches. It is a native of North America, from New England to Carolina, in hedges, also about Lake Huron, in Canada, and was introduced in 1731. Its leaves vary in shape, from roundish-obovate to oval, are somewhat thin in texture, glabrous, and of a bright shining green on the upper surface, crenately serrated on the edges, and on longish, smooth, marginal foot-stalks. The flowers are white when fully expanded and produced in May and June, in numerous terminal sessile cymes, on the short lateral branchlets. The berries are rather small, ovate, or roundish, and, when ripe, in September, nearly black, with a bluish tinge.

14. THE NAKED-CYMED VIBURNUM (*V. nudum*).—This forms a shrub, from 6 to 8 feet high, somewhat resembling the Plum-leaved one, but it has a more compact habit of growth. It is a native of North America, from Canada to Georgia, in swamps, particularly about Quebec, &c.; it is also found in Newfoundland, and was introduced in 1752. Its leaves are oblong ovate, bluntnish at the point, angular at the base, quite glabrous, and with revolute, slightly crenulated, margins; the petioles are rather long, and beset with minute scale-like scurf or down. The flowers are whitish, and produced, in May and June, in rather large branching dense cymes or corymbs, on long, naked peduncles; the berries are globose, and, when ripe, in September, black. In mild seasons, this kind is more or less sub-evergreen, and there is a variety of it, named *Squamatum*, which has smaller leaves, and the young shoots, leaves, and petioles, more or less covered with minute rusty-coloured scales.

15. THE CASSINE-LIKE VIBURNUM (*V. cassinoides*).—This grows from 6 to 8 feet high, and has tetragonal branches, covered with scurfy dots. It is a native of North America, from New York to Carolina in swamps near the sea coast, and in Georgia in shady woods, and was introduced in 1761. Its leaves are either ovate-lanceolate, and acute at both ends, or oblong-obovate, obtuse at the apex and tapering at the base, crenately toothed or quite entire and sub-revolute on the edges, glabrous on the upper surface, covered on the under one with scurfy dots and on short scurfy foot-stalks. The flowers are white, and produced in June and July, in loose few-flowered sessile corymbs on the ends of the lateral shoots. The berries are ovate or roundish, shining, and of a bluish-black colour when

ripe, in September. Its synonyms are *Viburnum obovatum* and *punctatum*.

16. **THE SMOOTH VIBURNUM** (*V. lævigatum*).—This forms a stiff shrub, from 6 to 8 feet high, and has quite smooth tetragonal two-edged branches. It is a native of North America, in Virginia and Carolina, near the sea coast, and was introduced 1724. Its leaves are lanceolate, or oblong-lanceolate, remotely and unequally serrated on the upper part, wedge-shaped, and quite entire near the base, light green on the upper part and quite smooth on both surfaces. The flowers are white and produced in June and July, in loose, few-flowered, sessile corymbs. The berries are roundish and black when ripe, in September. Its synonyms are *Viburnum lanceolatum* and *corymbosum*. Its American name is Cassioberry bush.

17. **THE SHINING-LEAVED VIBURNUM** (*V. nitidum*).—This is a dwarf bush, which grows from 2 to 4 feet high, and has glabrous, four-sided, slender branches. It is a native of North America, in Carolina and Georgia, in sandy barren woods, and was introduced in 1758. Its leaves are small, linear-lanceolate, quite smooth, shining on the upper surface, slightly serrated or entire on the edges, and of a bright yellowish-green colour. Flowers, white, in few-flowered corymbs, and produced in May and June. Fruit, oval, and black, when ripe, in September. This forms a very neat and distinct shrub, and one that deserves to be more generally known than it is.

Evergreen Varieties.

18. **THE COMMON LAURUSTINUS** (*Viburnum Tinus*).—The Laurustinus, as is well known, is one of the most ornamental of evergreen shrubs; it is a native of the south of Europe, from whence it was introduced in 1596. The leaves are of a bright shining green, and the flowers, which are in flat corymbs, appear from November to April, and, in mild seasons, are often succeeded by small dark black berries. Of this there are the following varieties:—

THE VARIEGATED-LEAVED COMMON LAURUSTINUS (*V. Tinus variegatum*).—This only differs from the common form in having a portion of its leaves variegated with pale yellow.

THE HAIRY-LEAVED LAURUSTINUS (*V. Tinus hirtum*).—This is more hardy than the common kind, and is a native of Spain and Portugal. Its leaves are oval-oblong, hairy beneath and on the edges, and the flowers, which appear in the autumn, continue all the winter. There is a variegated form of this, which has a portion of the leaves of a golden-yellow colour.

THE SHINING-LEAVED LAURUSTINUS (*V. T. lucidum*).—This is a native of Algiers and Mount Atlas, and is less hardy than the preceding. Its leaves are oval, smooth, and of a deep shining green colour above. The cymes, as well as the flowers, are larger than those of the common kind, but seldom appear till the spring, and, when the winters are severe, the flowers are killed or never expand, unless in very sheltered places. Of this kind there is a variegated variety.

THE TWIGGY-BRANCHED LAURUSTINUS (*V. T. virgatum*).—This forms a somewhat erect fastigiate bush, from 4 to 6 feet high. It is a native of Italy, particularly about Rome and Tivoli. Its leaves are oblong-lanceolate, pilose on the margins and principal veins on the under side, and the shoots erect. Of this variety there is, also, a variegated form.

19. **THE CANARY ISLANDS LAURUSTINUS** (*V. rugosum*).—This forms an erect dense bush, from 4 to 6 feet high, and has rigid, hairy branches. It is a native of the Canary Islands, in woods, and was introduced in 1795. The leaves are broadly-ovate, wrinkled on the upper surface, and hairy all over. The flowers are white, and produced from December to March, in rather large, open, bracing, terminal corymbs. The berries are ovate-oblong, and of a purplish colour when ripe. Its synonyms are *Viburnum rigidum* and *strictum*. This differs from the common Laurustinus in the leaves being hairy all over. It is too tender for the open border, but makes a fine display when planted against a south wall.

20. **THE JAPANESE LAURUSTINUS** (*V. suspensum*).—This forms a fine round dense bush, from 4 to 6 feet high, and has rather drooping and slender branches. It is a native of Japan, where it is called "Awa-fuki, and was introduced, in 1841, by Messrs. Rollisson, of Tooting. Its leaves are opposite, rather large, broadly-ovate, crenate, and rounded at the point, somewhat waved on the margins, smooth, and of a bright uniform

green above, strongly veined beneath, and rather thin in texture. The flowers are greenish-white, with the tube of the corolla, rather more than a quarter of an inch long, and cylindrical, and the limb divided into five blunt lobes, shorter than the tube; they are produced freely in February and March, in rather large, drooping, terminal compact cymes. It is rather tender for planting in the open border, but makes a fine plant for training against a wall. Its synonyms are *Viburnum Awa-fuki*, and *japonicum*.

21. **THE SWEET-SCENTED CHINESE VIBURNUM** (*V. odoratissimum*).—This forms a fine robust bush from 4 to 8 feet high, and in its general appearance greatly resembles the common Laurel. It is a native of China and Japan, and was introduced in 1818. Its leaves are large, elliptic-oblong, acuminate, leathery in texture, almost entire or sub-dentate with revolute margins, glabrous, of a deep shining green above, pale beneath, and nearly as large as those of the common Laurel. The flowers are white, very fragrant, and produced in February, in large thyrses, having opposite branches, trichotomously pedicellate. The berries are oblong, crowned by the calyx, and one-seeded, and, when young, of a rich red colour, but, when ripe, blackish and shining. This *Viburnum* is too tender for planting in the open border, but makes a fine evergreen for training to a wall. Its synonyms are *Viburnum sinense* and *Coffea monosperma*. GEORGE GORDON, A.L.S.

Hedges.—In addition to the garden-hedges mentioned by your correspondent the other day, there are several plants suitable for this purpose, and not used generally in this country. In the Casino, at Florence, are small hedges, about 4 feet high and the same in thickness, dividing the carriage-drive from the foot-passengers' walk. These are of three different kinds—some of *Mahonia* (*Berberis*) *Aquifolium*, which has a beautiful effect, showing here and there a crimson leaf; the other two are of *Euonymus japonicus*, one the common form, the other the variegated. In the south and west of Ireland one of the most striking of hedges is the common *Fuchsia*. I am myself trying *Cupressus macrocarpa* as a hedge-plant, and feel confident that it will bear clipping well, and in four or five years will form a dense and good-coloured hedge, 8 or 9 feet high. I am surprised to hear that Yew suffers from the shears if often used, having seen in Aberdeenshire a flower-garden, the beds of which were all edged with Yew about 8 inches high, and clipped square as a wall; and I was informed that they had been the same for ten years. The effect was good, the Yews being of a richer shade than Box, which, at a distance, they somewhat resembled.—J. H. W. T.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Conifers for Smoky Towns.—Mr. Bullen, Curator of the Botanic Gardens, at Glasgow, informs us that he finds *Thuja Lobbi* to be the best of all Conifers to withstand smoke. Next to this come *Cryptomeria japonica* and elegans, *Araucaria imbricata*, and *Cupressus Lawsoniana*. These are what succeed best in the neighbourhood of Glasgow.

Twelve Flowering Shrubs for a Small Lawn.—Double Variegated *Althæa*, Double white *Almond*, *Deutzia crenata* fl. pleno, *Spiræa Reevesii robusta*, *Weigela nivea*, *Forsythia viridissima*, *Hydrangea paniculata*, *H. grandiflora*, Japan Quince, large-flowered white Lilac, dark crimson Quince, *Prunus trilobata*, and *Pyrus Malus floribunda*.—G. ELLWANGER.

The Pinon (*Pinus edulis*).—In the upper portion of what is termed Williams' Canon, are a considerable number of the Pinon (*Pinus edulis*). I climbed a number of these trees, and examined the foliage from the ground to the summit, and find all the forms in the same tree which characterise *Pinus Fremontiana*, *P. monophylla*, and *P. edulis*; and have no doubt that these three so-called species are really but one.—MR. MERRAN.

New Trees.—Up in Colorado, in what is called Williams' Canon, is the only tree I have ever seen of the Elder-leaved Mountain Ash (*Sorbus sambucifolia*), which will prove a great addition to our ornamental trees when introduced to cultivation. The berries are smaller, and of a deeper orange than those of the common American Mountain Ash. In Engelmann's Canon, the long-beaked Hazel Nut (*Corylus rostrata*) abounds; which, I believe, none of us met anywhere else in the Rocky Mountains.—MR. MERRAN, in *Gardeners' Monthly*.

The Yellow Winter Jasmine.—Passing some cottages near Croydon the other day, I was pleased to see two of them most gracefully draped with this winter-flowering shrub, the shoots all drooping and densely laden with clearly coloured perfectly-opened flowers. Their condition suggested the thought that the common way of nailing this precious winter-bloomer too primely to the wall, spoils its beauty. After being sufficiently secured to the wall the shoots should then be allowed to droop freely down. Thus trained it becomes on the warm side of a house, a unique object in winter.—R.

When to take Cuttings of Variegated Hollies.—I should feel much obliged if you would kindly tell me when I should do this, and, also, how I should afterwards treat them?—B. F. [Cuttings of Variegated Hollies, made in autumn, of the ripened summer shoots, and planted in sandy soil in a shady border, covered with a hand-glass, will root freely in the following spring, and will be ready for transplanting into nursery-beds in the following October, where they should remain for two years. They should then be set out in lines sufficiently far apart to give room for fresh growth.—E.]

THE FRUIT GARDEN.

RASPBERRIES ON WIRE TRELLISES.

I FIND that Raspberries, when trained on trellises, yield more fruit than when tied to stakes, and they also have a neater appearance. I train mine on a wire fence, which consists of three galvanised wires stretched horizontally, and supported by upright posts. The wires are fastened at each end by means of screws, and to the intermediate posts by staples—a kind of fence which may be put up by any ordinary labourer. The stools are planted 2 feet apart in the rows; the canes are trained vertically, 5 inches from each other, and their tops are bent over the fence about 1 foot, which allows but a very small portion to be taken off in pruning. I may mention that it is off this bent part of the top we get our finest fruit, both as to quality and quantity. The rows are 6 feet apart, and they run from north to south. The soil here is loam, resting on marly clay, which is wet and cold, on account of the River Thames, at high water, coming up to within a few feet of the rows. I never dig between my Raspberries; they are simply mulched with good cow manure, which keeps their roots near the surface. In autumn, the surplus rods are cut out, in order to admit light and air to the remaining ones; and we run twine along from one end of the trellis to the other, for the purpose of keeping the canes up to the wires. In November they are gone over again, when the old rods are removed, and the canes for the ensuing year's crop tied in. This is accomplished by one man holding them in their proper position, while another ties them to the wires, and, in this way, it is surprising how much work two men can get over in a day. We have thus no trouble with stakes, and our Raspberry fence is always admired. I believe, too, that the longer the plants remain in one place the stronger the canes become, provided the system is carried out properly; and, under it, we always get strong canes, which bear good crops.

D. S. GILBERT, *Court Garden, Great Marlow.*

Flavour of Pines in the Winter Season.—Some years ago I ventured to assert my opinion on this subject. I then stated that the Black Jamaica was the prince of winter Pines, and since that time I have grown and tasted some scores, and now see no reason to alter that opinion; within the last two months I have had opportunities of more fully testing their different flavours. The smooth-leaved Cayenne, certainly a noble-looking fruit to look at, I pronounce third-rate as to flavour. The different varieties of Queens form better summer than winter Pines, in consequence of their pips not swelling evenly, but still we have an exception in the Thorsby Queen, which certainly does swell better than any other with which I am acquainted. This variety has one great fault, in having such a small crown. Flavour, first-rate. In the prickly Cayenne we have much to admire, when it ripens off regularly, but, unfortunately, the lower pips are generally greatly in advance of the top ones; this, however, happens more in summer than in winter. I have this day tasted one, as well as fruits of Charlotte Rothschild and Black Jamaica, and I pronounce it to be inferior in flavour to both. This I should set down as second-rate. Black Jamaica is a truly fine yellow-fleshed Pine, while both the Cayennes are white, and the flavour delicious. The fruit has also a good crown, and at all seasons swells well. I award this a first-class certificate, which, in my estimation, it well deserves. Charlotte Rothschild has a commanding appearance, and its flesh is not so white as that of the Cayenne. This I should pronounce barely second-rate in flavour.

—R. GILBERT, *Burghley, Stamford.*

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Standard Apricots.—I think the Apricot may be successfully grown as a standard in the south of England. I have seen a good standard tree at Little Comberton, near Pershore, which bore good crops.—W.

The Loquat out of doors in Buckinghamshire.—We have several plants of the Loquat (*Eriobotrya japonica*) out of doors on a south wall here, and notwithstanding the frosts which we have had, they are looking well.—D. S. G., *Great Marlow.*

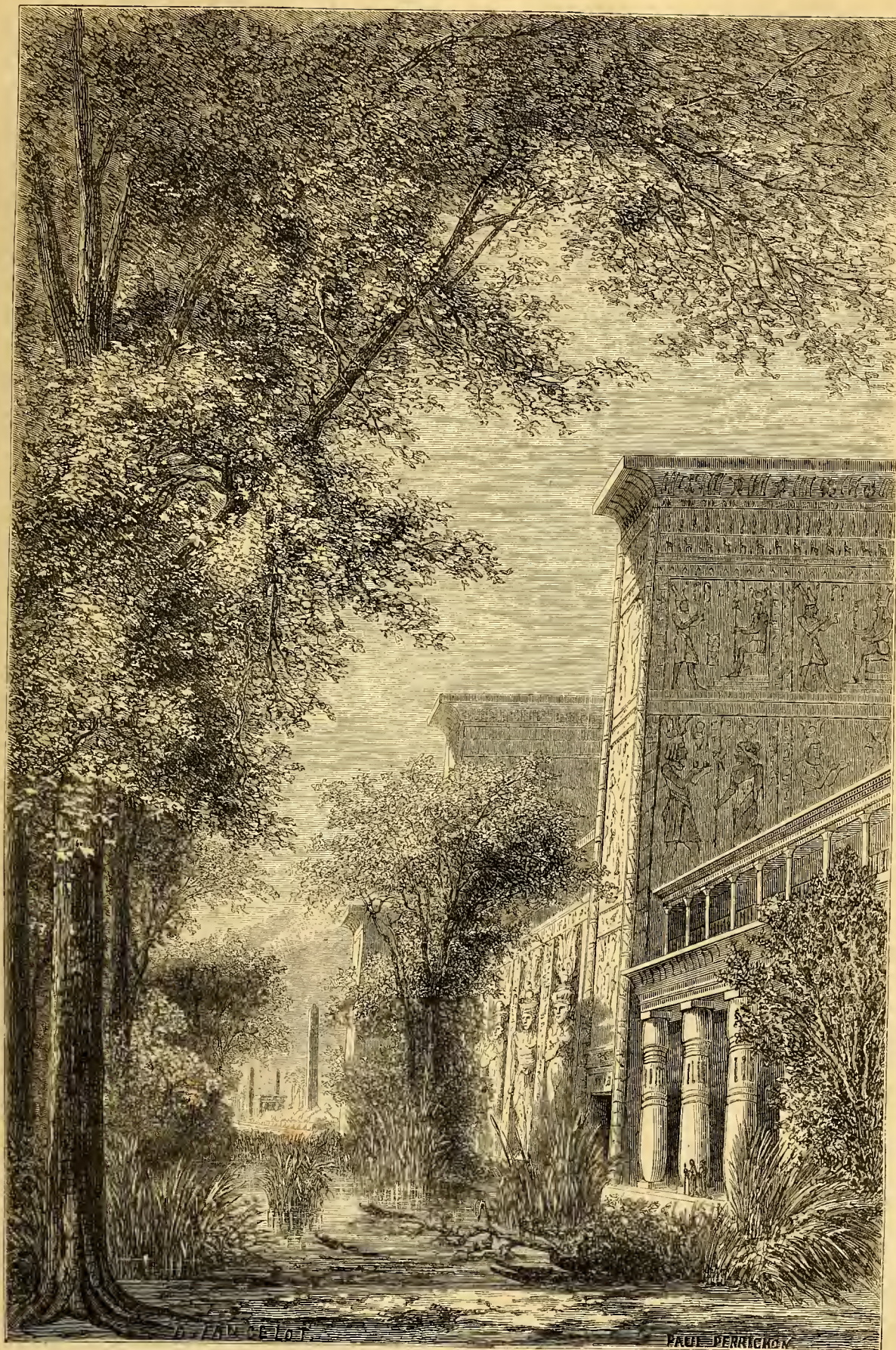
Figs and Pigs.—A newspaper in Southern California advises greater cultivation of the Fig tree, because the fruit is so good for hog-feed. An acre of Figs will fatten more hogs than an acre of Corn. All that is necessary is to stick a Fig-cutting in the ground, and in three or five months the plant will bear fruit—three crops a year—and in three years the tree attains the size of a twelve-year-old Apple tree.

Keeping Apples.—I sometimes query whether the old masters in pomology really knew everything, as they would have us think. Among other things, we were taught that moisture was the greatest possible evil to guard against. Now, in looking over my Apples, placed in a damp cellar, I noticed that the skins were wet, not merely moist, and yet they are sound; and, from present appearances, are likely to be for some time to come. Others, who are not "shining lights" in the horticultural world, tell me that if the temperature is preserved at a very low degree dampness is a decided advantage. How about this new idea? If it should prove to be a general law we shall certainly have less shrivelled specimens.—*Tribune.*

ANCIENT EGYPTIAN GARDENS.

THE Egyptians appear to have had great thought for the future. They knew that the existence of a nation is not eternal, and they wished that, after they had disappeared from the face of the earth, those who succeeded them should not be ignorant of what they had been. It was, doubtless, with this view that they erected the Pyramids, those enormous monuments which have so successfully resisted the wear of time, and on which they carved scenes both of public and private life. From these monuments we are able to learn something of the kind of gardens that existed in the time of the Pharaohs. These gardens were of two kinds, sacred and private, among which were the royal gardens, used only by the kings. These sacred gardens surrounded the best temples, which served not only as sanctuaries, but also as places of abode. In the enclosures were planted Palms and the Sycomore Fig-tree; they also contained large basins made of granite and porphyry, in which grew the Lotus, and in which swam sacred crocodiles. In these gardens also were kept the ibis, the ichneumon, and the najah, a formidable serpent, which the priests knew how to tame, also the varan, or monitor, a large lizard, which, according to the belief of the Egyptians, and which is still preserved by the Arabs of the present day, gives warning to people by whistling on the approach of wild animals, but more particularly on the approach of the crocodile. It rarely rains in Egypt; consequently, all the cultivation of the Nile valley depends on artificial irrigation. For only three months of the year can irrigation be dispensed with—that is, from the beginning of September to the end of November—as, during those months, the Nile is nearly full. The period of its greatest height is at the end of September. The manner of watering followed by the ancient Egyptians was very simple. They suspended their buckets or leathern bottles to the end of a balance-pole tied to the cross-bar of a low scaffold, the pole being weighted by a stone at the opposite end to give impetus to the lift. The water, when drawn, was put into jars or skins, and carried to the plants requiring to be watered. The gardens were looked after with a great deal of care; their contents were very varied, and the great number of useful and ornamental trees cultivated in them bears witness to the good taste of the Egyptians. In the tombs at Thebes, and other Egyptian towns, are found numerous sculptured representations of their gardens. We will only cite a royal garden, which was surrounded with bastioned walls. A canal, communicating with the Nile, was cut before the principal entrance, running parallel with the wall and the river. The entrance consisted of a raised portal, opening on a large avenue of fine trees. The lintels and pedestals of the gateway were decorated with hieroglyphic inscriptions, among which is the name of the prince, proprietor of this domain. On each side of the entrance are the lodges of the guards, and other servants, charged with the care of the garden; likewise a waiting-room for visitors, whose names had not been announced. These palaces had doors opening on the enclosures in which Vines were cultivated. On one side was a house of three storeys, surrounded with beautiful trees, offering an agreeable retreat for repose and refreshment. At a little distance from, and in front of this edifice, are seen two kiosques, or pavilions, on colonnades, half hidden among the trees and surrounded with parterres of flowers. The Vines, which occupy the middle of the garden, are surrounded by plantations of Date and Doum Palms, and there are four pieces of water, in which are cultivated many varieties of aquatic plants; they, also, furnish water for irrigation. Two squares on each side of the Vine garden are reserved for the cultivation of particular plants and fruits of superior quality. The two kinds of Palms that have been mentioned, held the first rank in the estimation of the Egyptians, not only on account of their beauty, but, also, for their great utility. The fruit of the Date Palm was to them, what it is now to the Arabs and modern Egyptians, a popular food. They used it fresh from the tree, when ripe, prepared with honey, or simply dried in the sun, and the stem, branches, and fibre, were converted into a variety of uses. The Sycomore Fig, varieties of the Pomegranate, Olive, Jujube tree, Almonds, Peaches, Myrtles, several varieties of Acanthus, the Lotus (*Nelumbium*), and the Papyrus or Paper plant, were also grown in these ancient gardens.

PETER WALLACE.



GARDEN OF AN ANCIENT EGYPTIAN TEMPLE.

THE GARDENS OF ENGLAND.

ALNWICK CASTLE GARDENS.

The Forcing Department.

The glass structures in these gardens devoted to the forcing of Pines, Vines, Peaches, and Melons, are, with the exception of two or three succession Pine-pits, and a range of Melon-pits, made entirely of iron. The houses are curvilinear in shape, and heated seemingly in a most efficient manner; they are also kept in the highest state of repair. The Pine-stoves are five in number, besides several pits for suckers; the fruiting houses are really fine structures, admirably adapted for the work to which they are devoted, and, I have no hesitation in saying that the Pines they contain are grown to great perfection. The Queens, which are grown largely here, are all that could be desired, compact in habit, with a depth of colour in their leaves that shows the care and attention that are bestowed upon them. Charlotte Rothschild, Black Jamaica, Smooth Cayennes, and Prince Albert are also grown here to great perfection. The latter variety is much in favour; it is a fine handsome Pine, producing fruit from 5lbs. to 6lbs. in weight, of a reddish-yellow colour, with a small neat crown, melting and juicy, with a rich aromatic flavour. A neat trellis forms a sort of canopy over the back passages of the Pine-stoves, and Cucumbers are grown in great quantities upon these trellises. The passages are lofty enough to allow fruit from 30 to 35 inches long to depend from them without coming in contact with the visitor's head as he passes along. They all appeared to be of one variety—the Marquis of Lorne. We also observed a few very fine Bananas just ripening their fruit. The Vineries here—six in number—are all, I believe, devoted to the growth of late summer or autumn Grapes for winter use. The borders of the whole range have been lifted or renewed within the last six or seven years, and the success of this operation is very evident in the exceeding fine crops of Grapes we saw in those houses, two of which were entirely occupied by Black Hamburgs. In regularity of crops, size of berries, and depth of colour, they were all that could be desired. The next two houses we found filled with a mixed collection, principally black varieties, including Lady Downes, Black Alicante, and Barbarossa; Mrs. Pince has also been worked into those houses, and showing very finely-finished bunches. The last two houses are wholly set apart to the growth of Muscats, including Cannon Hall and Escholata, which, strange to say, always set well here. The borders of these two houses have only been renovated last year, and the Vines were only lightly cropped; but, upon a former visit to this place we saw in these houses as fine a crop of Muscat Grapes as we have ever seen anywhere. The seedling Grape, referred to by us in our first paper on this place, is an early black variety, grows strong and robust, sets its fruit freely; the bunches are large, and the berries oval in shape, of good size, and keep as well as a Hamburg. I understand that the judges at the Glasgow International, in 1872, highly commended this seedling Grape. We were shown another black seedling Grape here, something in the way of Lady Downes, but larger in bunch and berry. Many who have tasted this Grape consider the flavour superior to the above variety. Altogether, this is a very promising Grape, and the entire stock of both the seedlings is in the hands of Mr. Ingram.

All the Grapes grown here are upon the short spur system, which may, in some measure, account for the regularity in the size of the bunches. The range of glass devoted to Peaches is divided into three compartments. All the fine old sorts are here in force, laden every year with excellent crops of fruit of very superior quality. Melons are grown here very extensively in forcing pits, and upon dung-beds. The green-fleshed varieties preferred are Bassett's Seedling, Heckfield's Hybrid, Suttons' Prince of Wales; the other varieties including Golden Queen, Ward's Netted Scarlet, and Malvern Hall. Strawberries are also forced here in quantity, but not very early in the season, Keen's seedling seems to be the sort preferred for this purpose.

A large and elegant conservatory of recent erection, 100 feet by 30 feet, stands at the north end of the flower garden; the lofty roof is supported by a double row of pillars, which are

festooned with fine creepers, amongst which we noticed *Lapageria rosea*, *Tacsonia Van Volxemi*, *Bignonias*, and *Habrothamnus* of sorts between each pair of pillars. Along the front side a semicircular recess is formed, an arrangement which takes away from the flat stage that sameness which would otherwise have been unavoidable in such a width of flat surface. Along the back of the house the stage rises at a sharp angle, and it is always kept well filled with large well-grown specimen plants in bloom in autumn and winter. We saw about 400 *Primulas* in preparation for this purpose, the strain seemed to be one of the finest we have seen; almost every shade of colour was represented amongst them. Nearly an equal number of *Cinerarias* were in readiness for the same purpose. Just outside the boundary of the flower garden stands a span-roofed house 100 feet by 16 feet. One half of this house is filled with bedding and soft-wooded plants; in the other half we noticed a lot of fine specimen and half specimen Heaths, Azaleas, *Epacris*, &c.; close beside it stands a lean-to house, 40 feet by 16 feet, which is filled with a very fine collection of Ferns. In the same block stands another span-roofed house 100 feet by 16 feet, in two compartments. This house is filled to overflowing with specimen and half specimen plants suitable for table decoration. We observed here a small collection of Orchids, which are growing larger every year. Altogether this is a very interesting house, from the quantity of plants that have found a place in it. A small propagating-house completes the list of glass structures, together with framing, which is very extensively carried on here.

The Kitchen Garden.

These, including a small nursery ground, are about 7 acres in extent. They seem in a high state of cultivation, and the crops are abundant; the brick walls are not of very great extent, but they are certainly the best finished walls we have seen, and the trees upon them are models of perfection. As there are no glass structures against them the whole of the south wall is devoted to Peaches and Apricots. The fruit-trees along the borders are trained in the cup shape, very dwarf, and are annually laden with excellent fruit. Two orchards, which have undergone a thorough renovation, are bearing fine crops of Apples; one of them is specially interesting from the fact that, it occupies a part of the dry moat that surrounded the castle on the south-western side, close beside it there is still standing a part of the wall that enclosed the ancient kitchen-garden belonging to the castle. This relic of the past is, I believe, to be removed, in order to enable his Grace the Duke to carry out, more fully, his extensive alterations around this interesting place.

The Gardener's House

Stands very conveniently in the centre of the grounds; as a matter of necessity, it has been built low, but it is, nevertheless a roomy and comfortable house, replete with every convenience, the gardener's office, store, and fruit rooms join it. These have all been recently erected upon the most convenient and improved principle. The fruit-room is especially worthy of notice; it is 30 feet by 18, and is warmed and ventilated upon the best principles; the windows are double; in the false roof, Heather has been laid to a depth of several feet as a non-conductor of heat; indeed, everything has been done here that art or science could suggest. The same may be said of the gardener's office and store-room.

The Park

Encloses within its extensive boundary a rich variety of natural beauty. The Aine runs through its extensive length, shaded in many places by over-hanging rocks and pendent trees, the higher grounds being sheltered by extensive Fir woods, where the purple Heath in Autumn contrasts well with the great Ferny brakes that intermingle with it. The lower grounds are rich in pastoral beauty, and the two fine old mediæval ruins, along with other historical associations, makes this park extremely interesting to the visitor, who cannot help observing that, as he strays through the gardens and park, the sky-line, in one direction, is broken by the picturesque battlements and towers of the noble castle. J. T.

THE KITCHEN GARDEN.

THE VARIETIES OF THE GARDEN PEA.

(From the *Journal of the Royal Horticultural Society*.)

Division I.—Frame Peas.

Ripe seed, white, almost round, small, smooth, and occasionally pitted. Foliage, pale green, but not blotted.

Dillistone's Early (*Carter's First Crop*; *Clarke's Rapid Prolific*).—The plant is of a slender habit of growth, produces a single stem 2 feet high, and bears on an average from seven to nine pods. The pods are generally single, but occasionally in pairs, almost straight, and containing seven Peas in each. The seed, when ripe, is white. Sown on February 23. The first flower opened May 10; and the plants were in full bloom on the 16th. Slats appeared May 24; and the pods were fit for use on June 9. This is one of the earliest Peas known, about three or four days earlier than Sangster's No. 1, which has hitherto been regarded as the earliest variety. A striking feature of Dillistone's Early is, that its changes take place all at once. It blooms in a mass; its pods all appear together, and the whole crop is ready to be gathered at the same time. The pods are considerably smaller than those of Sangster's No. 1.

Sangster's No. 1 (*Dickson's First and Best*; *Daniel O'Rourke*; *Dickson's Olimas*; *Early Caractacus*; *Washington*; *Taber's Perfection*; *Hooper's Early Rival*).—The habit of this variety is similar to that of the preceding, but it grows somewhat taller, being about 2½ feet high. Each plant bears from eight to ten pods, which are 2½ inches long, and upwards of half an inch wide, quite straight, and containing seven and frequently eight Peas in each; they are generally produced singly, but occasionally in pairs. Sown on February 23. The first flower opened May 12; and all were in bloom May 24. Slats appeared May 27; and the pods were ready for use June 12. The varieties which appear as synonyms exhibited slight variations as to character, some stocks being more pure and better selected than others, thus presenting in the mass a different aspect from the others. Caractacus produced fully the largest pods, and had a distinctive look. Taber's Perfection was rather later and a little more robust. Daniel O'Rourke and Hooper's Early Rival were exceedingly strong in growth and very inferior stocks. It appears that Isherwood's Railway has of late years advanced in earliness and become a synonym of Sangster's No. 1. Seven years ago it was the same as Early Emperor.

Early Emperor (*Morning Star*).—Plant of a slender habit of growth, always with a single stem, which is 2½ to 3 feet high, and producing from eight to ten pods, which are from 2½ to 3 inches long, generally single, but sometimes in pairs, and become perfectly straight as they approach ripeness. They contain about seven good-sized Peas, which, when ripe, are white. The samples of Early Emperor grown last year in the garden were very inferior and degenerate stocks of the true variety, possessing more of the character of the old Double-blossomed Frame, being even more robust in growth, and with smaller pods. Sown February 23. The first flower opened May 21. In full bloom May 30. Slats appeared June 3; and the crop was fit for use on the 19th. Ruelle Michaux, a variety from France, is an inferior form of Early Emperor. The same may be said of Clamart, which has also a near resemblance to Double-blossomed Frame; it keeps on growing and podding, but it is not a desirable variety to cultivate. This is a taller grower and a heavier cropper than either of the two preceding, but, as an early variety, it is not to be compared with either of them.

Early Frame (*Double Nimble*).—In adopting the name "Early Frame," I mean to include all forms known under that name, whether they are called single or double-blossomed; for, in fact, there are none that are absolutely "single" or absolutely "double-blossomed." These expressions are not meant to indicate any peculiar structure of the flower as regards the number of the petals, but merely that the blossoms are produced singly or in pairs on the same peduncle. Great efforts have from time to time been made to preserve the single-blossomed character; and, notwithstanding the care that has been bestowed upon the selection, growers have hitherto failed in rendering it permanent. There is, however, no real advantage to be obtained even if that character were secured, for the supposed earliness of the single-blossomed Frame Peas is now far exceeded by other varieties that have been introduced of late years. The variety I shall now describe under the name of Early Frame is one received from Messrs Hurst & M'Mullen, under the name of Marshall's Double-blossomed Frame—a very excellent and carefully selected stock of Early Frames. The plant is 3 to 4 feet high, and has a single stem of rather vigorous habit of growth, more stont and robust than that of Early Emperor, and bearing from nine to twelve pods; but frequently as many as fourteen. The pods are produced either singly or in pairs, and contain seven to eight Peas in each. The ripe seed is white. This is decidedly the best form of Early Frame I have met with. Sown on February 23. The first flower appeared May 14. In full bloom on the 25th. Slats appeared May 28; and the crop was fit for use June 15.

Beck's Gem (*Tom Thumb*; *De Grace*; *Royal Dwarf*; *Nain Hatif Extra*).—This is the most dwarf-growing of all the varieties. It rarely ever exceeds a foot in height; the stem is of a stout habit of growth, and branches at every joint to within three or four of the top, producing from fourteen to eighteen pods. The pods are almost always borne in pairs, rarely singly, and are produced at every joint, particularly towards the top; they are smooth, of a dark green colour, and well-filled, containing from five to eight Peas, which are almost as large as Imperials. The ripe seed is somewhat ovate, and of a greyish-pearly colour. Sown

February 23. The first flower appeared May 19. In full bloom May 25. Slats appeared on the 25th; and the crop was fit for use on June 17. This is a very excellent Pea for forcing, and for early sowing under walls or other shelter. It is remarkably prolific, and cannot but be of great use in small gardens where sticks cannot be conveniently obtained or made use of.

Early Ringwood (*Ringwood Marrow*; *Essex Rival*; *Flanagan's Early*; *Beck's Marrow*).—Plant, with a moderately vigorous habit of growth, 3½ to 4 feet high, not branching. The pods are single or in pairs, in about equal proportion; they are produced from within a foot of the ground at every joint, even to the extremity, and contain from six to eight large Peas. Ripe seed, white. Sown February 23. The first flower opened May 23. Was in full bloom on the 30th. Slats appeared June 2; and the pods were ready to gather on the 17th. Essex Rival, as grown in this trial, is an inferior stock of Early Ringwood, being later and with smaller pods.

Auvergne (*White Sabre*; *White Scimitar*).—This is, without doubt, the best second early of the Frame class in cultivation. The plant is of moderately strong habit of growth, 4 to 5 feet high, and bears from twelve to fifteen pods. The pods are generally single, and sometimes in pairs; when fully grown they are 4½ inches long, and over half an inch broad, tapering towards the point, and very much curved. They contain from nine to twelve Peas, which are very closely compressed, and are of the size of Early Frames. Even the small pods contain seven to nine Peas in each. Ripe seed, white. What was grown in the garden last year for Auvergne was a spurious stock, and resembled, and seemed intermediate between that variety and Dickson's Favourite, and inferior to both. It was quite unworthy of the name of Auvergne. Sown February 23. The first flower appeared May 28. Was in full bloom June 8. Slats came June 11; and the crop was fit for use on the 21st.

Glory of Cassel.—An indifferent mixture of Auvergne and Dickson's Favourite, with smaller but well-filled pods; pale green in colour; plant less robust, and about two days earlier.

Leopold II.—Resembles Early Ringwood, the foliage and pods being of the peculiar pale green colour which that variety possesses; pods long, narrow, nearly straight, very badly filled, the middle Pea in each pod being wanting; quite worthless. Sown February 23. First flower opened May 25. Was in full blossom May 30. First slats appeared June 2, and were fit for use June 19.

Bishop's Long-podded Dwarf.—Plant, robust, branching close to the ground, about 2½ feet in height, producing from twelve to sixteen large broad pods, of a pale green colour, which contain from seven to eight large Peas. A fine-looking Pea, and a great cropper. Sown February 23. First flower opened May 21. Was in full flower May 30. First slats appeared June 3. Fit for use June 24.

American Early Comet.—A later and inferior variety of Bishop's Dwarf.

Dwarf Waterloo Branching.—Resembles in every respect Bishop's Long-podded Dwarf, but two days earlier.

Carter's Farmer's Prolific.—Resembles Early Emperor in general appearance. It is very strong, robust, and wonderfully prolific, producing from fourteen to sixteen pods, generally in pairs, on each stem; pods narrow, very closely filled, containing about six or seven small Peas. Height 5 to 6 feet. Sown February 23. First flower appeared May 26. Was in full blossom June 3. First slats appeared June 5, and were fit for use June 20. This is a distinct Pea, more suited for the farm than the garden.

Nabob (Laxton's).—Cross between Little Gem and Laxton's Prolific Long-pod; plant of strong and robust growth, with large deep-green foliage; height, 18 inches to 2 feet; pods, long, curved, well filled, of a deep-green colour, containing from seven to nine medium-sized Peas, of a pale green colour. The pods are produced in pairs from ten to twelve on each stem. It is the largest and most handsome early dwarf round white Pea, and very productive, most nearly resembling in appearance Dwarf Waterloo Branching, only with larger pods and dwarfier. Sown February 23. First flowers opened May 27. Was in full bloom June 1. First slatted June 3. Fit for use June 24.

Dwarf Dutch.—Plant, robust, in growth resembling White Prussian, about 3 feet in height, sometimes branching, and producing from twelve to sixteen pods on each stem, in pairs. The pods are small, narrow, but very closely filled, of a deep green colour, containing about seven small Peas. Sown February 23. First flower opened June 3. Was in full flower June 11. First slats appeared June 15. Fit for use June 24.

Peabody.—Plant, bushy, branching, very neat and compact in growth, the leaves being rather small and numerous, of a bright colour; height, about 2½ feet; pods, rather narrow, small, but extremely well filled, of a fine deep green colour, containing from six to seven rather small Peas of but poor quality. A very productive sort, standing the dry weather well. This belongs to the white Prussian class. Sown February 23. First flower opened June 12. Was in full flower June 15. First slats appeared June 18. Fit for use June 29.

Crown (*Bunch*; *Cluster*).—This is a very distinct and singular Pea in the appearance of its growth. The plant is 4½ to 5 feet high, of moderately strong growth. The stem gradually increases in thickness from the root upwards, frequently to the thickness of one's thumb, when it becomes broadly fasciated, producing all the pods, twenty-four to thirty in number, in a bunch at the top of the stem. The pods are small, round, but well filled, in appearance like Emperor, containing from four to seven small Peas. Ripe seed, small, round, white. Sown February 23. First flower opened June 16. Was in full flower June 17. First slats appeared June 21. Fit for use July 1. This is more curious than useful, being poor in quality. It is frequently called the Mummy Pea.

Division II.—Marrow Peas.

Ripe seed, white, large, smooth, uneven, compressed, irregular or egg-shaped; skin, thick. Foliage, blotched.

Paradise Marrow (*Paradise Early Marrow*; *Excelsior Marrow*; *Champion of Paris*).—This is a rather strong-growing variety, 5 to 6 feet high, having generally a single stem, which is, however, occasionally branched, and produces from eight to ten pods. The pods are, for the most part, single, but sometimes in pairs, about 4 inches long, nearly three-quarters of an inch wide, and remarkably well filled with from seven to nine large Peas. Ripe seed, white, medium-sized, somewhat flattened and pitted. Sown February 23. First flower opened May 30. Was in full flower June 7. First slats appeared June 11. Fit for use June 24. This is a very excellent Pea, an abundant cropper, quite as early as Early Ringwood and Early Frame, and considerably earlier than Auvergne and Shilling's Grotto, to all of which it is in every respect greatly superior.

Dixon's Early Dwarf Paragon.—Plant, robust, from 2 to 2½ feet high, resembling Bishop's Dwarf. Stem, branching, producing from sixteen to eighteen pods, which are generally borne in pairs; they are of a fine deep green colour, but fill badly, and contain from five to six medium-sized Peas. Dried seed, large, white, flattened, indented. Sown February 23. First flower opened May 23. Was in full flower May 30. First slats appeared June 2. Fit for use June 24.

Harrison's Perfection.—Plant with a robust habit of growth, having a thick succulent stem, 3 to 3½ feet high, and large dark green foliage. The pods are produced in pairs from every joint, averaging sixteen or eighteen on a plant, but they are very irregularly and badly filled, and contain only from four to six Peas. The Peas are large and thick-skinned. Ripe seed, white, medium-sized, and somewhat lentil-shaped. Sown February 23. First flowers opened May 16. Was in full flower May 26. First slats appeared May 29. Fit for use June 20. When this was first introduced, it was considered a great acquisition, as being an early dwarf Marrow Pea, and as such it would have deserved all that was said in its favour, provided it had not the very objectionable property of filling irregularly. The pods early assume the appearance of being ready for use, but when opened are found to contain half-grown Peas, four to six of which only come to maturity. It ripens at the same time as Prizetaker and Fairbeard's Nonpareil, and is some days later than Advancer, which has the same habit, is far more productive, and has the additional advantage of being a sweet wrinkled Pea. A very good cropping Pea, but with indifferently filled pods. Has long since been superseded.

Laxton's Prolific Long-pod (*Laxton's Prolific Selected*).—Plant of a robust and vigorous habit of growth, having large and pale-blotched foliage; height from 5 to 7 feet, producing from twelve to fourteen pods on each stem in pairs. The pods are very large, of a pale green colour, broad, much curved, and pointed, containing from seven to nine medium-sized Peas. Dried seed, white, indented. This resembles Prizetaker in general appearance, only being of a pale light green colour, instead of dark. This is the true variety, although most rarely to be met with, the other and commoner variety being but a bad stock of Prizetaker Green Marrow, and with the mixed coloured seed of that variety. Sown February 23. First flower opened June 1. Was in full flower June 5. First slats appeared June 11; fit for use June 25.

Thurston's Reliance.—The plant grows to the height of 6 or 7 feet, and is very strong and robust. The stem is simple, and bears, on an average, from ten to twelve pods, which are generally single, but occasionally in pairs, and from 3½ to 4½ inches long. They are broad and flat, shaped like the pods of the Blue Scimitar, and contain from seven to eight very large Peas. Ripe seed, white, large, unevenly compressed. This is a very distinct and very useful Pea, an abundant bearer, and the pods are of a fine deep bright green colour, which is a recommendation to it when grown for market. It comes in at the same time as the Auvergne and Shilling's Grotto, but it is of a more tender constitution, for, during the past summer, while the pods of these varieties filled well, those of Thurston's Reliance did not contain more than six to seven matured Peas; a character, however, which it does not exhibit in ordinary summers. What was grown in the garden last season for Thurston's Reliance proved to be small-podded, worthless stocks of Victoria Marrow.

Victoria Marrow (*Gibbs's Defiance*; *The Rector*).—This is also known by the names of Waterloo Marrow, Giant Marrow, Wellington Royal Victoria, and Tall Marrow. The plant is of a strong and vigorous habit of growth, having a simple stem from 6 to 7 feet high. The pods are produced near the top of the stem, sometimes single, sometimes in pairs in about equal proportion, and contain from five to seven very large Peas. Ripe seed, white, large, uneven, and roundish. Sown February 23. First flower opened June 8. Was in full flower June 13. First slats appeared June 16. Fit for use June 29. Extremely vigorous in growth, quite fresh and green when Dixon's Favourite was dead.

Princess Royal.—A very excellent cropper; pods, large full, broad, pale green in colour, and very handsome. Sown February 23. First flower opened June 1. Was in full flower June 6. First slats appeared June 9. Fit for use June 25. It is very doubtful if this is the true Princess Royal of Dr. McLean.

Division III.—Green Marrows.

Ripe seed of a mixed white and olive colour, either small, round, and pitted, or large, irregular, and uneven. Foliage, dark green and blotched. Pods, dark bluish-green, very glaucous.

William the First (Laxton).—A new hybrid raised by Mr.

Laxton. The plant is from 4½ to 5 feet high, somewhat slender in growth, like the Early Frame class; stem, simple, and producing from fourteen to sixteen pods, generally single, but frequently in pairs. The pods are long and very handsome, of deep green colour, covered with a thick bloom like Prizetaker, much curved and pointed like the Auvergne, and contain from seven to eight good-sized Peas of a deep green colour. The ripe seed is small, round, indented, of a mixed white and olive-green colour, like Prizetaker. Sown February 23. First flower opened May 12. Was in full flower May 22. Slats appeared May 24; and pods fit for use June 14—two days later than Sangster's No. 1, and nine days earlier than Prizetaker. This is the earliest Green Marrow Pea, and was awarded a first-class certificate.

Unique (Laxton).—A cross between Laxton's Prolific and Little Gem. The plant has the habit of Tom Thumb and Little Gem, and is moderately robust, from 1 foot to 1½ high; stem, branching; producing from eight to ten pods on each, generally in pairs. The pods are rather long, broad, slightly curved and pointed, of the scimitar-shape, of a fine green colour, containing from six to eight bright green Peas in each. Ripe seed parti-coloured. Sown February 23. First flower opened May 15. Was in full flower May 24. First slats appeared May 27. Fit for use June 19. A fine long-podded and prolific early dwarf Pea, which received a first-class certificate.

Prizetaker (*Bellamy's Early Green Marrow*; *Rising Sun*; *Prolific Long-pod*—*Green seed*; *Carter's Hundredfold*). These are all forms one of another, without any marked distinction.—The plant is 4½ to 5 feet high, of a vigorous habit of growth. The stem is sometimes simple and sometimes branched, and produces from twelve to eighteen pods. The pods are in pairs, very rarely single, and of a deep bluish-green colour, covered with a thick and distinct bloom; they contain six to seven large Peas in each, which are of a dark bluish-green. The ripe seed is small, round, and of a mixed white and green colour. Sown February 23. First flower opened May 28. Was in full flower June 3. First slats appeared June 8. Fit for use June 23. This is a very excellent Pea, and an abundant bearer, but I cannot perceive any great difference between it and Bellamy's Early Green Marrow, which I grew in a collection for the purpose of comparison in 1853, and a very excellent form of which was grown by Messrs. Noble, Cooper, & Bolton, under the name of Noble's Early Green Marrow. In that year the latter was sown as late as the 5th of April; bloomed on the 15th of June; slatted on the 21st; and on the 8th of July the crop was ready for use.

Laxton's Prolific (*Leicester Defiance*. Mixed green and white seed.)—This consisted of mixed stocks of inferior Prizetaker and Laxton's Prolific (true).

Laxton's Supreme.—Plant, robust, in appearance and character like Prizetaker, but having the foliage and pods of a much paler green, which marks their distinction; pods, very large, long, broad, but scarcely so well filled as they appear, containing from seven to nine large Peas. Olive green, ripe seed indented. A large and very handsome Pea. Sown February 23. First flower opened May 30; Was in full flower June 4. First slats appeared June 9. Fit for use June 24.

Superlative (Laxton).—A cross between Ne Plus Ultra and a hybrid of Supreme; plant exceedingly strong and robust, having a strong succulent stem, from 7 to 8 feet high, and large broad pale green foliage; stem generally simple, producing from fourteen to sixteen pods, mostly in pairs. The pods are very large, about 7 inches long, and somewhat irregular in form, broad, much curved and pointed, of a pale green colour, containing from seven to nine large Peas of a pale green colour and of no particular flavour. Dried seed flattish, parti-coloured. Sown February 23. First flower opened May 30. Was in full flower June 5. First slats appeared June 10. Fit for use June 26. The largest-podded Pea, exceedingly handsome in appearance. The pods, however, do not fill to nearly their full extent, many of them being only half-filled. Received a first-class certificate.

Mossy-podded (*Australian*; *Blankney Marrow*).—Plant, 6 to 7 feet high, of strong and vigorous habit of growth, with deep-green foliage, which is maintained healthy for a lengthened period; stem, generally simple, producing from twenty to twenty-four pods, mostly in pairs. The pods are long, slightly curved, full, and round in form, of a bright green colour, and frequently covered (especially where slightly shaded) with minute excrescences in appearance like Moss, which give the pods a rough appearance; they contain from seven to eight medium-sized Peas, closely packed together, which are of a deep green colour, and of poor flavour. Dried seed, parti-coloured, green, half-wrinkled. Sown February 23. First flower opened June 18. Was in full flower June 20. First slats appeared June 24; fit for use July 3.

The Baron (Laxton).—A hybrid Green Marrow, raised by Mr. Laxton; plant of moderately robust growth, not much branched; height from 5 to 6 feet; pods, produced in pairs, from ten to twelve on a stem, very large, from 5 to 6 inches long, curved and pointed, of a fine deep green colour. Very much like Superlative in appearance, but more than a week earlier. They contain from ten to twelve large Peas of a fine green colour. Ripe seed, blue, indented. Sown March 21. Fit for use June 27. Awarded a first-class certificate.

Division IV.—Prussian Peas.

Ripe seed, small, almost round, and smooth. Skin, blue. Foliage, dark green, blotched.

Harbinger (Laxton).—A cross between Dillistone's Early and Alpha. The plant has the habit of Dillistone's Early; stem, from 2½ to 3 feet, simple, producing from seven to eight pods singly. The pods are small, rounded in form, slightly curved, very tightly filled, of a light green colour, and contain about six fair-sized Peas of a fine colour and

good flavour. Ripe seed, small, round, blue. Sown February 23. First flower opened May 9. Was in full flower May 15. Slats appeared May 21. Fit for use June 6. The earliest Pea in the collection, being three days earlier than Dillistone's Early, and six days earlier than Sangster's No. 1. Received a first-class certificate. Last season (1873) this Pea was not so much in advance of other early sorts.

Eastes's Kentish Invicta.—The same as Harbinger in every other respect, but seven days later. Sown February 23. First flower opened May 14. Was in full flower May 25. Slats appeared May 27. Fit for use June 13.

Carter's First Crop Blue.—Has the habit of Burbidge's Eclipse, but dwarfier. Height, 18 inches to 2 feet, robust, producing from eight to nine pods on each stem, single and in pairs. The pods are rather short, but broad, very slightly curved and bluntly ended, of a light green colour. They contain from five to six Peas of medium size, and do not fill out well at all times. Ripe seed, large, round, blue. Sown February 23. First flower opened May 22. Was in full flower May 26. First slats appeared May 30. Fit for use June 19.

Woodford Marrow.—Plant of a strong and robust habit of growth, having very dark bluish-green blotched foliage, and a stem 3½ feet high, which is sometimes simple; but generally branched at about half its height from the ground. The pods number about eleven on a plant, and are produced singly or in pairs. When ready to gather, they are rather flattened; but, as they become ripe, they assume a roundish shape. They contain, on an average, eight Peas in each, which are of a very dark olive-green colour, rather thick in the skin, and very closely packed—so much so as to be quite flattened where they come in contact. Ripe seed is very dark blue. On account of its fine dark green pod, this is an excellent Pea to grow for market; but it is one that requires to be very carefully selected when grown for seed, as it has a great tendency to degenerate back to the Blue Prussian, from which it has evidently been raised. Sown February 23. First flower opened June 5. Was in full flower June 13. First slats appeared June 16. Fit for use June 27.

Green Noyon.—The plant has the habit of Blue Prussian, having a stem about 2½ feet high, with deep green foliage; pods, small, round, and very full, nearly straight, there being from eight to nine on each stem, generally in pairs, of a pale green colour, and containing from five to six small Peas. Ripe seed, round, light green, small, smooth. A worthless variety. Sown February 23. First flower opened June 12. Was in full flower June 14. First slats appeared June 16. Fit for use June 27.

Blue Prussian.—Plant not robust or strong in its habit, having a stem 3 feet high, which is sometimes branching, and with dark green blotched foliage. The pods are generally in pairs, from twelve to sixteen on each plant, and contain about seven closely packed Peas. The ripe seed is blue, small, and almost smooth. This is a very old and popular variety, much used for extensive culture in fields and market-gardens on account of its great fertility—a character which it maintains superior to any of the other blue Peas, most, and indeed all, of which during the past season have exhibited much less hardy constitutions. Sown February 23. First flower opened June 9. Was in full flower June 13. First slats appeared June 16. Fit for use June 30.

Evergreen (Laxton).—Plant 5 to 6 feet high. Habit of growth like Anvergne, with rather small pale green foliage. Stems, generally simple, producing from fourteen to sixteen pods in pairs. The pods are rather small, slightly curved, and bluntly pointed; very closely filled with from seven to eight medium-sized Peas. The Peas are of a bright green colour, tinged with dark green. Flavour, very inferior. Ripe seed of a deep green piebald colour. Sown February 23. First flower opened June 2. Was in full flower June 13. First slats appeared June 16. Fit for use July 1. A very inferior Pea.

Nimrod (Laxton).—Plant, slender; in the habit of growth and general appearance like Alpha. The stem is simple, 3 to 4 feet high, producing from seven to eight pods singly, which contain from six to eight Peas each, of a deep green colour. Pods, round, full, much curved, of a very deep green colour, resembling William I. Ripe seed, round, bluish-green, indented. Sown February 23. First flower opened May 10. Was in full flower May 21. First slats appeared May 26. Fit for use June 14.

Blue Peter (Carter).—The habit and growth are similar to that of Tom Thumb; height from 1 foot to 1½; pods, large, broad, of a fine green colour, from eight to ten being produced on each stem. They contain from five to six large Peas generally; but they frequently fill badly. Ripe seed, round, blue. Sown February 23. First flower opened May 19. Was in full flower May 27. First slats appeared May 29. Fit for use June 18. A larger form of Tom Thumb, with round blue seed. This received a first-class certificate.

Griffin (Laxton).—Plant, 3 to 4 feet high; habit, form, and colour of the pods resembling those of the Frame class. Stem, simple, producing from fourteen to sixteen pods, generally in pairs, containing from six to seven medium-sized Peas, of a pale green colour, tinged with darker green, giving them a very peculiar appearance. Flavour very inferior. Ripe seed, small, deep mottled green, indented. Sown February 23. First flower opened May 16. Was in full flower May 27. First slats appeared May 30. Fit for use June 21. An inferior variety.

Fairbeard's Surprise (Early Surprise).—The plant is a free but not robust grower, and always with a simple stem, which is about 5 feet high. The foliage is bright and not dark green, like the other varieties of this class. The pods are generally single, but sometimes in pairs, and are from eight to ten on a plant; they contain from seven to eight good-sized Peas. The ripe seed is somewhat oval, of a pale blue colour. This and Fairbeard's Champion of England were originally taken from the same pod, the former having a round, and the latter a wrinkled, seed. It is the earliest of all the round blue Peas, and very superior in every respect

to the following, which comes into use two or three days later. Sown February 23. First flower opened June 1. Was in full flower June 6. First slats appeared June 9. Fit for use June 24.

Harrison's Glory.—The only distinction between this and Harrison's Perfection is the blue-coloured seed, that of the latter being white; they differ in no other respect, being of the same height, equally productive of pods, which always fill very badly, and both come into use at the same time. Sown February 23. First flower opened May 26. Was in full flower June 5. First slats appeared June 8. Fit for use June 24.

Harrison's Royal Blue.—Plant resembling in its aspect Dancroft Rival, differing, however, from that variety in the stem, stipules and the pods being devoid of glaucousness, the leaves having the usual glaucous hue. This peculiarity gives it a very singular appearance. The plant is moderately robust, about 3 feet high, producing from fourteen to sixteen pods on each stem. The pods are short, broad, slightly curved, very badly and irregularly filled, containing only from four to five Peas in each, of very inferior quality. Ripe seed large, round, blue, flattened, and indented. Sown February 23. First flower opened May 21. Was in full flower May 27. First slats appeared May 30. Fit for use June 26.

Burbidge's Eclipse (Stubbs' Dwarf).—The plant is a dwarf but robust grower, from 18 inches to 2 feet high. The foliage is dark green, slightly blotched. The stem is always simple, and produces from ten to twelve pods, which are generally in pairs, rarely single. They contain from five to six Peas, which are of good size, and closely packed. The ripe seed is large, uneven, oval, and of a blue colour. This is the dwarfest of all the blue Peas, and is an excellent bearer. Sown February 23. First flower opened June 2. Was in full flower June 8. First slats appeared June 12. Fit for use June 25. Clipsestone Hero is a somewhat taller and more robust form of this variety.

Mogul (Laxton).—A cross between Prolific Longpod and Little Gem; plant moderately robust, resembling Burbidge's Eclipse, and from 18 inches to 3 feet high; stem, branched, producing from eight to ten pods, generally in pairs. The pods are long, very full, rounded in form, much curved and pointed, of a beautiful green colour, containing from six to eight medium-sized Peas. Extremely handsome, prolific, but inferior. Dried seed, large, round, blue, indented. Sown February 23. First flower opened May 27. Was in full flower June 1. First slats appeared June 4. Fit for use June 25.

Fillbasket (Laxton).—A cross between Laxton's Standard and Supreme; plant very robust and vigorous, growing to about 3 feet in height; foliage, large, pale green, of a very distinct character; stem, branching, producing from twelve to fourteen pods on each, generally in pairs. The pods are very long, curved, closely filled, rounded in form, of a fine bright green colour, containing from seven to nine good-sized Peas of a fine green colour. Dried seed, large, light green, flattened. Sown February 23. First flower opened June 2. Was in full flower June 8. First slats appeared June 11. Fit for use June 26. A large very handsome, and prolific Pea, which received a first-class certificate.

Flack's Imperial (Flack's Victory; Flack's Victoria).—This variety, introduced about ten or twelve years ago as an improvement on Bedman's Imperial, appears now to represent the varieties formerly known as Blue Imperial and Bedman's Imperial, and deservedly so, for it is the only one of the name really worth growing, when true, and it requires careful selection to keep it so, from its tendency to degenerate into Blue Prussian. The plant is of a robust habit of growth, with a stem which is always branching, and generally about 3 feet high, producing dark green blotched foliage. The pods are from twelve to eighteen on a plant, generally in pairs, but frequently single, and contain from six to eight very large Peas, which are of an ovate shape, about half an inch long, and seven-twentieths broad. The ripe seed is large, irregularly oval, and dark blue. Sown February 23. First flower opened June 4. Was in full flower June 10. First slats appeared June 14. Fit for use June 25.

Bedman's Imperial.—Bedman's Imperial was the first improvement on the Old Blue Imperial, but it has now been for many years superseded by Flack's Imperial. Sown February 23. First flower opened June 3. Was in full flower June 9. First slats appeared June 11. Fit for use June 26.

Blue Scimitar (Blue Sabre; Scimitar).—The plant is a strong, robust grower, 2½ to 3 feet high, generally with a simple stem, but sometimes branching, and having dark green blotched foliage. The stem bears from twelve to eighteen pods, which are also of a dark green colour, and very much curved and flattened. They are produced generally in pairs, and contain on an average nine to ten Peas in each. The ripe seed is irregularly oval and dark blue. This is an old variety, and now very much grown by farmers and market-gardeners as a field crop, for the supply of the markets of large towns, the fine large dark green pods always commanding a ready sale. It is very prolific, and is, without doubt, one of the best varieties for culture on a large scale, but is one which is very liable to degenerate, and demands very careful attention to preserve a pure stock. Sown February 23. First flower opened June 7. Was in full flower June 14. First slats appeared June 14. Fit for use June 30.

Supplanter (Laxton).—A cross between Veitch's Perfection and Little Gem; plant, very robust and vigorous; height about 3 feet; foliage, deep green, like the Woodford Marrow; stems, branching, producing from fourteen to sixteen pods on each, in pairs; pods, very large, broad, scimitar-shaped, of a deep green colour, and containing from seven to eight very large Peas, which are of a deep green colour. Dried seed, very large, bluish-green, flattish, round, and sometimes indented. Sown February 23. First flower opened May 26. Was in full flower May 30. First slats appeared June 2. Fit for use July 1. A large, handsome, and very prolific Pea, which received a first-class certificate.

Division V.—Wrinkled White Marrows.

Ripe seed, white, compressed and wrinkled. Foliage, most frequently dark green and much blotched; but occasionally light green, and slightly or not at all blotched.

Pioneer (Laxton).—A cross between Dillistone's Early and Little Gem. Plant of the type of Sangster's No. 1, but with paler foliage, especially when in a young stage, which gives it a sickly appearance. Height from 3 to 3½ feet, producing from nine to ten pods on a stem, generally simple. The pods are of fine size, nearly straight, pale green, and contain from five to six Peas. Ripe seed, rather small, wrinkled, white. Sown February 23. First flower opened May 9. Was in full bloom May 18. First slats appeared May 22. Fit for use June 13. One day later than Dillistone's Early. The earliest white wrinkled Marrow, of fine quality, resembling Alpha, only differing in the colour of the seed.

Alexandra (Laxton).—A cross between Prolific Longpod and Advance. Habit and general appearance of plant like the Frame class. Somewhat straggling, attaining a height of 4 to 4½ feet. The pods are produced singly from ten to twelve on each stem; they are large, somewhat curved, and contain from eight to nine fair-sized Peas in each, which are very closely packed. The colour of the plant throughout is a pale green. Ripe seed, white, slightly wrinkled. Sown February 23. First flower opened May 12. Was in full flower May 16. First slats appeared May 24. Fit for use June 12. Of the same earliness as Sangster's No. 1. A very early wrinkled Pea, of excellent quality when cooked.

Nutting's No. 1 (Carter's White Gem).—Plant very robust and vigorous, with pale green blotched foliage; height, 2 to 2½ feet, stem, branching, producing from eight to twelve pods in pairs on each, which are borne almost close on the ground; pods short, well filled, rounded in form, slightly curved and bluntly ended, of a pale green, almost whitish colour. They contain from six to seven large Peas in each, of a whitish green colour. Exceedingly sweet and excellent. Dried seed large, white, wrinkled. Sown February 23. First flower opened May 21. Was in full flower May 28. First slats appeared May 30. Fit for use June 18. A remarkably prolific and handsome dwarf Pea, flowering at the same time as Alliance, but coming into use three days before that variety.

Fairbeard's Nonpareil Marrow.—The plant is of a free, but not vigorous, growth, resembling the Early Frances both in habit and in foliage, the latter being light green and not blotched. The stems are branching, 3½ to 4 high, and producing twelve to fourteen very full and plump pods, which are generally in pairs, and contains six or eight closely packed Peas. The ripe seed is small, white, and wrinkled. This is an early and very productive Pea, and comes into use at the same time as the Early Frances and the Early Ringwood. The Peas, however, are small, and, as a wrinkled variety, it is now surpassed. Sown February 23. First flower opened June 3. Was in full flower June 11. First slats appeared June 14. Fit for use June 25.

Alliance (Eugenie; Evershed's Early Prolific; Early White Wrinkled Marrow).—Plant with a free habit of growth, having a succulent stem, and rather light green blotched foliage. The stem is simple, 3 feet high, and produces from twelve to sixteen pods, which are generally in pairs, and are produced at every joint. They are not well filled, and contain only five or six good-sized Peas in each. The ripe seed is white and wrinkled. This differs from Climax only in having the ripe seed white. When first introduced it was a valuable acquisition as being a tolerably early dwarf white wrinkled Pea, but it is now far surpassed in every way. Sown February 23. First flower opened May 21. Was in full flower May 27. First slats appeared June 1. Fit for use June 24.

Prince of Wales.—A finely selected stock of Alliance, a little later, and with better filled pods. Sown February 23. First flower opened June 1. Was in full flower June 5. First slats appeared June 8. Fit for use June 24.

Nelson's Vanguard.—Resembles in its general characters Alliance, but dwarfer than that variety, and with broader pods. It flowered, slatted, and came into use at the same time.

Rajah (Laxton).—A cross between Little Gem and Laxton's Prolific Long-pod. This is intermediate in form between Advance and Little Gem. The plant has the appearance of the former, but is dwarfer. Height, 18 inches to 2 feet. The pods are borne in pairs, eight to ten on a plant. They are very long and much curved, very full, giving them a rounded form, and contain from eight to nine fair-sized Peas in each. Dried seed, white, wrinkled, flattened. Sown February 23. First flower opened May 29; was in full flower June 4. First slats appeared June 7. Fit for use June 24.

Dean's Dwarf Marrow (Robert Penn).—This somewhat resembles in its general appearance James's Prolific. It is, however, distinct from that variety, in the shape of the pods, they being more abrupt, and of greener colour. The plant is also dwarfer, not much exceeding 2 feet in height. It is remarkably robust and upright in growth. Ripe seed, large, green, wrinkled. Sown February 23. First flower opened May 30. Was in full flower June 4. First slats appeared June 6. Fit for use June 24.

Standard (Laxton).—A cross between Veitch's Perfection and Little Gem; plant, robust, branching; height, 3 feet; foliage, light green. The pods are borne in pairs, from fourteen to sixteen on each stem. They are very long, much curved, like Auvergne, rounded in form and pointed, closely filled, showing the form of the Peas through the pod, and of a light green colour. They contain from nine to eleven Peas in each, of large size, of a fine deep green colour, and excellent in quality. Ripe seed, white and green, wrinkled and flattened. Sown February 23. First

flower opened June 4. Was in full flower June 9. First slats appeared June 12. Fit for use June 25. A very handsome and prolific Pea.

Wonderful (McLean's).—Plant, resembling in its general character Alliance, but more even and regular, stem not so succulent; height, about 3 feet, producing from eleven to twelve pods on a plant, generally in pairs. The pods are large, very slightly curved and pointed, of a pale green colour. They are well filled, containing from six to seven large Peas of a light green colour. Quality excellent. Dried seed, rather small, very white, wrinkled. Sown February 23. First flower opened June 2. Was in full flower June 8. First slats appeared June 11. Fit for use June 26. Two days later than Alliance, and a much superior Pea.

Prolific (McLean's).—Resembling Wonderful in its general characters, but having much larger pods; height, about 3 feet, of strong and robust growth, producing from twelve to fourteen pods on each plant. The pods are large, broad, slightly curved and bluntly pointed, and contain from six to seven large Peas in each, which are unusually sweet and good. Sown February 23. First flower opened June 3. Was in full flower June 9. First slats appeared June 13. Fit for use June 28. This variety keeps long in fit condition for use.

British Queen (Rollison's Victoria; Shanley Marrow; Hooper's Incomparable; Imperial Wonder (excellent stock); Carter's Leviathan (strong stock); McMillan's Queen of the Marrows; William's Emperor of the Marrows; Ward's Incomparable; Wonder of the World; Champion of Scotland; Queen of the Marrows; Thome's Royal Britain; Great Britain).—These are all forms, more or less selected, of the British Queen and Tall White Mammoth. This is a free and robust grower, 6 to 7 feet high. The stem is generally single, but also sometimes branched when the seed has been sown thin, and then it is furnished with two or three laterals which are the same height as the main stem; pods, generally single, but occasionally in pairs, and are to the number of thirteen to eighteen on a plant; they contain five to seven very large Peas, some of which are more than half an inch in diameter. The ripe seed is white and wrinkled. British Queen is now an established variety, and justly esteemed as one of the best and most productive of the tall wrinkled Marrows. On a well-branched plant I have counted as many as thirty-one pods of all kinds, including those full-grown and those just formed; and, in a mild autumn, it is not unusual for it to continue growing, blooming, and podding as late as Christmas. I do not see any material difference between this and Tall White Mammoth, with the exception that the latter is two days earlier; the plants are exactly similar in habit, and are equally productive. Sown February 23. First flowers opened June 12. Was in full flower June 15. First slats appeared June 18. Fit for use June 30.

Challenger (Dean)—Sussex Hero (Wood & Son)—Wrinkled White (Chamberlain).—These proved to be good stocks of British Queen.

The Prince.—Intermediate in form between Veitch's Perfection and Premier; plant, robust and vigorous, much branched; foliage, rather small, deep green. The pods, which are produced in pairs, are smaller than Veitch's, of a pale green colour, showing the form of the Peas through, like Premier. It flowered, slatted, and was fit for use the same time as Premier. A very vigorous and prolific form of Veitch's Perfection, standing the dry weather well.

The Prince (Selected) (Dean).—No improvement on the old stock.

Dwarf Canada (Evershed's Marrow).—A somewhat taller and stronger-growing form of The Prince, coming into use a day or two later, but otherwise not distinct.

Premier (McLean's).—Plant, robust, but not producing so succulent a stem as Veitch's Perfection; foliage, smaller and deep green; pods, borne in pairs, from sixteen to eighteen on a stem. They are large, broad, pale green in colour, showing the form of the Peas through the pods, and contain about six or seven very large Peas of excellent quality. Dried seeds, small, green and white mixed. Sown February 23. First flower opened June 5. Was in full flower June 14. First slats appeared June 17. Fit for use June 30. An excellent, somewhat earlier and hardier Pea than Veitch's Perfection, of the same class.

Lincolnshire Defiance is very similar to Premier.

Bland's Defiance (Bland).—A selection from Premier, but no improvement.

Cowle's Wrinkled Marrow.—Plant, robust, resembling Premier in general characters; pods, long, curved, rounded in form, of a light green colour, containing from six to seven large Peas. Sown March 1. First flower opened June 5. Was in full flower June 11. First slats appeared June 19. Fit for use July 2.

Lynn's Wrinkled Marrow.—The plant is a robust grower, 3 feet high, and with dark green and much blotched foliage. The stem is simple, producing from twelve to fourteen pods, which are in pairs, and contain from six to eight Peas in each. The ripe seed is white, wrinkled, and with a black hilum, like the Pigg Pea. This is a very hardy variety, and, as such, is grown rather extensively in the neighbourhood of some of the manufacturing towns in the north; but it is not a desirable sort. Sown February 23. First flower opened June 17. Was in full flower June 19. First slats appeared June 21. Fit for use July 1.

Knight's Tall White Marrow.—This is a strong and robust grower, 6 to 7 feet high. The stem is much branched, and keeps on growing and producing pods till late in the season. The foliage is dark green and much blotched. The pods are produced in pairs to the number of twelve to eighteen on a plant, and they contain from seven to eight Peas in each, which are very closely compressed. The ripe seed is white and wrinkled. Sown February 23. First flower opened June 11. Was in full flower June 15. First slats appeared June 10. Fit for use July 3.

James's Prolific (James).—A selection from Wonderful; plant robust; height, 3 feet; stem, strong and succulent, occasionally branched, producing from eight to ten pods on each, generally in pairs; foliage large, pale green, and much blotched; pods, very large, broad, nearly straight and bluntly ended, of a very light green colour, similar in that respect to Excelsior Marrow. They contain from six to eight very large Peas, of a pale green or whitish colour, of excellent quality. Ripe seed, large, white and pale green, wrinkled. Sown March 1. First flower opened June 13. Was in full flower June 16. First slats appeared June 19. Fit for use July 14. An extremely handsome Pea when growing, of firm and erect growth, the pods being well sustained from the stem, and nearly all being fit for use at the same time. This received a first-class certificate.

Dagmar (Laxton).—Plant, robust, branching; height, about 12 inches; pods, produced in pairs, full, rounded, curved, and pointed, of a pale green colour, from $3\frac{1}{2}$ to 4 inches long, and contain from seven to eight large peas of very fine quality. Very prolific. Ripe seed, white, wrinkled. Sown March 21. Fit for use June 20, at the same time as Sangster's No. 1. A very fine early dwarf wrinkled pea. Awarded a first-class certificate.

The Shah (Laxton).—Plant of the habit of Sangster's No. 1, simple; height, about 3 feet; pods, produced singly, but abundantly, very full, rounded, almost straight, or but very slightly curved, about 3 inches long, of a pale green colour, and contain from eight to nine very large peas, of very fine quality. Ripe seed, white, wrinkled. Sown March 21. Fit for use June 20, at the same time as Sangster's No. 1. An exceedingly fine early prolific white wrinkled pea. Awarded a first-class certificate.

Marvel (Laxton).—Plant of robust habit of growth, branching; height, 3 feet; pods, produced in pairs great abundance, very large, from 4 to 4½ inches long, full, rounded, much curved and pointed, of a light green colour, and contain from nine to eleven very large peas, of very fine quality. Ripe seed, white, wrinkled. Sown March 21. Fit for use July 2. A remarkably handsome, large, and exceedingly productive white wrinkled Marrow. Awarded a first-class certificate.

Division VI.—Wrinkled Green Marrows.

Ripe seed, mixed white and olive; foliage, dark green and blotched; pods, dark dull green, very glaucous.

Dr. Hogg (Laxton).—A cross between Prolific Long-pod and Little Gem. It has the habit and type of Sangster's No. 1. Stem, simple, rather straggling; height, about 3½ feet; pods, produced singly and in pairs, from ten to twelve on each stem. They are long, narrow, much curved and pointed, very well filled, of a beautiful deep green colour, like William the First. They contain from seven to nine medium-sized Peas, which are of a fine deep green colour, like Ne Plus Ultra. Very sweet and of excellent quality. Ripe seed, green, much wrinkled. Sown February 23. First flower opened May 15. Was in full flower May 24. First slats appeared May 27. Fit for use June 16. A very handsome Pea, of excellent quality. The earliest green wrinkled marrow, only four days later than Dillistone's Early, and two days later than Alpha. This received a first-class certificate.

Ne Plus Ultra.—Cullingford's Champion; Jeyes' Conqueror; Edwards' Invincible; Champion of the World; and Late Wrinkled Green, are later and inferior forms of this. It is of a strong and robust habit of growth, 6 to 7 feet high, and with a branching stem and dark green blotched foliage. The pods are from twelve to eighteen on each plant, mostly in pairs, and contain seven very large Peas, which are of a dull green colour, like those of the Green Marrows. The ripe seed is mixed white and olive. This is one of the best Peas in cultivation, being an abundant bearer, as early as the Early Green Marrow, and having dark-coloured pods and Peas similar to those of that variety. Sown February 23. First flower opened June 6. Was in full flower June 13. First slats appeared June 15. Fit for use June 29.

Omega (Laxton).—A cross between Veitch's Perfection and Ne Plus Ultra; plant, robust, erect growth; stem, 2 feet 6 inches high, branching; foliage, large, deep green. The pods are produced in pairs from twenty to twenty-four on each plant. They are long, nearly straight, rounded in form, and very closely filled, showing the form of the Peas through the pod, of a very deep grassy green colour, which is retained for a long time; they contain about eight very large Peas, which are of a deep green colour, like Ne Plus Ultra, and of excellent quality. Ripe seed large, deep green, compressed, and wrinkled. Sown February 23. First flower opened June 9. Was in full bloom June 13. First slats appeared June 16. Fit for use June 30. A very excellent, handsome, and prolific Pea. Very distinct from all others. Keeps long in condition, after being fit for use, and stands the dry weather well; would be most appropriately named Dwarf Green Ne Plus Ultra. Received a first-class certificate.

Progress (Laxton).—A cross between Veitch's Perfection and Ne Plus Ultra. Resembling Omega in every other respect. It is a day or so earlier, and scarcely so large in pod.

General Wyndham (Boyes's Masterpiece).—The plant is of a robust habit, 6 to 7 feet high, and frequently branched. The foliage is dark green and blotched. The pods are either single or in pairs, and number from ten to fourteen on each plant. They contain eight very large Peas, which are of the deep dull green colour of the Early Green Marrow. The ripe seed is white and olive mixed. This is a valuable acquisition, and has evidently been raised from Ne Plus Ultra; but it is a much more robust grower, and produces much larger pods. The plant continues growing, blooming, and podding till very late in the season, and, when this is in the full vigour of growth, Ne Plus Ultra is ripening

off. Sown March 16. First flower opened June 13. Was in full flower June 17. First slats appeared June 19. Fit for use July 1. The Peas, when cooked, are of a fine bright green colour, and unlike those of any other variety.

Munsted Marrow.—Plant, very robust, with broader and shorter pods than Ne Plus Ultra, containing from six to eight very large deep green Peas; ripe seed, very large, deep green. Distinct in character. Comes into use a few days later than Ne Plus Ultra, of which it is a broader and shorter-podded form.

Sturdy (Laxton).—A cross between Veitch's Perfection and Ne Plus Ultra; plant, extremely robust and strong-growing; stem, 3 feet, branching very much, and flowering successively; foliage, large, deep green, slightly blotched. The pods are produced in pairs, from twenty to twenty-four on a plant. They are long, nearly straight, resembling Omega, but broader than that variety, of a beautiful deep dark green colour; they contain from six to eight large Peas, which are of a fine dark green colour, like Ne Plus Ultra. Ripe seed, very large, deep green, compressed and wrinkled. Quality excellent. Sown February 23. First flower opened June 13. Was in full flower June 19. First slats appeared June 21. Fit for use July 9. This is the latest Pea by several days of any in cultivation, and, by its habit of growing and flowering successively, a continuous supply of Peas fit for use is maintained for a week or ten days later still.

Dwarf Green Wrinkled Marrow (Veitch).—Plant, very robust, much branched; height, about 2½ feet; foliage, large, broad, bright green, glabrous, or destitute of the usual glaucous hue, being similar in this respect to Danecroft Rival; pods, large, broad, pale shining green, but rather rough. They contain from seven to eight large pale green peas, which are very sweet and of good quality. Ripe seed, large, white, wrinkled. Sown March 21. Fit for use June 29. This is a perfectly distinct pea. It appears, however, to be somewhat tender, as, although the plant grew well and flowered abundantly, but very few of the pods filled out, the produce being exceedingly small.

Division VII.—Wrinkled Blue Marrows.

Ripe seed, blue and wrinkled. Foliage, dark green and much blotched.

Laxton's No. 1.—A cross between Dillistone's Early and Little Gem. This resembles Alpha in the characters and general appearance of the plant, but having straight pods, the same as Pioneer (white seed). Ripe seed, same as Alpha, small, light blue, wrinkled. Sown February 23. First flower opened May 10. Full flower May 22. First slats appeared May 25. Fit for use June 12. The earliest blue Wrinkled Marrow, coming into use the same time as Dillistone's Early.

Alpha (Laxton).—Habit and general appearance of plant like the Frame class or Sangster's No. 1; plant, rather straggling, weak, and somewhat tender, from 3 to 3½ feet high; stem, simple, with light or pale green foliage. The pods are produced singly, from seven to nine on a plant. They are long, rounded in form, narrow, much curved and pointed, of a pale green colour like Sangster's. They contain from seven to nine good-sized peas in each, of a fine colour, and most excellent quality. Ripe seed, small, light blue, much wrinkled. Sown February 23. First flower opened May 12. Was in full flower May 23. First slats appeared May 26. Fit for use June 14. A very early and excellent wrinkled Marrow Pea, only two days later than Sangster's No. 1.

Fertility (Laxton).—A cross between Prolific Long-pod and Little Gem. This is scarcely distinct from Alpha, only having the pods a little more curved and the dried seed a little more green. It flowered, slatted, and came into use at the same time.

Little Gem (McLean's).—Plant, very dwarf, from 12 to 18 inches in height, but of robust and vigorous growth. Stem branching; foliage, dark green. The pods are produced in pairs, from seven to eight on a stem. They are of fair size, rather broad, nearly straight, very full, and contain from six to seven fair-sized Peas of fine colour and excellent flavour. Ripe seed, bluish-white, wrinkled. Sown February 23. First flower opened May 16. Was in full bloom May 25. First slats appeared May 28. Fit for use June 16. This is, indeed, a little gem amongst Peas, very valuable for forcing or growing in pots, from its extremely dwarf and prolific habit and its earliness, coming into use four days later than Sangster's No. 1.

Laxton's Gem (Laxton).—Plant, robust, branching; height, about 18 inches; pods, produced in pairs, from eight to ten on a stem, from 3 to 3½ inches long, and a good deal curved and pointed, well filled, containing from eight to nine good-sized peas of very excellent quality. Ripe seed, green, wrinkled. This was selected as an improvement on Little Gem, having larger pods, and being more prolific than that variety. Sown March 21. Fit for use June 23. Awarded a first-class certificate.

Early Emerald.—Plant, from 2 to 2½ feet high. This closely resembles Little Gem. It may be termed a somewhat taller and stronger form of that variety. It comes into use a day or two later. The dried seed is small, green and white, wrinkled.

Multum in parvo (Nutting).—Plant, robust, with large foliage, resembling Little Gem, but very distinct in the character of the pods. These are produced generally singly, and have very short peduncles. They are, generally, rather short and very broad, but well filled, containing from 5 to 6 large Peas, of excellent quality. Ripe seed, large, mixed blue and white, wrinkled. Sown February 23. First flower opened May 21. Was in full flower May 27. First slats appeared May 29. Fit for use June 19.

Multum in parvo (Selected).—No improvement on the true Multum in parvo.

Carter's Premium Gem (Carter).—This was considered an improvement on Multum in parvo. Sown March 21. Fit for use June 23.

Stamford Marrow (Laxton).—A cross between Supreme and Little Gem; plant of somewhat slender growth; height, 5 feet; foliage, pale green, blotched. The pods, which are produced in pairs from fourteen to sixteen on a plant, are very long, rounded and full, rather narrow, but much curved and pointed, of a pale green colour, like Alpha. They contain from nine to eleven medium-sized Peas, of a light green colour, very closely pressed, and excellent flavour. Ripe seed, pale green or blue, wrinkled. Sown February 23. First flower opened May 21. Was in full flower May 28. First slats appeared June 2. Fit for use June 17.

Advancer (McLean).—The plant is a free grower, of robust habit, and about 2 feet high, with dark green and blotched foliage. The stem is rather succulent and sometimes branching, producing from twelve to eighteen pods, which are generally in pairs, and contain eight very large peas, which are closely compressed. The ripe seed is green and wrinkled. This is one of the most valuable acquisitions that has been obtained of late years. It is, in fact, a green wrinkled marrow, as early as Early Emperor. It is remarkably productive, the pods fill well. When cooked, the peas are most delicious. It was raised by Dr. McLean, of Colchester. Sown February 23. First flower opened May 25. Was in full flower May 30. First slats appeared June 3. Fit for use June 21.

Universal (Laxton).—A cross between Little Gem and Laxton's Prolific. This resembles Little Gem in every respect, but with much longer, more curved, and narrower pods. The pods contain from seven to eight Peas, and, in some cases, nine, of fair size and excellent quality; ripe seed, blue, wrinkled, and flattened. Sown February 23. First flower opened May 24. Was in full flower May 28. First slats appeared June 2. Fit for use June 21, five days later than Little Gem.

Popular (Laxton).—Plant of rather slender growth, 6 to 7 feet high. The pods, which are produced in pairs from twelve to fourteen on each plant, are long, narrow, very tightly filled and compressed, like Fairbeard's Nonpareil, much curved and pointed, of a light green colour. They contain from six to eight large Peas in each, of excellent quality. Ripe seed, pale green or blue, wrinkled. Sown February 23. First flower opened May 24. Was in full flower May 27. First slats appeared May 30. Fit for use June 21. An excellent Pea for a general crop.

Epicurean (McLean).—Plant, robust, of full growth; height, 3 feet, having the habit of Nutting's No. 1, but inferior to that variety. The pods are borne in pairs, from ten to twelve on each stem. They are rather small, not very well filled, containing from six to eight Peas. Excellent quality. Ripe seed, white and green, wrinkled. Sown February 23. First flower opened May 27. Was in full flower June 2. First slats appeared June 5. Fit for use June 21.

Climax (Fairhead's Excelsior; Napoleon; The Claimant; Lacking's Queen of the Marrows).—The plant is of strong and robust health, 3 feet to 3½ feet high, unbranched. Foliage, rather light green and blotched. The pods, which are from thirteen to nineteen on a plant, generally in pairs, fill very badly, rarely containing more than four to six fully-developed Peas, the others being abortive. Ripe seed, green and wrinkled. This produces a great many pods, but they are badly filled. When first introduced, it was considered useful on account of its earliness; but now it is not worth growing.

Champion of England.—The plant is of a strong and luxuriant habit of growth, with a stem from 6 to 7 feet high, which is generally simple, but occasionally branched, and having light green foliage, which is scarcely blotched. The pods are from twelve to eighteen on a plant, and are generally single, but frequently in pairs, and contain seven to nine very large Peas closely compressed. Ripe seed, pale green and wrinkled. This valuable Pea is now too well known to require any commendatory remarks. This and Fairbeard's Surprise originated in the same pod, the latter being a round and the Champion of England a wrinkled-seeded variety. When sown, both varieties preserved their distinctive characters. Sown February 23. First flower opened May 29. Was in full flower June 9. First slats appeared June 21. Fit for use June 25.

Fairbeard's Fortyfold.—A selection of Champion of England, having large scimitar-shaped pods. Comes into use at the same time.

Culverwell's Early Wrinkled Marrow.—A fine form of Champion of England, with large broad pods and large Peas. Ripe seed, large, bright green.

Huntingdonian.—A large-podded and very excellent form of Champion of England.

Laxton's Quality.—Plant resembling Champion of England in growth, but with larger foliage of a much paler green and fully more robust. The flower is also large and handsome. The pods, which are produced in pairs, from fourteen to sixteen on a plant, are very large, rounded in form, much curved and pointed, of a light or pale green colour, they contain from seven to eight very large Peas of a light green colour, and of excellent flavour. Ripe seed, pale green and white, wrinkled. Sown February 23. First flowers opened May 21. Was in full flower May 27. First slats appeared May 30. Fit for use June 24.

Laxton's Quantity.—This, which originally was a round white-seeded variety, proved in the trial to be now but a form of Laxton's Quality with straighter pods.

Lord Palmerston.—In the way of Veitch's Perfection, with broader pods, but not quite so long, and somewhat paler in colour, very uniform. Comes into use with Hair's Dwarf Mammoth.

Knight's Tall Green Marrow (Cullingford's Champion).—Sown February 23. First flower opened May 29. Was in full flower June 5. First slats appeared June 12. Fit for use June 25.

Yorkshire Hero.—Plant, moderately robust; height, 3 feet, stem, simple, producing from twelve to fourteen pods on each, in pairs. The pods are short, broad, nearly straight, of a light green colour, and do

not fill well. They contain only from four to six fair-sized Peas. Ripe seed, light green, wrinkled. Sown February 23. First flower opened May 27. Was in full flower June 5. First slats appeared June 8. Fit for use June 25. This very much resembles McLean's Prolific.

Princess of Wales.—In habit and general appearance this very closely resembles Advancer. It might, indeed, be termed a good selected late stock of that variety. The ripe seed is lighter in colour than that of Advancer. Sown February 23. First flower opened May 30. Was in full flower June 8. First slats appeared June 12. Fit for use June 27, six days later than Advancer.

Conquest.—Plant of slender growth; height, 5 to 6 feet. The pods are borne in pairs from twenty-two to twenty-four on each plant; they are in appearance like the Early Emperor, small and narrow, containing from five to six small Peas in each, parti-coloured, light and dark green, of poor quality. Ripe seed, small, dull green, wrinkled. Sown February 23. First flower opened June 3. Was in full flower June 9. First slats appeared June 19. Fit for use June 27. A worthless and undesirable Pea.

G. F. Wilson (Carter).—Plant, robust, having the same appearance as Veitch's Perfection; height, 4 feet. The pods are produced in pairs, from ten to fourteen on a plant. They are very large, of a light green colour, and contain from seven to eight very large peas in each, which are of a fine green colour. Ripe seed, smaller than Veitch's Perfection, light green, wrinkled. Sown February 23. First flower opened May 29. Was in full flower June 4. First slats appeared June 7. Fit for use June 27. This is an early form of Veitch's Perfection, coming into use seven days before that variety. Received a first-class certificate.

Culverwell's Prolific Marrow (Veitch's Tall Green Wrinkled Marrow).—Resembling some of the forms of Tall Green Mammoth, of strong and robust growth; pods, short, straight, pale green, containing from five to six exceedingly large peas of excellent quality. Ripe seed, very large, bright green, wrinkled, very distinct in appearance. Sown February 23. First flower opened June 3. Was in full flower June 12. First slats appeared June 16. Fit for use July 1.

Tall Green Mammoth (Green Tall Square Mammoth; Competitor; Epps' Monarch).—The plant is a strong and vigorous grower, with a thick succulent stem, 6 to 8 feet high, and branched; foliage, dark green, and blotched. The pods are produced in pairs, and are from twelve to sixteen on a plant. Ripe seed, large, green, and wrinkled. Sown February 23. First flower opened June 3. Was in full flower June 15. First slats appeared June 19. Fit for use July 1. Thorpe-Perron Early Marrow is a few days earlier, and with smaller and more pointed pods.

General Havelock.—A small-podded worthless form of the same. **Veitch's Perfection**.—The plant is very robust in its habit, and produces a succulent stem, 3 feet high; foliage, dark green, and only slightly blotched. The pods are generally in pairs, of a large size, and from ten to fourteen on a plant. They contain from seven to eight very large Peas, which are closely compressed. The ripe seed is large, green, and wrinkled. This is an improved form of Hair's Dwarf Mammoth, than which it produces much larger pods, and comes into use about six or eight days later. It is decidedly the finest pea of its class, and one deserving of general cultivation. During the past season it suffered like many other varieties from the unusually cold wet weather, and dropped many of its blooms; but in the previous summer it set every bloom, and matured a profusion of its large well-filled pods. Sown February 23. First flower opened June 2. Was in full flower June 9. First slats appeared June 15. Fit for use July 4.

Mammoth Dwarf Marrow.—This is of the same type as Veitch's Perfection, but with rather smaller and more curved pods, of deeper green, and a day or two later.

Connoisseur (Laxton).—A cross between Ne Plus Ultra and Evergreen; plant of somewhat straggling growth; height, 6 feet; foliage, dark green. Stem, branching, producing from twenty to twenty-five pods in pairs. The pods are long, nearly straight, well filled, of a deep green colour, like Ne Plus Ultra. They contain from six to seven Peas each, which are parti-coloured, light and dark green, of very excellent quality. The ripe seed is small, very deep green, wrinkled. Sown February 23. First flower opened June 14. Was in full flower June 16. First slats appeared June 19. Fit for use July 7.

[The above article consists of three reports from the Royal Horticultural Society's Journal. These reports were prepared by, or under the direction of, the Pomological director and other officers of the society, from trials at Chiswick, extending over a series of years. We have combined and reprinted them, believing they will be useful to our readers for reference.—Ed.]

THE SEASONS.

If this white benediction of the snow
Fell not from Heaven upon our frozen fields,
Thy summer festival would hardly know
What wealth June ripeneth or proud autumn yields.
If never sorrow should come near thy heart
Nor any coldness dim the light of love,
Thou could'st not know thy nature's better part,
Or look for hope's best harvest from above.
Unbroken sunshine and perpetual heat
Make deserts only. Clouds that bring no rain
Shelter no gardens; and thine eyes, my sweet,
Must know what tears are, fond eyes to remain.

—Galaxy.

WORK FOR THE WEEK.

PRIVATE GARDENS.

Greenhouse Plants.—Remove some of the most backward Cinerarias to a north house, so as to preserve their lateness; water those that are in bloom freely, and occasionally with manure-water; keep them free from insects by fumigation. Chinese Primulas required for seeding should not be burdened too much; therefore reduce the quantity of flowers on each plant to one or two trusses, according to the strength of the plants. Remove into a corner of some pit the finest Cyclamens for seeding purposes; a dozen or so of flowers are sufficient on each plant, and there is no necessity for artificial assistance in fertilisation unless new colours are aimed at. Keep herbaceous Calceolarias growing gently, by supplying them liberally with water and keeping them in a light and airy house and near the glass. Re-pot such show and fancy Pelargoniums as require it, and, if possible, place them on stages quite close to the glass in houses abundantly ventilated; if a little artificial heat be given at the same time, a beneficial influence will soon be manifest in green healthy foliage and the firm stubby growth which are so productive of abundance of flowers. Violets that were bloomed in pots during the winter may now be transferred to a warm border. Give a little water to such Japanese Lilies as are beginning to grow. Hyacinths and Tulips should be kept as cool as possible, and in light houses. Lachenalias are now blooming pretty freely; keep them near the glass, and treat them liberally. Re-pot young Fuchsias, pinch the points of the branches at the fourth or fifth joint, and keep the plants in the warmest part of the house. Some of the old plants may be shaken out of their present pots and re-potted in others, according to size, in good open compost. In pruning the old plants, be rather sparing until they begin to grow. Statice should be re-potted and kept in the warmest part of the greenhouse; the old plants may be shaken out of last year's pots and re-potted in smaller ones, for once growth begins in Statice they must never suffer for want of pot-room. Save all seeds of *Solanum Capsicastrum*; cut down the old plants, and use the young shoots for cuttings. Re-pot, and remove for the same purpose the suckers of *Calla æthiopica*. Cut off the ends of the branches, and thin plants of *Veronica Andersoni*; then start them into growth. *Salvias* in pots, and rested during the winter, if now pruned, re-potted, and kept in moderate heat, become fine flowering plants in a short time. *Kalanthes coccinea* should be re-potted in a compost of good loam and some thoroughly decayed manure. Cut back *Bouvardias* that have done flowering, and use the young shoots for propagating. Cut back, re-pot, and start into growth some plants of the Lemon-scented *Verbena*. Turn out into frames young *Chrysanthemums*, and see that none suffer for want of potting. Re-pot and stake choice *Petunias*, and sow some seeds in light soil in gentle heat, for conservatory blooming; the surplus may be economised for bedding purposes. Train Tree *Mignonette*, and admit plenty of air to dwarf-growing plants in pots. *Mimulus* of the finer varieties, as well as *Musk*, may be potted in two parts loam and one of decayed manure, with some sand; they soon grow and form nice flowering plants. Wire baskets containing the latter, and also others planted with *Saxifraga sarmentosa* may now be made up either for the window or for suspending from the roof of the conservatory. Some *Globe Amaranths* may now be sown in moderate heat, and pricked off when the young plants appear. *Balsams*, *Cockscombs*, and other *Celosias*, *Cinerarias* for autumn flowering, *Schizanthuses*, &c., may be treated in the same way. Train *Tropæolums* on their trellises, and give them a little manure-water once a week.

Fern-house.—Any potting that remains to be done here should be attended to at once. Many of the commoner kinds reproduce themselves freely; therefore, keep a quantity of these in small pots; they are useful for intermixing with large plants, the appearance of which is much improved by an admixture of small ones; and, if the latter are allowed to get somewhat pot-bound, their fronds will last in a cut state much better than those from plants more freely grown, and the better plants are saved from mutilation. All ought to be carefully picked over, removing such fronds or portions of them as are naturally decaying, yet do not cut out much that has life in it, as this has a tendency to weaken the plants. As the days lengthen, raise the temperature a little. Potting should now be proceeded with, as it is best to shift Ferns before they begin to grow; otherwise, they receive a check. Over-potting should be avoided, but, where good specimens are required, they should be shifted as they need it, and if for grouping amongst other plants, they should be grown in comparatively small pots. Brown Scale is the greatest enemy of the Fern-house, and, with the approach of warm weather, this pest will begin to increase apace if not checked. Every means should therefore be used to keep it down, as it soon renders the plants unsightly. As soon as growth commences, shade slightly during sunny weather,

and allow more moisture in the atmosphere as well as at the roots. Give air on all mild days, otherwise the fronds push weakly, a condition that should be avoided, as leaves of that kind never maintain a healthy appearance so long as is desirable. If thrips makes its appearance, fumigate frequently yet not too strongly.

Stoves.—Gradually increase atmospheric humidity and temperature in these structures, though very sparingly, and apply water rather more liberally to the roots of the plants. Almost all stove plants will now require re-potting or top-dressing, and insects, if any, must be destroyed; for, should they be spared till next month, they will reward such kindness by committing unlimited mischief. Plants of all kinds should, therefore, be thoroughly cleaned before they are re-potted. In the evening, place over some boiler "at work" or introduce into some warm house or pit, some soil, mixed and ready for potting purposes, for no stove plant should be shifted into cold soil. Shift Palms, using for the purpose a compost consisting of fibrous peat two parts, turfy loam one part, and some sand and finely broken crocks, an open compost, and plenty of water being requisite for such plants. Shake out plants of *Impatiens* and re-pot them in a mixture of loam, leaf-mould, well-decomposed manure, and some silver-sand. Give *Gardenias* a compost of loam and peat in equal proportions, mixed with sand; the same compost, with a little more loam mixed with it, will also suit *Brownneas*. *Dalechampsias* should have leaf-mould, loam, and peat, in about equal proportions; *Stephanotis*, fibrous loam, peat, and well-decayed manure; *Sanchezias* and *Rondeletias*, peat, loam, a little leaf-mould, and sand; and *Lagerstroemias*, peat and loam. Indeed, most hard-wooded plants grow freely in good peat and loam, with some silver-sand added; and but few of them will object to the addition of a little leaf-mould. Gross-growing and soft-wooded plants, however, such as *Muscas*, *Crinums*, *Eranthemums*, *Torenia*s, *Puyas*, *Pentas carnea*, *Gesneras*, *Lasiandras*, *Coccydys*, *selums*, *Carcumas*, &c., are very fond of some thoroughly decayed manure mixed in the soil in which they are potted; leaf-mould, Mushroom-dung, spent hot-bed manure, &c., may be so used. *Anthuriums*, *Marantas*, tropical Palms, and many other stove-plants, should now enjoy a brisk and moist temperature. Pitcher plants and prunings may be economised for cuttings, that strike in any open material. *Nepenthes* should be re-potted in loose material, such as Sphagnum and very fibrous peat. *Dracenas* and *Dieffenbachias* may be propagated from pieces of the roots and stems, inserted in Cocoa-nut fibre, or similar material, in a brisk heat. Plants of *Bonaparteajuncus* raised from seed may now be potted off singly into small pots. Take *Aralias* that have been struck from pieces of the root, and that are now pushing a few leaves, out of their propagating pans, and pot them separately. Prick off *Gloxinias* raised from seed into pans, or pot them singly into thumb-pots.

Indoor Fruit and Forcing Department.—Increase the day and night temperature of Pine-pits, in accordance with the weather, and give a little extra moisture to the roots, especially those of plants swelling fruit; but such as have nearly finished swelling should be kept moderately dry. Shift into fruiting pots all plants requiring that attention, and take off and pot suckers as they become ready. Do not starve young growing plants; for, if once checked, they are almost sure to produce small and premature fruit. Syringe with tepid water the surface of the beds and about the necks of growing plants, especially on fine days. As regards Vines, thin and stop the shoots, thin the berries, and keep up a steady moist temperature. Thin young Peaches where too thick; but do not make the final thinning until after the stoning period is over, and until that time maintain a steady and moderately low temperature. Regulate and thin the young shoots, and syringe morning and afternoon with tepid water on fine days, and once every day, regardless of the weather. If a little top air can be left on at night, and artificial heat given to maintain the requisite temperature, it will be of material importance to the crop. For Cherries, a temperature of 50° or 55°, will be sufficient until the fruit has stoned; afterwards the heat may be increased 10° by sun-heat, and, when the fruit is colouring, a night temperature of 60° and a day one of 75° or 80°, with sun-heat, will not be too much for them. An airy house and a position near the glass is of the utmost importance in Cherry forcing, and a high temperature either by night or day before the fruit has stoned is ruinous. Give manure-water, occasionally, to Fig-trees swelling their fruit, and syringe them freely until they begin to ripen. Pot Figs are commonly used for the earliest crop, and, where houses are not specially devoted to their culture, they may be successfully ripened in the Pine-stove or early Vinery. Stop the young shoots at the third or fourth joint, and remove all root suckers, unless a few are wanted next winter for fresh plants. The earliest Strawberries will now be ripe, or ripening, therefore they are best kept moderately dry and airy. Introduce plants of them for succession into Peach-houses or Vinery shelves, or into houses built purposely for them. For Cucumbers, keep up a bottom-heat of 75°, and an atmospheric.

one a few degrees lower; but, in the event of bright weather, an extra 5° would be rather beneficial to them than otherwise. If the heat from fermenting material be wanting, apply fresh linings or mix fresh dung with the old fermenting material. Sow a good succession crop of Cucumbers and Melons. Kidney Beans should be sown in succession fortnightly, or according to the demand; a Cucumber-house, Pine-stove, or early Vinery, suits this crop perfectly, and the plants must be freely syringed, to keep down red spider. Sow a few Tomatoes at once in a moderate hot-bed, or propagate by cuttings from old plants saved in pots during the winter; plants from these cuttings fruit earlier than from seedlings. Dust some sulphur over the foliage of Potatoes grown in frames, to keep down Fungi, &c., apply water between the drills, but keep the necks of the plants dry. Rhubarb will soon be obtained abundantly from the open air, *i.e.*, if a forkful or two of litter be placed over the crowns; but a few roots for succession may still be taken into the Mushroom-house. Keep up a constant succession of forced Asparagus, either by placing roots in moderately-heated frames, or by filling trenches between the beds with fermenting material. Start a few more Seakale roots. A temperature of 60° and a humid atmosphere should be maintained in the Mushroom-house. Protect Lettuces in frames from snow and wet, and plant some out as convenience and weather may permit; sow some seeds for succession. Sow a few Capsicums in boxes, and pot them off singly, or prick them off when they are fit to handle. Sow some Celery seeds in a gentle heat. Sow some New Zealand Spinach in a brisk temperature, for summer and early autumn use. Thin Carrots in frames; keep them dry, and shelter them from snow or rain, but expose them freely in favourable weather. Sow some Turnips, Radishes, and Onions, in gently-heated frames, to precede those sown out-of-doors.

Hardy Fruit Trees.—Finish the pruning and nailing of fruit trees on walls as expeditiously as possible, and give the trees a thorough washing with the garden engine. Some kind of protection must be afforded to Apricots and Peaches, so as to preserve their blooms from frost. Fruit trees and bushes may yet be planted, but the sooner the operation is finished now the better. Cuttings of Gooseberries may still be made, and inserted in nursery lines a foot apart, and from 4 to 6 inches asunder in the row; cuttings put in in autumn are, however, preferable to those inserted in spring. The cuttings should be 10 inches long, and divested of all buds except three or four at the top. No buds should be buried in the soil, nor be allowed to exist on the 3 inches of stem just above the ground. Scions for grafting should be taken off, if not already done, and "heeled in" until wanted for use. Make fresh plantations of Strawberries if necessary; remove all runners from old ones; fork over the soil between the rows, and incorporate with it some well-decayed manure at the same time. If a dressing of rough litter be applied between the rows after the ground has been forked over, it will serve as a mulching, and the rains will wash down nutriment from it to the roots, while the surface will form a clean resting-place for the forthcoming crop.

Kitchen Garden.—Make plantations of Jerusalem Artichokes in lines from 2 to 3 feet apart, in any odd corner of the garden. Plant Horseradish sets 15 inches deep, in deeply-trenched ground, in rows 18 inches asunder. Plant the main crop of Potatoes. Autumn-sown Angelica should now be transplanted in rows 2 feet apart, in rather moist soil. Mint may be divided and transplanted alongside of the Angelica, in lines 15 inches apart. Seakale roots may be transplanted for next year's crop, and some seeds of it sown thickly in beds. Divide the roots of such plants as Hyssop, Chamomile, Pennyroyal, Sage, Savory, and Rue, and transplant them into fresh beds. Sow some Marrow Peas; a good plan is to plant four rows of Potatoes, then a row of Peas, and so on; this gives the Pea crop more light than it otherwise would have. Sow a full crop of Beans, and draw some earth to those that are above ground. Sow some Leeks for transplanting; also some Parsnips in lines 20 inches apart, in deeply-trenched ground. Sow likewise some Cos Lettuces on a warm border, and plant out those that have been wintered in frames. Sow some round-leaved Spinach between rows of dwarf Peas or elsewhere; also early Horn Carrots at once, if the ground is in good order. Sow a crop of Onions as soon as the ground is in good condition for its reception, and, if Parsley has not been already sown, some may now be put in. Sow also some Asparagus seeds in drills 18 inches apart, but do not transplant last year's seedlings till April. Gradually remove the protecting material from the necks of Globe Artichokes. Sow some Brussels Sprouts and other members of the Cabbage tribe for autumn use. Of Rocambole, Garlic, Chives, and Shallots, transplant cloves or offsets at once.

WOMAN is like Ivy—the more you are ruined the closer she clings to you. An old bachelor adds: "Ivy is like woman—the closer it clings to you the more you are ruined."

SOCIETIES, EXHIBITIONS, &c.

THE ROYAL HORTICULTURAL SOCIETY AND GUINEA SUBSCRIPTIONS.

Will you kindly allow me a small space to answer objections raised to the guinea subscription plan. At the Wednesday meeting, the other day, I was placed near some good specimens of their respective branches of the profession, two well-known nurserymen and two first-class gardeners. One of the former suggested that I was trusting too much to gardener subscribers; as one of the gardeners spoke out well for his class I left them to settle the matter between them, but afterwards had the objection raised more fully. Will you now allow me to answer it? I never contemplated the social position of the society being lowered, or that the renovated society should consist, in a very large part, of gardeners, though I believe that a considerable accession of these more working bees would greatly strengthen it. A head gardener, to keep his situation in a large place, must be a superior man, and it is only the best of these (such as those who work so actively on our committees) who would take enough interest in general horticulture to make them afford the guinea annual subscription. In very many cases their influence would make their employers join the society. Judging from the letters that come to me, the idea of the guinea fellowship has been most warmly taken up by people in as high social station as that of the present fellows, and they talk of influencing their friends (presumably of the same class) to join with them. I see the acting council has published, *in extenso*, in one of your contemporaries the society's accounts for the past year. Let anyone look through these, bearing in mind that much of the cost of Chiswick goes for furnishing South Kensington, and judge for himself whether a society with the guinea subscriptions of 5,000 fellows would not have far greater working power than the society in its present state has with the much larger income, of which the lion's share goes to keep up a square for the Kensingtonians.

GEORGE F. WILSON.

Heatherbank, Weybridge Heath.

THE LINNEAN SOCIETY.

AN article, which appeared in *Nature* about ten days ago, referring to what took place at this society's meeting, on the 5th instant, is stated by the *Globe* to have been somewhat one-sided. It relates to certain changes made in the bye-laws, which are unsatisfactory to many of the fellows. Into all these changes, it is unnecessary to enter, as several of them are of little importance. Their chief effects are to remove the disability of fellows of the society to hold any office of emolument in its service, and to transfer the appointment of paid officials from the hands of the fellows to those of the council; and to enable the council to pay for the editing of the "Journal and Transactions" of the society, which has hitherto been done by the honorary officers. Some objected to the last of these changes, others wished to retain the abnegation clause in its integrity; but all who opposed the action of the president were, not unnaturally, averse to allowing the appointment of their paid officials to be taken entirely out of their hands. That there is some reality in this grievance may be inferred from the fact that the present librarian, who has performed the duties of his office most satisfactorily for many years, was appointed by the society at large in opposition to the nominee of the council. But besides the possible inconvenience of the appointment of a paid official in such a manner as to render him responsible only to the council, the objectors to this course have another argument on their side. This transfer of the power of appointment is in direct contravention of the charter of the society, which definitely places all elections and appointment of the officers of the society in the hands of the fellows only. It is, of course, impossible for a bye-law to override the charter by which the society is incorporated, but the opposition feels that if the new bye-law is acted upon, the position of the society may be very seriously compromised. We hope that, at the approaching general meeting, the fellows may be able to arrive at a satisfactory solution of their difficulty.

OBITUARY.

THE current number of the *Belgique Horticole* contains a notice of the death, and a review of the life, of M. L. Jacob-Makoy, of Liège. Readers of horticultural journals are familiar with his name as that of one of the most successful cultivators of Camellias, Cape plants, hardy Rhododendrons, Roses, and Dahlias. So far back as 1845, the houses of M. Jacob-Makoy contained no fewer than 200 species of Palms.

THE GARDEN.

"This is an art

Which does mend nature:—change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE WHITE LILAC IN WINTER.

AFTER the sweet Violet—sold by millions of bunches—perhaps the most welcome plant in the flower-shops of Paris in winter and spring is the white Lilac. It has for a good many years been popular in Paris and other continental cities, and more recently has been frequently seen in Covent Garden, invariably imported from Paris. The production of this white Lilac has long been a source of interest to cultivators, on seeing snowy fragrant masses of it in the shops so early as October. Many persons have supposed it to be a white variety of Lilac, but this is not so; it is the common kind forced into bloom in the dark, and, though the blossoms are of as pure a white as most white flowers, they are simply blanched, just as the shoots of Seakale are blanched. At first, the white variety of the common Lilac would seem to be the most suitable for forcing in the above-named manner, but those who have tried it found it much less suitable. In the dark it does not make such a vigorous growth as the common Lilac, and, oddly enough, the flowers do not come of so pure a white. The French force the common Lilac in great quantities, for yielding these white blossoms, both in pots, and planted out in beds under glass. The plants intended to be forced are cut round with a spade in early autumn to induce them to form flower-buds more abundantly, and this also facilitates their removal in a compactly-rooted manner at a later period of the same year. They are at first, when taken up and placed in the house in which they are to be forced, kept somewhat cool, but soon the heat is increased till it reaches from 80° to nearly 100°, and abundance of moisture is supplied at the same time, both at the roots and over the tops; in the last case by syringing with tepid water. The chief point, however, is, that from the day the plants are placed under glass they are not allowed to receive a gleam of light, the glass being completely covered with *paillassons*, or woven straw mats, such as are much used on the Continent for covering frames, pits, and all sorts of garden structures in winter. Thus they get the Lilac to push freely, and gather its white blooms before the leaves show themselves much. The heat and moisture and complete darkness effect all that is desired. The Paris growers commence to cut the white Lilac at the end of October, and continue to do so till it comes in flower in the open ground. Up to the present time, the white Lilac blossoms have rarely been seen with us except when imported; but we are glad to say that a well-known and excellent plantsman, Mr. Howard, gardener at Bedford Hill, Balham, near London, has produced it this winter abundantly, and in a simple manner. In autumn, and at various periods throughout the past winter, he dug up some bushes of the common Lilac and placed them in a darkened stokehole-shed used for forcing Seakale, &c. This structure is heated by a hot-water pipe which passes through it, but not to so high a temperature as that which is used by the Paris growers. In fact, the conditions are such as gardeners commonly employ for forcing Seakale, and any roots which they desire to force and blanch. From this shed, in which the bushes have flowered abundantly through the winter, Mr. Howard has gathered quantities of pure white Lilac, with all its fragrance perfect. Thus, Mr. Howard has proved that the production of this charming addition to our winter forced flowers may be effected wherever Lilac bushes are grown in the shrubberies, and where Seakale, Mushrooms, or the like are forced in a shed. As the Lilac, in a free-flowering condition, is usually a goodly-sized shrub, more head-room will, of course, be required for it than for the other subjects named. One grower in Paris found that ventilation, even that afforded by a broken pane, caused the flowers to commence assuming their natural colour. Among the coloured varieties found to succeed treated in this way, the best were the Lilas de Marly and Charles X. The Persian Lilac tried in this way has not been found to suit.

THE TREE MEDICK (MEDICAGO ARBOREA).

At p. 148, you ask if any of your correspondents have noticed this plant at Brighton or elsewhere. I have known it as growing freely in most exposed situations at Weymouth for the last twenty years, in front of some of the villas. It is planted against the palings, and entwines its branches through the rails, forming, when cut with the knife or shears, a pretty close-growing evergreen hedge, generally covered with its bright orange flowers throughout the whole year. I may just say that I was at Weymouth the other day, and picked some flowers of the Medicagos there, and, as many persons are much interested about what grows well or best on exposed sea coasts, I will mention a few that I can say brave the most stormy locality. One locality I saw last week covered with sea spray as with a shower of rain. In this spot, upon a strong blue (Oxford) clay, I planted last year about 2,000 trees and shrubs, of as many kinds as I could, on purpose to try their sea-resisting properties. They were exposed to the N.E., E., and S.E. winds, and were close to the beach, up which the storms often hurl the dashing waves in wild fury, bathing everything in salt and water, and leaving every vestige of vegetation drenched with wet. In such a locality one would have thought all sorts of trees would have perished. I give below a list of some kinds that I found sea-proof, and this, too, after encountering one of the fiercest storms that has visited the Weymouth coast for several years. But it is not the winter storms that destroy the trees. April and May are the fatal months; just as the young growth begins, and the plants are full of sap, it is, at the sea-side as it is inland, the time when vegetation suffers most, when exposed to pinching frost and cold N.E. storms, the plant in full growth succumbs with more certainty at this period of the year, when the thermometer is at 6° to 8° below freezing, than it does in midwinter with the glass below zero. I will mention one plant that the slightest frost in spring destroys, whilst it will stand unharmed through the severest winter; this is the *Cupressus funebris*. Such is the effect of spring frost upon it, that it has been found almost impossible to keep it alive. But to return to the sea-coast and the plants I find do best upon it; these are mostly those kinds that have got thick, leathery, shining, or glaucous leaves, and those that are covered with cottony down. Amongst the first, I may instance the *Euonymus* tribe, as they, *par excellence*, hold the first place; no storm or sea-spray seems to injure them, however severe; I planted many hundreds of them in the bleak place I mentioned above, not one has suffered, but, on the contrary, they are shooting their young growths as if it were mid-summer. Then follow *Pittosporum*, *Tobira*, *Camellia*, *Escallonia*, *Daphne*, *Mahonia*, *Griselinia* (as hardy as the *Euonymus*), *Olea ilicifolia*, *Phillyrea*, *Evergreen* *Privet*, *New Zealand Flax*, *Bay*, *Ivy*, *Rhododendron*, *Hydrangea*, *Veronica*, *Laurustinus*, *Arbutus*, *Ardisia*, *Brooms*, *Cotoneaster*, *Eleagnus*, *Eugenia*, *Eurybia*, *Garrya*, *Double and Single Furze*, *Evergreen Oak*, *Fulham Oak*, and the evergreen sort called *Austriaca sempervirens* (this is a grand sea-side tree), *Photinia dentata*, *Pyracantha*, *Cock's-Spur Thorn*, *Raphiolepis*, *Skimmia*, *Pyrus japonicus*, *Sambucus*, *Ribes sanguineum*. Amongst *Coniferae* but few will brave such a locality as I have mentioned, and of this tribe the best is *Arancaria imbricata*, the *Silver Fir*, and *Picea Nordmanniana*; all others of the tribe perished in May, even the celebrated sea-side *Pine*, *P. austriaca*, failed. Amongst woolly-leaved plants, I may set at their head *Cineraria maritima*, *Stocks*, *Centaureas*, *Gnaphaliums*, *Cerastiums*, *Buddleia*, *Salvias*, *Santolinas*, *Lavender*, and *Rosemary*. Of glaucous-leaved sorts, pre-eminent is *Sea Purslane*, *Silene montana*, *Horned Poppy*, *Eryngium maritimum*, and *Frankenia fruticosa*. Amongst many sorts of Grasses, I may mention *Arundo Donax* and *conspicua*, *Pampas Grass*, and *Dactylis glomerata variegata*, and I must not forget *Coronilla glauca*, *C. Emerus* and *valentina*; and of trees, *Scotch and Canadian Elms*, *Turkey Oak*, *Beech*, and *Horse-Chestnuts*. The above are what I find to resist the best in the most exposed places; but, on getting a little away from the immediate beach, a greater variety succeeds. I have just finished planting some thousands of all sorts, at Weymouth, and hope to be able to give you an account of their behaviour next year. JOHN SCOTT.

What is the best Stove for a small Conservatory?—I have a conservatory 18 feet by 12 feet, with a span roof 15 feet to the top. It used to be heated by an ordinary portable stove, with a descending flue, which never acted, so the stove was taken away, a large copper pipe still remaining available for a flue. We have tried Joyce's stove, and several gas stoves, not connecting them with the piping above-named, but the smell is very bad, and we cannot sit in the adjoining drawing-room. I ought to say that the conservatory is too far from the other hothouses to be connected with them. Can any of your correspondents recommend any stove which we could connect with the copper piping, which would contain fuel enough to last a winter night and just keep the frost out?—R. J. B.

NOTES OF THE WEEK.

— We are informed, by M. Boissier, that the handsome purple-flowered Geranium, recently figured and described in the *Gartenflora* under the name of *G. Backhousianum*, is, in reality, *G. armenum*, described at p. 878 of M. Boissier's "*Flora Orientalis*." This plant, in its wild state, is only found in Armenia, whence, some years since, M. Boissier received seeds of it, which first germinated in the Botanic Garden at Geneva.

— The sap of the Rhododendron and Laurel are strong poisons, and, when cattle partake of the leaves, death is often the result. A Scotch ox died last week from eating the dead leaves that had been thrown into a field some days previously.

— On Saturday evening, during some rejoicings at Wardour Castle, the seat of Lord Arundell, on the result of the Claimant's trial, a small cannon burst, and Mr. George Ford, the gardener, was struck by a fragment of the metal, and so much hurt that he died in the course of the evening. A boy was also killed on the spot.

— Mr. PHILIP BARNES, long known to many frequenters of the Botanic Gardens in the Regent's Park, died the other day at the age of eighty-two. Thirty-four years ago he founded the Royal Botanic Society, and was the oldest fellow and father of the society.

— THE current number of the *Botanical Magazine* contains figures of the following plants:—*Odontoglossum Roezlii*, a handsome white-flowered Orchid from New Grenada; *Bauhinia natalensis*, a white-flowered Leguminous shrub, from Natal; *Arabis blepharophylla*, from California, a rosy-flowered species, now often seen in good collections of hardy plants; *Nunnezharia Geonomiformis*, a pretty dwarf Palm from Guatemala; and *Rhipsalis Houletii*, a singular-looking plant belonging to the Opuntian section of Cactuses, and supposed to be a native of Brazil.

— M. JEAN SISLEY, of Lyons, has recently sent to the *Revue Horticole* an extract of a letter from his friend, Dr. Henon, who is at present in Japan, in which the latter states that he was much surprised to find, in the neighbourhood of Ikonno, several specimens of Bananas growing in the open air, which died down under the winter frosts, but made fresh growth in the following spring. These, he adds, were cultivated for ornament only. It would be interesting to know what species of Banana is thus alluded to, as we do not suppose the climate of Ikonno can be much milder than our own; and a hardier kind of Banana than any of those with which we are, as yet, acquainted, would be a material acquisition in our gardens and pleasure-grounds.

— In the *British Medical Journal* for February 21, Dr. J. Dixon, of Whitehaven, publishes a case of a boy who exhibited severe symptoms of poisoning after eating Mistletoe berries. The patient was fourteen years of age, and was found lying in the street in a state of insensibility, within forty minutes of the time of eating the berries. The first impression was that he was in a state of alcoholic intoxication, but no trace of alcohol was found in the breath or subsequent vomit. An emetic of sulphate of zinc was administered, which brought off eight partly masticated berries. There were indications of considerable cerebral hyperæmia, which was appropriately treated, and the boy was well the next morning. He stated that soon after eating the berries he began to feel giddy, and from that time had no recollection of what transpired.

— ACCORDING to the *Bulletin Thérapeutique*, an attempt made by a Paris merchant to utilise the sewage of that city in the cultivation of labiate plants in the plain of Genevilliers has been so successful, that at the present time three hectares of land ($7\frac{1}{2}$ acres) are devoted to the raising of Peppermint alone. The plant is said to grow with such vigour, that three collections are made in each year, whilst the essential oil obtained from it by distillation is asserted to be superior in delicacy of aroma and flavour to that imported from England. So satisfied are the directors of the Pharmacie Centrale with the results, that they express their readiness, should any pharmacist be sufficiently enterprising to extend the experiment to the neighbourhood of the manufactory at St. Denis, to undertake to use all the produce.

— We have to record the death of Dr. Neil Arnott, an event which took place the other day at the advanced age of eighty-five. To horticulturists he was best known by his treatise on "Warming and Ventilation," and by the stoves which bear his name. For this and for other novel applications of science, to the preservation of public health, the jurors of one department of the Universal Exposition of Paris of 1855 awarded him a gold medal, to which the Emperor added the Cross of the Legion of Honour. As the inventor of the "Arnott stove," the "Arnott ventilator," and the water bed, for which many a sufferer owes him a debt of gratitude, it is not likely that his name will soon be forgotten; but it deserves to be recorded in his honour that he constantly refused to patent his invention, from the wide use of which he might have reaped, had he pleased, a handsome income. This, however, he declined to do; he

sought a higher reward than that which money could have given him; and, accordingly, what he sought he found before his decease.

— In order that some idea may be formed as to the enormous extent of land required to grow trees for building and other purposes, in Europe alone, it may be stated that no less than 500,000,000 of acres are at this moment estimated to be in cultivation as woodlands, which is a very large per-centage on the whole area.

— THE coloured plate of the current number of the *Revue Horticole* represents the flowers of *Hydrangea acuminata*, a very hardy, vigorous-growing, and handsome species, from Japan. The umbel bears, on its outer margin, a single row of large sterile flowers, the petals of which are of a fine rose-colour, and are cut or scalloped on the anterior edge. The centre of the umbel contains a great number of very small fertile flowers, the colour of which is of a much deeper rose. This species, unlike some other *Hydrangeas*, thrives well in the full sunshine. It is offered for sale by MM. Thibaut and Keteleer, nurserymen, Sceaux, Paris.

— ONE of our correspondents in Paris writes to us (says the *Pall Mall Gazette*) that the most superb bouquets of artificial flowers are being prepared there for presentation at Chiselhurst on the 16th inst. In most of them Violets predominate. One, which is exhibited in the Boulevard Haussman, is of great size, and is composed of Red Roses, in the centre of a circle of white flowers, and an outside one of blue. The whole is, at it were, powdered with golden bees, and some Laurel twigs artistically twined, form the following inscription:—"To Napoleon IV. on his birthday, the 16th of March." One immense bouquet of Violets has already been sent to Chiselhurst. It measures 3 feet in height, and is fully $2\frac{1}{2}$ yards in circumference at the broadest part. It is composed of dark and light-coloured Violets, surrounded with leaves of the same flower, and around the centre is a circle of flowering Heather, emblematic of the Scottish descent of the Empress.

— THE last number of the *Gartenflora* contains a description and coloured plate of a very handsome species of Saxifrage, which, up to the present, seems to be very little known or appreciated by cultivators. This species, which is named *S. florulenta*, Moretti, is a native of Northern Italy, in the region of the Maritime Alps. It forms a dense and handsome rosette of lance-shaped, sharply-pointed, radical leaves, very closely crowded together, the entire rosette being roundish in outline, 4 inches or so across, and nearly 3 inches deep. From the centre of the rosette it sends up a very stout flower-stem about 10 inches high, which, at blooming-time, is covered, throughout its entire length, with a great profusion of rose-coloured flowers, arranged in a thyrsoid panicle. The plant, as figured in the *Gartenflora*, is one of the most effective species of Saxifrage we have seen, and is well worthy the attention of all lovers of hardy plants. We believe Mr. Maw was the first to introduce it into English gardens.

— In the report of the directors of the Chiswick Gardens, it is stated that a trial of Grapes will forthwith be instituted there. Many new varieties of the Grape Vine, it is observed, have been introduced into our gardens within the last few years, and it has been thought desirable to devote a house to the growth of these, with a view to a closer observation of their peculiarities and merits. The small curvilinear Vinery in which the different sorts of White Muscats had been brought together some years since for a like object, which has been accomplished, has been set apart for this purpose. Such work as this, and the trials of vegetables and flowers which are every year made at Chiswick, well belt a society like the Royal Horticultural, which was founded for the advancement of horticulture. It is to be wished that circumstances permitted more of this kind of work to be taken in hand, and that the strife and bickerings which have of late been too notorious might be abandoned, and a united and unanimous effort made to put the affairs of the society on a more secure foundation.

— At a recent sitting of the Institut Egyptien, Dr. Schweinfarth pointed out that many of the cultivated plants which are not known in the wild state in Lower Egypt are represented by identical or nearly allied spontaneous forms in the countries adjoining the Upper Nile. The common Luffa, or Washing-gourd (the fibrous skeleton of the fruit of which is sometimes sold in this country as a substitute for sponge), is wild in Central Africa, and only known as cultivated in Egypt. He finds the origin of the Vine of Egypt in a wild Abyssinian species. The Olive he seems inclined to refer back to the shores of the Red Sea; while the Sycomore Fig, Donm Palm, and Date all seem to him to belong, in a wild state, to the south. From the remarkable but well-known fact that the Lotus (*Nelumbium*) has disappeared from the whole Nilotic region within historic times, and that the Papyrus is not now found beyond 9° N. lat., he arrives at the conclusion that the climate of Egypt has lost the characteristic features which formerly united it with that of tropical Africa, and that the natural productions of the country have gradually become more northern.

THE FLOWER GARDEN.

TALL BELLFLOWERS.

By J. C. NIVEN, Botanic Gardens, Hull.

THE genus *Campanula*—with which, in its widely-distributed representative, the common Hairbell of our heaths and hedges, and the Canterbury Bells of our gardens, we are all familiar—is one to which the gaiety of our herbaceous borders is, in no small degree, indebted. The result of the close and careful analysis of the natural order Campanulaceæ, made by De Candolle for publication in his “*Prodromus*,” led to a slight dislocation in the old typical genus of the order, by which sundry offshoots sprang into existence; and, while a large majority of species of *Campanula*, according to old authors, were retained as Bell-flowers, certain distinct forms were made sponsors for new genera on account of special structural peculiarities, into the details of which I need not here enter, but content myself by saying that these peculiarities are co-existent with a distinct general habit and contour. Foremost amongst these new genera stand *Platycodon* and *Adenophora*, to the former of which I wish now to direct attention. The title *Platycodon*, which is of Greek etymology, literally means broad-bell, and has been given to this genus, which embraces a small group, in which, although the base of the corolla is somewhat contracted, the limb expands broadly into widely-diverging segments. It has also a marked peculiarity in its unexpanded flower-buds, which are so much inflated as to justify the name by which it is known amongst Orientals, viz., the “balloon plant,” a name which, no doubt, will acquire general popularity.

Platycodon grandiflorum.

This was originally an introduction from Chinese Tartary, about the close of the last century, and was then supposed, as coming from the East, to be, if not tender, at least only half-hardy. Under the somewhat restricted mode of culture to which it was subjected as a pot-plant, it so rarely produced more than one flower on each stem, that there were some doubts as to whether it was justifiably referred to Jacquin's *Campanula grandiflora*, in which the flowers were described, from wild specimens, as usually occurring in terminal clusters. It was, however, found, on reference to the “*Herbarium*,” that occasionally the stems were unifloral, even amongst the native specimens. Possibly, in a wild state, as in cultivation, the number of flowers depended very much on the circumstances under which the plant was grown, and also the age of the plant from which the specimen was taken; as, in my experience, I have never known, except in a solitary instance, more than one flower produced in the first season of blooming. The same remark applies to many of our very best long-lived perennial plants; hence the frequent dissatisfaction expressed by over-sanguine cultivators, who forget that in proportion to the natural longevity of the plant is the time required to attain its full power of floral development. *Platycodon grandiflorum* is a thoroughly good herbaceous plant, perfectly hardy in light dry soils, but most impatient—as, indeed, is *P. autumnale*—of damp and undrained situations, where its

*Platycodon autumnale*.

thick fleshy roots are sure to decay—sometimes from below, upwards; but more generally from above, downwards, rotting off just at the neck. As the specific name would indicate, the flowers of *P. grandiflorum* are much larger than those of its closely-allied species *P. autumnale*, being as much as 2 to 3 inches across, of a deep blue colour, with a slightly slaty shade therein, reminding one a good deal of the old *Lisianthus Russellianus*, now so rarely met with in cultivation. They are produced in clusters at the summit of each of the branches, which proceed from the old root-stock, rising to a height of about 18 inches, and being very slender at the base. If neglected in the matter of supports in their early stage of growth, they are sure to fall to the ground, thus giving the plant, however beautiful its blossoms may be, an untidy appearance. This a little forethought will readily obviate; but, be it noted, if such a result occurs from early neglect, it is almost impossible to remedy it when the flowers are nearly developed, as branch after branch will break away, if made to assume the usually erect position, in the process of tying. When down, it will be better to leave them as they are, allowing the bloom to compensate, by its beauty, for any untidy appearance that the plant may present, merely taking the precaution to peg down the branches, else the sportive winds may whisk them round, and effect their total dislocation from the parent stock. Possibly the best position for such a plant would be overhanging a rock-ledge in a sunny corner of the rock-garden, where a somewhat negligent character of growth would be in keeping with its situation, and its flowers, produced on a level with the eye, would be shown to great advantage. Like most of the *Campanulas*, it has a tendency to sport in colour, and to revert from blue to white through various modifications. Equally pretty and acceptable, as a garden plant, is the white variety; though it is by no means so frequently met with as the blue type.

Platycodon autumnale.

This species comes from China and Japan, and I am not sure if those botanists who look upon it as nothing more than a slightly modified form of the Siberian plant, may not be correct; be that as it may, its general characteristics, as regards growth and habit, are, under cultivation, both distinct, and constant, and give it a much better defined specific character than that which many universally recognised species possess. Compared with *P. grandiflorum*, it is both taller and more robust in growth, attaining a height of 3 feet under favourable circumstances; its leaves are narrower, but more densely arranged than those of *P. grandiflorum*; and its flowers, though smaller in size, are produced in greater quantities and are pretty evenly distributed along the upper half of the stems—this arrangement is shown in the accompanying representation of the plant. From its taller stature, and, also, the fact that its young shoots are far more woody and vigorous in their growth than those of *P. grandiflorum*, its true position should be in the second or third rank of the herbaceous border. Besides a white variety, we find in this species, a tendency to become semi-double, by a sort of “hose in hose” re-duplication of the corolla, similar to what occurs in many of our *Campanulas*. This variation I have not noticed in the large-flowered species.

Cultural Remarks.

There are one or two specialties in the matter of cultivation that apply equally to both species. First, as regards removal; if a strong well-established plant is to be transplanted, let it be done in the month of May, when growth has commenced; the thick fleshy roots are sure to be, more or less, damaged in the process, and nature must be in an active state to repair such damage. If this be done during the winter, when the plant's energies are dormant, decay from the mutilated parts of the root upwards, is sure to take place, and the strong probability is that the entire root-stock will become affected. The spade must be looked upon as a decidedly warlike implement to use among these plants; one unlucky thrust through their brittle crowns and they, the plants, are gone for ever. Indeed, the less such an implement is used, in borders devoted to the culture of herbaceous plants, the better. In cutting down the stems in autumn, it is usual, with a view to neatness, to cut close to the crown. This, however, as Nature herself teaches

us, is not at all times good practice, and this especially applies to the *Platycodons*; if cut close, their hollow stems form conducting pipes to carry water into the very heart of the plant, and the result is decay from above downwards. The same caution is applicable to many other plants besides *Platycodons*. As regards propagation, the best mode is that of raising seedlings. Unfortunately, our climate is ill adapted to the maturation of seeds in general, and especially so with regard to *Platycodons*; they, however, seed freely on the Continent, and from that source a supply can readily be obtained. The young shoots, taken off when about 3 inches long, in spring, will strike if placed in a gentle bottom-heat, but not freely. I have seen it stated that the fleshy roots, cut into lengths and placed under similar treatment, will grow; but my experience only realised the development of buds at the upper end, accompanied by decay in place of root-development below, and the final result was failure. To those who possess strong vigorous plants of either species, I would say: Don't disturb them, even at the pressing wish of your best friend who may covet a portion thereof; rather get a packet of seed, and exercise all the patience you may happen to possess, and the result will be more satisfactory both to yourself and your friend than if your well-established plants had been mutilated in an attempt at division.

BEDDING CALCEOLARIAS.

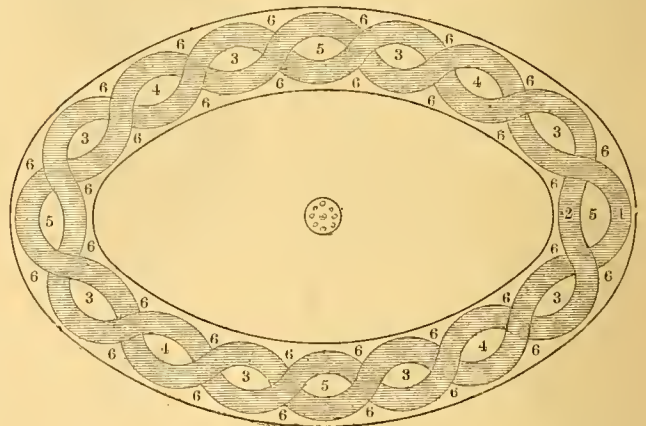
THE following directions as to how these should be propagated may be of use to beginners. The *Calceolarias* bloom mostly in summer, and scarcely can a shoot be then found that does not contain an embryo flower-spike. Such shoots make bad cuttings; and, besides, they are then so soft and watery, that they do not strike well; and, although, we might like to propagate our next year's stock at that season, they would grow too much before winter, and would not only require transplanting, two months' extra attention, and pinching, but they would also occupy more frame-room during winter than later-struck cuttings would do. The proper time for propagating such *Calceolarias* is the end of September and October. For this purpose, prepare a cold wooden or turf frame on a dry basis, fill it to within 6 inches of the top with sandy loam, and over that spread some clean silver-sand. Then select nice stubby side-shoots, as firm as possible, pick out any flower-spikes that are visible, remove one or two of the base-leaves, cut horizontally below a joint with a sharp knife, and dibble them thickly, regularly, and firmly into the frames, giving them a sprinkling of water, through a fine rose, to settle the soil and to prevent the cuttings from flagging. Keep the frames close and shaded for a day or two; but afterwards remove the shading, and only use it again during the succeeding month to counteract the effects of bright sunshine. Such cuttings take a long time to root; but, if the atmosphere of the frame is kept dry, and the plants free from damp by dressings of wood-ashes, dry dust, and old lime-rubbish, they will root satisfactorily during winter, and in spring will yield tops for additional cuttings; but, whether employed for cuttings or not, they are best pinched off. These frames require no further care beyond protection, by means of covering the sashes, in the event of frost, and banking up the sides, if of wood, with soil. Wooden boxes, seed-pans, or pots might also be used for striking *Calceolarias* in; in which case they might be wintered in any pit, greenhouse, or conservatory. Whether they are propagated in frames or boxes, they should be transplanted further apart than they previously were into other frames, filled with rich open soil, in which they will become fit for planting out by the middle of May, if the shoots have been attentively pinched when they required it. In autumn, too, it is a good plan to draw some earth around the necks of the old plants, so as to induce the emission of roots from that portion of their stems; and, at lifting time, in November, to separate every rooted branch, and plant them as independent plants in frames. They will yield abundance of cuttings in spring, but it is from a few old plants, lifted and saved in frames for the purpose, we get our chief supply of such young-rooted plants. Spring propagation is often a matter of uncertainty, but, as fine a lot of *Calceolaria* cuttings as I ever beheld, I saw last year

in the frame-ground at Battersea Park, and these were struck in February. These cuttings were selected from old plants wintered in frames, and fully exposed every fine day by drawing the sashes completely off them, consequently they were pretty hard and well-seasoned. They had been inserted in cool frames, precisely as advised for autumn cuttings, and a failure could scarcely be found even in four lights of them, and by bedding-out time they had formed very serviceable, well-rooted, stocky plants. Spring cuttings, however, are mostly rooted in hot-beds, in boxes or pans, and often as many of them damp off as survive to become plants; nevertheless, where the stock is deficient, this mode must be resorted to. It is best to strike them after the middle of March in pure sand, in a hot-bed or propagating-pit, where there is no stagnant atmospheric moisture, and, when rooted, to pot them, or put them in boxes in light sandy soil, still keeping them in warm quarters, for a few days. After that, gradually shift them into places in which there is less heat. Powdered charcoal or wood-ashes, strewed on the surface of the soil amongst the cuttings, are great preventives of damp, and a judicious use of the watering-pot should be exercised.

W. F.

A SPRING FLOWER BED.

I AM glad to find your artistic correspondent, Miss A. Hassard, recommending spring bedding, and I am sure that her arrangement of colours must be perfect. The accompanying plan, but



little altered this winter from last spring, was so much admired by some of my friends, that I venture to send it to you. The oval is cut on the turf, the grass on the inside being slightly raised. In the centre stands an inverted root of a tree, about 3 feet high, densely clothed with Ivy, which hangs in a fringe all round; the inside of the root is filled with *Centaurea candidissima*, which gives it a cheerful appearance in winter, and, should it survive till spring, will furnish abundance of cuttings. In the oval, the curving lines 1 and 2 are crimson and white Daisies alternately crossing each other (8 inches wide); 3, (of which there are eight small ovals) is *Pansy Imperial Blue Perfection* (Henderson); 4, *Pansy Sunset*, bright yellow with black eye; 5, a large blackish-purple *Pansy*, found by a neighbour in an old-fashioned garden, and increased by him. It is a far better bedder than the well-known *Cliveden Purple*. 6, *Pansy Cliveden Blue*. This forms the groundwork of the whole bed. All the Pansies and Daisies are planted thickly, which ensures a mass of bloom. All my other *Pansy* and *Daisy* spring beds are arranged in patterns, except where *Tulips* are used, when one variety only is planted as a groundwork. The oval before mentioned is nearly 5 feet in width of the flower-bed, and between 40 and 50 feet in extreme length. PANSY.

Cytisus fragrans.—This makes one of the prettiest of all early spring blooming window-plants, and deserves to be more extensively grown than it is for this purpose. It bears an abundant supply of sweet-scented yellow flowers, and is easily grown in any ordinary apartment. All the attention it requires is to cut it down after flowering, and either to syringe or sprinkle the plant every day while making its young growth. It does well in any room window if protected from frost.

GARDEN DESTROYERS.

SLUGS AND SNAILS.

THESE are often troublesome, both in our outdoor and indoor gardens. They are equally at home in the plant-stove or Cucumber-house, with a winter temperature of 70°, or under a hand-light of Lettuce or Cauliflower plants, silently doing their work of destruction, unless prevented by hard frost. The means required for the destruction of these and other garden pests are almost as varied as the different plants and situations to which their depredations are extended. There are few Orchid-growers who have not had cause to lament their presence, in the shape of young growths, flower-spikes, and roots eaten off: for here their operations are not interrupted by excessive droughts or pinching frosts. The wonderful powers of instinct possessed by even such pests as these are scarcely known to those even who make their habits a life study. In the open air, where slugs and snails are more numerous, and where their food abounds in greater quantity than in plant and fruit houses, we have not an opportunity of fully seeing how they are attracted to a given spot where food suited to their taste exists. A bed of crisp Lettuce, Cabbage, or a row of winter Celery is a favourite haunt with them. Here, however, it might be supposed that, in their nightly peregrinations, they accidentally discovered their feeding-ground; but, in the Orchid-house, the power which they exhibit of discovering food which they like is a subject for contemplation. I have often observed that a slug will travel over the surface of a pot in which is growing a *Dendrobium nobile*, a *Cattleya*, *Vanda*, or similar upright plant, for a score of times without ever attempting to ascend into the head of the plant—unless it is in bloom, in which case they are certain to find their way straight to the flowers; after which they will descend, and return to some favourite hiding-place, often at the opposite end of the house, returning regularly every night to feed on their dainty dish, unless means are taken to cut short their career. Being animal as well as vegetable feeders, they are extremely fond of fat. I have frequently dropped tallow about in places where they were least likely to find it, but seldom did many nights pass before they made its acquaintance. Slugs do serious harm in the Orchid-house by eating indiscriminately whatever young roots are made above the surface of the soil, as well as young growth and flower-spikes. They do not often exist here in great numbers; but a few continually get in, often in the shape of eggs, in the potting materials, or they find their way in under the doors. As soon as the unmistakable slimy trace is apparent, the best way is to get a few sweet Apples, if in season—of these they are very fond—slice them and lay them about plentifully; look them over two or three hours after dark, when the slugs are almost certain to be caught feeding. Small bits of fat meat or crisp Lettuce leaves can be used in the same way. There is a small snail, not more than three-sixteenths of an inch in diameter, which, when full grown, smells strongly of Garlic if crushed. If numerous, it is very annoying, eating the flower-spikes and young growth when they first begin to push. Sliced Apples or Potatoes should be laid about in quantity on the surface of the pots, looking them over in the morning, and an hour or two after dark; perseverance in this way will shortly rid the Orchid-house of their presence. If tan is allowed to lie for any considerable time after it is taken from the pits before being used, it is sometimes much infested with this species of snail. I have seen it introduced by thousands in this way into a pit of fruiting Pines, and, when they began to push, the snails set to them in such quantities as to cause every fruit to become deformed. In the Cucumber and Melon-house, and in pits and frames devoted to the cultivation of these plants, slugs are generally troublesome, finding their way in among the fresh soil, which is frequently required in such houses. The best way is to constantly keep some of the materials advised for the Orchid-house laid down to entice them, occasionally looking them over. Pieces of board about a foot square, laid down upon the surface of the soil under which they take shelter in the daytime, make good traps. In the Mushroom-house, if troublesome, they must be sought for by candle-light diligently until caught. In Fern-houses, where masses of rock-work

exist, they are sometimes very troublesome, destroying the young fronds of some Ferns as they appear, such as *Adiantums*, *Thamnopteris*, some *Polypodiums*, &c. They have such facilities here for hiding and breeding that it is difficult to eradicate them if once they are allowed to get to a head; continual trapping with materials such as above advised, and frequent hunting for them by candle-light, will, if persevered in, clear the house of them.

Slugs Out-of-doors.

It is out-of-doors, however, that they exist in quantities, and it is here that they frequently sorely tax both the patience and the perseverance of the gardener. It is often said that slugs and weeds are the natural consequence of bad gardening; this in some measure is true, but not always. If the land is kept continually stirred by the hoe, as it should be, for the due admission of air and the destruction of weeds, slugs are destroyed thereby in great numbers; and in gardens completely walled round, and where there is no Box edging for them to harbour in, a thorough system of good culture will soon reduce their numbers so as to render them comparatively harmless. But where the soil of the kitchen-garden is of a heavy adhesive nature, and happens to be adjoining to Grass land, with only a growing fence of some kind for a division, through which they can come by thousands—as they may be seen doing on a damp April morning—the work of keeping them under is continuous. All ground that has been trenched, ridged, or dug over in the autumn, should be gone over with the pick, when hard frost occurs, turning it up roughly as deep as the frost has penetrated. This will destroy numbers. In the spring and summer some recommend a few ducks in the kitchen-garden; these will destroy very great numbers, and they will also spoil both Peas, Lettuces, and other crops, rendering their presence as objectionable as the pests which they are introduced to destroy. Numbers of slugs may be got rid of by placing small heaps of refuse vegetable tops on the ground for a few days, and then removing them to the rubbish-heap, which should always be liberally mixed with quick-lime before it is returned to the garden. But the most effectual method I have ever tried for destroying them in quantities is to procure, in April, May, or June, a plentiful supply of air-slaked lime. On a warm damp evening at dusk (if in June, after a thunder-shower all the better), take and sow by hand the whole of the garden over with lime, so as to give the ground the appearance of a sprinkling of snow. Thousands will receive their quietus on the first sowing, but numbers that have only got a slight powdering will throw off their slimy coat, lime and all. To make sure of these, the ground should all be gone over a second time forthwith; and if trouble is taken to see the effect which the second application has upon those that have escaped the first dose, it will be seen that a very small quantity destroys them, owing to their not having the power to throw off a second slimy jacket. If the colour of the lime is objectionable, a little soot may be added, but not in such quantity as to weaken the caustic properties of the lime. Two or three applications of this description during spring and summer will greatly reduce their numbers.

Plants most Liable to Attack.

Care should always be taken not to plant on the same ground two crops in succession that are particularly subject to the ravages of snails or slugs, such as Lettuce after winter Broccoli. I have seen half an acre of Peas, after winter Celery, completely destroyed, almost every Pea eaten off before they appeared above ground. In old gardens an occasional dressing of salt in the autumn or winter, half a pound to the square yard, over ground that is trenched or dug over, will greatly benefit the land as well as destroy the slugs and other pests. Slugs are amongst the greatest enemies with which the Dahliagrower has to contend. Many make a circle round the plant with lime or soot; but this gets wet and becomes baked, and the slugs then crawl over it without difficulty; and, if the dressing is kept renewed repeatedly, it becomes injurious to the plants. The short bristle-cuttings from the brushmakers are the best material with which to strew the ground round the plants. In either a wet or dry state, this material sticks to slugs as they attempt to crawl over it. Wheat straw chopped

fine, or Wheat chaff, is also an excellent material for strewing round the collars of herbaceous plants, such as Delphiniums, Phloxes, double Rockets, or other choice plants. It is not only a protection from the slugs, but, also, from severe frost. Slugs are, often, very annoying amongst Strawberries when in considerable numbers, destroying much of the best fruit, and the mulchings required for the Strawberries are very favourable for the protection of the slugs. In this case I have found no method for their destruction equal to laying down every two or three yards, amongst the plants, a piece of flat tile, and looking these over twice a week through April and May. An active boy will go over a considerable breadth in a couple of hours, dropping the slugs into an empty flower-pot, or any vessel in which they can be taken and destroyed. If this is persevered in, by the time the fruit ripens they will be reduced in number so as not to do serious damage. In gardens that have been neglected, where slugs abound in large numbers, it frequently happens in a damp and showery spring that it becomes almost an impossibility to plant anything out in the shape of Cauliflowers, Cabbage, Lettuce, or anything they will eat. You may strew the ground with wood or coal-ashes amongst the young plants, dust with lime and soot until the plants are so overdone with it that they refuse to grow, and still find it impossible to keep the slugs in check. In such cases there is no resource but hand-picking morning and evening. This slow and unsatisfactory business should, however, be dispensed with as soon as their numbers can be reduced by the more general means already advised, and, above all, by adopting a thorough system of cultivation. Deep trenching buries great numbers of both them and their eggs, so deep as to cause them to perish. The removal of all refuse vegetable matter as soon as the crops are cleared, keeping the ground, as far as possible, amongst growing crops continually stirred, as also all ground from which the crops have been gathered—this, more especially in dry weather, is destructive both to them and their eggs, exposing them to the scorching sun, and to their natural enemies the birds.

Large Wall-snails.

The large wall-snail, that bears its house on its back, is sometimes very troublesome, especially on Peach or Cherry walls. If left unchecked in spring, it quickly denudes Cherries of their leaves whilst they are young and tender, doing serious mischief. The growing fruit of Nectarines, being, unlike the Peach, smooth, is an especial favourite with them. It is surprising the damage half-a-dozen of these snails will do, every night breaking into a number of fresh fruit; and they are by no means so easy to find as might be supposed. They get under the leaves and behind the branches, and continue their depredations until the last fruit is gathered; and, when ripe, attacking Peaches and Nectarines alike. In the winter they take up their abode in any open joint in the wall where the mortar has become defective, under the coping, or right over the wall at the opposite side, or under anything that may be lying near the foundation under which they can pass the winter. The best traps I have found for them are empty Seakale-pots, with the lids on, placed on the ground at intervals of a few yards on each side of the wall, a little before the leaves begin to fall. If these are examined once a fortnight during the autumn, the snails will be found attached to the inside of the pots, and before Christmas not many will escape. At the same time, every crevice in the wall on both sides should be carefully looked over, for a number of the small fry will be in existence, and must also be destroyed. T. BAINES.

NOTES AND QUESTIONS ON GARDEN DESTROYERS.

Moles in Flower-beds.—I shall feel much obliged to any of your correspondents who will kindly inform me of some effectual means of getting rid of these troublesome little burrowers. I have tried an iron spring-trap without much success.—G. S. W.

Traps for Catching Blackbirds.—I beg to inform your correspondent "R" (p. 162), that the steel or iron rat-traps for catching blackbirds may be obtained from any ironmonger in his neighbourhood. They are only the miniature steel traps, so commonly used by ratcatchers, the larger ones being used by gamekeepers for catching rabbits, cats, and other vermin. I find the best bait for tying on the plates of the traps is a small piece of a ripe Apple or Pear, these being tougher to peck at than Gooseberries or Currants; and the blackbirds, in their efforts to devour them, are invariably caught by their necks or head, and killed instantly.—WILLIAM TILLERY, *Welbeck*.

THE GARDEN IN THE HOUSE.

NATURE-PRINTING LEAVES AND GRASSES.

BEFORE proceeding to give the following directions for nature-printing Ferns, leaves, Grasses, &c., I will make a few remarks on the machine for applying the necessary pressure; and, also, on the paper. I use Bradford's No. D. roller-press, which is better known in the laundry than in the printing office. It consists of two 12-inch India-rubber-cased rollers fixed in a strong wooden frame, with screws to fasten it to a piece of wood projecting from a wall. The pressure is obtained by means of a strong spring and screw, which are put in motion by turning a handle. Now, I am not sure that better impressions could be obtained by using a higher class machine, such as a lithographic press for instance; I think, perhaps, it might be more convenient in working. To those who have one at command, I would say, try it; I have not had the opportunity, I have used an ordinary copying press, but the prints are wanting in sharpness. With regard to the paper, choose that of a fair quality, and free from manufacturers' marks; I think it is called, in the trade, "wave-paper." Albumenised paper answers well, and gives a photographic appearance to the print, but it is too expensive for general use. The size I have found most convenient, and quite large enough to take a good specimen of most Ferns, is 17½ by 11 inches the half sheet. If it is desirable to use a larger frond than the half-sheet will take in, I double it previous to drying, of course arranging it so that the character of all its parts may be seen; or I cut it in half and take a print of each part on separate papers, which I have only to lay end to end and I get a full-length portrait. The necessary articles are rather numerous, but, with the exception of the press, they can be had for a few shillings. The price of the press I have just described is £2 2s.

As regards requisites, I get a small jar of printer's ink (black) a little linseed oil, a 5-inch roller, such as is used by printers; a piece of smooth slate, about 16 by 6 inches; an old table-knife, worn thin; a paper-knife; a quantity of paper, as previously described; four pieces of thin card-board, 18½ by 12 inches; two pieces of chamois leather, and a press. Cut the two pieces of leather a little smaller than the card-boards, take two of the boards, lay a leather on each, then stitch the board and leather together all round the edge, at the same time stretching the leather, just a little, to take out the wrinkles. This pair of boards I shall now call pads for the sake of distinction. The other pair may be fastened together with two or three strips of tape, so as to resemble a book-cover. Procure the fronds, leaves, or whatever is to be printed, dry them between sheets of blotting-paper under heavy pressure. If the rachis, or mid-rib, is too thick (as will be seen if the parts near it do not come out clearly in the print), it must be cut thinner with a sharp knife, taking care to preserve the scales on the part left.

All being ready, proceed as follows:—Put a small quantity of ink on the slate, add a few drops of oil, and mix well together with the knife, then take the roller and work the ink all over the surface of the slate. I cannot give the exact proportions of ink and oil; the proper consistency will soon be found by a little practice. Now, the ink must be taken from the slate to the pads, which is best done by working the roller alternately on the slate and the leather until the ink is evenly distributed over the latter. Lay the pads together and pass them several times through the press, in order to get the ink well in. After this, just a touch over with the roller occasionally will be found sufficient. It is necessary to have an assistant (a little boy would do) to attend to folding the paper and to pass it through the press &c., as it is impossible for one who does the inking to keep his hands from being soiled. So far, all has been preparation, and some may think it rather a long one; but it is not so much to do after all. Now for the actual work. Lay the dried frond or leaf between the pads, and pass them two or three times through the press. Then separate them carefully. If the frond adheres to the pads, the paper-knife will be found useful. Let your assistant open a sheet of paper and lay on the clean pair of card-boards, place the frond in the middle of the half-sheet and fold the other half over it, also fold the boards, and pass them once through the press. Remove the frond and two faithful prints will be the result.

Should they, however, be a little too black, which is sometimes the case, take another impression without re-inking the frond. In this way, I have frequently taken four; of course, each is a little lighter than the preceding one. It will be seen that the same frond may be used till some accident renders it imperfect. Care must be taken that nothing gets attached to the frond, for so fine a thing as a hair would spoil the otherwise beautiful prints. Anyone having a machine, the rollers of which are not cased with India-rubber, may get on capitally with a piece of sheet-rubber the same size as the card-boards, cutting it half through down the middle, so that the part uncut may act as a hinge. Place the boards containing the frond or leaf within this, previous to putting it through the press. I forgot to say that the ink takes better if the paper is damped a little. The prints must be thoroughly dried before being laid together.

Teignmouth.

THOMAS SMITH.

WREATHS AND GARLANDS.

THESE rank among the prettiest styles of floral decorations, their only drawback being that some practice is wanted to make them nice and light-looking. Long pieces of wire are required for the foundations, and some bundles of Moss to keep the stems of both flowers and Ferns fresh. There are so many flowers suitable at all times of the year for this kind of decoration, that I need not enumerate them, as the selection must depend on the size and description of the wreath or garland intended to be made, and, as a rule, light and airy-looking flowers are the best to select. As each flower is bound on to the foundation after having been previously wired, it should be drawn out into the required position, and plenty of damp Moss should be bound round its stem, so as to preserve its freshness. For small sprays, use very little Moss, for, were it to appear, it would tend to make the wreath look heavy, but in a large garland its appearance does not matter so much; indeed, if the Moss is fresh and green, its being shown will be an improvement. Though the Moss should be damp, permit no water to remain therein, beyond what does so when pressed, after being washed, for, if water is allowed to drip from it, it would spoil anything the garland might happen to touch. A few sprays of *Lygodium scandens* look light and elegant twined through wreaths of any description. Heavy flowers should, as a rule, be avoided, as, though in themselves they may be handsome, they tend to give a heavy appearance to the wreath, which no amount of dressing with Ferns or other foliage will obviate. I am of opinion that if fewer Camellias were employed, and more of other flowers substituted, such as *Bonvardias*, *Stephanotis*, &c., wreaths that are exhibited in the florists' windows would often have a lighter and more elegant appearance than they sometimes present. Sprays of Ivy intertwine charmingly in this style of decoration; but young sprays of a good colour and with small leaves should be selected. Another creeper admirably suited for this purpose is the Japan Honey-suckle.

A. H.

HOW TO ARRANGE VIOLETS EFFECTIVELY.

THESE charming little flowers are difficult to arrange, so as to be effective, owing to the slenderness of their stems, but this difficulty may be obviated; and Violets, when properly treated, will last in perfection for a considerable length of time. The usual way in which Violets are attempted to be kept fresh is to put them in water tied up in the bunch, as when bought, but the stems are never all of the same length, and the consequence is that, in reality, only about half of them reach the water, and the other half becomes withered, causing the whole bunch to be thrown out as dead, whereas only half of it is in that condition. The style in which I like best to see these

simple little flowers arranged is as follows:—Take an ordinary saucer and fill it with fresh-looking Moss, such as grows in woods or is sold in the market in bundles, and which has previously been well washed; build the Moss up in the form of a little mound in the saucer, keeping the fresh points of the Moss to the front, so as to make it look as fresh and velvet-like as possible. The water should be well pressed out of the Moss, but enough moisture should be left in it to keep the flower-stems placed in it fresh. Round the edge of the saucer Fern fronds should be arranged, so as to hide the china; and, for this purpose, the tips of the common Brake are best. Then take the Violet blooms and make them into bunches, say, eight or ten in each bunch; their stems should be then bound together with a piece of binding wire. The binding wire, besides keeping the stems together, makes them firm, and renders them capable of being bent into any position required. When as many of these little bunches are made as are considered to be sufficient, they should be dotted over the ground-work of green Moss. A few Snowdrops, if procurable, placed here and there amongst the Violets, produce a charming effect, and a mixture of white Violets also looks very well in an arrangement of this description. The addition of a few fronds of Maiden-hair Fern, too, tends to lighten the general effect. The Moss should be well damped every morning, and, if this be not forgotten, the Violets will keep fresh and emit their sweet perfume for many days. Some use the leaves of sweet-scented *Pelargoniums* in place of Fern fronds, but the perfume of the *Pelargonium* leaves quite overpowers that of the Violets, therefore Ferns are best, and there are few places in which a frond or two of them cannot be had.

A. HASSARD.

Upper Norwood.

Sibthorpia europæa as a Window Plant.—This pretty little plant is, perhaps, better suited for the window than for either the flower-garden or conservatory. It is easily cultivated, being particular neither as to soil nor situation; it seems, however, to like a sandy loam mixed with leaf-soil, or decayed manure best, and the more light and air it gets the better it thrives. During late spring and summer it requires plenty of water, but in winter it should be kept moderately dry. When it begins to make fresh growth, it should be re-potted; shake away part of the old soil, use fresh material and re-pot in the same sized pot in which



A Floral Wreath.

the plant was formerly growing. In the event of any of the plants, at re-potting time, being too large, divide them into two or more pieces, and pot each portion separately. Shorten back the old growths at potting-time, so as to induce the plants to break afresh. They may be readily propagated by means of cuttings, divisions, or seeds. They thrive apace either in stoves, cool green-houses, frames, or windows, but, under all circumstances, the pots, or baskets, containing them should be suspended, so as to permit the Moss-like growths to hang over the edges, and form a dense drooping coverlet for the pot or basket. Coconut-shells, or any other little ornamental pot or basket, may be used for this *Sibthorpia*, which is one of those plants that grow better alone than when associated with other plants; therefore, small pots or baskets should always be used for it in preference to large ones. When at the Lawson Nurseries, Edinburgh, a short time since, I saw some hundreds of a variegated form of this plant. Its leaves were deeply marked with pure white; and, if anything, I think the habit of the variegated sort is dwarfer and more compact than that of the common green-leaved kind.—W. FALCONER.

NOTES AND QUESTIONS ON THE GARDEN IN THE HOUSE

***Sonchus laciniatus pinnatifidus*.**—This is a very graceful plant for dinner-table decoration, as, having such finely-cut leaves, it has a beautiful light-looking appearance. It is a plant of quick growth, and is easily increased by means of cuttings or seeds.—R. H. B.

Button-hole Bouquets.—Very pretty little bouquets of this kind may now be seen in the shop windows and also in Covent Garden Market. A very effective one may be made of white Hyacinth flowers, and a bloom or two of *Scilla sibirica*, or white Hyacinth, and a pip or two of *Euphorbia jacquiniiflora*, backed in both cases either by a fresh Rose-leaf or Maiden-hair Fern. The Rose-buds with their own foliage are always fresh, fragrant, and effective, and few button-holes equal these for the winter months.—B.

THE ARBORETUM.

ON THE TENDERNESS AND DECLINE OF THE LARCH IN BRITAIN.

I REJOICE to see that this subject is attracting the attention of your correspondents. I have been a close observer of arboriculture in Scotland—no less than in the north of England—during fully fifty years, and began to plant Larches myself as long ago as in 1825 and 1828. Even at that time young plantations containing this popular tree, of which all were so confident in their praises, occasionally exhibited unexpected signs of sickness, though the older woodlands on all sides of them, which had been formed twenty years previously or more, were full of fine robust Larch trees. In 1830, I saw the then magnificent forests of Dunkeld and Blair Athol; but even then great misgivings were beginning to be felt by planters in the Lowlands, and not always to be accounted for by the tree having been placed on dead-flats, on heavy tills, or on poor ferruginous sub-soils unsuited to its Alpine nature. Ominous whispers were rife that the young Larch plantations were no longer healthy and prosperous, like those of an earlier date, but were liable to a peculiar kind of "blight," and to a fungus upon the stem. Afterwards came tales of downright destruction of the saplings by frost in various places, and then we heard an alarm about a new malady of ulcerated stems and effusion of resin on the diseased parts. All these appearances were regarded as specific maladies or diseases. They were never perceived to be consequences of weakness and tenderness in the constitution of the plants affected, and especially presenting themselves after the young trees had suffered from frost-bite. Blights, whether of an animal or vegetable character, readily develop themselves upon the surfaces of the trees so weakened, and, with their sap, perhaps, chemically altered by the cold they have only barely been able to resist. Individual plants of hardier constitution will be seen altogether free from blight, from fungus, and from ulceration. The Larch forests in the Tyrol are full of instruction to the arboricultural traveller, as I can personally testify. Nature never scatters the seeds of her own majestic trees from out of the cones until the latter are opened by the warm vernal sun in March and April, that is to say, not until the seeds themselves have been thoroughly wintered upon the trees, and their maturity confirmed by the severe frosts of the climate; whilst they continue to imbibe the resin and essential oils peculiar to their species. Compare such seeds, extracted by sun-heat from cones gradually matured until March, with the produce of British or North-German plantations, gathered, half-ripe, in November, from inferior trees, and then kiln-dried in order that the immature cones may be made to open and yield up their contents. Even if gathered in the Tyrol itself in November, they are not ripe.

Can any one wonder that our Larches are now poor sickly plants, ready to perish from frost-bite or chilblain, which mother Nature vainly strives to medicate and heal by resinous effusion? In the so-called Larch-disease we find the ever-repeated old story. The after-symptoms of the malady are mistaken for the malady itself. Tenderness is the disease; cold is the destructive agent; ulceration and fungus are the consequences; and resinous effusion and intumescence are Nature's efforts to heal the sore. Good and sound seed, from our British woodlands, may be procured in limited quantities from the summits of healthy Larches, when felled in February or March, after the cones have been fully wintered, and exposed to every frost and storm upon the trees. They may also be gathered in February or March from the pendulous side-branches of healthy trees. The largest cones, and the reddest or brightest, are ever the best. Extract the seed by laying them in the April sun upon a sheet, on the floor of a room or of a greenhouse. Give them two or three weeks to open, sprinkle them, at intervals, with water from a pan with a rose, in imitation of April showers, and at last thresh the cones with a stick repeatedly. The seeds must be sown very shallow, and as thick as may be, in some half-shaded situation in the garden, say, under an east or west wall, and carefully protected from chaffinches for some time after the plants have appeared. This is the way by which healthy Larches may be procured

in small numbers, to be used as principal trees, and carefully inserted in favourable localities in our woodlands. And, if we be willing to pay a proper price, similar plants will in time be supplied by nurserymen, both from British and from Tyrolean seed, in considerable numbers. But it is doubtful whether we can wisely adhere to the practice of using Larch as a cheap nurse-plant for Oak and other hardwood. At all events, let us understand that the ordinary seedlings are only good by accident, when they happen to come from well-wintered seed, and from healthy parent trees. And here let me recommend a more general use of the Scotch Fir and the Spruce as nurse-plants. Moreover, we possess, both in England and Scotland, a valuable but neglected variety of the Birch, very superior as a nurse (to Oak, Ash, &c.) to the white or ornamental Birch commonly cultivated, but which last grows much too quickly and too tall for an efficient nurse. The variety desiderated is the common brown Birch of our open plains, which we see among the Oaks and Hazels in so many coverts, holts, and thickets. It comes sufficiently true from seed, though differing only as a variety from the white Birch, and united with it by intermediate crosses or sub-varieties between them. But this common brown Birch is the hardiest of all, and is the most ready to reproduce itself as coppice, which is a great merit. It does not become too tall and domineering like the graceful and pendulous white Birch, which has been far too exclusively cultivated. The brown Birch is rigid and erect, of lower stature; its bark often partly brown, partly white. Another nurse-plant of great value is the Silver Alder (*Alnus incana*), a native of Sweden, of Germany, and the Tyrol. It is as hardy as the Birch, and does not require so moist a soil as the common Alder. It both ripens seed well and throws up numerous suckers, so that it is quickly becoming known to planters. In conclusion, let it be remembered that cones of the Scotch Fir, or Pine, are never truly matured until February or March. If we gather them in autumn, we are sure to propagate an inferior and tenderer offspring, which will probably prove short-lived. Early luxuriance is no recommendation. Spruce-cones must be gathered up as they fall from the trees, during winter or in early spring. The cones of both these trees open readily in the sun. As a general rule, the cones of all exotic Coniferae should be allowed to hang as long as possible, to be thoroughly matured by time and frost, ere we cull them.

R. C. E.

THE FEVER GUM-TREE.

THE many very interesting accounts which have been published with regard to the *Eucalyptus globulus* do not seem to have exposed all of its values. And we find in "Comtes Rendus," of October 6, a note presented to the French Academy of Sciences by M. Gimbert, in which he describes another value equally as great as those with which all are so familiar. From reports received from various reliable sources, it seems to have been determined that in localities where the *Eucalyptus* flourishes there has been a complete disappearance of intermittent fevers. "A tree," says the author, "springing up with incredible rapidity, capable of absorbing from the soil ten times its weight of water in twenty-four hours, and giving to the atmosphere antiseptic camphorated emanations, should play a very important part in improving the health of malarious districts." It has the property of absorbing, directly and rapidly, the water of shallow marshes, thus preventing fermentations which are produced, and paralysing the animal miasma proceeding from them which might arise from them. The predictions with this regard, which were made in 1869, have in all cases been realised. The author furnishes a few of the numerous results, which are very interesting. The English were the first to experiment in their sanitary plantations in Cape Colony, where they were eminently successful. Two or three years were found sufficient to change the climatic conditions, and the aspect of the malarious districts of their possessions. Some years ago the Algerians took occasion to spread the *Eucalyptus* throughout the French possessions in Africa, and the following are some of the results obtained, as communicated by M. Trettier:—"About twenty miles from Alger, at Pondouk," he says, "I owned a property situated near the river Hamyze, the emanations from which produced intermittent fever among the farmers and their servants every year. In the spring of 1867 I planted upon this farm 13,000 plants of the *Eucalyptus globulus*. In July of that year—the season in which the fevers appear—the farmers were completely free from them. In the meantime, the trees had scarcely attained a height of more

than 8 or 10 feet. Since that time the settled population has been entirely free from fevers." Fourteen thousand Eucalyptus trees were planted upon the farm of Ben Machydlin, in the vicinity of Constantine. It has for several years past been noted for its insalubrity, being surrounded with marshes throughout the entire year. The trouble entirely disappeared, and the soil became perfectly dry in five years. The atmosphere is constantly charged with aromatic vapours, the farmers are no longer troubled with disease, and their children are bright with health and vigour. The operations of the manufactory of Gué in Constantine were rendered wholly impracticable during the summer on account of the pestilential emanations from the marshes with which it was surrounded. M. Saulier conceived and put into practice the idea of planting a large number of Eucalyptus trees in these marshes, and in three years about 12½ acres of the marshy soil were converted into a magnificent park. The water completely disappeared, and the health of the workmen has since been in good condition. In consequence of the large grove of Eucalyptus globulus on the farm of Maison-Carrée, which is situated in a district in which the inhabitants formerly succumbed to the malaria, similar hygienic revolutions have taken place. It is stated by land-owners in Cuba, that, there also, the paludal and telluric diseases have disappeared from the malarial districts where the Eucalyptus has been cultivated. According to Ramel, Australia is very healthy where the Eucalyptus flourishes, and unhealthy where the tree is not found. On the banks of the Var, near the entrance of a railroad bridge, is situated a garrison-house, near which earth-works were thrown up to dam the river in order to build the bridge. The malaria arising from it made it necessary to change the guard each year. Two years ago, M. Villard, the engineer in charge of that section of the road, planted forty trees in the vicinity of the building, and since that time this post has been the most healthy in the country. These evidences fully establish the fact that the Eucalyptus globulus has a good effect in preventing the spread of malarial diseases, and that it may serve decidedly practical purposes in this particular. Throughout our entire South and South-west many valuable enterprises have been wholly impracticable from causes stated above; and, if the examples thus set before us were followed throughout the South, there is no doubt that many of the dismal, swampy, and marshy districts, hitherto entirely worthless, may be transformed into beautiful, pleasant, and healthy sections.—*Monthly Report of the Department of Agriculture.*

Thujopsis dolabrata from Cuttings and Grafts.—This Conifer may be readily raised from seeds, cuttings, and grafts, but the two latter methods are practised most. I find cuttings, too, make the best and longest-lived plants, and they strike freely if taken off in August and September, and inserted in pots filled with sandy peat, surfaced with sand, and half filled with crocks. The cuttings should be pricked thickly and firmly into the pots, and the pots should afterwards be placed, for the next two months, in cold frames, when, if the cuttings have callused, they may be removed to a close and gently heated pit, so as to induce them to root. When rooted, they should be removed to a shelf in the pit, and, after a few weeks, transferred to another pit or frame, and, if the cuttings are in a thriving condition by next spring, they may be potted off singly in small pots. When grafted, I find that, although the stock and scion unite kindly enough, and, under favourable circumstances, grow well together for a few years, the union is never so complete as to ensure permanent success, for a rough blast of wind or unfriendly touch soon snaps them asunder; whilst other Conifers, side-grafted in the same fashion and treated in the same way, are almost as strong at their union as elsewhere. I should advise those, therefore, who purpose grafting this Conifer, to graft it close to the ground, and, in re-potting or replanting, to plant deeper each time than before, so as to encourage the emission of roots from the scion, which in this way will ultimately be able to support itself independently of the stock.—FORRES.

Red Pine.—What is the botanical name of the Red Pine from British North America? Is it the *Pinus australis*, or Long-leaved Pine, which is described by Mahan (an American civil engineer) thus:—"This tree has but little sap-wood, and the resinous matter is uniformly distributed throughout the heart-wood, which presents a fine compact grain, having more hardness, strength, and durability than any other species of the Pine, owing to which qualities the timber is in very great demand." This author, though an American, does not mention Pitch Pine. Are there the following four distinct Pines from America:—White Pine, Yellow Pine, Red Pine, and Pitch Pine, and what are their botanical names?—L. [The Red Pine is not the *Pinus australis*, or Long-leaved Pine of the Southern States; it is *Pinus resinosa*, and forms dry woods from Maine to Pennsylvania, westward to Wisconsin, and northwards. It is a tree of

50 to 80 feet high, belonging to the Scotch Pine section, with leaves in twos, and has reddish and rather smooth bark; the cones are about 2 inches long, and sometimes aggregated in large and close clusters; it has been erroneously called the Norway Pine. The colloquial names, mentioned in the above inquiry, do all occur in North America, and most of them represent more than one species of Pine; for they have been carried with them by the settlers to California, and there applied to other trees of allied nature which occur there. The White Pine is the name applied to the Weymouth Pine (*P. Strobus*), and in California it is transferred to *Pinus monticola*. The Yellow Pine is the name applied to *Pinus mitis*, which occurs in the southern parts of eastern America, on dry and sandy soil, and reaches westward from New Jersey to Wisconsin. This is a valuable timber, durable, fine-grained, and fitted for flooring, &c. In California, the name Yellow Pine is usually applied to the *Pinus ponderosa*. The Pitch Pine is *Pinus rigida*. It extends along the eastern coast of North America, from Maine to the west of New York, and southwards, common on spare sandy rocky soil. This species belongs to the section with leaves in threes. The *Pinus australis*, also, is sometimes erroneously called the Pitch Pine.—A. M.]

Ornamental Peaches.—Of these, several varieties were sent out last spring by Mr. J. P. Berckmans, of the Fruitland Nurseries, Augusta, Georgia, who has a fancy for getting together the unusual forms of the Peach. Some are worthy of a place in a collection of ornamental trees. The pyramidal would hardly be taken for a Peach-tree if one was not near enough to see the character of the leaves. Its branches all turn upwards, and the general aspect is that of a Lombardy Poplar. The purple-leaved was rather a disappointment. Its leaves, to be sure, are purplish-red in the spring, but it loses its colour as they mature, and the tree is then as green as any other. The young leaves of the second growth are also coloured. The Australian dwarfs are very promising. These are said to have originated from the Peen-To, the flat Peach of China. Two specimens that I have are beautiful bushes; the joints are so close together that the foliage is singularly crowded. They have not bloomed yet, but are said to have double crimson flowers and good fruit. Mr. B. sent me leaves of a curious cent-leaved variety, which he discovered in a bed of seedlings, and which we may hope to know more of.—*Agriculturist.*

Cost of Planting the Paris Boulevards.—The following items of the cost of planting a young Chestnut or Plane-tree (say, three or four years old) on the Boulevards of Paris, are given in a late number of *La Municipalité*:—Excavation of the ground, which is generally heavy, 15 mètres, at 4f. per mètre = 60f. The same quantity of vegetable soil to re-place that taken out, at 4f. per cubic mètre = 60f. A prop for the tree, 13 to 19½ feet high = 1f. 50c. Drainage, by means of earthenware tiles = 11f. 15c. Pipes for supplying water = 2f. 50c. Cast-iron grating round the base of the tree = 46f. 69c. Carriage of the tree and the prop, and placing them in position = 5f. Iron guard round the tree = 8f. 70c. Cost of the tree = 5f. Workmen's wages = 1f. 69c. Annual interest on the cost of every tree that has to be re-placed in twelve years = 18f. Total, 220f. 23c. From this is to be deducted the value of the soil excavated = 18f. 23c., leaving 202f., or £8 1s. 7½d., the net cost of every tree planted.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Kœlreuteria paniculata.—To what height does this grow—does it blossom and is it hardy and ornamental?—*Sussexian.* [This Chinese tree is perfectly hardy in the south of England, where it grows to a height of some 30 feet. It bears foliage not unlike that of the common Ash, and terminal panicles of yellow flowers, which are succeeded by bladder-like fruits. The tree is very ornamental, and may be seen at Kew.—*Ed.*]

A Swarm of Squirrels in an Old Oak Tree.—Some men felling timber in a wood near Cudham, Kent, the other day cut down an old hollow Oak tree, when upwards of thirty squirrels rolled out, most of them dormant or in a state of semi-sleep, but, upon being roused, they dispersed to various parts of the copse. A large stock of Nuts and Acorns was found, stowed away in the hollow of the tree, which had been collected as a provision for the winter. It is common to find squirrels laid up for shelter during winter, but it is seldom such a swarm is found together.

Vitality of Tree Seeds.—An instance is mentioned in the *Prairie Farmer* by Dr. Hubbard, where seeds of the Burr Oak, buried beneath the surface of a well-drained piece of land, remained thirty years in a dormant state, till thrown up nearer the surface, which caused them to germinate. It is familiar to nurserymen that Peach stones buried compactly a foot or two below the surface will remain dormant for a time, and it would be an interesting subject of enquiry to ascertain to what length the period might be extended by deep and compact burying, for different kinds of tree and other seeds.

Cryptomerias and Deodars from Cuttings.—Can I increase these by means of cuttings, and, if so, at what season should I attempt the operation, and in what aspect should they be planted?—*Sussexian.* [Cuttings of *Cryptomerias* and *Deodars* strike freely, if made of the half-ripened shoots in the autumn. They should be inserted in a soil composed of loam and silver-sand in equal proportions, and placed in a cold frame, facing the north. Let them be kept close and free from frost during the winter. In the following spring, if they are removed to some close pit or frame where there is a little bottom-heat, it will greatly promote their rooting.—*Ed.*]

A NEW RHUBARB (*RHEUM OFFICINALE*).

THE following information respecting the new species of *Rheum*, which is now considered to be the true origin of the Official Rhubarb, has been supplied by Professor Baillon to M. Regnaud for insertion in a new edition of Sonbeiran's "*Traité de Pharmacie*:"—"Besides the *Rheum rhaponticum*, which yields the *Rhapontic Rhubarb*, Linnaeus recognised four species of the genus *Rheum*, to which have successively been referred the origin of the true Rhubarbs of China and Russia. These were the *Rheum Rhabarbarum* (afterwards named *R. undulatum* by Linnaeus himself), *R. compactum*, *R. palmatum*, and *R. Ribes*. The latter, to which has been attributed the origin of Persian Rhubarb—or, rather, of the products which are received through Persia—has never been more than a culinary herb. As to the three other species, they have all contributed (from the root) certain European and native Rhubarbs. A species more recently discovered in India (*R. Emodi* or *R. australe*) has, like the preceding, been considered to yield the Chinese and Russian Rhubarbs; but it would appear that it only produces a kind peculiar to India. As to the true plant, a native of Tibet, which furnishes to commerce both the Russian and Chinese Rhubarbs, it has only been known since 1867, in which year M. Dabry de Thiersant, consul-general of France at Shanghai, procured from Thibet some stalks of the species which yields this valuable drug, and which, cultivated in the garden of the Faculty of Medicine, at Paris, and in the Vallée de Montmorency by M. Girardeau, have received from M. H. Baillon the name of *Rheum officinale*. It is a very large species, exceeding a man in height, and remarkable for the considerable development of its inflorescence. The leaves answer perfectly to the indications formerly given by Bokharian and Chinese merchants to Pallas and others concerning the true official Rhubarb plant—namely, that the leaves have a limb of a delicate green colour, in shape like an open fan, and also as analogous as possible to that of the leaves of the *Ricinus communis*, or common Castor-oil plant. This new Rhubarb (*R. officinale*) belongs to the same botanical section as *R. palmatum*. The dimensions of the limb of the leaf extend to nearly $3\frac{1}{2}$ feet in each direction; it is, however, a little broader than it is long, and the petiole is about the same length. In the plants of it that have been raised, some leaves have been noticed which were more than 5 feet long. When the plant has become fully developed, it has scarcely any roots, for these are gradually destroyed, and the plant draws its nourishment from the soil only by small adventitious roots which could not be employed in medicine. But, contrary to the other species enumerated, and of which the root can be prepared and employed, this develops above ground a stem and cylindro-conical branches, 8 to 12 inches high, and of the thickness of an arm or a leg. These are the only portions which, cleansed from the so-called bark, divided transversely and longitudinally, and properly dried and prepared, can be used in medicine. They bear leaves, and, after the fall of these, there remains on the surface only the brown dried base of the petioles, together with the remains of the ocreæ; these vestiges together constitute the pretended bark. In the axil of each of these aerial leaves there is necessarily a bud. These acquire frequently a considerable development, and are elongated into leafy branches. Each of these buds, detached at a suitable season, will, in its turn, easily take root from its base, and may thus be used to multiply the plant."

A Decoction of *Bouvardia triphylla*, a Remedy for Hydrophobia.—A drug, which is sold under the name of *Trempanilla*, is said to be successfully used in Mexico for the prevention and treatment of hydrophobia, for which complaint it is freely given in the form of decoction. It consists of short segments of the stem and branches of this plant, varying from one-fourth to three-fourths of an inch in diameter, terete, and slightly bent. There is no perceptible odour to either wood or bark; the former is tasteless, the latter has a slight bitterish taste. The central pith is scarcely a line in diameter, and of a brownish or purplish-brown colour.

Green Lanes.—England surpasses the world in the peculiar beauty of her green lanes. Italy has its skies, Greece its classic ruins, Egypt its pyramids, Switzerland its Alps, Germany its Rhine, America its Niagara; but none of these has a green lane such as there are thousands of in England. The green lane is essentially English, and is confined to England. There are green lanes neither in Scotland nor Ireland—we mean grassy roads arrayed in greenery, shaded by lofty old hedges, Beech trees, Alders, or Willows, leading to some quiet cot or farm-house, or range of pasture-lands; and often leading on merely to some other green lane, or series of lanes, branching off to right or left, which are there seemingly without any other purpose than that they are there, to feast the eyes of country strollers with the sight of their quiet green beauty.

* "*L'Union Pharmaceutique*," Vol. XV., p. 21.

SUNDRIDGE PARK GARDENS.

SUNDRIDGE HOUSE is pleasantly situated in a finely undulating and well-wooded park, and is sheltered by a sloping hillside behind. Fine specimens of Larch, Birch, Elm, Cedar, Walnut, and fine old Hawthorns are dotted here and there, singly and in groups. The common Larch as seen in the park at Sundridge is one of our finest ornamental trees, which might even be planted with good effect on lawns, where its long lower branches, being undisturbed, would sweep down gracefully on to the mossy turf; its elegant habit is best seen when contrasted with heavier round-headed trees, and when its fresh green foliage makes its appearance about April, it forms an interesting object in any landscape. Sundridge House owes much of its interest to the gracefully undulating and profusely wooded park by which it is surrounded, and from which some fine views of woodland scenery may be obtained. It is, indeed, in point of beauty, far before some Kentish parks of much greater fame. Among the finer trees in the garden we noticed a fine specimen of *Salisburia adiantifolia* 50 or 60 feet high. It is now, of course, denuded of its curious foliage, and in habit reminds one of a very fine pyramidal Pear tree, the colour of the shoots and spurs being nearly identical.

The Conservatory.

From a gardening point of view, the most attractive feature of Sundridge Park is the conservatory, and, as will be seen from our illustration, it is a very beautiful one. Our illustration represents the interior arrangement of this noble structure—one of the finest we have seen for some time, and one, moreover, which combines a handsome exterior with every quality essential to the growth of the vegetation within. The last remark is borne out by the vigorous progress made by the beautiful specimens of tropical vegetation since their introduction. The house is 100 feet in length, by nearly forty feet wide, and thirty-five feet in height, and is constructed almost entirely of iron and glass, having perpendicular sides and a curvilinear lantern-shaped roof of pleasing proportions, supported on light iron-work pillars, which also serve as supports for rare graceful climbers. The house has been designed and built by Mr. Henry Ormson, of Stanley Bridge, Chelsea, who has erected many of the best conservatories in the country. Our engraving, beautiful as it is, gives but a very faint idea of the interior, which would require at least half-a-dozen such views to do it full justice. The central portion of the house is laid out in beds, in which Palms, Ferns, Cycads, Camellias, and other rare exotics luxuriate with something of their native vigour. Around the sides, substantial stone benches have been erected for smaller decorative plants in pots, and beneath these the hot-water pipes are placed and concealed from view by a neat and ornamental cast-iron grating. The hot-water apparatus is of the latest and most approved kind, while the genial temperature maintained is amply sufficient for the choice blooming Orchids and stove plants, which are grown for the purpose of decoration in ranges of plant-houses to the rear of the conservatory. A notable feature is a pair of lean-to curvilinear-roofed houses behind the conservatory, and connected with that structure by doors opening into an alcove, very tastefully decorated with virgin cork, and planted with Orchids, Filmy Ferns, and other choice exotics, the effect of which is considerably heightened by a large mirror which extends the whole length of the alcove behind. These very agreeable adjuncts to the conservatory are very tastefully and systematically arranged in the natural style and planted out with Ferns, Orchids, and choice foliage plants, all of which luxuriate in the most vigorous manner possible. The doorways are fringed with masses of virgin cork, over which *Lygodiums*, *Ficus stipulata*, fresh green *Selaginellas*, *Begonias*, and bright-veined *Eranthemums* ramble in rich profusion, and with a vigour only attainable by planting them out in good fresh soil with ample room to extend themselves in all directions. Conservatories, arranged in the natural style and having the finest specimens planted out, are specially to be recommended, as they are not only effective, but much less trouble is entailed on the gardener than when pots or tubs are employed. Amongst the creepers



VIEW IN THE CONSERVATORY AT SUNDRIDGE PARK, KENT.

which adorn the ornamental trellises and pillars, we may allude to a fine plant of the white-flowered *Lapageria*, 12 or more feet in height, with leaves 4 inches long by 3 inches in breadth, and of a deep glossy green colour, which betokens the most exuberant health and vigour. *Cobaea scandens variegata* is now very effective, drooping in elegant festoons from the tapering columns as shown in our figure. Among the specimen plants we may mention a fine *Asplenium Nidus-avis* with fronds fully 6 feet long. A fine pair of *Aralia japonica variegata*, and a fine specimen plant of *Dicksonia antarctica*, *D. squarrosa*, *Cyathea medullaris*, and *C. dealbata*. At the time we saw it, the side benches were gay with forced shrubs and bulbs, Azaleas, Roman Hyacinths, Tulips, *Scilla sibirica* var. *præcox*, *Schizostylis coccinea*, scarlet berried *Solanums*, and other decorative plants. The side stages are margined with ornamental wire-work, planted with fresh green *Selaginella*, and the effect thus produced is very neat and effective, contrasted with the bright-hued flowers above. What is probably the finest specimen of the Double White *Camellia* in the country is here planted out. We do not know its exact size; but perhaps Mr. Dedman, under whose care the house and collection are in such excellent condition, will enlighten us on this point, and on the history of the plant—or, rather, tree; for it is rare, indeed, one sees a finer evergreen indoors or out.

THE KITCHEN GARDEN.

VEGETABLES AND THEIR CULTURE.

By T. BAINES, Southgate.

Trenching.

WHERE good gardening is carried out, the whole of the kitchen-garden should be trenched every three years, a third of the work being done every season. Trenching a piece of ground is an operation of so common-place a character that everyone is supposed to know how to do it, in every description of soil; yet, I have frequently seen ground trenched at considerable expense, that had much better never have been touched than done in the manner in which it was; simply, through the impression that if the work was done deep enough it must be right. All the best surface soil was buried and a quantity of raw unfertile stuff was brought to the surface, in which nothing would grow until some of the soil previously at the surface was again brought up and mixed with it. Whereas, if not more than a couple of inches of this under soil had been brought to the surface, and some 4 inches more of the sub-soil loosened up with the fork and left in the bottom, it would have been in fit condition to have been brought to the surface at the next trenching. All vegetable-matter, in the shape of Cabbage-stalks, or similar refuse, should be buried in the bottom of the trench, and never taken off the land, as is sometimes done; when placed thus, deep below the surface, such material gradually decays, affording food which the roots eagerly lay hold of, helping the crop over a dry time in summer, in a way that shows its value. Strong heavy soils are much benefited by a good quantity of leaves, even a foot thick if obtainable. Being buried in this way, they not only lighten the soil when, at subsequent trenchings, they get more intimately mixed with it, but, from the first, they act as a drain to the soil above them, rendering it so much better to work than it otherwise would be. They also hold a good deal of moisture in which the roots of vegetable crops, during a dry time, delight. Judgment should also be exercised in the selection of the crops to follow each year's trenching. These should consist of the deepest rooting plants, such as Onions, Carrots, Beet, Peas, and Leeks, keeping the surface-rooting *Brassica* family for the shallower dug ground.

Double Cropping.

Some cultivators are fond of double cropping, but I have long come to the conclusion that there is much more of it done than is profitable, either looked at from a labour point of view, or for its returns in the shape of a crop. The system of double cropping with some things is an advantage, but with others with which it is frequently practised, it is a loss, as well as an inconvenience, preventing the ground from being so well

worked as it otherwise would be. Tall Peas and Celery often go together; unless the rows of Peas are so far asunder as to prevent the possibility of any gain in the crop obtained from a given space of ground, the Celery always suffers by the drawing effects of the Peas, and, in gathering the latter, the ground gets so trampled as to require a good deal of labour before it is fit for earthing up the Celery. In a hard winter, Celery so grown never stands the frost so well as if grown openly by itself. Peas with rows of winter Broccoli betwixt them are open to the same objection; the Broccoli gets injured in gathering the Peas, and becomes drawn, rendering it in anything but a condition to stand the effects of frost. The results of double cropping of this description is like "a wrinkle on Wrinkled Peas," with which a noted horticulturist favoured the gardening world a short time back, and which was simply to mix Dwarf Peas with tall ones in sowing, so that the sticks might carry pods lower down than it was natural for the tall Peas to bear, forgetting that the ground could only support so many and no more, consequently by sowing these dwarf Peas along with the tall ones, he must have so many fewer tall ones in each row. By growing rows of Cabbages or Winter Greens alternately with Potatoes, there is the advantage of the Potatoes receiving more room and air in their early stages than they otherwise would have, rendering them better able to withstand the attacks of disease later on in the season. I do not, however, mean to say that any amount of room that could be given will render Potatoes disease-proof in seasons when that malady appears in a virulent form; but, where Potatoes are grown with plenty of room, they are generally less affected than where space is limited. If the Potatoes are mid-season varieties—the best for cultivation whilst disease so often makes its appearance—the Cabbages get plenty of time to grow after the Potatoes are cleared off. The following crops, I have found, can also be grown together with advantage:—Tall Peas I always sow 6 feet apart, sticking them as soon as they are up, and then sowing a row of Spinach between them. This comes off before the Peas are fit to gather, does no harm, and is, so far, a gain. Celery trenches I make 3 feet wide, planting two rows in each trench, leaving 3 feet betwixt the trenches (if less than this is left the points of the roots of the Celery will be cut in earthing-up); on this 3-feet space I make a shallow trench that will hold water, in the bottom of this I sow a row of Lettuce, thinning them well out (always sow Lettuce in summer, never plant, as they bolt in half the time the sown plants do) and giving plenty of water. In this way Lettuce can be got as large as York Cabbages, and all cleared off before the Celery wants earthing-up.

Parsley.

There are few things so continuously in demand as Parsley, and a plentiful supply of it through the winter is always desirable. For many years I have never sown Parsley more than once, and never transplanted it. Onions I sow in rows a foot apart; at the time of sowing, I put a pinch of Parsley seed in a yard apart in every third row of Onions. When the Onions are thinned, the Parsley is also thinned to a single plant in each place. This does not in the least interfere with the growth of the Onions, but as their tops begin to go down, the Parsley begins to grow in earnest; and such Parsley; every plant will run from 18 to 20 inches across. About the end of October I move a quantity of these plants with good balls, filling up one corner of the ground so as to be covered with frames. Parsley grown strong in this way will not suffer from frost near so much as the poor starved stuff often met with. A good way to preserve Parsley through the winter, and anything but ugly in appearance, is to take some flour barrels, get a 2-inch auger and bore their sides with holes a foot apart every way; put 6 inches of soil in the bottom of the barrel, then draw the roots of a good plant through the bottom holes, fill up with soil till the next holes are reached, draw in some more plants, and so on, until the barrel is full, then put four or five plants on the top; place the barrels in a cool house where they can get plenty of light. The produce, in both quantity and quality, will be such as will not disappoint anyone who gives the method a trial, and they are not unsightly. The plants should be really strong for this purpose or the produce will be proportionately small. As to the cultivation, in

general, of vegetables there is nothing like growing everything in rows; it takes a little more time to sow in this way than broadcast, but it saves a great deal afterwards in labour, by the freedom with which the hoe can be used amongst the crops.

Manchester Market-gardening.

The market gardeners, who grow for the Manchester market, and the surrounding districts, manage some double crops well. The quantity of Onions, especially autumn-sown ones, for drawing small in the spring, consumed in the manufacturing towns is enormous. The tons of Lisbon and Tripoli seed that some of the seedsmen sell every autumn would scarcely be credited. The ground is well prepared, generally by a crop of early Potatoes being taken off it; it is laid out in beds, 4 feet 6 inches wide, and along with the Onions is sown a sprinkling of hardy green Lettuce, and Altrincham Carrots; if the Lettuces run two or three to the square yard, and the Carrots one to the yard, they are thick enough; the beds are then planted with two rows of Strawberries, kept clear from weeds during the autumn. The first thing to come off in the spring is the Lettuce. The Onions are begun with as soon as they are as thick as a common lead-pencil, going over all the ground, taking the largest first, and so on until they are cleared. The Carrots all remain for seed, and interfere little with the Strawberries, which, being planted thin, get as much light as they require, and bear fine crops. When the Carrot-seed is ripe, it is gathered and bunched, the ground cleared, and the Strawberries allowed to remain for several years. This is the way in which the bulk of the noted Altrincham Carrot-seed is grown; but not the choicest "brands," which are saved from selected roots planted in the spring, and which, for quality, colour, and general appearance, are unequalled by any Carrot in cultivation. I am not alluding to the rough green-topped roots, generally known as Altrincham Carrots; but to a carefully selected root, as smooth as a gun-barrel, nearly all the same thickness from end to end. On the sides of the beds of the spring-sown Onions is grown Horseradish, for which the Manchester market is so noted. As soon as Onions are sown, the Horseradish is planted. Whipthong-like pieces, quite straight, from a foot to 18 inches long, are planted with a dibble, slanting inwards from the sides of the beds at an angle of 45°; and I have seen Horseradish produced in this way, in a single season, 3 lbs. weight per stick, straight, and free from forks. The Celery grown in that neighbourhood is unequalled, as regards quality and appearance, by any in the kingdom, and the quantity is prodigious. The soil is superior to that with which our London market-gardeners have to deal; but, for some things, the climate is much inferior to that of London. Autumn frame-sown Lettuce for spring planting out are rarely, if ever, attempted. Nothing but yellow Turnips are sown. White Turnips in the Manchester market are as unsaleable as yellow ones are in London.

Varieties.

The following is a list of the different vegetables which I grow, and which I have proved to be all that can be required as to edible qualities, weight of crop, and general excellence. The greater part are established favourites, with such new varieties as are found superior to older kinds:—

BEANS.—Early Long Pod and Taylor's Large.

FRENCH BEANS.—For forcing—Newington Wonder and Osborn's Early Forcing. For general crop—Long-podded Negro and Paris Red Flageolet. This is synonymous with Canadian Wonder; it is the best dwarf bean in cultivation. Excellent in quality, and a prodigious cropper.

RUNNER BEANS.—Scarlet Ranner and Painted Lady. The latter, in some soils sets better in extreme seasons of wet and drought.

BET.—Barrett's Crimson. This variety should not be grown too thin in the row, or it is apt, in good soil, to get rather large. When cooked, it is a splendid colour, and it is not liable to run to seed. There is a mistake in many of the new varieties; the colour is in the leaves instead of the roots, which, when cooked, are little better in colour than a common Mangold.

BORECOLE.—Buda, Dwarf Green Curled, and Cottager's Kale. In this latter I have always found two colours, green and purple, tinged. In planting, I discard the green, as it is very inferior in flavour and texture to the purple, which is an excellent vegetable, hardy, and not surpassed in flavour by anything except a summer Cauliflower.

BROCCOLI.—Snow's (true), Backhouse's Winter White, Williams's Alexandra (the best late Broccoli extant), and Purple Cape.

BRUSSELS SPROUTS.—Roseberry and Scrymger's Giant.

CABBAGE.—Cocoa-nut (Wheeler's), Early Dwarf York, Hardy Green Colewort, and Red Dutch.

CAPSICUM.—Long Red and Long Yellow.

CARROT.—French Horn and Altrincham Improved.

CAULIFLOWER.—Early London, Walcheren, and Veitch's Autumn Giant. The last is one of the most distinct and valuable vegetables introduced for some years.

CELERY.—A pink sort of my own raising; and Williams's Red and White are really good varieties.

CRESS.—Plain-leaved and American.

CUCUMBER.—Rollisson's Telegraph (True).

ENDIVE.—Green Curled and White Batavian.

LEEK.—Musselburgh.

LETTUCE, Cos.—London White, Victoria Cos (the latter is far the best Cos Lettuce, after midsummer, I have ever met with—large, fine flavour, and stands well), and Black-seeded Bath.

LETTUCE, CABBAGE.—Hammersmith Hardy Green and Wheeler's Tom Thumb.

ONION.—For autumn sowing, Giant Rocca and White Tripoli; for spring sowing, Nuneham Park and Brown Globe; and James's Long-keeping for winter and spring.

PARSLEY.—Myatt's.

PARSNIP.—The Student.

PEAS.—Caractacus, Sangster's No. 1 Improved, Advancer, and Champion of England. The above I sow all at the same time, and, by so doing, they come in nicely in succession. For later on—Champion of Scotland, Ne Plus Ultra, William's Emperor of the Marrows, and James's Prolific, which is the best of the Veitch's Perfection type, and is in every way an excellent Pea.

RADISH.—Olive-shaped Scarlet, Olive-shaped White, and Wood's Scarlet Short Top. The Olive-shaped are the best Radishes in cultivation, and will force well.

SAVOY CABBAGE.—Early Elm and Green Globe.

SPINACH.—Round and Prickly.

TOMATO.—Earley's Defiance and The Trophy.

TURNIP.—Red-top American Stove. The best for all seasons.

VEGETABLE MARROW.—Custard and Long White.

Staking Peas.—To those who have to procure stakes at a great cost, the following method will prove advantageous, being very cheap, simple, and easily performed. A few rough stakes should be obtained, and driven into the ground on each side of the row, about 12 feet apart. These stakes should be of a corresponding height to that of the Peas, and when the required number for a line is inserted, some tar-twine, or other strong cord, may be tied to the end stake, and passed along the line of stakes, making a turn on each within a few inches of the ground, and, as growth progresses, raise the next turn a little higher, advancing in succession, until the plants attain their full height. These lines being run on at the right time, the tendrils of the Peas will clasp firmly round them and support the plants quite equal to the well-known plan of sticking. Some imagine an advantage to be obtained in this way of training, as the lines get a better circulation of air, and pods can be gathered at all times without injuring the haulm.—J. C. M'A.

To Preserve Peas from Mice.—Either from their acute sense of smell, or some wonderful instinct, mice soon discover the whereabouts of Peas and other large seeds usually sown at this season. They are always more troublesome now than they are later in the season, and, it is astonishing what a deal of mischief a small number of mice will do in a short time. Red lead is a good preventive when used as a dressing for the seeds before sowing. I, however, object to using anything of a poisonous nature, when the same object can be easily accomplished by harmless and simple means; and the best and simplest means of preserving early-sown Peas, &c., is to scatter over the surface of the rows a few sifted ashes, just sufficient to give it the thinnest possible covering. I suppose it has the effect of destroying the scent; at any rate, I have never known this plan to fail. It is scarcely necessary to say anything about mousetraps, for every gardener is acquainted with the common brick-traps usually employed in the open-air. The best trap I have ever used for catching mice in rooms or buildings, is one called Pullinger's Patent; it does not require setting or baiting after the first bait of Wheat or Rice has been placed in the receptacle, as the mice cannot get at it. I have, with this trap, caught a large number of mice in a short time. In comparison with other traps it is expensive, its price being 2s. 6d.; but it is substantially made, and, with ordinary care, would last for a great many years, and would, in the long run, prove the cheapest.—E. HOBDAV.

THE PROPAGATOR.

PROPAGATION OF IVIES.

IVIES are propagated by means of cuttings, layers, and grafts. Cuttings make good quick-growing plants, and they root freely and easily; this, therefore, is the method generally adopted for increasing all the common kinds of Ivy. The variegated sorts may also be struck from cuttings, but some of the more delicate and slow-growing kinds are increased by grafting.

Cuttings.

For cuttings, select strong well-ripened shoots, cut them up into pieces about 8 inches in length, and insert them firmly in a bed or wall-border, in lines, from 9 inches to a foot apart, and 2 inches asunder in the row. Before planting, the cuttings should be cut across horizontally, just below a joint, and two or three of the lower leaves should be removed from them; the upper ones should be retained, and, if some leaf-soil and rough sand be added to the border in which they are inserted, it will materially assist them to root quickly. When cuttings are employed they should be put in in October or November, and left for twelve months undisturbed, and, unless the winter is very severe, they will require no protection, but, in the event of its being severe, straw or Fern may be strewn over them. Next autumn, lift and transplant them permanently, or set them in nursery lines a little further apart, so as to allow them to become stronger before they are finally planted out or for convenience. Nurserymen generally pot them in 60-sized pots, and keep them out-of-doors summer and winter, plunged in beds, their shoots being tied to upright stakes. They are thus always ready for sale; and, when potted, they can be turned out free from root-mutilation; when lifted, a large portion of their most serviceable roots are sometimes cut away in the operation. In planting out of pots the hall of roots should be carefully unravelled, every fibre being spread well out. Common Ivies are often struck at once in pots, and kept in pits or frames—in fact, generally underneath stages, but this is a practice not to be recommended, unless the situation is low and damp, and even then it is better to raise a bed for the purpose, a foot above the level of the alleys, than to be troubled with such cuttings indoors.

Layers.

Ivies naturally layer themselves as they trail along the ground, and, in that case, all that is needed is to cut the runner across with a spade, lift it carefully with all its rootlets attached, and transfer it to its new situation. In layering Ivies artificially, select good shoots, stretch them out on the ground, place small pots under their joints at intervals of about 15 or 18 inches apart, cut the joints half-way through and in a longitudinal direction for about half an inch; then peg these joints into the pots, which should be filled with a sandy compost, placing some sand about the incision, and cover the joints over with the ordinary soil to the depth of an inch or two. By doing this early in spring, and pinching out the point of the shoot after it begins to grow, layers thus treated will be found to be pretty well rooted by autumn, when they may be separated, and wintered in frames if badly rooted, but, if well rooted, a sheltered place outside will suit them. When very badly rooted, they may be left uncut till spring. Ivy may also be layered in the ordinary way without the aid of pots.

Grafting.

Grafting is a good way of propagating Ivies, provided suitable stocks are chosen, and, for this purpose, the common Irish Ivy is the best. Good plants from cuttings of this kind, struck out-of-doors in October, should be lifted and potted into 60-sized pots from July to October, using loam, with a little leaf-soil and sand mixed in it, and the plants should be kept in a close frame until they have made some good roots, and any that do not do so soon enough for autumn-grafting may be used for that purpose in the following spring. The chief point to be observed in grafting plants in pots is to have the stocks thoroughly established before they are operated on, otherwise they will be unable to contribute sufficient nourish-

ment to the scion. It is unnecessary, however, to have stocks so young as to be ill-furnished with roots, for, whether they are one or three years old, is matter of little importance. Side-grafting is the method generally employed, and the scions are put on close to the base of the stock; the ligatures used should consist of soft bast or worsted, and both grafting-wax and clay are unnecessary. The operation may be performed any time during autumn, or any time after Christmas onwards through the spring. A union between stock and scion is, however, sooner effected in spring than in autumn or winter; hence, spring should be chosen, as a rule, for grafting. After the operation has been performed, keep all close for a few weeks, a little warmth being beneficial, but not absolutely necessary, and, as soon as a union has taken place, unfasten the ligatures, and, when the scion has become fully established, pinch off the point of the stock, which, before that, should remain intact, and afterwards gradually reduce it as the strength of the scion advances, until it is ultimately cut over immediately above the point of union between graft and stock. At the first pinching of the stock, the plants may be taken out of close frames and placed on side-stages for a time; then let them be transferred to a cold frame. If necessary, the plants may be re-potted. The finer Ivies are usually grown for indoor decoration, but even when destined to be planted out-of-doors they are best grown in pots until they have become good strong plants, when they may be finally planted.

WM. FALCONER.

THE LIBRARY.

WHERE THERE'S A WILL THERE'S A WAY.*

IN "Where There's a Will There's a Way" Mr. James Cash has given an interesting account of the labours of naturalists in humble life—an account which should be read attentively by everybody, but more particularly by gardeners who would wish to rise in their profession. The book records the history of several Lancashire operatives, who, having, in many cases, quite accidentally, as it were, imbibed a taste for natural history, have followed it out during their hours of leisure, and in every case with the best possible results. Such achievements are valuable as indicating what may be done by means of energy and perseverance, even with appliances of the most limited character. We have little sympathy with those who wait for "something to turn up," instead of manfully striking out a course for themselves, and following it up until success crowns their efforts. If societies or clubs organised on the same self-supporting plan as those of Lancashire were diffused throughout the country, an immense amount of good might be effected. The following extract with reference to one of our best miscologists will show the style in which the author has treated his subject:—

"Mr. William Wilson, as a botanist, enjoyed a reputation hardly inferior to that of Sir William Jackson Hooker—whose intimate friend he was for many years—and others, whose names have been more prominently before the public. His *magnum opus*, the 'Bryologia Britannica,' published in 1855, is acknowledged to be the best work on British Mosses that has ever been published, and at the time of his death, on the 3rd of April, 1872, a new and enlarged edition of it was in contemplation. As a bryologist, indeed, no man living was a better authority. The late Mr. Wilson's friend and correspondent, Professor Schimper, of Strasbourg, can be said only to have equalled him, and even that eminent man yielded the palm to our countryman in the matter of manipulation. It is said that, when in Warrington, a few years ago, the professor was astonished to find Mr. Wilson sketching with one hand and dissecting with the other, and he could not find words in English to express his feeling—'Non equidem invidéo; miror magis.' . . . Only a fortnight before Mr. Wilson died, the publishers of the 'Bryologia,' Messrs. Longmans, wrote, saying that Dr. Hooker, of Kew (the son and successor of the distinguished Sir W. J. Hooker in the curatorship of the Royal Botanic Garden) had expressed an opinion that, as the 'Bryologia' was so frequently asked for, it would be desirable to reprint the first edition as it was, unless Mr. Wilson was likely to be able to prepare a new one in a very short time. The hopes, however, of so many friends, who looked forward to the new edition from Mr. Wilson's own hands—and for which that gentleman had spent two years in gathering material—were cruelly disappointed by his death."

* "Where There's a Will There's a Way." By James Cash. London: Robert Hardwicke, 192, Piccadilly, W.

THE INDOOR GARDEN.

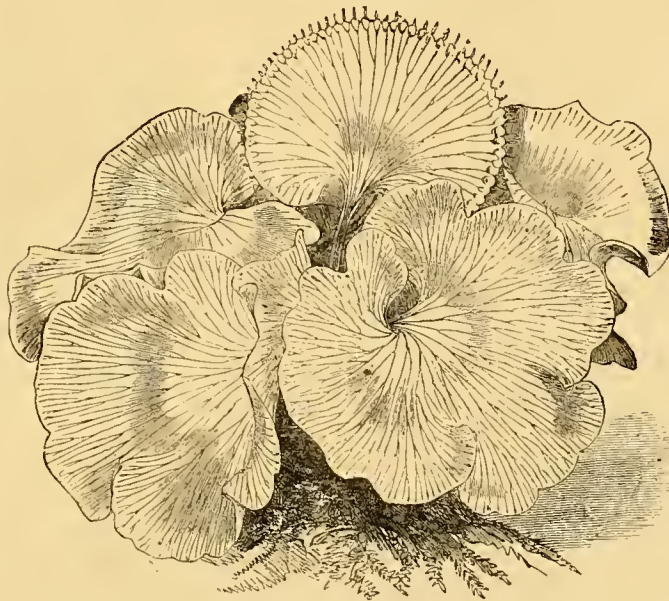
TRICHOMANES RENIFORME.

THIS, to which allusion was briefly made at p. 318, Vol. IV., is one of the most remarkable of all the Filmy Ferns, and is well worth growing either under a glass shade or in a Wardian case as an ornament in a sitting-room. The accompanying illustration gives an excellent idea of the habit of the plant, of which fine examples may be found in Mr. Williams's collection at Holloway. It succeeds well in an open fibrous compost of peat and turfy loam, intermixed with a little living Sphagnum, and coarse well-washed road or river sand, to keep the whole as porous as possible. When the plant is throwing up its young fronds, it should be watered freely, taking care to use water not lower in temperature than that of the room or case in which it is growing. It should be kept drier during the winter than in summer, but must never be allowed to get altogether dry. It should be sprinkled overhead occasionally with clean tepid water, and the glass with which it is covered should be regularly wiped every other morning. When in good condition, it is one of the prettiest of all tender Ferns.

B.

PHALÆNOPSIS.

THE different species belonging to this genus have long been considered to be the rarest and most beautiful of all Orchids; and, as no collection of the warmer-growing kinds is complete without them, a few remarks on their culture may prove useful. These beautiful plants, with one or two exceptions, come from the hottest and most humid portions of the earth's surface—viz., Java, Borneo, Sumatra, and other islands of the Malayan Archipelago; while a few are found on the Continent of India itself, their principal habitats being Moulmein, Rangoon, and the Eastern Himalaya; one or two are, also, natives of the Philippine Isles. In cultivation, they require the warm humid temperature of a plant-stove, or East Indian house; for, of all Orchids, these are the least likely to adapt themselves to what is generally termed "cool treatment." *P. Schilleriana*, however, perhaps the hardiest of the whole group, grows moderately well in a warm Cattleya-house, or cool plant-stove, where the temperature does not descend below 50° during winter. But it is best to grow all the species together in a warm corner, where the winter temperature is regular, and never below 60°. When well-grown, few other Orchids rival these in graceful beauty, while they are not only profuse bloomers, but their delicate white or rosy-tinted flowers last in perfection for many successive weeks; indeed, it is nothing uncommon for *P. amabilis* and *P. grandiflora* to be in flower for six or eight months out of the twelve, while it is a rarity to find *P. rosea* except in bloom. Mr. Robert Warner has had over 1,000 *Phalænopsis* flowers fully expanded at the same time in his collection at Chelmsford. Young plants, with only one or two leaves, frequently throw up flower-spikes, and, if allowed to flower, they often seriously injure themselves in so doing. It is best in practice to pinch off all flower-spikes as soon as they appear, until the plant has become thoroughly well established, for nothing tends so much to weaken their constitutional vigour as early flowering. *Phalænopsis* may be propagated by dividing plants that break from the base, and some plants do so very freely, especially if the leading growth becomes checked or injured in any way, while not unfrequently some of the species produce young plants adventitiously on their old flower-stems. *P. amabilis*, *P. grandiflora*, *P. Schilleriana*, but more especially *P. Luddemanniana*, frequently throw off young plants in the way just named. When these plants commence to emit roots, they can be fixed on small flat blocks or rafts of teak or acacia-wood, and left on the parent plants until



Trichomanes reniforme.

established firmly in their new quarters, after which they can be severed from the plant and treated as separate individuals. During the summer months, a little fresh living Sphagnum Moss placed around the fleshy roots of plants on blocks is beneficial, as it preserves them from extremes of moisture and exposure to the sun. Small plants do best on blocks suspended in a close warm corner of the house, and near the light. As they increase in size, they can be partially plunged in well-drained pots, taking care, however, not to hamper the roots with too great a bulk of finely-divided compost, which is apt to settle down among the drainage and become sodden, in which case the roots embedded will speedily rot. In Orchid-houses, which are naturally dry, the roots of nearly all Epiphytal Orchids seem quite willing to keep to the shade and moisture afforded by rough lumps of fibrous peat and fresh Sphagnum; but only supply them with a genial temperature, saturated pretty regularly with the soft vivifying humidity in which they luxuriate so vigorously in their native habitats, and the roots will soon creep out into the light and air, wrap themselves round pots, blocks, or anything that comes in their way, or even bind themselves together in bundles. If *Phalænopsis* are grown in pots—and we know that noble specimens are so grown—the compost used should consist of the best fibrous peat obtainable, carefully broken into lumps the size of pigeons' eggs,

or larger, and mixed with an equal quantity of crocks and fresh living Sphagnum. The pots themselves should be thoroughly clean, and may be filled four-fifths of their height with fresh crocks well washed, placing a layer of small ones on the top, and a layer of good tough Moss above that, to prevent the smaller particles of the compost from washing down and choking the drainage below. Elevate the collar of the plant well above the rim of the pot, and gently imbed the lower roots into the above compost, placing a layer of freshly-picked Moss over the whole, so as to form a rounded cone with the plant at its apex. Plants potted in this manner rarely fail to grow well, as the air has free access to the roots; and, unless this is the case, they soon go wrong, while it is almost impossible for them to be injured by any undue excess of water, as there is every facility for any superfluity of moisture to escape. The secret of Orchid-growing is

genial humidity in the atmosphere, small pots well drained, fresh living Sphagnum on the surface of the compost, and an abundant supply of tepid water, and a regular temperature when making their growth. Some of the finest specimens of *Phalænopsis* in this country are grown in pots. A superb example of *P. Schilleriana* in the collection of Mr. Milne, Yewfield House, Arbroath, is growing in a great tub, and bears nearly 200 flowers on a single spike! Mr. Rawson, of Mill Hill House, Halifax, has some remarkable specimens of *P. amabilis* and *P. grandiflora* with ten or twelve fine leaves each, and these are grown in common square wooden baskets, suspended near the roof of an ordinary span-roof plant-stove. On one plant of *P. grandiflora* I saw eighteen flowers on the tip of a branched spike all open at the same time, and these were nearly 4 inches across, and of good substance. It is seldom one sees nine fully-expanded flowers on each side of the tip end of a single spike, as above described; although we occasionally come across a plant bearing fifty or sixty flowers open at once on several great branched spikes. Mr. Turner, of Leicester, grows his noble plants of *Phalænopsis* on semicircular rafts made of teak, and surfaced with fresh Sphagnum only; and when I saw them, some months ago, they were perfect in health and vigour. Messrs. Veitch & Sons, of Chelsea, have a noble plant of *P. Schilleriana* growing on a teak-wood raft, partially plunged in a pot of fresh open compost, as above described. This specimen has ten or more fine speckled leaves in that state of fresh vigorous health so pleasing to the true plant-grower, and it is now bearing a noble spike of nearly a hundred flowers. I mention these diverse methods of treatment in order to show that there are several ways of growing *Phalænopsis* in perfection. They grow best, as a

rule, in a warm, sheltered corner, not far from the glass; and the beginner who would be successful, should try them in different positions in his house until he is perfectly satisfied as to the position in which they do best. Fortunately, some species of *Phalenopsis* have been imported in quantity, and in excellent condition; their price is, therefore, now moderate. Imported plants generally come on long blocks, and, occasionally, a part of the branch on which they grew in their native habitats is lopped off and nailed to the side of the case with the plant *in situ*. If these plants arrive during dull weather or in the autumn, it is best not to disturb them until the following spring, when they may be removed, and either placed on other blocks or potted as above recommended. When well bloomed, the plants are very ornamental from a decorative point of view, or for exhibition purposes; while their waxy flowers are invaluable for cutting, either for bouquets, vase decoration, dinner-table ornaments, or for arranging along with fresh green Ferns or other foliage in ladies' hair, especially as they last in perfection for a considerable time after being cut. The following descriptive list comprises all the species at present introduced to our gardens:—

P. amabilis.—This is generally known as “the Queen of Orchids,” it has dark green foliage tinted with purple beneath, and its branched flower-spikes are borne very freely, its individual blooms lasting a month, or even longer, in perfection. The flowers vary from 2½ to 3½ inches across, and are of pearly whiteness, except the lateral or side lobes of the lip, which are streaked with rosy-crimson. Good specimens of this plant have from eight to fourteen leaves, and bear spikes from 2 to 4 feet long. When well grown it is one of the best of *Phalenopsis*, and its snowy blossoms are useful for cutting. It is a native of Manila.

P. amethystina (*P. Wightii*).—This pretty little plant is rather rare in collections, and is not so showy as some of the other species; still it is well worth growing, and lasts a long time in bloom. It has deep green oblong foliage, with wavy margins, and bears short-branched spikes, which vary from 3 to 12 inches in length. The flowers are little more than half-an-inch across, the sepals and petals being white, dotted with rosy-purple at the base. The lip is of a deep amethyst-purple tint, tipped with white, and having two slender horns at its base. It is a native of the Sunda Isles, and has flowered with Dr. Ainsworth, Mr. C. Stead, and Mr. Day, of Tottenham.

P. cornu-cervi (Stag's-horn *Phalenopsis*).—This is a peculiar plant, somewhat resembling *P. Luddemanniana* in habit, but bearing shorter flattened spikes of yellow flowers, blotched transversely with brown. The flattened flower-spike is a peculiar feature; hence its specific name. It grows well treated like its congeners, and is worth cultivation for the sake of variety. It was discovered by Mr. Lobb, and is known as *Polychilos cornu-cervi*. Native of Moulmein.

P. grandiflora.—This is now one of the commonest of all the species, and may be bought for shillings where guineas were formerly demanded for it. It is one of the best and most profuse flowering of *Phalenopsis*, and grows well either on a block or in a pot near the light. There are numerous varieties of it in cultivation, all more or less distinct, the Bornean plants being for the most part the best. The sepals and petals, like those of *P. amabilis*, are pure white, the lateral lobes of the lip being tinted with golden-yellow; and, in the best forms, the tails at the tip of the lip are yellow, spotted with crimson. The best variety is known as *P. grandiflora aurea*, or *Ruckerii*, and has the side lobes of the lip deeply stained with golden-yellow, while the petals are very broad and more rounded than is generally the case. The varieties of this grand Orchid not only vary in the size of their flowers, but also in the length and breadth of their light green foliage. Mr. Williams, of Holloway, has a fine plant of it, with ten or twelve fine leaves borne on a stem nearly 6 inches high, and this is now producing two very strong spikes. Mr. C. Stead, of Baildon, near Leeds, has a fine plant of the narrow-leaved variety, with fourteen or fifteen leaves 10 to 15 inches long, and only 2 to 2½ inches broad. This is a Bornean plant, and flowers very freely, bearing large flowers of good substance. Native of Borneo and Java.

P. intermedia (*P. Lobbii*).—This plant is very beautiful, having white flowers shaded with rose, about the size of those borne by a small-flowered *P. Schilleriana*, the lip being of a still deeper rosy-tint. In habit it resembles its allies, and it also does well under the same treatment. It is a native of Manila. There is a fine variety of this species known as *P. intermedia Portei*, a native of the Philippine Islands, only a solitary plant having been found by M. Portei, its discoverer. Its foliage is light green above, and purple below; being 8 or 10 inches in length. It is supposed to be a natural hybrid, and is one of the rarest of all known Orchids. The flowers are 2 inches across; sepals and petals white, suffused with rose; the lip being of a dark rosy-purple tint.

P. Lowii.—This is a pretty little species that grows best on a block suspended near the light. Its bears eight to ten-flowered

spikes, about a foot high; the flowers themselves being of a soft rosy-lilac tint. The front of the column is curiously prolonged, like the beak of a bird. In its native habitat it grows on limestone, fully exposed to the sun, and loses its foliage every year during the hot and dry season; but, here at home, the plant frequently retains its foliage through the winter months. Its leaves are about an inch wide, and 2 or 3 inches long, of a dark-green colour, speckled with purple. Mr. Bockett, The Firs, Muswell Hill, has a fine plant of this species, with leaves nearly 4 inches long and 2 inches wide; and it also does well in Lord Lonsborough's collection. It should be kept rather dry during winter, and fully exposed to the light, or it is apt to lose its leaves. It comes from Moulmein.

P. Luddemanniana.—This is one of the most beautiful and distinct of all the *Phalenopsis*; having leaves of a bright-shining green, and about 6 or 8 inches long. The flower spikes are very variable in length, but generally about 18 inches or 2 feet; the flowers being of a soft amethyst-purple tint—in the best varieties blotched with brown—the narrow lip being set with a row of white hairs down its centre. There is a poor variety of this plant, having pale yellow flowers, barred with brown, called *P. Luddemanniana ochracea*, but the amethyst-tinted varieties are best. This plant grows very freely in a pot, and very often produces young plants on its flower-stems. There is a fine plant of the best variety in Mr. W. Hadwen's collection at Fairfield, near Manchester, which seldom fails to bear two or three young plants every year. Philippine Isles.

P. Parishii.—This is the smallest, and, at the same time, one of the prettiest of all the *Phalenopsis*. Its leaves are about 2 inches long and of a grey or glaucous tint. The small violet and white flowers are borne five or seven together on spikes about the same length as the leaves. Although not so showy as the larger-flowered kinds, it is, nevertheless, well worth cultivation. Native of Burmah.

P. rosea (*P. equestris*).—This is a pretty plant, similar in habit to the last named, and worth growing in every collection for its free-blooming qualities. Its flower-spikes are of a deep purple colour, and keep on producing flowers for months in succession. The flowers are of a soft rosy-lilac colour, scarcely more than half-an-inch across, but the want of size is made up for by the numbers produced. There is a good plant in Mr. B. S. Williams's collection, and another at Kew. It is a free grower, and comes from Manila.

P. Schilleriana.—One of the best of all Orchids with variegated foliage, bearing great branching spikes 3 or 4 feet high, with from 100 to 200 rosy flowers fully expanded at the same time. Few of the other species rival this when well grown, and the plant is hardier in constitution than any of the others at present introduced. The leaves are of a deep green colour, variously mottled and marbled with silvery-grey. The sepals and petals are of a rosy-lilac colour, the lip being tinted with rose and spotted at the base with warm crimson-brown. It does best in a pot, although small plants luxuriate well enough on flat blocks. It is a native of Manila.

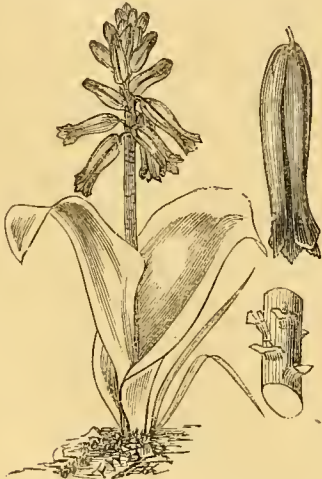
P. Sumatrana.—The foliage of this plant resembles that of *P. Luddemanniana*, and it grows well under the same treatment as recommended for the last-named species. The flowers are white, barred with pale rosy-crimson, and about 2 or 2½ inches across. It flowered with J. Day, Esq., of Tottenham, in 1865, but is still extremely rare in collections, although well worth growing. As implied by its specific name, it comes from the island of Sumatra.—*Gardener.*

Philesia buxifolia.—This pretty evergreen shrubby plant is a native of South America, and is hardy in the warmest parts of England and Ireland; it, however, succeeds best when treated as a cool greenhouse plant. Its leaves are short and stiff, not unlike those of Box, and it produces a profusion of bright rosy-red flowers, the petals of which are thick and fleshy, and not unlike those of *Lapageria rosea*, but much smaller. Indeed, the relationship between the two genera is so close, that Messrs. Veitch raised a hybrid between the *Philesia* and the *Lapageria*, which they called *Philageria*. In this case the *Philesia* was the male and the *Lapageria* the female parent. The finest specimen of the *Philesia* with which I am acquainted is that in Dalvey Gardens, Forres. It is in a 14-in. pot, and is fully 3 feet high and 3½ feet through, a dense mass of erect shoots. It is grown in an airy greenhouse, on a central bench near the glass. Mr. Berry, the gardener at Dalvey, finds that it does not bloom well unless it is considerably pot-bound; therefore, he only re-pots it once in four or five years, using in the operation a compost consisting of peat and loam. It is now three years since the plant in question was last shifted, and the pot is as full of roots as it well can be; indeed, they are even over-running the surface. Its growths are remarkably healthy and strong, many thick-branched shoots, fully 3 feet long, being annually produced. Whilst growing, this plant requires abundance of water, and sometimes a little weak manure-water; but in winter it should only be kept moderately moist.—W. F.

BROAD-LEAVED LACHENALIA.

(LACHENALIA PENDULA.)

THIS is an old plant, but it is one which is rarely met with in collections of bulbous plants. In habit, it is quite distinct from its congeners, having very broad and massive leaves, of a fresh green colour, and not blotched or spotted, as is the case with many of the others. This species was lost sight of for some years, until it turned up at one of the meetings of the Royal Horticultural Society in November last, when it was exhibited in good condition by Mr. Chambers, of the Westlake Nurseries, Spring Grove, Isleworth. Our figure, made from a sketch taken at the time, shows the habit of the plant extremely well. The stout spikes are about a foot high, as thick as a swan's quill, slightly stained, or blotched, with crimson, the flowers being of an orange tint, tipped with green and purple. The segments of the perianth, as shown in our illustration,



Lachenalia pendula.

are all about the same length. It succeeds well, like the other species of the genus, in a cool greenhouse.

Reineckia carnea variegata.—This is a pretty little plant, with green and white variegated leaves that have a somewhat Grassy appearance, and are thickly produced on prostrate or pendent Dracæna-like stems. It produces annually a profusion of showy rosy flowers, and it is easily cultivated as a pot plant in a greenhouse. It grows well in peaty soil, or in loam mixed with leaf-mould, but in this respect it is not particular. Plants of this are useful for growing with Ferns in shady corners, where they thrive almost as well as if exposed to light. They are more suitable for growing in pots than in baskets, because when alone they flourish best. Their slender shoots or stems droop down over the sides of the pots in which they are placed so as almost to entirely hide them. This plant is readily increased by means of cuttings struck in a little heat, or from layers. It is very suitable for window, as it is tenacious of life, and grows well in a low temperature, and in a shady place.—F. W.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

White Forced Lilacs.—What is the name of the White Lilac which forces so well, and when ought it to be potted for winter-flowering?—**STRINGA.** [The White Lilac, seen in our flower markets in winter and spring, is the common purple Lilac forced in darkness, a system of culture largely practised in France. The plants should be potted (see p. 181) in the October previous to that in which they are to be forced.—**EN.**]

Scarborough Lilies.—A friend has sent me some bulbs under this name. What are they?—**G. S.** [Your bulbs are, doubtless, those of *Vallota purpurea*, which, though a Cape plant, is often called the Scarborough Lily. It succeeds perfectly in a greenhouse, and, if treated liberally in summer, especially as regards water, it will flower freely in autumn.—**EN.**]

Camellia Cuttings.—When should these be struck? and what is the best method of striking them?—**T. G. H., Alston.** [August is the best time for striking cuttings of Camellias. Select good firm shoots, cut them about 6 inches in length, and insert them in pots filled with peat and silver sand in equal proportions, and surfaced with the latter. Place the pots containing the cuttings under a hand-glass or frame in a gently-heated pit. When rooted, remove them to the side shelves, but do not disturb them at the root till next spring, when, if they are in good condition, they may be potted singly in small 60-sized pots.—**ED.**]

THE FRUIT GARDEN.

RASPBERRY CULTURE.

THE main question at issue between Mr. Taylor (see p. 168) and myself seems to be this: What ought to be the duration of Raspberry plantations? Mr. Taylor says, in effect, do not make a new plantation so long as the old one bears well, and he takes his stand upon a plantation in his mind's eye, from twenty to thirty years old, thereby suggesting that Raspberries ought, at least, to last that length of time. My advice is, do not delay making the new plantation till the old one fails; it is obvious, however, that, whether the period of duration shall be six, ten, or more years, must depend, in some measure, upon local circumstances, always, carefully bearing in mind that it is not easy to do wrong by transplanting too frequently, whilst a mistake in the opposite direction would certainly, for a time, curtail the supply. In the ordinary course of cultivation, I would not take cuttings or save seeds from a sickly plant, and, on the same principle, I would not willingly plant suckers from an exhausted Raspberry plantation. Raspberries are indigenous to Britain, and I have seen acres of them growing wild in woods, but, as might have been expected, I always found the strongest canes and the finest fruit on the outskirts of the thicket where the roots had access to fresh soil, and the canes had more breathing-room. I consider the system of culture that permits them to remain from twenty to thirty years in one place tied up in a most unnatural manner in bundles is but one degree removed from their wild state in their native thickets. There are, I know, in a few spots, deep soils of alluvial origin, where the Raspberry will continue in bearing condition for many years; but even there I am far from admitting that a more frequent removal would not be beneficial. These, however, are exceptional cases, and cannot be fairly considered as applicable to the majority of gardens. Mr. Taylor, in his closing remarks (to use his own words), offers me a nut to crack. In effect, he says, that some years ago he assisted in planting several rows of Raspberries; that for the first two or three years they grew immensely, producing canes like Bamboos, and with eyes a foot apart, and then he adds—Strange to say, they produced very little fruit, and asks what was the reason? I may be allowed to ask, does not this description of early luxuriance tend to confute Mr. Taylor's exhaustion theory started in the early part of his communication. The solution to the problem just propounded lies in a nut-shell; it is, I think, a clear case of "plethora," caused by over-feeding; probably, the plants were planted in trenches full of manure; at any rate, too much food of a stimulating character had been placed in contact with the roots. I have already stated that, in my opinion the land should be deeply trenched for Raspberries, burying the manure at the same time. When bearing commences, and the roots extend, they will, in that case, find food ready prepared for them. Plant without manure, but, if the soil is very inferior, a compost, consisting of burnt earth, lime-rubbish, and loam may be advantageously used, a spadeful or so being put into each hole just to give the roots a start. Above all things, at the commencement of dry weather, do not forget to mulch; the water-cart will not then be so often required; in fact, I seldom water; and, with a soil deeply cultivated and mulched, there is not much necessity for it in nine seasons out of ten. As to frost killing Raspberries, the destruction is not always fairly due to the severity of the weather; there are predisposing causes, induced, in some instances at least, by the system of culture pursued. In the case of over-luxuriance, when I thin the young growths in summer, I leave the weakest and cut away the gross shoots, on the same principle that we pinch a gross shoot in a fruit tree, and, in the winter-pruning, do not cut the canes back to the orthodox 4 feet, but leave them longer, say up to 5 feet, or longer if necessary. If they are trained to wires, espalier-fashion, as I have previously recommended, and trained diagonally in an oblique direction, it will have a tendency to break the back eyes, and the best way of moderating growth is to leave the canes a good length and let them bear well. Suckers not required for new plantations should not be allowed to grow; and, in forking over the ground, they should be cut off without injury to the roots.

E. HOBDAV.

THE DIFFERENT RACES OF STRAWBERRIES.

In a recent number of THE GARDEN we called attention to the second edition of the treatise "Le Fraisier," which the Comte de Lambertye has written on the history and culture of this fruit, to which much more attention has been paid by continental cultivators than by our own fruit-growers. The following extract from the first section of M. Lambertye's work, which describes the geographical distribution of the original species, will perhaps be interesting to some of our readers. After remarking that the French name of the Strawberry-plant (Fraisier) is derived from the Latin word fragrans, in allusion to the sweet smell of the fruit, the Comte proceeds as follows:—According to Jacques Gay—a learned botanist, who made a very attentive study of these plants—Strawberries may be classed under eight distinct species, which are thus distributed:—Three European—*F. vesca*, Lin.; *F. elatior*, Ehrh.; *F. collina*, Schrb. Three American—*F. chilensis*, Duch.; *F. virginiana*, Mill., Ehrh.; *F. Grayana*, Elisa Vilm. Two Asiatic—*F. Daltoniana*, Gay; and *F. Nilgerrensis*, the two last being natives of northern India.

Descriptions of the Species.

EUROPEAN KINDS.

1. *FRAGARIA VESCA*, Lin. (The Wild Strawberry).—This is the most common species of all, and is found in the mountainous parts of Europe, as high as the region of the Pines. In the Alps, it ripens its fruit in August, at an elevation of over 5,000 feet. It is found as far north as Iceland and Lapland, and occasionally occurs in Asia and America. Of this species the following are the chief varieties:—(1) *F. semper-florens*, which in France is known under the name of des Quatre-saisons, or de tous les mois. (2) The very curious variety, *F. muricata*, or the Plymouth Strawberry, the petals of which present the strange anomalies of being five-lobed, and green instead of white, while the stamens are transformed into small leaves. The seeds on the fruit are also transformed into leaf-buds. (3) *F. monophylla*. (4) *F. efflagellis*. This variety does not produce runners. (5) *F. multiplex*, with double flowers; and (6) *F. hortensis*.

2. *F. ELATIOR*.—Known in England as the Hautboy, and found in certain localities, here and there, throughout Central Europe. It is generally dioecious, from a partial abortion of the flowers, so that it is often found sterile in a wild state, and sometimes, even when grown in gardens. The chief original varieties of this species, which is known in France under the name of Capron, are (1) Capron royal, of which every plant is fertile, and (2) Capron framboise or Capron noir. All the Caprons, or Hautboys, have a peculiar flavour, very distinct from that of all other kinds of Strawberry.

3. *F. COLLINA*, Schreb.—This species is very widely distributed over Central Europe, and extends partially into Asia. A peculiarity of this kind is, that the calyx covers the fruit in the form of a star, hence its French name of Fraise étoilée. Its principal varieties are (1) *F. pentaphylla* or *F. heterophylla*, and (2) *F. Hagenbachiana*, the variety in cultivation. This is known as the Bargemon Strawberry, and is the famous Majaufe de Provence of Duchesne. Jacques Gay considers it a hybrid between *F. vesca* and *F. collina*.

AMERICAN KINDS.

4. *FRAGARIA CHILENSIS*, Duch. (the Chili Strawberry).—This plant, which is a native of Chili, and probably, also, of California, is only found on the Pacific shores of America. It is distinguished from all other species by the greater size of its leaves, flowers, and fruit. It was introduced into France in the year 1712. The flowers are liable to become sterile from abortion. It does not succeed very well in the neighbourhood of Paris; but is grown on a large scale, and with much success, in the commune of Plougastel, near Brest. Its original varieties are—(1) *F. Ananassa* (the cultivated type, *F. grandiflora*); and (2) *F. de la Caroline*. This Chili Strawberry and its variety, *F. Ananassa*, are the origin of most of the large-fruited Strawberries which have been obtained by hybridisers.

5. *F. VIRGINIANA*.—Mill. Ehrh. The Old scarlet or Original scarlet of the English. This kind is named in the catalogue of Jean Robin (botanist to Louis XIII.), so far back as 1624.

Either from natural hybridisation or from artificial crossing with the Chili Strawberry, it has been the parent of many varieties.

6. *F. GRAYANA*, Elisa Vilmorin (*F. Asa-Gray*).—A North American species, closely allied to *F. virginiana*. A variety of it (*F. Incida*) has shining leaves.

ASIATIC KINDS.

7. *F. DALTONIANA*, Gay, and 8. *F. NILGERRENSIS*, at present are only to be found in Europe in the condition of dried specimens in herbariums.

From the foregoing original species, numerous varieties have been raised in gardens. A list of twenty-four of the best kinds, classed according to their distinguishing qualities, is given by M. de Lambertye, as follows:—(1) Varieties, which combine all the excellencies of fine flavour, fertility, beauty, and hardiness—Avenir, Gabrielle, Marguerite, Marquise de Latour-Maubourg, Sir Harry, Souvenir de Kieff, and Wonderful. (2) Varieties, which produce the most exquisitely-flavoured fruit—Avenir, Belle Lyonnaise, Carolina superba, Doctor Hogg, Gabriel, Madame Nicaise, Marquise de Latour-Maubourg, Quatre-Saisons, Savoureuse, Sir Harry, Souvenir de Kieff, and Wonderful. (3) Varieties which produce the largest fruit—Anna de Rothschild, Belle de Sceaux, Doctor Hogg, Marguerite, Napoleon III., Muscadin de Liège, Sir Joseph Paxton, Sir Harry, and Victoria (Trollope). (4) Varieties which bear carriage best, and which from the firm nature of the fruit are most suitable for making preserves—Avenir, Belle Lyonnaise, Bonté de Saint Julien, Carolina superba, Madame Nicaise, Marquise de Latour-Maubourg, Sir Joseph Paxton, Souvenir de Kieff, and White Pine-Apple. (5) The latest-ripening varieties—Anna de Rothschild, Bonté de Saint-Julien, Doctor Hogg, Napoleon III., and Wonderful.

Points to be Observed in Judging Orchards.—The following is the scale of points adopted by the committee of the Michigan Pomological Society, for the purpose of facilitating the examination of the large number of orchards in different parts of the State, entered for the premiums offered by the society.

	Apples.	Pears.	Peaches.	Plums.	Grapes.	Small fruit.	Nurseries.
Soil	15	20	10	10	15	20	52
Protection	5	10	25	10	15	10	10
Market	5	10	10	15	10	20	5
Variety and arrangement	15	10	10	10	10	15	25
Culture	10	10	10	10	10	5	15
Pruning	10	10	10	5	15	15	15
Health, and absence of insects	20	20	20	20	20	20	20
Fruitfulness	5	5	5	5	5	5	—

Any orchards receiving all the numbers as high as those given, would, of course, be regarded as perfect, and various lower grades of merit would be indicated by smaller numbers. This scale of points would vary somewhat from the above in other States or localities, when the different qualities or departments in management become mere or less prominent or important, but such a table would be of great use to any committee about to make similar examinations.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Fruits admitted by the French Pomological Congress in 1873.—Cherry (of the Black Heart class), Pourprée Hâtive. Very large; stalk, long and slender. A productive, very early sort. Raspberry, Surpasse Fastolf—A commendable variety, producing two crops of fruit. Pear—Benrê de Nivelles—An excellent late variety, raised by M. Parmentier. Pear, Jules d'Airoles—A seedling, from M. Léon Leclerc, of Laval. Flesh, delicate, juicy, melting, tender. Ripens in December. Apple, Bouque preuve—A late-flowering variety, largely cultivated around Marseilles. Apple, Rose de Provence—Another good Apple, widely distributed in the south. Grape, Tsehachou Safra Usum—Handsome bunches, with large white berries. Introduced from Turkey.

Receipt for Making a Mixture for Painting Vines, Peaches, and Figs.—Take 1 lb. of soft-soap or Gishurst Compound to every gallon of water, and let the water be boiling hot, so as to thoroughly dissolve the soap. Add ½ lb. of flowers of sulphur to every gallon of water, and as much quick lime as will bring the mixture to the consistence of thick paint. Mix all well together when the water is hot, and, when the mixture gets cold, add a gallon of strong tobacco-liquor to it. When painting this mixture on Peach trees, it is safest to reduce its strength by adding a little more water, and some clay as well, so as to take off the whiteness of the lime, which is an eyesore to some when looking at the trees. Before painting this mixture on Vines and Figs, remove all the rough bark, and, when the mixture is dry, it will be seen where any part or crevice in the wood has been missed. Where such occurs, apply the mixture again.—W. TILLERY, Welbeck.

WORK FOR THE WEEK.

Conservatories.

THE materials for keeping up an effective display in conservatories will now have become more plentiful than during winter, and one of the most important considerations is, to see that portions of such things as will bear retarding without injury are at once placed under conditions to ensure their being made available later in the season. Where, indeed, anything like a continuous supply of blooming plants is required, it is quite necessary to have at command a house so placed that the sun will have little influence upon it, except for an hour or two morning and evening. A lean-to with a north aspect is best. Many imagine that such houses are only required by those who retard plants for purposes of exhibition; this is a mistake. By selecting a portion of the stock of Camellias, Azaleas, Epacris, Geraniums, Cinerarias, Cyclamens—in fact, any of the numerous greenhouse plants that are used for conservatory decoration, the blooming season may be prolonged to almost double its usual length, especially if judgment is used in selecting varieties that are naturally late in flowering. Camellias—candidissima, fine white; Bealii, red; Lavinia Maggi, striped;—Azaleas—Brilliant and Juliana, both red; Extrani and coronata, both bright rose; Gledstanesii formosa, white striped;—Epacris—Eclipse, grandiflora, rubra, and miniata splendens. These, and others, which the careful observer cannot fail to note, can be retarded without injury, so as to come in at a time when they will be found of great use. And it is not only during spring that such a house will be found of the greatest value; it will also be an excellent place in which to harden the stock of Ghent Azaleas, double-flowering Plums, Lilacs, Spiræas, &c., that have been forced, and which frequently, from want of a suitable place, are subjected to treatment ill calculated to render them of use the following season. Later in the season, too, it will suit Camellias well that have set their bloom, and which, from want of proper accommodation, are turned out of doors; still further on in the season, late-flowering Chrysanthemums may be kept safely in such a house until the middle of January, at which time they will be found most useful. Large Camellias, which have got leggy from want of judicious pruning when young, or through overcrowding, may be improved in the following manner:—Take, at once, a couple of healthy young plants, in 6-inch pots of any approved kind, place these on the surface of the ball of the plant to be operated upon; then inarch the heads of each of the young plants as low down as they can be got on the opposite sides of the large plant. These will become firmly united during the summer, when they may be severed from their original stems; and, in the following season, before growth commences, the head of the stock may be cut away just above where the young plants have been inarched, when they will commence to grow apace, and, in a little time, make handsome plants. Moveable shading, of thin material, should be got ready, as bright sunshine on a March day makes short work of many things in flower. Pinch out the points of a portion of the stock of Pelargoniums. These will be useful in July, after the early ones are over. Start another batch of Achimenes, Gloxinias, and Tydæas for summer decoration. See that Lilies, breaking through the soil, are not left where they have an insufficiency of light; otherwise they make weak growth, which no care afterwards will put right.

Orchids.

Last month and the present one constitute the recognised season for re-potting Orchids; it is, however, almost impossible to adhere strictly to this rule, other departments requiring so much attention at this busy time of the year; Orchid-potting and overhauling are, therefore, for the most part, done in winter. For such as are quite dormant, winter-potting is quite applicable, provided the plants are kept dry after the operation until required to start into growth. Lælias, Cattleyas, Angreecums, &c., also Oncidiums on blocks, and others, may be safely treated in this way; whereas terrestrial Orchids, such as Phajus, Miltonias, Calanthes, Sobralias, Bletias, &c., should be shifted just as they begin to grow. Now, when all Orchids are in a growing state, a moist atmosphere and a gradually-increasing temperature should be maintained. Sprinkle water on the paths, walls, and stages, and keep a supply in the evaporating troughs. Syringe the plants daily, in time to permit the foliage to get dry before nightfall. Take care that plants on blocks are not hung up immediately over pot-plants, as the drip from them injures the leaves of the latter. See to the eradication of insects, such as green-fly, thrips, scale, &c., by fumigating or washing with water in which some soft-soap or Gishurst compound have been mixed. Let traps for cockroaches, in the form of jam-dishes with some treacle and water in them, be set amongst the plants, so that, when these pests fall into them, they may get drowned. Phosphorus paste also kills them. Ants may be trapped by means of sponges steeped

in sugar and water, or in other sweet substances, placed here and there amongst the pots. Ants congregate on them in thousands, when they may be destroyed by plunging the sponge into boiling water. After the water cools, wring out the sponges, re-steep them in the sweet matter, and place them again amongst the pots. Fresh bones form excellent traps for ants, which should be thrown into boiling water every morning, as in the case of the sponges. Trap wire-worms with cut Potatoes, and woodlice by means of little pots containing dry Moss.

Indoor Fruit Department.

Pine-apples that have not been already shifted should now be re-potted or transplanted into beds. Whether grown in pots or planted out in frames or pits, the heating material should be entirely or partially renewed. If fire heat is used for bottom-heat, greater care than would otherwise be necessary must be exercised in watering, as the bottom part of the soil frequently becomes dry, when that on the surface is apparently quite moist. Now that the store-plants are beginning to push, the atmosphere, as well as the soil in which they grow, must be kept moist. Ventilate a little during the heat of the day, and cover the frames with mats at night. Fig-trees in pots will be swelling their fruits; therefore, some liquid-manure given to them two or three times a week will be of great importance to the crop; mulchings of manure answer the same purpose. Those on walls or on front trellises should be started in succession, by closing up the house, syringing twice a day, and stopping the shoots at the third and fourth joints. Pot-Vines, if liberally fed, will produce good crops; and, as they are frequently thrown away after bearing, as many bunches may be left on them as they can properly mature and colour. Thin Grapes in general, stop and rub off young shoots, encourage good foliage, and maintain a brisk moist temperature except in late Vineries. All old Grapes yet on Vines should now be taken off and preserved. The dampness of the winter has been rather productive of mouldiness amongst those kept in water-bottles. Regulate the growth of Peaches and Nectarines, and disbud and thin the shoots as necessary; thin out, also, all the smallest fruits, and syringe morning and evening. Keep Cherry-houses well aired. Introduce successions of Strawberry plants, and place them on top shelves in Vineries or Peach-houses, or arrange them near the glass in pits or frames, when a little bottom-heat, given by fermenting material, is very beneficial to them. To plants whose fruit is colouring, little or no water should be given, as it deteriorates the flavour. Sow the main crop of Melons and Cucumbers, and pot off those already up; such as are large enough may be transplanted permanently. Beds for the reception of the seedlings should be formed completely of fresh soil, for from the plants raised now the greatest amount of fruit is commonly obtained.

Hardy Fruit Trees.

Pruning and planting should now be completed, and any training yet undone should also be finished. Espaliers requiring new stakes should have them supplied at once. Any trees loosened from walls for the purpose of "pointing" the latter i.e., filling up holes between the bricks caused by repeated nailing, should be fastened to them again, for the buds are now swelling fast. Fruit trees, however, are not nearly so forward as it was anticipated some two months ago they would be. If not already done, however, no time should now be lost in affording protection to Apricots, Peaches, and Plums on walls. If Strawberry plantations require increasing they should now receive attention. Old plantations of them, if not already done, should be unclched, which will both feed the plants and keep the fruit clean.

Roses.

Roses are now in so forward a state as to almost necessitate immediate pruning in order to have dormant eyes to prune back to. The present time is considered, we believe, by amateurs early for the operation; but, from considerable experience, we think pruning should be done earlier in the season than it is in general. Thin the shoots well out, leaving no wood in the head that is not healthy and fairly vigorous. Study the individual habits of the Roses; the catalogue descriptions of vigorous, robust, and moderate being in some sense guides. For instance, *Maréchal Vaillant*, a vigorous kind, does not bloom if cut in close. Its shoots require to be left at least one foot to one and a half foot in length. Robust Roses, as *Madame Vidot* or *Baroness Rothschild*, with short stumpy wood, should be pruned to a prominent bold eye—the best on the shoot, high or low. The small wood of these sorts never yields blooms worth having, and must be cut clean out. Moderate Roses, as *Mlle. Bonnaire* or *Xavier Olibo*, need close pruning. They may be cut in almost to the old wood; quite so, when the shoots are weak. The eye to which the shoot is pruned should, if possible, look outwards. If this rule is followed, a hollow head will be formed, allowing air to circulate well amongst

the foliage and flowers. Prune, if possible, after a day's drying weather, as, if the ground is in good order, Roses do not bleed badly. Choose, likewise, fine weather to dig the ground, turning in some manure, unless this has been already done, when a mulching of some short horse-dung (road-droppings, fermented by having been in a heap, are good for them) may be applied early in April. Make good all vacancies in borders where the kinds to be planted are Hybrid Perpetuals, Noisettes, and standards of the Teas, and reserve places for dwarfs of Tea Roses, which are better planted from pots in May. In the forcing-houses a few kinds started in November will be just opening. *Souvenir d'un Ami*, *Madame Falcot*, and the white Hybrid Perpetual *Marquise de Montemar* are amongst the first. Where plants are just breaking, syringe twice a day, which will also supply almost sufficient moisture to the plants; 55° to 60° is a good day temperature, which may fall to about 50° at night. All pot-Roses should now be pruned, as after May, grown under glass, they do not compare favourably with the early flowers from out of doors. It is well, therefore, to get all pot-Roses over by the end of that month. Pot-Roses should always be pruned some days before being started, however slowly, into growth.

SOCIETIES, EXHIBITIONS, &c.

ROYAL HORTICULTURAL SOCIETY,

MARCH 4.

THIS exhibition consisted almost wholly of nurserymen's productions, foremost amongst which stood those of Messrs. Veitch, who deserve credit for the liberal way in which they show their plants on such occasions. The proceedings of the Fruit Committee were reduced to a minimum, two dishes of Apples, and six pots of French Beaus being all the exhibits staged. The attendance of fellows and their friends was anything but numerous.

Miscellaneous Plants.—Messrs. Veitch staged a basketful of fine hardy rosy-purple-flowered *Rhododendron*, named *Early Gem*, a most profuse bloomer, and its deep glossy foliage contrasted well with the flowers. The specimens staged were just taken up from the open ground, and they certainly deserve a prominent position in a collection of early spring-flowering shrubs. The Roses in pots staged by the same firm, though small, were admirable. The pots in which they were grown were neatly covered with fresh Moss, which contributed much to their effective appearance. Among the Tea-scented kinds we noticed *Coquette de Lyon*, pale sulphur; *Madame Falcot*, salmon; *Marcelin Roda*, creamy-white; and *Madame Willermoz*. The hybrid perpetuals were most profusely flowered, and included *La France*, pale silvery-rose; *Princess Mary of Cambridge*, rosy-pink, fine in bud; *Paul Neron*, crimson, with silvery backs to its petals; *Camille Bernardin*, rich crimson; *Marquise de Castellane*, rosy-salmon; *Felix Genero*, deep rose, densely imbricate; *Fisher Holmes*, deep velvety-crimson; *Madame Victor Verdier*, with revolute petals, and fine vivid crimson in colour; *Richard Wallace*, deep rosy-crimson; and *Madame Marie Rady*, a finely-formed flower of a deep rose. Such plants as these are amongst the most useful of all plants for general decorative purposes, in pots or for culture. The Japanese Privet, *Ligustrum japonicum*, was shown by Messrs. Veitch, contrasted with a much better variety, *L. japonicum lucidum*. The former has a dull and somewhat rusty appearance; while the latter has deep glossy foliage, as bright, but much larger than that of the broad-leaved Myrtle. One of the most interesting features in the show was a collection of *Clematis*, staged by Messrs. Veitch. These plants bear great white, lilac, or purple, star-shaped flowers, very easily grown. Miss Bateman, a large-flowered waxy-petalled variety, and a most profuse bloomer; *Albert Victor*, lilac-purple; *Lady Lonsborough*, very large and fine soft lilac; *Lucy Lemoine*, fine white semi-double, with lance-shaped sharply-pointed segments. This is likely to become a favourite. One of the most curious points in both the specimens of this plant is the production of variegated foliage and bracts among the foliage in the whorl, immediately below the flowers. Messrs. E. G. Henderson & Sons, of St. John's Wood, staged a group of *Cyclamens*, and a basket containing twenty-four well-bloomed plants of *Soldanella montana*. Messrs. Standish & Co., of Ascot, staged a nice group of *Spiræas*, *Lily of the Valley*, *Hyacinths*, and other spring flowers. From Messrs. Barr & Sugden came a box of *Iris reticulata*—one of the finest of the early-blooming kinds. It has sharp angular glaucous foliage, and bears solitary dark purple flowers marked with golden-yellow. A nice variegated form of *Imatophyllum minimum* was staged by Mr. E. J. Barker, Exotic Nursery, Little Hampton, under the name of *I. Barkerii*; the bright green foliage of the normal form is, in this instance, heavily striped with creamy-yellow; the plant staged was not well grown, and there is little doubt that a well-grown specimen would obtain a first-class award. Mr. W. Bull exhibited a nice plant of *Encholirion corallinum* with arched glaucous foliage covered with dark irregular marks, and bearing a crimson flower-spike with golden flower-buds. A cut specimen of a *Medinilla*, supposed to be new and named *M. amabilis*; it is similar in habit to *M. magnifica*, but taller, and bears large erect spikes of rosy-lilac flowers, without the large bracts so characteristic of the last-named species.

Orchids.—A fine bank of these was set up by Messrs. Veitch, including the following rare species:—*Angraecum citratum*, a dwarf

species, resembling a *Phalaenopsis* in general habit, and bearing long spikes of creamy-white flowers, each furnished with a curious bent spur; *Dendrobium Boxallii*, nearly resembling *D. crystallinum* in flower, with the habit of *D. Wardianum*; it has white sepals and petals tipped with rosy-lilac, the lip having a large central blotch of yellow. In this group was a fine plant of *Dendrobium glumaceum*, bearing fifty or sixty spikes of its graceful grass-like flowers among foliage of the freshest and healthiest description. *Epidendrum paniculatum* is a tall-growing species, bearing a large terminal panicle of flowers, not unlike bunches of the common Lilac in form and colour. A plant of *Dendrobium thyrsoform* bore two fine drooping spikes of its elegant flowers. The sepals and petals are pure white, the lip being of the deepest orange-yellow colour, very much fringed around the margin. A plant of *Odontoglossum Hallii* bore five very large flowers; and several specimens of *O. Alexandrae*, *O. gloriosum*, *Ada aurantiaca*, *Lycaste cruenta*, and *Vanda suavis* made up the display. Mr. Bull staged a fine healthy plant of *Cymbidium Mastersii*, bearing a seven-flowered spike of flowers. Mr. Denning staged a plant of *Epidendrum Imperator*, bearing two spikes of crimson blossoms with a white-crested lip.

First-class Certificates were awarded to the following:—

Clematis Lucy Lemoine (Veitch), a free-flowering variety with fresh green foliage, and ample semi-double white flowers.

Rhododendron Duchess of Edinburgh, a vivid crimson-coloured variety, and a welcome addition to the already beautiful group of greenhouse species.

Epidendrum Imperator (Denning), a tall-growing species with deep green glossy foliage, and long terminal spikes of crimson flowers, having an elegantly-fringed lip. The plant grows a yard in height.

COVERING IN COVENT GARDEN MARKET.

IT is, to a certain extent, gratifying to learn that at "an extraordinary general meeting" of the Market Gardeners, Nurserymen, and Farmers' Association, lately held at the Bedford Head, Covent Garden, it was announced that his Grace the Duke of Bedford had at length determined to cover in Covent Garden Market; and a model of the proposed roofing was exhibited and taken into consideration by those assembled. Of the advisability of being thankful for small mercies there can be no doubt, especially when we reflect on the weary length of years during which the most desperate attempts were made to "get at" the late Duke of Bedford, and induce him to accede to some structural reform on his magnificent but shamefully neglected Covent Garden estate. London has every reason to be grateful to the present head of the princely House of Russell for entertaining a proposition which, if carried out, will shelter the stall keepers and their customers from the inclemency of the weather. It is, however, somewhat vexatious to learn from our contemporary, *THE GARDEN*, that the improvement contemplated will be slight indeed in comparison with what is really required. Several members of the association who met at the Bedford Head considered that the proposed covering was too low; while, by others, a 4-foot opening left on either side was held to be most objectionable. They were told that the lowness of the roof and the side openings were rendered necessary for the convenience of those who occupied the upper rooms over the central avenue of the market. So that it is to be the old, old story over again; the story of a great public want being left but half fulfilled, and of a structure which needs pulling down altogether, and re-building in accordance with modern ideas, being cobbled and patched up in order to serve the "convenience" of persons possessing ostensibly "vested" interests. Boldly and liberally re-built, Covent Garden and the surrounding piazzas might be made one of the most splendid public places in London, and, in a few years, would repay the Duke of Bedford thrice the amount per cent. that his property yields him now. Patched and cobbled up, the market will not cease to demand reform, and some day or another it will have to be reformed altogether, by being abolished as a nuisance. —*Telegraph*.

OBITUARY.

WE have to record, with much regret, the death of Mr. Frederick Barter, which happened on the 15th ult. on board one of the P. & O. steamers, between Malta and Gibraltar. He was a man who was a credit to his profession, though, for some years past, he has not practised as a gardener in this country. He went out to India (after his return from the Isle of Ascension) in the winter of 1869 to fill a position under the Indian Cotton Commissioners, having been recommended from Kew. Though his time (five years) would have expired this year, failing health compelled him prematurely to return. His father, himself an old gardener now nearly seventy years of age, had gone to Southampton to meet his arrival, when he received the sad news that he had been buried at sea. Another of his sons, Charles, fell a victim to fever some years ago up the River Niger whilst botanist to the Niger Expedition under Captain Baikie. Charles was once in the Regent's Park, and sent home many new plants from the neighbourhood of the Niger.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

CAN PINE-GROWING BE MADE PROFITABLE?

"THESE are the things that do not pay, are they not?" said a gentleman to me not long ago when looking into my Pine-pits; and, when he said so, it occurred to me that he expressed a very prevailing opinion among proprietors, founded, it must be admitted, upon facts in a good many cases. The question, too, is all the more pertinent now, because the English Pine-grower is likely to find a very formidable opponent in his brother cultivator in the Azores, from which we are yearly getting an increased quantity of fruit of the best description, and which has already had the effect of reducing the prices in our markets considerably. As yet, however, the supply of these Pines has been confined to the autumn and winter months chiefly, and it is questionable if the St. Michael Pine-grower will ever be able to enter into competition with the English grower during the late spring and summer months. English gardeners will, therefore, still have to be depended upon to keep up the supply during these months; and this, I maintain, they can do profitably. Let us begin with good-sized suckers in September. These should be divested of their bottom leaves as far as the stem is of a brown ripe colour; and, after the heels have been cleaned with a sharp knife, they should be potted in 8 or 9-inch pots, deep enough to bury the stem considerably above the base of the bottom leaves. A good fibry turf, chopped small, to which may be added a good sprinkling of bone-dust, is the best soil that can be used; but the Pine will do exceedingly well in ordinary garden soil, sifted and mixed with about its bulk of decayed hot-bed manure, and one-third or more of clean river or silver-sand. It may be said of the Pine—as is said of many trees and shrubs—it will thrive in any ordinary soil if it has head-room, light, and air. The pots should be crocked about 1½ inches deep, and the suckers must be potted very firmly. I always ram the bottom layers with a wooden rammer, and then fill in around the sucker, making the soil as hard as finger and thumb can make it. A compact firm soil is one of the best aids to a woody and well-matured stock. When potted, they should be plunged in the succession pit near the glass, which should be kept clean. Shading in September will only be required on sunny days, and should be discontinued in a fortnight after potting, if all has gone well. A bottom-heat of 85° must be kept up for three weeks, and a top-heat of 75° by night and 85° or 90° by day. The plants should be dewed over with clean tepid water morning and afternoon, except on very dull days, and little or no air should be given during that time. By the fourth week the plants will be fairly rooted, and, if needful, they may be watered thoroughly. Up to this date the syringing will have been sufficient if the soil was in a properly moist condition at potting time, which it should be. After the plants are rooted, however, and a more liberal supply of air is given, they will want more water at the root, and when they are watered, it should be done thoroughly, each plant should get a good soaking. The Pine requires as much water as any ordinary stove plant, and unless it gets it, it will not thrive. Towards the end of September syringing over head should be discontinued, and the bed only sprinkled, but the evaporating troughs may be kept full always. The bottom-heat should also be reduced to 80°, and by the end of October to 75°, while the night temperature may range from 60° to 65°, and the day from 65° to 75°, according to the weather. These temperatures are adhered to here as nearly as possible all the winter, and, by long and constant experience, I find they are just sufficient to keep the roots and leaves in healthy action without growing much, which is all that should be aimed at; growth in winter, under a too high temperature, is only an elongation of the leaves, and is good for nothing. On the other hand, if the temperature, top or bottom, gets too low, the roots will perish, and the leaves will damp off in the hearts of the plants; and if, through timid watering, the soil in the pots is allowed to get too dry, the

plants will go to rest, and, probably, many of them will show fruit prematurely in spring. Against these accidents, growers always put in more suckers than they want, discarding the surplus stock in spring at potting time. By the beginning of March, soil, the same as recommended for the suckers, should be prepared for potting. It should have the chill taken off it before using, and the potting should be done in some comfortable place. At the same time the requisite number of 12 or 14-inch pots should be got ready and crocked, and, when everything is prepared, the plants should be turned carefully out of their pots, the ball of soil just reduced sufficiently to disentangle the roots, and transferred to the larger size, potting firmly as directed in potting the suckers. The plants should then be transferred to their summer quarters, and plunged, at least 2½ feet apart—if more room can be afforded all the better. The bottom-heat must be raised to 80°, and the top-heat to 70° at night, and from 80° to 85° by day, and shading, dewing, and keeping close for a week or two must also be practised as with newly-potted suckers. The prospect of fruit now depends upon the treatment from this date. Towards the end of March the bottom-heat should be raised to 85°, the minimum top-heat to 75°, and the maximum to 85° or 90°, according to the weather. These temperatures should not be exceeded, but they must be adhered to as closely as possible, especially in the bottom-heat, till the end of August, always ventilating freely on all occasions consistently with keeping up the proper temperatures. Water, also, must be given at the roots as often as needful, and in abundance. In addition to watering the plants, I frequently in hot weather, deluge the bed in which the pots are plunged; it helps to keep the atmosphere sweet and moist; but, with plenty of water at the root, a Pine will thrive luxuriantly without shutting up or syringing at all. Frequent waterings with weak liquid-manure should also be given during the summer. If these simple directions are followed, the plants cannot fail to thrive, and, by August, robust stocky plants will be the result, such as will be sure to bear fine fruit the following summer. By September the bottom-heat should drop to 80°, also the top-heat proportionately, and it should still further decline by October to 75°, and the top-heat to 65° minimum, and from 75° to 80° maximum. If this descent is gradual, the plants will complete their maturation and go to rest entirely by November, when the bottom-heat should not exceed 70°, nor the top 75° maximum, nor 60° minimum; nor will the plants require much water at this time, though they must not be allowed to become parched in the least. If fruit is wanted in May or June the plants must be started again by the end of November, and to this end the bottom-heat must be raised to 75° and the top-heat proportionally, and this figure must not be exceeded till the plants show fruit. It is very often at this stage that the prospect of a crop is ruined. It is not at all an uncommon thing for growers to jump the bottom-heat to 85° or 90° at once, and, unless the fruit is almost already visible, which it should not be under proper management, the chances are a hundred to one that the plants will throw up a tuft of leaves instead of fruit, and they will not fruit afterwards. Anyone can satisfy himself on this point by experiment. I would undertake to make the best ripened plants miss fruiting by this treatment. It is exactly the same with forced Strawberries, Peaches, and other things, only a more rational practice is usually adopted with these. The Strawberry, particularly, will not bear pushing at the first; if it is, it will simply throw up a crowd of leaves, and the flower scape will rarely even get out of the socket, and if it does manage that length, the flowers will be weak and useless. Once the Pines have shown fruit, both top and bottom temperatures must be raised another 5°, and, after they have done flowering, they may be treated to the ordinary summer temperatures of the year before, which should be kept up till the fruit is ripe and the suckers are fit to be detached for another stock. If well-swelled glistening fruit, with the juice almost oozing out of the pips, is desired, watering must never be discontinued, even when the fruit is quite ripe, though damping overhead may be given up, and more air given. In other respects, the treatment during the fruiting period should be the same as during the growing season.

J. S. W.

NOTES OF THE WEEK.

— THE fine specimen of *Agave univittata*, in the succulent-house at Kew, is now bearing a flower-spike some 9 or 10 feet in height. This Aloe, which is one of the most distinct of the spicate group, has leaves prettily striped in the centre with yellowish green.

— WE learn, from the *Gartenflora*, that the extensive herbarium of the eminent Greek botanist, Orphanides, has been purchased by Herr Rhodocanaki, of Odessa, and has been presented by him to the University of Athens.

— MR. WILLS writes to us respecting the fine conservatory figured in last week's GARDEN, and requests us to state that the plants in it were supplied and arranged by him. Better, or more suitable subjects, or a more effective arrangement we have not seen.

— A FAIR number of entries, it is said, have been made for the prizes offered by the Royal Agricultural Society for disease-proof Potatoes. The competitors evidently have confidence in the virtues of their varieties, for, in the event of failure, they are liable, for cost of cultivation, to the amount of £20.

— ARTIFICIAL nests have been suspended in many of the trees in the Bois de Vincennes, near Paris, with a view of attracting birds that may prove useful in destroying insects. The attempt was first made last year, with the result of filling about sixty per cent. of the nests.

— IN his address at Trenton, Mr. Quin gives the Strawberry crop of New Jersey at 2,000,000 quarts in favourable seasons, worth, at 16 cents per quart, £60,000; Blackberries, Raspberries, and Grapes, about as much more. He estimates the Cranberry crop at 125,000 bushels of sound fruit (worth about £60,000), and more than half the entire crop of the country, and bringing into use thousands of acres of swamp lands which could not otherwise be employed.

— WE (*Pharmaceutical Journal*) have been favoured with a communication from Mr. Daniel Hanbury, in which he states that having recently had occasion to search some old newspapers in the British Museum, he observed the following advertisement in the *Mercurius Politicus*, No. 435, September 23rd to 30th, 1651, which, though probably well-known to antiquaries, may be interesting to some of our readers:—"That Excellent, and by all Physicians approved, China Drink, called by the Chinese, *Tcha*, by other Nations *Tay alias Tee*, is sold at the *Sultaness-head*, a *Coffee-house* in *Sweetings* Rents by the Royal Exchange, London."

— THE common wood Nettle of America has been transplanted to Europe by M. Rossel for the purpose of being applied to textile purposes. It is known botanically as the *Laportea pustulata*, and is perennial. As it is, therefore, unnecessary to sow the seed each year, the plant has, in this respect, an advantage over hemp or flax, while it is said to necessitate less labour and expense in preparing the fibre. In a wild state, the Nettle attains a height of 2 or 3 feet; but we learn that those that have been cultivated in Berlin have already exceeded this limit, and it appears possible that, by care and proper soil, even a still greater altitude may be gained.

— AT a recent meeting of the French Academy of Sciences, M. E. Faivre read a paper detailing a series of experiments in support of the theory that the fluid which supplies the tissue of plants with food ascends beneath the bark. He found that, when strips are cut away from the bark of trees, the buds always continue to develop when a communication is still left between them and the lower part of the tree; while, if this communication is completely destroyed, the buds wither away. If a complete ring was removed beneath the bud, it withered away the more slowly the greater the distance of the strip from the bud. The starch disappeared in these cases from the portions of the wood above the cut piece, and between it and the bud, while beneath the cut it remained unchanged. If cylinders of bark are left, bearing buds, they may be made to develop even into branches.

— THE reports of the ravages made among the Potato crops in the United States last year by the Colorado beetle have naturally caused considerable alarm to growers in this country, as it is feared that this insect pest may be brought over in the large quantities of seed Potatoes which are imported from the other side of the Atlantic. With a view to preventing its introduction, Mr. J. Algernon Clarke, secretary of the Central Chamber of Agriculture, addressed a letter, on the 10th of February, to Mr. Gladstone, calling his attention to the imminent risk to which the United Kingdom, especially Ireland, is exposed, and suggesting that the importation of Potatoes from the United States and British America should at once be prohibited. In reply, a letter was received last week from the office of the Privy Council for Trade, to the effect that, according to the American official reports, it does not appear that the eggs or larvae of the Colorado beetle have been, or are, deposited or conveyed in the tuber of the Potato; and, therefore, there is considered to be no reason to

prevent the importation of seed Potatoes from America into the United Kingdom until the case is proved to be otherwise. We think this a wise decision.

— OUR correspondent, Mr. George Gordon, A.L.S., author of the "Pinetum," has been appointed one of the jury for awarding the medals at the Great International, Botanical, and Horticultural Congress, to be held at Florence, in May next.

— A HORTICULTURAL curiosity is now on view in the Crystal Palace, in the shape of a Hyacinth with no fewer than eleven flower-spikes, all excellent ones, issuing from the same bulb, the total number of bells being 170. The variety is Norma, a flesh-coloured kind.

— IT is worth noting that (according to a report made to the Lyons Society of Industrial Sciences) the Broom (*Sarothamnus scoparius*) which grows so abundantly in many parts of this country, and which has been long known to yield a yellow dye, and a fibre which has been used as thread, may, by a little care, be made to produce a fibre quite equal to hemp, in strength and fineness.

— MESSRS. HOOPER & Co., of Covent Garden, have imported roots of a Begonia (*B. octopetala*) new to cultivators in this country. The foliage of the plant, as shown in a beautiful drawing before us, is of a fresh green tint, and, in shape, not unlike that of a very large fancy Pelargonium; while the flowers, each as large as a crown-piece, are of pearly-whiteness in front, and deep rosy-carmine behind. It is a native of Peru, and is said to grow well in a cool-house.

— THE second number of the *Illustration Horticole*, just published, contains beautifully-coloured plates of *Anthrrium floribundum*, a deep glossy-leaved Arad bearing milk-white spathes; *Lasiandra lepidota*, a very showy greenhouse Melastomad, bearing deep rosy-crimson flowers, each as large as a crown-piece, while, in general habit and mode of flowering, the plant has some resemblance to the well-known *Pleroma elegans* (it inhabits the cold regions of the Cordillera of the Andes); *Pritchardia pacifica*, a deep green glossy-leaved Fan-Palm, a native of the Fiji Islands and Polynesia, where it was discovered by the late Dr. Berthold Seeman.

— THE first number of "Orchids, and how to grow them in India and other tropical climates," by J. Jennings, F.L.S., has just been published by Messrs. Lovell, Reeve, & Co. It is a royal quarto, printed on fine paper, and embellished by four coloured plates of the following choice Orchids, viz., *Cattleya exoniensis* (rosy variety); *Dendrobium Wardianum*, a richly-tinted form, first figured in the *Botanical Magazine* as *D. Falconeri obtusum*; *Angraecum sesquipedale*, a good figure of this pearly-white Orchid; and the new *Cypripedium Sedeni*. The author treats his subject in a straightforward manner, likely to be appreciated by amateur Orchid-growers, while some of his Indian experience will be valuable to our cultivators here at home.

— THE Botanical Society of Edinburgh offers a prize of ten guineas for the best and improved essay on the reproduction of *Lycopodiaceae*, to be competed for by students who have attended the botanical class at the Royal Botanic Garden, Edinburgh, during, at least, one of the three years preceding the award, and have gained honours in the class examinations. The author is expected to give results of practical observations and experiments made by himself on the subject, illustrated by microscopical specimens. The essay and specimens to be given in on or before 1st May, 1876, with a sealed note containing the author's name, and a motto outside. Facilities will be given for carrying on observations and experiments at the Royal Botanic Garden, Edinburgh. A prize of ten guineas is also offered, through the council of the Botanical Society, by Charles Jenner, Esq., for the best and approved essay on the Structure and Re-production of the *Frondose* and *Foliaceous Jungermanniaceae*. This prize is subject to all the conditions specified above.

— IT may be of interest to know that, in connection with the reception of the Duke and Duchess of Edinburgh, at Windsor, on Saturday last, Messrs. Veitch & Sons, of Chelsea, had the honour of offering to Her Majesty, the Princess of Wales, and the Duchess of Edinburgh, splendid bouquets composed exclusively of the rarest Orchids, Roses, and Lilies of the Valley. The Queen and the Princess of Wales were pleased to receive their personally from Mr. Harry J. Veitch, Her Majesty retaining also that for the Duchess of Edinburgh for presentation on her arrival at the Castle. The floral decorations for the banquet given on Monday, in honour of the newly-married couple, were very extensive. Five large groups of Palms, Musas, and other fine-foliaged plants, interspersed with choice flowers, were very effectively arranged on the grand staircase by Mr. Jones, Her Majesty's gardener at Frogmore; whilst, in the reception rooms, the fire-places were, as usual, most tastefully filled by Mr. Turner, of the Royal Nurseries, Slough, who also supplied all the plants and flowers required for the banquet table. Messrs. Bromwich & Co., of South Belgravia, had the honour of supplying the bouquets for the drawing-room and boudoirs of Buckingham Palace, on Thursday last.

THE INDOOR GARDEN.

ATACCIA CRISTATA.

THIS very curious plant—one of the most extraordinary we are acquainted with—is a native of the islands of the Malayan Archipelago. Though by no means new, it is far less commonly seen than it ought to be, considering the ease with which it is propagated, and the anomalous features it presents in regard alike to aspect and to structure. The love and admiration given to flowers, for the sake of their bright colours and their sweet scent, are well deserved, and there can never be too much of either. We must confess, at the same time, that we like to see intellectual interest in what may be termed the vagaries of nature. Nature's ways are very imperfectly apprehended so long as we rest content with Roses and Lilies, Fuchsias and Primulas. The plant before us was originally introduced into the gardens of Kew, under the generic name of *Tacca*. The other members of this curious Indian genus have multifid leaves, and the roots are tuberous. *A. cristata*, having undivided leaves and a rhizome, was separated by Presl, who gave it the name of *Ataccia*; and in this he was followed by Endlicher and Kunth, though both express their doubts as to the necessity of the new genus. What differences may lie in the essential characters appear to be but trifling; and a distinction founded alone, or chiefly, upon habit and foliage, is usually considered unimportant. But, leaving the doctors to decide, we take the name as we find it, and commend the plant to every one who has a liking for the exceptional. The underground portion consists of a short and conical root-stock, marked with the scars of former leaves, and here and there throwing up some small gemmæ or tubers, by the removal of which it is readily multiplied. The actual roots consist of a few coarse fibres. From the crown of the root-stock rise three or four handsome and dark green leaves, the petioles several inches in length, the large and elliptic-oblong blade acuminate, entire, and elegantly veined, the veins flowing in parallel curves. In the midst rises a stout scape, like that of a Hyacinth, twelve or eighteen inches in height, quite erect, and bearing on the summit a unilateral and half-pendulous umbel of twelve to twenty brownish-purple flowers, each as large as the top of one's little finger. In figure they are not unlike the flowers of the *Asarabacca*, having a turbinate and six-angled ovary, to which the lower portion of the perianth is adherent, while the six triangular lobes, all of the same size, are reflexed upon it in such a way as to give a circular mouth, of precisely the same truncate character as that of the *Cyclamen*. But here, instead of pure white, or lovely lilac-rose colour, we have sombre and lurid purple, and, moreover, the matchless twist of the *Cyclamen* is wanting. So completely are the perianth lobes laid back against the ovary that, at first sight, the flower seems only a circular muzzle, with half-a-dozen stamens for quaint front teeth. The petioles supporting these odd flowers are about an inch and a half in length. Intermingled with the floriferous ones, or, perhaps, rather behind, and somewhat laterally, are many more that are abortive, attenuated to a length of at least 12 inches, and hanging down like thin straight hair, a lock upon either side; while, at the back of all, stand up two enormous vertical bracts, and two smaller ones, the former resembling the sheaths of the common English Arum, but flattened out, and of a cadaverous greenish-purple hue. The

whole thing is so weird and gipsy-like that one almost starts at the supernatural mockery. Had the witches in "Macbeth" wanted a flower a-piece on a certain celebrated occasion, and, had the plant grown at home instead of ten thousand miles away, this *Ataccia*, of all the productions of nature, would have suited them best. Ovid would have been glad of it for an additional legend in the *Metamorphoses*. It is very easily propagated; all that is necessary is to detach one of the gemmæ from the rhizome, and place it in a small pot of light loam and peat, giving plenty of water, and preserving it, at all events while the plant is young, in a close moist atmosphere. We have seen the *Ataccia* in many good collections of curiosities, especially near Manchester, and, no doubt, it is to be had from the leading nurserymen.

LEO GRINDON.

GARDEN AQUARIA.

THE culture of aquatic plants seems, for the most part, limited to our large public and private gardens, such as Kew, Chatsworth, or Syon House; but proper appliances for the culture of the smaller kinds cost but little, and, by adding them to our plant-houses, we may greatly increase the beauty and interest of our collections. A large and expensive structure for



Ataccia cristata.

growing the *Victoria* Lily cannot be erected in every garden, but, every one who possesses a plant-stove, greenhouse, or conservatory, may, with but little trouble or cost, devote some portion of it to the cultivation of the more beautiful water-plants. Aquatics and succulents may be grown by the merest novice in plant-culture, since they require so little attention after they are once planted. Watering plants is a source of trouble to most gardeners; but, in succulents, this is reduced to a minimum, while, in the case of aquatics, they are, of course, always well supplied, though a change is occasionally desirable. The introduction of a slate tank into the plant-stove occasions but little extra trouble and expense, while it may be made one of the most interesting features in the house; or one side of the side-benches might

be covered with several of these shallow tanks placed side by side. Their size will vary according to the width of the staging, but from 3 to 4 feet square, and a foot or 15 inches deep, will, in most cases, be amply sufficient. These portable tanks are, in many cases, preferable to permanent erections, as, during the winter months, they can be removed and stored away in any dry shed until required for the next season, or the water they contain may be emptied out and plants in pots can then be set inside in the usual way. In tanks like those above described, a great variety of the smaller aquatics can be grown that will not be less interesting to the ordinary visitor than the more common terrestrial plants grown in pots. We want variety in our gardens, and the culture of aquatics is one way to set about obtaining it. Among the commoner aquatic plants there are some which should be in every garden, as the *Aponogetons*, their forked sprays of silvery bracts being most valuable for cutting. *Vallisneria spiralis* is always interesting as a microscopic object, and some of the smaller tropical Water Lilies grown in tanks like those above described, unfold their pure white, bright rose, or cerulean blue flowers, as freely as those of our native ponds and streams. A little good sandy loam is the best compost in which to plant the stronger-growing kinds, while some of the smaller *Pistias* and *Pontederias* will float on the surface. These tanks are valuable for assisting the

growth of other plants as well as aquatics; for example, Palms grow far more vigorously during the hot summer months, if the bases of their pots are sunk about 2 inches into the water. This is best effected by setting the pot, in which the plant is growing, on another pot reversed beneath the water in the tank. *Richardias* (Callas) grow far more robustly and flower better if the pots are plunged overhead in the water, and if they are sunk deep enough, say, from 2 to 3 feet, the plant will withstand our climate all the year round, and form a noble ornament on the margins of ponds, lakes, streams, or other ornamental waters. We will now give a short descriptive list of aquatics best adapted for growing in shallow stove-tanks indoors.

Aponogeton distachyon.—An old plant in our gardens, having been introduced from the Cape in 1788, but never very generally cultivated. It is nearly allied to the Lattice-leaf or Lace plant of Madagascar, and has similar venation, but in the case of the *Aponogeton* the intervening spaces between the veins are filled with cellular tissue. It is one of the most accommodating of all plants, as it may either be set in a drawing-room window, planted in a little earth at the bottom of an inverted bell-glass, or it will grow vigorously in a shallow tank in the open air, where it seldom fails to flower freely throughout the spring and summer months.

A. monostachyon bears pretty pink blossoms on its undivided spikes. It is smaller in habit than the last-named, and, being a native of the East Indies, requires the warm humid temperature of the stove aquarium.

A. angustifolium, a narrow-leaved form, was introduced from the Cape in 1788, but is now lost to cultivation.

The Water Fern (*Ceratopteris thalictroides*).—A rare Fern, and one of the few that grow well plunged in water. It grows beautifully in a shallow tank in one of the stoves at Chatsworth, and has recently been added to the Kew collection. It is of a fresh green colour, and a most vigorous grower in a hot moist stove.

Umbrella Sedge of Madagascar (*Cyperus alternifolius*).—We have here a forcible example of the adaptability of plants. Grown in a pot in ordinary compost, this makes pretty little plants 1 to 2 feet high, and well adapted for ordinary decorative purposes; but, if planted in a pot of rich soil, and partly plunged in the tank, it often produces large growths 5 or 6 feet in height. In the Palm-house at Kew there is a curious glaucous variety under this name, with stems between 4 and 5 feet high, the leaves at their apex being only 5 or 6 inches in length. There is also a pretty variegated form, very valuable for decorative purposes, although it is apt to revert to its normal green state. If the plant is grown in very poor soil, with at least one-half of sand, it comes beautifully coloured, each leaf being striped with pure white. This plant is always useful, especially for table decorations, and for grouping along with choice flowers in the drawing-room vases. Its foliage radiates in a gracefully drooping manner from the apex of the slender stems, and is distinct from any other decorative plant.

Limncharis Humboldtii.—This plant bears beautiful, clear, soft yellow flowers among its floating foliage. The general part of the plant is similar to that of *Aponogeton distachyon*, but its leaves are heart-shaped, and the plant is sufficiently hardy to stand out-of-doors in sheltered tanks during the hottest portion of the year only. Grown in the shallow stove-tanks above alluded to, it grows and flowers vigorously, forming a really beautiful object.

Nymphaea cerulea.—This is a pretty little plant, that grows and blooms well in any plant-stove treated as an aquatic. It has bright green foliage and light blue flowers, both of which float gracefully on the surface of the water. *N. pygmaea* is a charming companion to it, and might readily be grown in an inverted bell-glass a foot wide, as recommended for the *Aponogeton*. It has fresh heart-shaped leaves, and pearly flowers of the most pearly whiteness.

Nelumbium speciosum.—This is the well-known "Sacred Bean" of Egypt, and is best treated as a sub-aquatic, or it can be grown in a tub half filled with good sandy loam covered with about 12 inches of water, so as to keep the roots in a consistent state of moisture. This makes a fine object, having large peltate leaves borne on long stems, and great rosy-tinted *Nymphaea*-like flowers. Its seeds are borne in a peculiar top-shaped head perforated with holes, something like the rose of a watering-pot. It is easily propagated from seeds sown directly after Christmas.

Common Water Lettuce (*Pistia Stratiotes*).—This plant is of a light and fresh green colour, and forms a most interesting object in the stove aquarium, as it floats on the surface of the water in a manner analogous to our common Duckweed (*Lemna*). Its leaves are arranged in a rosulate manner, and are 2 to 4 inches in length, by about half the width, while their general appearance certainly

does give one an idea of Lettuce, whence its popular name. This plant readily propagates itself by offsets.

Pontederia crassipes.—This is a most curious plant, having inflated leaf-stalks to its kidney-shaped leaves, and which give it the general appearance of a *Sarracenia*. It should be grown in every stove tank as a most interesting and curious object.

Vallisneria spiralis.—This is a Grass-like plant, which roots freely into the mud at the bottom of the tank, and sends up its female flowers on long spiral hair-like stalks, often 15 inches to upwards of 2 feet in length. It is a popular plant for indoor or parlour aquariums, of which we shall treat more fully in a future notice.

F. W. BURBIDGE.

CYPRIPEDIUM IRAPEANUM.

This rare Lady's-Slipper is a native of the Savannas of Upper Mexico, where it is found at an elevation of from 3,000 to 4,000 feet. It grows about 2 feet high, the stem bearing 3 or 4 oblong, acute, pilose leaves, with undulating margins. The flowers are large (being 4 to 5 inches across), with broad petals of a clear sulphur-yellow, and a large golden-yellow lip, marked inside with crimson spots, reminding one of a yellow-flowered herbaceous *Calceolaria*. They are borne, one or two, on the summit of the stem, and, in form, resemble those of *C. spectabile*, except that the petals are broader. This plant has been frequently introduced into European gardens, but, from ignorance of its requirements, or other causes, has hitherto been found difficult to keep alive for any length of time. The following communication, on the subject of its culture, from the Comte du Buysson, appears in a recent number of the *Illustration Horticole*, and may be interesting to some of our readers:—

I plant this *Cypripedium* in a deep pot, 7 or 8 inches in diameter, thoroughly drained by a thick layer of crocks and coarse gravel, and then filled with a compost formed of equal parts of turf-soil or alluvial meadow-soil, heath-soil in lumps, and the *detritus* of wood, such as the hillocks of the large wood-ants are composed of (an excellent and handy material, which I use for all my Orchids). In potting, I spread the roots of the plant well out, and cover them deeply, so as to have about 2 inches of soil over the point where the stem issues from the root-stock. This operation should be performed when the plant is about to commence growth, in February or March. The pot should be placed on the front of a shelf or bench in a temperate house, facing the south, in the full sunshine. Water, at first, very lightly, until the stems appear overground, then, by degrees, more freely, according to the state of growth, and, as may be needed, never allowing the soil to become dry, until after the plant has done flowering. When the stems have made their appearance, give air night and day, except in bad weather; when the flowers are fully expanded, remove the pot either into a room, or to a shady part of the green-house. This will prolong the time of flowering, which commences in June and continues for nearly two months. As soon as the flowers shall have all faded, gradually diminish the supply of water, so that the leaves and stem may dry off, when the soil should be left dry from November to March. The plant should then be re-potted and treated in the same manner as before. The long winter rest will secure the preservation of the plant, by permitting the root-stock to become perfectly matured. The treatment is, in fact, the same as that required for plants of the *Gesneraceae*; the temperature being kept at from 43° to 55° during the season of rest, and at from 66° to 100° during the period of growth in summer.

[To the foregoing, M. Linden appends the observation that he has frequently introduced this plant into his hot-houses, and treated it in almost precisely the same manner as that recommended by the Comte du Buysson, but without success. We understand that this difficult Orchid has been grown, for the last year or two, in the most satisfactory manner by the Messrs. Backhouse & Son, in the York Nurseries.—Ed.]

RENANTHERA COCCINEA AT DALVEY.

This, being one of the shyest blooming of Orchids, is usually submitted to a variety of temperatures, varying from that of the intermediate house to that of the warmest department in the establishment, but, at no place have I seen it receive less special care than at Dalvey, and there it not only grows freely and healthily, but blooms abundantly. The Orchid-house in which it is grown is a long

spanned-roofed house, running north-east and south-west, and is heated by 4-in. hot-water pipes, of which there are more at the end nearest the boiler than at the other end, where the *Renanthera* is grown. The winter temperature of this house at the warmest end is 55°, and at the coolest end it varies from 43° to 45°. In the centre of the house is a long bench or table, of Caithness flagstones, on which are set the largest specimens of Orchids, some of which are in pots and some in tubs; whilst, from the roof hang numerous blocks and baskets. On the surface of the bench, between the specimen Orchids, is a thin layer of earth, consisting of peat, charcoal, Sphagnum, crocks, &c., part of it having been placed there purposely, and part of it washed from the Orchid-pots in the process of watering and syringing. In this earth some Orchids, a great variety of Ferns and Selaginellas, together with *Eranthemums*, *Gymnostachyums*, *Achimenes picta*, *Tradescantias*, and many other pretty little old-fashioned plants grow luxuriantly, quite uncared for. Surrounded by this semi-natural vegetation, in a pot on this bench at the coolest end of the house, the *Renanthera* in question is growing. It was originally planted in sphagnum, turfy peat, and crocks, and trained upwards to the roof on strong branched and peeled Oak stakes. It has now, however, out-grown the limits at first assigned to it, and its roots ramble, here and there, over other pots, and amongst the soil on the slate. Mr. Berry, the gardener, attributes his success in flowering this plant to its being allowed to grow in this negligent manner, and to its top being near the glass, where it gets plenty of light, and but little shade in summer.

W. F.

MAMMILLARIA SULCOLANATA.

This stout-growing species from high latitudes in Mexico, belongs to the same section as *M. elephantidens*. The Mammæ



Mammillaria sulcolanata.

are globose, and terminated by a set of from eight to ten strong reflexed spines, $\frac{1}{2}$ inch in length. It grows from 5 to 6 inches high, and is not so prolific as *M. elephantidens*. At the base of the Mammæ is a dense forest of white wool, which disappears as the plant gets old. Its flowers are yellow and $1\frac{1}{2}$ inch in width; indeed the whole of the section has large reflexed yellow flowers, very distinct from those of ordinary *Mammillaria*, which have short bell-shaped blossoms, which scarcely protrude beyond the spines, and are produced in whorles, while in this section they spring from the apex, as in *Echinocacti*. They do not require much heat, and if not kept well away from fire-heated surfaces during winter they get over-run with red spider, and often die; otherwise they are easily grown, and flower from July to November in the open air in the same way as Alpines do; in fact, if treated like Alpines, except that they must be dry during winter, they do very well. Offsets treated liberally will flower the second season.

J. CROUCHER.

***Sobralia macrantha*.**—This is a splendid Orchid, in the form of a large specimen, but it is a shy flowerer when small. We saw a noble plant of it at Dalvey the other day, which, every season, produces scores of flower-spikes. It occupies a tub 3 feet in diameter, and is growing in a compost consisting of rough fibrous peat, Sphagnum, and crocks; the tub is placed on a central stone table in a span-roofed Orchid-house, and the shoots or reed-like stems, of which there are quite a forest, varying from $3\frac{1}{2}$ to 5 feet in height, run up to within a foot of the glass. The night temperature of the house is about 45° in winter, and 65° in summer. As regards watering, it gets abundance, both at the root and overhead in summer; but, in winter, owing to the low temperature at which the house is kept, it only gets enough to keep the roots from suffering, and not a drop overhead. The roots of this *Sobralia* being fleshy and very brittle, the greatest care is exercised in re-potting it, an operation, however, only needed at intervals of several years, as by keeping it pot-bound, it is more floriferous than if it were permitted to have more root-room.—W. F.

Rare Orchids now in Bloom.—*Vanda Cathcartii*, a tall-growing species resembling a robust *Renanthera*, bearing pendulous spikes of fleshy-streaked brown flowers, with a lemon-yellow lip. *Angraecum citratum*, a pretty little species, bearing slender spikes of creamy-white flowers 16 inches long, the flowers being very regularly arranged, and each furnished with a curiously bent spur; *Laelia Jongheana*.—In habit this is identical with *Cattleya marginata*, and has rosy-lilac flowers with a fringed lip; *Masdevallia Lindeni*, a richly-coloured species, bearing flowers of the finest silvery-purple or majenta. No coloured drawings at present published have done justice to these richly-coloured Alpine Orchids. They are all readily grown in a cool temperature, and, as they are vigorous in habit, and most profuse bloomers, they deserve general cultivation. *Dendrobium thyrsiflorum*.—This is one of the finest of the whole genus, but, unfortunately, very short-lived. Its flowers are produced on drooping spikes, the sepals and petals being of pearly-whiteness, the latter elegantly fringed; while the crumpled lip is densely set with short hairs, and contrasts well with the other segments, being of a deep orange-yellow. This is the best *Dendrobe* of the class, of which *D. densiflorum* may be considered the type.—B.

***Cymbidium Mastersii*.**—Many Orchids bloom in winter that are not really winter-flowering, but *Cymbidium Mastersii* may be reckoned amongst the best of true winter-flowering plants. It is a native of the East Indies, and requires the temperature of a *Cattleya*-house to grow it well. It may be successfully cultivated in the *Odontoglossum*-house, where it would flower some weeks later than more warmly-nursed plants. The leaves are of a deep green colour, gracefully arched, an inch wide, 18 or 20 inches long, and the flowers are of a yellowish-white colour, with a blotch of yellow on the lip. They are large, and borne thickly on spikes of from 15 to 18 inches in length, as many as sixteen blooms being frequently produced on a spike. If transferred from the house where they are growing when they are opening their flowers to a shady corner in a cooler one, they retain their beauty for a considerable period. They commonly come into flower in November, and continue blooming until January, when *Cymbidium eburneum* may be coming in. Both of these are extremely like one another in foliage, but there is a marked distinction in the construction of the flowers, those of the latter being more beautiful than those of the former. It is also a free-flowering, easily cultivated, showy, winter-blooming plant.—WM. FALCONER.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

***Echeveria metallica*.**—Not only is this a most useful plant for summer decoration in the flower and rock-garden, but it is also a very ornamental plant, especially when it has obtained a large size, for blooming under glass in winter. We have several large plants of it that were lifted and potted last October, when in bloom, that have been in flower ever since, and the long-branching spikes of wax-like flowers have a very striking appearance.—E. HOBNAK, Ramsey Abbey.

***Asphodelus acaulis*.**—A plant of this rare plant was exhibited the other day at South Kensington, by Mr. Munby. It has slender Rush-like leaves of a fresh green colour, that curve gracefully in a rosulate manner, the flowers being borne in the centre on a very short stem. The individual flowers are of a rosy-salmon colour, with a streak of green up the back of each segment. The plant is a native of Barbary, and is rare in collections of half-hardy herbaceous plants. Although not showy, its distinct habit and colour recommend it to the consideration of amateurs.—B.

***Crassula quadrifida*.**—This is a most profuse-flowering plant, the inflorescence of which somewhat resembles that of *C. lactea*, but is stronger, and the buds and tips of the petals are pink instead of white; indeed, the flower-spike forcibly reminds one of that borne by the London Pride (*Saxifraga umbrosa*). Its leaves are very distinct, being of a bright green and distinctly pitted, while their apices are retuse. Like other species of this genus, it may be readily propagated, and grows vigorously in any ordinary apartment. The compost best suited for it and its allies, is one consisting of crocks, sandy loam, and lime rubbish, on a well-drained bottom. It is a most valuable addition to succulents adapted for window-culture. It blooms in March, or about a month later than the better known milk-white *Crassula* (*C. lactea*).—H.

THE PROPAGATOR.

PROPAGATING AUCUBAS.

THESE are propagated by means of seeds, cuttings, layers, and grafts.

Seeds.

The finest of the berries should be gathered when thoroughly ripe, freed from the pulp by washing in water, and sown in seed-pans half-filled with drainage, and made up with sandy loam. After sowing, store the pans in cold frames or pits, where they had better be kept until the plants have appeared, and have grown sufficiently to require shifting. Then, instead of potting them singly, prick them off into other boxes or into a frame, and keep them well exposed whenever the weather is mild. By the time they are two years old they will be fit for transplanting into the open ground, but this operation is frequently deferred until the third year. When thus transferred, a piece of sheltered ground should be provided for them, and, although partially shaded by trees, that is a matter of no importance, as the *Aucuba* does well in company with such plants as *Hypericum*, *Berberis*, *Ivy*, and *Periwinkles*, that grow under shady trees, and thrive where even Grass can scarcely exist.

Cuttings.

This mode of increase is that which is usually adopted, and, as the *Aucuba* strikes freely, the cuttings are subjected to many different sorts of treatment. Half-ripened wood makes the best cuttings, and August and September are the best months for propagating in this way. Cut off as many branches from the old plants as can be spared, and divide them into pieces having two or three eyes each, and also one or more leaves. For these prepare a cold frame or border at the base of a wall, wooden fence, or hedge, mix a good deal of sand and some leaf-mould with the soil, and, in this, insert the cuttings pretty thickly and firmly. If in frames, cover with sashes, and shade from sunshine, but, if in borders, hand-lights should be employed. Here the plants may remain till next April or May, when most of them will be rooted, and, consequently, may be potted off singly into 60-sized pots, and kept in frames or plunged in ashes in a north border, or they may be transplanted further apart in other frames, or into lines in sheltered and shady positions out of doors. Some prefer nipping out the soft points of the cuttings, so as to induce them to throw up two or three shoots instead of one. Where the object is to strike them quickly instead of slowly, they should be inserted thickly in 48-sized pots, filled with sandy peat, surfaced with silver-sand, and kept indoors in a gentle heat and well shaded. As fine a "strike" as I remember having seen of them was in the Ashburnham Park Nurseries, where the central bed of one of the propagating-houses was quite carpeted with the common sort. In this bed there was a good depth of Cocoa-nut fibre for plunging pot-plants in; the surface was, therefore, levelled, some sand was mixed with it; and between the pots the cuttings were then inserted; here they rooted early and satisfactorily, and were soon fit for potting and for being transferred to a frame. Sometimes strong shoots of *Aucubas* make awkward cuttings, owing to their robust character and the great distance between the eyes on them, but for this there is a remedy and a good one. Use the best cutting-making parts for that purpose, and cut up the other portions into little pieces, each possessing a single eye and a leaf, and insert them, as recommended for cuttings in pots, in gentle heat, putting several in a pot. A little wooden peg should be applied as a support to each eye-cutting, the leaf being neatly affixed thereto, in a somewhat upright direction, by a piece of matting. Thousands of *Aucubas* are struck in this manner under glass cases in the intermediate propagating-houses at Coombe Wood Nurseries, where they root successfully, although put in as late as the end of October or beginning of November. In the same nurseries, too, I observed current year's shoots from 12 to 14 inches in length, propagated as single cuttings, each being inserted in a 48-sized pot, filled with sandy loam, and inserted in the cases in the propagating pits. These, when rooted, would not make nice permanent plants, but they were used as stocks for grafting on in the following spring.

Layers.

This is a convenient mode of propagation, especially where old plants are grown in broken soil, *i.e.* not on turfed lawns, and it is also useful for furnishing us, at once, with large and well-formed plants. The operation is best performed in August and September; it merely consists, as in the case of most other plants, in bending down the branches near the ground, so that they can be fixed in position by means of pegs pushed into the soil near the middle of the branches. A little slip or tongue should be cut at the bend where, also, the branches should receive a slight twist, so as to somewhat check the flow of sap and cause the ends to assume an easy upright posture. Some prepared compost, consisting of sand, peat, and some nice loam or leaf-soil, ought to be placed with the hand round the incision and bend; then level down the other mould, and press all firmly. In this way all the branches that can be brought down should be layered. Thus the plants should remain for two years, without even pruning out the young shoots that the old stock will inevitably produce; for, from these the batch of layers which are to succeed those at present layered should be selected. At the end of two years from the time of layering, lift the young layered plants, knife-dress them a little, if necessary, root and stem, and transplant them in nursery lines for a season or two till required. No sooner are these removed from the parent stocks, than the young shoots, made since they were brought down, should be layered; and so on, year after year, whenever increased stock is wanted.

Grafting.

This is the method pursued when standards are required; it is, however, more applicable in the case of plants for pot-culture than it is for those for outdoor use. Good clean stems of the common sort make the best stocks, and these are mostly selected from the strongest of the seedlings. *A. vera* is the favourite berry-bearing plant, and, consequently, more of that kind are worked than of any other sort. The operation is done in spring, by means of side-grafting in close gently-heated and well-shaded pits, and as the scions become united, the ligatures, with which they are fastened, are undone, and the heads of the stocks are gradually reduced. Grafting the *Aucuba* is a matter of no great difficulty; therefore, wax of any sort is but seldom used, although a little of it is beneficial as far as excluding wet from the incisions is concerned.

W. F.

Curious Experience of a Hybridiser.—The notion current among hybridists that the male parent exerts its influence chiefly over the fruit, while the female gives character to the plant or tree, is, according to my experience, erroneous. In many of my experiments in crossing Grapes, Raspberries, Strawberries, and Cereals, I have found the pollen to exert an almost entire pre-potent influence, so that scarcely a vestige of the character of the female parent was to be found in some of the cross-bred offsprings. Take, for instance, the Black-cap Raspberry crossed with White Four-seasons. Some of the seedlings bore white fruit, exactly like the male parent, and threw up abundance of suckers, but could not be induced to root from the tips of the canes like the female parent. Again, I have sown white sweet wrinkled Indian Corn, and early in the season removed its own pollen, and then, at the proper time, furnished pollen of some common yellow Indian Corn, then again, some pollen of purple Indian Corn; and when the Corn is ripe, I have found, instead of white sweet Corn, yellow Corn and purple Corn in the same ear, and, in some instances, both yellow and purple in the same kernel, distinctly marked; and yet the female parent, the kernel of seed that produced the stalk, was white sweet wrinkled Corn, showing, in my opinion, three distinct results in the Corn experiment, *viz.* the power of the pollen to change the colour and shape of the Corn; its immediate effect upon the embryo grain to which it is applied; and also a proof of superfecundation, or, in other words, of one seed being the joint issue of two male parents.—Mr. ARNOLD, in *Albany Cultivator*.

The Lattice, or Lace-leaved Plant (*Ouvirandra fenestralis*).—This reproduces itself freely from seeds, which healthy and vigorous plants ripen perfectly in this country. When ripe, the seeds drop all around the parent-plant and grow. These seedlings, when strong enough to handle, may be planted at once in a pan of loamy soil, and immediately plunged in the water a few inches below the surface. Should the seedlings have fixed themselves to the pebbles, these may be removed with them.—W. F.

THE FLOWER GARDEN.

SCARLET-FRUITED CUCURBIT.

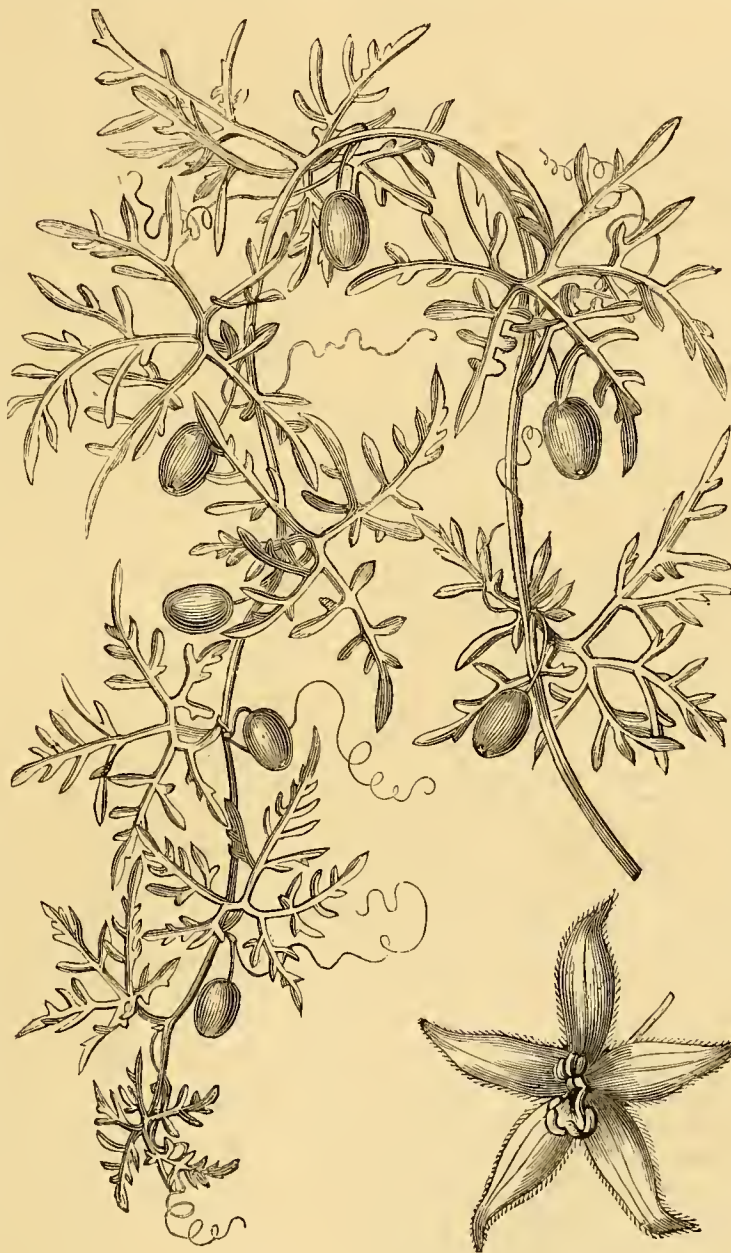
(ABOBRA VIRIDIFLORA.)

This plant is nearly allied to the common Cucumber of our gardens, and, although not yet generally cultivated, it is a very graceful trailing or climbing plant, suitable either for the cool conservatory, or for out-door culture during the hottest part of the year. It is well adapted for inside window boxes, and, like most other members of the Gourd family, it does fairly in any moist warm border, or it can be grown in hanging baskets. The foliage is of a deep rich green tint, while in form the leaves remind one of the old green-leaved Stag's-horn Geranium grown in old cottage windows many years ago. The plant is specially interesting on account of its scarlet or bright crimson fruits, which are borne in the axils of the much-divided leaves, and are very ornamental, as they contrast well with the foliage. The flowers are of a greenish or dingy white, and may be considered as the least ornamental portion of the plant. Seeds of it have germinated freely with Messrs. E. G. Henderson, sown indoors in spring in light rich soil.

RARE ALPINE PLANTS.

IN a list of new plants just issued by Messrs. Backhouse, of York, we find the following, viz.:—*Campanula Zoysii*: A dwarf species from the Tyrol and Carinthia, of great rarity, forming dense tufts bearing narrow pendent lilac-purple flowers. Blooms very freely, and, though delicate in structure, is of free growth in calcareous loam.—*Gentiana affinis*: A distinct and very handsome Gentian, introduced for the first time, forming dense tufts, 6 to 12 inches high, of dark brilliant blue flowers, which not only clothe the upper portion of the stems at each axil, but also form a dense terminal cluster. Allied to *G. gelida* and *G. septemfida*, the foliage reminding of both these species.—*Leucocrinum montanum*: A charming novelty, which may prove a rival to the Snowdrop as an early spring flower. Blossoms pure white, nearly 1½ inches across, borne on a profusion of stalks about 3 inches high, rising from each tuber. Leaves linear, very narrow. Blooms in the wild state with the melting snow.—*Pentstemon humilis*: Densely clustered, 6 to 9 inches high, more than one-half of the entire plant being a series of whorls of brilliant azure, almost "gentian" blue. Very free and pretty for both rock-work and borders. Rocky Mountains.—*P. secundiflorus*: Another new species from the same source, nearly allied to *P. acuminatus*. Judging by

the dried specimens received, it is equally valuable. The plant is rather taller, less glaucous, and has narrower and longer (linear-lanceolate) leaves, and more numerous rather shorter flowers of a deep rose, with blue segments. As the name implies, the blossoms of this species all "look" to one side of the spike. Being from a great elevation, and doubtless perfectly hardy, these and the other new Rocky Mountain Pentstemons will probably prove a great acquisition, the great defect in the varieties of *P. gentianoides* (so well known in gardens) having been their inability to bear severe frost.—*Romanzoffia sitchensis*: A high Alpine from the Rocky Mountains, with dense tufts of crenated leaves not unlike those of a *Sibthorpia* or dwarf *Chrysosplenium*. The numerous flowers, blooming early in spring, are pure white, and are borne on slender branching stalks 4 to 8 inches high. They seem to combine the forms of *Linnaea borealis* and *Saxifraga granulata*. Distinct and pretty.—*Sparaxis pulcherrima* v. *atro-purpurea*: A very dark purple-crimson variety of the well-known species, sent by one of our correspondents in South Africa. The gracefulness of this plant, especially for the margins of shrubberies or ornamental water, can scarcely be surpassed.—*S. pulcherrima* v. *floribunda*: Another distinct and highly-beautiful variety, found inhabiting a special district in Caffraria. Flowers very numerous, often quite weighing down the slender wire-like branched spikes, which are sometimes nearly 3 feet in length. The individual blossoms are of a deep shaded pink and white, more or less flaked.—*Veronica soratilis Griesei*: A variety of the well-known species, differing in having flowers of a deep rose colour. The individual blossoms are much larger than those of *V. fruticulosa*, and are far brighter and finer than those of the plant long known as *V. saxatilis rosea*, being fully equal in size to the finest forms of the blue *V. saxatilis*, and of the same habit and free growth.

Scarlet-fruited Cucurbit (*Abobra viridiflora*).

GLAND-BEARING BELL-FLOWERS.

THE genus *Adenophora*, like the *Platycodon*, is an offshoot from the *Campanula*, appropriately recognised by Fischer as something more than a mere section of that large generic group. Its most important distinctive feature, and that from which its name is derived, consists

in the fact that it possesses a cup-like glandular disc, whose variation in development is of considerable value in determining the specific distinctions of an otherwise very closely allied group of species. The home of the *Adenophoras*, geographically speaking, is in Siberia and Dahuria, where they enjoy a wide range of wild country, a district which, judging from herbarium and description, will yet yield many more interesting and lovely plants for our wild garden decoration than it has even hitherto done, and its con-

tributions are by no means few. The opinion we naturally form of that vast tract of country known as Siberia is based upon historical rather than physical knowledge. However black and repellent the former may be, whoever has read Atkinson's charming work descriptive of his wanderings from the Ural Mountains to the Amoor River, must have been compelled to modify his opinion, so far at least as regards the beauties of nature, and the grandeur of the scenery. In general appearance the *Adenophoras* have an erect habit of growth, the stems rising from a dense fleshy crown to a height of from 2 to 3 feet, a development much greater than that with which they are usually credited; but, in strong rich soil, they have attained with me a height of even 4 feet under exceptionally favourable circumstances. The upper half of the stems form a conical mass of flowers, individually small as compared with many of the *Campanulas*, but distributed with such regularity, and supported on slender, though, at the same time, rigid foot-stalks, interspersed with a few narrow bract-like leaves, giving a symmetry and regularity to the general group, such as are possessed by very few plants; each flower, with its long exerted style, is seen individually, and thus possesses its own individual beauty, besides which the whole is enhanced by a general elegance of contour and lightness of arrangement. In colour, amongst the score of species described, with about a dozen of which we are familiar in cultivation, blue predominates, varying from the fairly deep tint of *A. coronata* to the light and delicate cerulean hue of *A. liliifolia*, with all sorts of intermediate gradations. Possibly there may be a pure white form; but such I have not yet seen. So frequent, however, is the white associated with the blue amongst the old Bell-flowers, that I have no doubt it will appear some of these days as a seedling sport. To give a description of each of the species, seeing that their resemblance, viewed by the untutored eye of the ordinary cultivator, is so great, would be unnecessary; I will, therefore, merely enumerate half-a-dozen of the most distinct species—*Adenophora communis*, *A. coronata*, *A. liliifolia*, *A. Lamarckii*, *A. stylosa*, and *A. pereskiaefolia*. In these there occur slight variations in colour and size of flower, and also in the form of the radical leaves; the latter, however, being produced early in the spring, lose a large portion of their character before the season is sufficiently advanced for the full development of the floral axis, which takes place during the months of July and August. As I before stated, the thick fleshy roots of the *Adenophora* appear to revel in a strong rich loam, and rather to rejoice in a moderately damp sub-soil; they are impatient of removal, and should not be increased by division. Unlike the *Platycodons*, they produce their seeds freely; and, what is more, the seedlings reproduce very constantly the specific characteristics of the parent. The genus *Adenophora* should find a place in every choice selection of herbaceous plants, alike on account of the elegance of its habit, the chaste and beautiful appearance of its bell-like blossoms, and the time during which its blooming season lasts.

Botanic Gardens, Hull.

J. C. NIVEN.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The Common Iris (*I. germanica*).—The sword-shaped foliage of this plant, just now so fresh and green, apart from its great purple flowers produced later in the season, renders it well worth growing in town gardens, where so few other plants succeed. Clumps of this Iris look extremely well in out-door vases along with Irish Ivy during the early spring months, and it also makes fine masses planted in moist situations, or in shady borders.—J. C. L.

Hyacinth Roots.—Your correspondent who writes on Hyacinths does not seem to be aware that they make two distinct sets of roots. The first to support the blossoming, which are thin and fine, and can be seen in the water until the bloom is nearly over; the second set then comes forward, thick and fleshy, to mature the bloom for the succeeding season. Then is the time, not to dry them up, but to place them within the reach of food and nutriment.—J. W.

Graceful Wormwoods (*Artemisia*).—*Artemisia gracilis* is one of the most elegant of plants, and well adapted for imparting a grace to borders and sub-tropical gardens. *A. argentea* and *A. Judaica*, with their beautifully cut, graceful, silvery foliage, are no less attractive than *gracilis*, and, for dinner-table decoration, the three plants are most desirable when in a small state. They are easily raised from seed like half-hardy annuals.—P. B.

Rosa diversifolia.—M. Carrière invites the attention of Rose-growers to this very rare and interesting variety, which, up to the present, is hardly known outside of the precincts of some botanic gardens. In its general appearance, it resembles the common Bengal Rose, but its fine claret-red, or nearly violet flowers, and its peculiar leaves so far distinguish it from that species as to render it a subject deserving of some consideration at the hands of our most eminent Rose-growers and hybridisers.

THE FRUIT GARDEN.

THE MADRESFIELD COURT GRAPE.

THE efforts of raisers of new Grapes have been, for some time past, turned to the desirable object of obtaining a black Grape with a decidedly Muscat flavour, so as to be a fitting companion to the Muscat of Alexandria. The best type yet obtained in this way is the Madresfield Court Black Muscat, notwithstanding some have strongly denounced it. It would appear to be a natural course of events with all new Grapes that they should be at first loudly be-praised, and then as vigorously condemned, until they either drop out of cultivation, or are recognised as undoubted acquisitions. The former fate is the rule, the latter the exception. The Madresfield Court Black Muscat is now being recognised as an undoubted acquisition. If the bunch is not large, it is of a good table and exhibition size; the berries are long-oval in shape; it sets freely, and with a decided Muscat flavour, it combines an extraordinary lusciousness. Every Grape cultivator acknowledges it to be a fine-looking Grape, and to possess, in the main, all the characteristics of a fine variety, but many of them say it has a fatal tendency to crack just as it is becoming fully ripe. That this result has followed many attempts to cultivate it is, unquestionably, true, but, at the same time, it can be well done without cracking. I have this season seen the Madresfield Court Grape growing at three famous Grape-producing establishments, where ordinary hot-house treatment was applied to it, viz., at Syon House, at Gnnersbury Park, and at Heckfield. In each case magnificent development of berry, combined with high class flavour, was the result, and with only a very slight tendency to crack in one instance, and that, it would appear, was accounted for on ordinary grounds. One cultivator states that the tendency to crack is the result of improper cultivation. It would appear that it is when the berries are three-parts coloured that the cracking appears, and, therefore, it is at the colouring stage that airing is of the highest importance. His advice is to "air freely from the time the sun strikes the house in the morning until it goes off in the afternoon, leaving a few inches on all night. Avoid, by all means, a close, moist atmosphere for therein lies the cause of cracking. Maintain a pure, dry, warm air in the house, say 65° at night, and from 70° to 75° in the day. By so doing I do not think anyone will have cause to complain of this noble Grape; for, by the above treatment, we have had some fine examples of it here for the last few years." The greatest and the most striking success to be recorded in connection with the Madresfield Court Grape, is the manner in which it has shown itself when grown in a cool house at Chiswick. Against a north wall there is a lean-to orchard-house, constructed after a design of the Rev. J. Fountaine; this is a cold house, all the heat it gets being from the sun. In this house, Mr. Barron planted, some three or four years ago, three Vines—i.e., two Black Hamburgs and one Madresfield Court—to iron pillars along the house, about 3 feet from the front; a strong rod from each Vine is carried up the inside of the house, and one down towards the front, also; the back wall of the house, has, planted against it, Black Hamburg and Alicante. Here, the Madresfield Court is a grand cool-house Grape; it has borne a capital crop of nice bunches, the berries finely finished, and with a charming bloom, and without the slightest appearance of cracking. As compared with the Black Hamburg and Black Alicante growing in the same house, the Madresfield Court has decidedly the best of it; in fact, it was superior in flavour to the Muscat Hamburg growing in a neighbouring Vinery, and assisted by artificial heat. The only other Grape that has the Muscat flavour, that will ripen in a cool house, is the White Frontignan; but the Madresfield Court exceeds it in many respects. We have then in the Madresfield Court Black Muscat a Grape that can be grown in a cool house under quite ordinary treatment; and which, when so cultivated, possesses all the qualities of a first-class Grape.

R. D.

VINES ON THEIR OWN ROOTS BEST.

LET me first introduce the Mrs. Pince Grape, which, after five years' trial, worked on the Black Hamburg, has proved little short of a complete failure. During the time just mentioned, the diameter of the stem at its greatest circumference did not exceed that of a vigorous Vine two years old, and no amount of coaxing could induce increased action. In consequence of debility, the bunches and berries were constantly small, accompanied by a slight deficiency of bloom. In short, it was evident that the stock was unsuitable for this variety. Now for contrary results. Towards the end of last August I happened to be in Exeter, and paid a visit to Streatham Hall, where the gardener, Mr. Beddard, is a first-class Grape-grower. On entering the first house, planted principally with Mrs. Pince I was surprised

to find such a magnificent crop; the bunches were large, the berries of immense size, and the colour perfect. I said to Mr. Beddard, "You have certainly redeemed the character of this Grape from the repeated charges brought against it." He replied, "When rightly treated, it is not equalled by any late kind in cultivation." In this case it was growing on its own roots, I, therefore, at once, concluded that I was wrong in grafting it on the Black Hamburgh. The Lady Downes Grapes, in the same house, were equally meritorious, and the same may be said of all the Grapes under his charge. On two occasions, and under identical circumstances, the Alicante worked on the Hamburgh proved as great a failure as the Mrs. Pince. The bunches and berries were small and deficient of colour. As yet, sufficient time has not elapsed to enable me to offer a reliable statement of the White Lady Downes, but, from what I have seen of its character, I am by no means sanguine as to quality. On the same stock the Black variety is much improved, not more vigorous, but decidedly larger both in bunch and berry, and, I fancy, less subject to scorch. Whether grafted or grown on its own roots, I have never been able to manage the Madresfield Grape properly. I have never had any difficulty in producing large handsome bunches of it, and perfectly coloured; but just at the completion of the ripening process decay began, and soon destroyed the crop. The true Tokay, under most conditions, is a rampant grower, but I find, when grafted, it keeps badly, even when the roots are confined to the interior of the house. The West's St. Peter's is greatly benefited by being grafted, which increases both the size of the bunch and berry; but when worked on the Barbarossa it deteriorates. I am beginning to be convinced that, except in very few cases, such as Snow's Muscat and some of the more delicate varieties of the Frontignans, the Grape Vine will always prove more satisfactory when cultivated on its own roots, than when grafted.

ALEXANDER CRAMB, in the *Gardener*.

CHANGING DWARF PEARS TO STANDARDS.

WE observe that some recommend planting deep, or banking up the soil around dwarf Pears, for the purpose of converting



a. Trunk of dwarf Pear tree. b. b. Pear stock inserted into it for new bottom. c. Cut for receiving the Pear stock. d. Pear stock, cut sloping before insertion.

them into standards by the emission of new roots from the Pear stem above the place of junction between Pear and Quince. The difficulty is, they are apt to send out a very few Pear roots, often only on one side, which tend to push the tree over, and they are rarely as perfect as with a full spread of roots on every side. A better mode, and one attended with but little labour, is to set two, three, or four thrifty seedling Pear trees, a year or two old, on opposite sides, close to the trunk of the bearing dwarf tree; when established one year, cut off the tops in wedge form, and slip them in under slits cut in the stem of the dwarf, as shown in the annexed figures. This should be done as soon as the bark begins to peel in the dwarf tree, when the points of the young Pear trees may be easily inserted. Grafting wax may be then applied, and the work is done. Usually, two Pear seedlings, or one on each side of the tree, are enough, giving, in a few years, two stout legs to the bearing tree, that brace it firmly, and in a few years more make one flat trunk. If three seedlings are used, they form a tripod, and if four, a four-sided stem.—*Cultivator*.

Vines for a Hamburgh House.—At page 92, "G. S. D." makes inquiries about Vines for a Hamburgh house. For the three best suitable white kinds I would recommend him to plant Duke of Buccleuch, Buckland's Sweetwater, and Royal Muscadine, all well-tried varieties, which are sure to give satisfaction under the most

ordinary treatment. For black sorts, I would plant Black Hamburgh, Black Prince, and Barbarossa (Gros Guillaume), at the warmest end of the house. It is remarkable that black kinds, suitable as companions for the Hamburgh, are very scarce. Apart from the whites enumerated, there are Golden Champion, Foster's White Seedling, Golden Hamburgh, Duchess of Buccleuch, White Frontignan, Chasselas Musqué, Napoleon, Syrian, Trebbiano, &c., all adapted for a Hamburgh house; while of blacks (with the exception of the varieties of Hamburghs), I could not select four equally good and suitable neighbours. A Hamburgh house is the best place for the Duke of Buccleuch. Had I a Hamburgh house to plant now, I would not trouble myself about variety, but would have the one-half Black Hamburgh and the other half Duke of Buccleuch.—J. M.

THE LIBRARY.

FLORE DES SERRES.*

AFTER a more or less impatient waiting of nine or ten months, the subscribers to this interesting and beautiful, but most irregularly published work, have at last been gratified by the publication, on the first day of this month, of an unusually rich and abundant instalment, consisting of half a volume, contained in two thick triple parts, each of which is enriched with twenty-eight beautifully coloured plates, some of them of great horticultural interest, and most of them exceedingly true to nature, and exact and accurate representations of the plants and flowers which they profess to portray. These we may now proceed to examine cursorily and *seriatim*.—Plate 1. "Leucojum," or "Acis autumnalis." This is an exceedingly pretty little white bell-flowered gem, with grassy foliage, and blossoms closely resembling in shape those of the little Campanula pulla, of a pure white, the base of the bell, where the stalk joins it, being of a delicate rosy tint, and the flowers usually coming in pairs at the end of slight and gracefully-drooping flower-stalks, from 3 to 4 inches in height. This pretty little plant is perfectly hardy, and comes from the shores of the Mediterranean.—Plate 2. "Umbilicus spinosus." This, which is also known under the names of *Crassula spinosa*, *Cotyledon spinosum*, *Sedum spinosum*, *Orostachys chlorantha*, and *Sempervivum cuspidatum*, is a very ornamental and dwarf-growing species of the *Crassula* family, reproducing itself most freely in the shape of offsets, or young plants, thrown off from the root, and coming up all round the parent plant. This plant is found in Siberia, and also in both China and Japan. It will thrive well in the open ground during the summer, but must be lifted at the end of autumn, and wintered in a pot, as most of this family have to be in this changeable climate.—Plate 3. "Dolichos bicontortus." This singular leguminous plant, from Japan, is said to be quite hardy, and to produce large Pea-shaped blossoms, the outside petals of which, before the flower opens, are yellow, veined with black; but, when the flower opens, the inside colour is violet and white, making quite a pretty flower. But the curious parts of the plant are the seed-pods, produced in pairs on the top of long stems, and curling themselves round exactly like rams' horns; hence the name of "bicontortus," presenting a most singular and unique appearance. The plant, when grown at Bordeaux, reached a height of about 6 feet 6 inches. The flowers, however, are, unfortunately, extremely short-lived and can only be seen in beauty by early risers, as they expand at daybreak, and close their petals about 9 a.m. It is probably used as a vegetable in Japan.—Plate 4. "Amygdalus persicifolia rubra," an ornamental-foliaged variety of the Peach, raised from seed in America. Its leaves are of a bright rosy-claret underneath, a colour which also pervades the stems of the young growth. The fruit is also said to be of excellent quality, and entirely red-fleshed, and the leaves are said to be never affected by the disease which commonly attacks Peach foliage, and which the French call *La Cloque*, but which has apparently no equivalent in the English language.—Plate 5. "Zea Mais, varieties Reuteri and erythro-sperma," pretty deep red and golden-yellow ornamental varieties of the Indian Corn or Maize.—Plate 6. "Solanum ciliatum." This handsome bright scarlet-fruited annual variety of *Solanum*, from the Brazils, produces clusters of ornamental fruit in great abundance, each fruit about the size of a small Plum, and possessing the merit of not shrivelling as the season advances, but maintaining their round and plump appearance for nine or ten months. This variety was sent out a year or two since by Messrs. Carter & Co., of Holborn.—Plate 7. "Dicksonia antarctica at home." This is a representation of a large group of these magnificent Tree-Ferns as seen in their native habitat in the ravines of Tasmania, during a snowstorm.—Plate 8. "Hybrid Grape, Pearson's Ferdinand de Lesseps." This produces fruit of a bright golden colour and medium size, and of excellent quality and flavour. It is a cross between the Chasselas de Fontainebleau and an

* "Flore des Serres et Jardins de l'Europe." Completion of Volume XIX. Van Houtte, Ghent.

American variety known as the Strawberry Grape, and was raised by Mr. Pearson, of Chilwell.—Plate 9. "*Hyophorbe indica*, or *Areca butescens*." A graceful-foliaged cool greenhouse Palm, from the Mauritius and Isle of Bourbon.—Plate 10. "*Gladiolus purpureo auratus*." This is a much too highly-coloured representation of this species, which, instead of being the bright gold colour as painted in this plate, is, in reality, only a dull pale straw colour, only worth growing as a curiosity or in a collection of Gladioli, and by no means an ornamental variety.—Plate 11. "*Gladiolus Colvilli* and *Colvilli alba*." Faithful and accurate representations of these well-known, but too little cultivated, garden varieties of this beautiful and most ornamental autumn-blooming flower. Plate 12. "*Dahlia vert.*" A curious variety of this well-known flower, raised by Herr Sieckmaon, producing medium-sized fully double flowers of a bright clear green.—Plate 13. "*Lilium tigrinum flore pleno*." A beautiful fully double form of the common Tiger Lily, to which this plate hardly does justice, as the flower is, in reality, more double than it is there represented. This variety is perfectly hardy, and reproduces itself most freely by bulblets formed at the axils of all the leaves on the greater part of the flower-stem.—Plate 14. "*Cypripedium superbium*." A fine, bold, large-flowered variety of the Slipper plant, from Assam. This variety has been already figured in the 16th volume of this work, page 161; but the portrait there given was executed by a negligent artist from an almost faded flower, and gives no true idea of the beauty of the variety.—Plate 15. "*Kæmpferia Roscoeana*." A beautifully mottled-leaved foliage-plant from the East Indies, which requires the temperature of a stove.—Plates 16 and 17. "*Rhododendron hybridum nigrescens*." A double-page picture of one of Mr. Anthony Waterer's fine seedlings, all of which are quite hardy. This one is said to be extremely free-flowering, and is, as its name implies, of a shade of colour very nearly approaching black. These plates are not so well or so carefully executed as usual, and, I should think, hardly do justice to the variety.—Plate 18. "*Cocos Weddelliana*." This is, perhaps, the most elegant and graceful-growing of all cool greenhouse Palms, making a most beautiful pot-plant for table decoration, when in a small state, from its elegant feathering foliage.—Plate 19. "*Camellia japonica Etoile polaire*." An exceedingly pretty variety of this well-known plant, with striped rose and white flowers, sent out by Messrs. Henderson.—Plate 20. "*Wistaria multi-juga*." A new and ornamental variety of this well-known wall plant, producing immensely long racemes of handsome Pea-shaped blossoms, the upper petals of which are lilac-blush and the lower ones deep purple. It was introduced from Japan by Von Siebold, of Leyden, and is perfectly hardy and marvellously quick growing, producing shoots of 13 feet in length in a single year, and most free-flowering, its flower racemes attaining twice the length figured in this plate, or over 18 inches; altogether, a most desirable addition to any collection of hardy climbing plants.—Plate 21. "*Echeveria agavoides*." This is a thick and solid-leaved variety of the House Leek, introduced from Mexico into French gardens, and already used by a hybridiser there (Mon. Delenil) as one of the parents of his new hybrid *Echeveria scaphiphylla*.—Plates 22, 23. "*Azalea indica*," "*Mrs. Wright*." A beautiful seedling variety of this lovely flower, raised by M. Van Houtte, producing large semi-double flowers of a pure white, heavily and regularly streaked and spotted with bright carmine, and with a slight greenish-yellow shading towards the centre of the flower.—Plates 24, 25. "*Azalea indica*," "*Madlle. Louise de Kerchove*." A most lovely semi-double variety, also raised from seed by M. Van Houtte; no description of colours can do anything like justice to this exquisite variety, which must be seen in order to be fully appreciated.—Plates 26, 27. "*Azalea indica*," "*Cocarde Orange*." A charming semi-double variety of medium-sized flowers, of the most fiery orange-scarlet, with lighter crimson centre, reminding one of *Madame Iris Lefebvre*, but an improvement in clearness of colour on that fine variety. Mons. Van Coppenolle, of Ghent, is the fortunate raiser of this fine novelty, which was awarded the first prize for seedlings at Brussels when shown there last summer.—Plates 28, 29. "*Azalea indica*," "*Sigismund Rucker*." This magnificent single variety is, perhaps, the very finest for individual size of bloom of the many fine novelties raised and sent out by M. Van Houtte, of Ghent. Its flowers, of immense size, are mainly of a clear rosy-crimson colour, richly and evenly spotted on the upper petals with deep carmine, the whole flower being evenly and regularly bordered with an indented edging of pure white; altogether, a really first-class variety, which has already been seen and appreciated in London, having been awarded a first-class certificate by the Floral Committee of the Royal Horticultural Society when submitted to its notice during the season of 1873.

This notice concludes the first half of the present instalment of this work. The plates contained in the remaining triple part will be noticed and commented on in a future number. W. E. G.

Junior Carlton Club.

PENNY HILL, NEAR BAGSHOT.

THIS is one of the far from common gardens in which the most essential elements of garden scenery, trees, receive something like the attention which they deserve. Our attention was first directed to it by Mr. John Waterer, of Bagshot, who informed us that it contained some of the finest specimens of our rarer Pines. A recent visit made to the gardens showed this to be the case. The garden, which occupies a somewhat elevated and varied position near Bagshot, has not been long formed, and, therefore, old specimens of the common trees are not particularly noticeable; but, among the newer introductions, there are remarkably fine examples, and instructive to the tree-lover, as furnishing evidence of the value of some of the recent introductions. One of the foremost among these is the Albert Spruce (*Abies Alberti*), which we figure herewith, from a photograph taken by Mr. Vernon Heath, of Piccadilly. Some suppose this Spruce to be not very distinct from the Hemlock Spruce (*Abies canadensis*), and this may be so from a botanical point of view; but, judging from the fine and rapidly growing specimen at Penny Hill, we should say that they are essentially distinct in habit. No Pine or *Abies* throws up a freer or more graceful "leader" than this does, whereas the Hemlock is usually, in Britain, a low round-headed tree, which, from some unknown cause, does not thrive at all so well here as in its native country. There are two trees of the Albert Spruce at Penny Hill, one 25 and the other nearly 30 feet high, each as exquisitely graceful as the fairest young Deodar that graces an English lawn. Therefore, this tree may be assumed to be one of the most valuable for ornamental purposes, at least, that we have yet introduced. The remarkable Japanese Umbrella Pine is also in fine condition here, the largest specimen being 8 feet high by 6 feet in diameter, and in the most vigorous health. We have seen specimens as high, but not nearly so stoutly-formed and compact; Mr. Bohn's capital examples at Twickenham being quite open and slender, compared to Mr. Hodges's superb specimen. This is as dense as a compactly-clipped Box bush. After the *Arancaria*, it is the most distinct in aspect of all Conifers that will endure our climate, and will prove a more valuable acquisition than was at first expected. Its complete hardiness is greatly in its favour. There are many fine specimens of such plants as the *Libocedrus decurrens*, *Nordmanniana* Pine, the Giant Thuja (*Thuja gigantea*, commonly called T. Lobbi), *Cupressus nutkaensis*, &c.; but we are more interested in the remarkably striking specimens of the *Retinospora*, which here flourish so as to remind us of their tree-like character. *Retinospora pisifera* (true) is 15 feet high, and 14 feet through—a plummy mass of healthy deep-green shoots, each with all the grace of a Fern. There are various examples of *Thujopsis dolabrata variegata*, about 7 feet high, and in rude health, as are all the finer and newer kinds of *Abies* from Western America. Rarer still to see, however, is a specimen of the fine *Thujopsis Standishi*, 10 feet high, and in stout health. Although our present notice mainly concerns some of the rarer trees, we would like, in conclusion, to call attention to a very charming feature—an American garden on the model of that in the Botanic Gardens, Regent's Park, designed originally by Mr. Marnock, and long embellished by American plants from the Bagshot Nurseries. The American garden at Penny Hill occupies a hollow; it is, of course, permanently planted, and never covered over, so that it is only in the disposition of the ground that it can be said to resemble the Regent's Park arrangement. It was a good idea to imitate the pleasant diversity of the "Park" show, with its small clumps and isolated specimens as well as large masses, and, we should say, there are few prettier effects than that afforded by the American garden at Penny Hill, as seen from the rising ground around, when the bushes are in bloom. Some of the neatest and, in every way, the best Holly hedges we have seen occur at Penny Hill, and that to the collective extent of over three miles in length. These were all planted originally on the level ground, and there is much evidence in favour of this mode of planting instead of the ordinary one of planting on a slightly raised ledge. A peculiar aspect is imparted to various parts of the grounds by tall narrowly-pyramidal variegated Hollies; which are very strikingly associated with the green tapering Conifers.



THE ALBERT SPRUCE IN THE GARDENS AT PENNY HILL.

SOILS AND FERTILISERS.

USES OF LIME.

LIME, when applied to the soil, says the *Irish Farmers' Gazette*, acts in a two-fold manner. It acts physically by altering the mechanical condition of the soil, imparting friability to stiff soils and firmness to loose soils. It acts chemically by decomposing acid compounds existing in the soil, and in this manner it forms new and wholesome compounds out of others which were injurious to vegetation. It exercises a powerful influence upon inert organic matter; brings it into a state of active decomposition, and thus renders it fit for the support of other and more valuable forms of vegetation than it could have sustained in its natural state. Lime also acts on a variety of other substances, and sets them free to perform their office as part of the food of plants. It also forms a considerable proportion of the inorganic matter of many plants, so that it feeds them both directly and indirectly.

Quicklime.

Limestone is a carbonate of lime, more or less pure, and, if crushed into a fine powder, it may be applied to the soil in that state. The usual mode of preparation, however, is to burn the limestone in a kiln, specially constructed for the purpose; and the effect of this process is to drive off the carbonic acid which existed in the stone previous to its being put into the kiln. Freshly-burned limestone becomes caustic lime or quicklime; but if the burned lime is left exposed to the air for a sufficient length of time, it will re-absorb carbonic acid from the air; and, when this is the case, it becomes mild lime. It is in one or other of these states—either in its caustic or in its mild state—that lime is applied to the land. Both kinds ultimately produce the same effects, the great point in which they differ being the comparative rapidity with which they act. Caustic or quicklime has a speedy action on matter; while that of mild lime or carbonate of lime is not so immediately apparent. Limestone, gravel, shell-marl, and shell-sand are examples of carbonate of lime; and these produce a marked effect upon land and upon herbage, when judiciously applied. Lime, when brought from the kiln, is usually put down upon the land to which it is to be applied in small heaps, at regular distances; and, if allowed to remain for a considerable time, will gradually absorb sufficient moisture from the atmosphere to slake it. The heaps are then spread over the surface, and, in doing so, due care should be taken that the bottom of the heap is well cleared out. Lime is also sometimes laid down in a large long heap, and then slaked by pouring water over it. The value of lime depends upon the soil being rich in vegetable matters, or upon its containing plenty of mineral food.

Lime Composts.

Another and important mode of applying lime is in the form of a compost, with earth or vegetable matter. In forming a heap of this kind, first lay down a layer of earth, &c., fully a foot thick; then spread on this bed a layer of quicklime, at the rate of two bushels—that is, half a barrel—to the cubic yard of stuff. A layer of stuff is next laid down over the lime, and lime over it, and so on, until three or four layers of stuff and of lime have been laid, the upper layer of all being one of lime, slightly covered with earth. We have occasionally sprinkled a little coarse salt amongst each layer of stuff, and have had reason to believe that the addition was of service. The heap should remain untouched for three or four weeks, after which it should be turned over, beginning at one end, and carefully mixing the lime and soil together. If any part of the heap appears poor, a shovelful or two of lime may be thrown in at that spot. Another interval must elapse before the heap is again touched, and, when it is to be turned the second time, the operation should commence at the opposite end to that where it was begun at the first turning. This second turning will incorporate the materials, and, after a short time, the compost may be put on the land; at the same time, the longer it can remain, it will be all the better. We have had compost heaps lying nearly twelve months before the materials were spread upon the land. In preparing a compost, the nature of the land to which it is to be applied should be taken into account, so as to effect that intermixture of soils which is frequently productive of much advantage. A compost should not be formed of quicklime and decomposed or fermenting farm-yard dung, because the quicklime expels the ammonia from manure which is in a state of fermentation.

Quantity to Apply.

The quantity of lime that may be applied at a time varies with the nature of the soil; heavy clay soil requiring the largest quantity. Usually the quantity applied ranges from twenty to fifty barrels to the acre; but a less quantity will do.

THE KITCHEN GARDEN.

CULTURE OF THE ONION.

THE best soil to grow Onions in is a rich, deep, strong, and loamy one, and the best manure is deodorised night soil mixed with pigeon or fowl dung. The beds should be marked out early in November, and laid up in rough ridges so as to expose the soil to frost. If large Onions are wanted, some guano should be sprinkled on the bed in February. This should be raked in, and in a fortnight afterwards the seed may be sown. Where guano is used, the seed ought never to be put in before a fortnight's time has elapsed, otherwise the guano will kill the seed; but after a fortnight it is safe to sow it.

Sowing and Thinning.

In large gardens or allotments the seed is best sown in drills from 6 to 8 inches wide. On this system the plants not only get more air, but they are more easily cleaned from weeds. Where the garden is small, and where only a small space can be spared for a bed of Onions, it will be found the most profitable way to sow the seed broadcast, using about 2oz. of seed to a bed 18 feet long by 4 feet wide. Before sowing, whether on the drill or broadcast system, it is a good plan to moisten the seed with water, and, after rubbing it about in a cloth until every part of the seed is nearly dry again, then to sprinkle some flour or lime amongst it. As the seed then becomes white, you can see where you have missed sowing, and by this means lay it on more evenly. Always put in plenty of seed, as you can easily thin out if the plants are crowded. Early in March is the best time for sowing Onion seed for the main crop, or even earlier if the land can be caught in a fit state. Onion seed lies a long time in the land before sprouting; therefore, sow as early as you can—the plants then get the full benefit of the heat in summer. Onions sown late often grub off. Thin out the plants carefully by degrees; a few at a time. When they are a foot high, or thereabouts, you may give them a final thinning, always taking care to leave such plants only as show the most blade leaves. I once asked an aged cottager in Lancashire, who was growing for exhibition, why he was so very particular about thinning out the plants? He replied by asking me the following question: "Do you think a scallion with three-blade leaves can ever make as large an Onion as one with five-blade leaves? Do you not know that every leaf-blade makes a fold round the Onion, and that five folds will make a larger Onion than three folds?" I saw that the old man's idea was quite correct, and have adopted the plan ever since.

Remedies for Maggots.

During June, Onions are much troubled with the maggot. If the young Onions turn yellow and drop on the ground, they are attacked by a fly, *Anthomyia ceparum*. The grub which does the mischief is white, shiny, and cylindrical; it measures from a $\frac{1}{4}$ to $\frac{1}{2}$ an inch in length; it eats its way into the heart of the Onion and destroys it. As the fly lays its eggs within the leaf-sheaths of the plant close to the ground, any noxious top-dressing not injurious to the plant may be used to keep the fly at a distance. The beef fly would not deposit its maggots on the Onion, neither would the Onion fly deposit its maggots on the beef. Every fly has a nature of its own, which cannot be changed. Tansy, Mint, or any other strong herb, placed on a piece of beef, throws the beef fly off its scent, and it will not alight on it, or attempt to deposit maggots thereon. The Onion fly can smell the Onions growing on the bed, and it will not lay its eggs on any other plant; hence, soot with guano, or gas lime from the gas works, when thrown broadcast on the bed, are excellent remedies; for these top-dressings not only throw the fly off its scent, but they stimulate the young Onions into a vigorous growth, and they soot get both too large and tough for the young maggots to penetrate, who thus die for want of food. The fly only attacks Onions when they are very young and in a tender state. The best remedy known is a heavy top-dressing of soot, and it is astonishing what a large quantity can be used without injuring the plants. I may here mention that nothing equals a top-dressing of soot for Carrots when attacked by maggots deposited by the Carrot fly. As the Onion will root down from 18 inches to 2 feet, deep trenching and plenty of manure are necessary, and will be found the best preventives of the vermin that destroy the Onions.

Varieties.

The best for spring sowing and a profitable crop are White Portugal, James's Keeping, Reading, Strasburg, and Deptford, the two last rather strong in flavour, but good croppers and good keepers. Those who are fond of eating young Onions should make a bed and sow it with the Giant Rocca, a new variety only lately introduced; its flavour is much milder than any other Onion, and it is good to eat with Cucumber. The Giant Rocca can be grown to an immense

size—8 inches in diameter, and 2 lb. in weight. It is now very commonly exhibited above that weight; but, in order to grow it to its full size, the seed should be sown about the middle of August; and, in the month of March following, the young Onions should be transplanted into a very rich bed, in drills 9 inches apart. Unfortunately, the Giant Rocca does not keep for any length of time; but its fine mild flavour, combined with large size and a beautiful appearance, recommend it strongly to every one interested in the growth of fine Onions. Other varieties that will keep can be grown this way to a very large size, when they are wanted for exhibition, such as Blood-red, Danvers Yellow (very handsome), White Portugal, Flat Madeira, Deptford, and White Globe, all of which attain a very large size. For ducks, in July and August, no Onion is equal to the Giant Rocca for stuffing.

Advantage of Raised Beds.

In order to grow good-sized Onions, one grand result is obtained by raising up the beds, and this is done by throwing up the soil from the alleys; the bed should be left in a rough state during winter, in order to get it pulverised by frost. It is impossible to do justice in sowing the seed unless the surface is in a somewhat fine and friable condition, like a potting compost. One good result of raising the beds is greater certainty of ripening the crop; in fact, it is a very important matter. Anyone can grow a fat Onion with a sappy neck; but the perfection of Onion-growing is to have them large, hard, and the growth so completely finished that the top is withered at storing time. Whilst the Onion is growing it should receive no injury—not a leaf should be bruised nor a neck broken; and, though it may be necessary to break their necks in order to promote ripening, the practice is a proof either that the season is too damp, or the soil too rich, or the management faulty. When the alleys are thrown up, it naturally follows that the beds are better drained, and the Onions are warmer at the roots; gross, thick-necked Onions are produced by rank sour manure and want of drainage. Deep digging in winter causes the superabundant water to sink into the soil, and this process is absolutely necessary in strong rich soils. Another good point is obtained when the plants are kept clean and free from weeds. As soon as you perceive the young plants commencing to bulb, administer, once a week, doses of strong manure-water, which may be made in various ways. A peck of sheep's dung in about twenty gallons of water is excellent. Another good liquid manure may be made by mixing half-a-pound of sulphate of ammonia with twenty gallons of water. If regularly fed, they will grow to a great size, especially if they have a hot season. When you perceive the bulbs beginning to ripen, cease feeding them with liquid manure. In order to cause the bulbs to swell, it is necessary to bend the tops down, just above the crown of the bulb, by drawing the back part of a rake over them. In about a fortnight afterwards, if the weather should be fine and dry, the crop may be pulled up and laid on the bed, or any dry place, for about three or four weeks, turning them over occasionally. When the tops are dead you may tie them up in bunches, and store them in any building. They keep well hung against a wall in an outhouse or garden-shed. In some parts of Lancashire, gardeners hang them up in bunches against the garden-walls, where they remain all winter, and are taken away as wanted. Onions, like Strawberries and Roses, are fond of a dry sunny heat at the surface whilst their roots are wallowing in a rich moist soil below. I have seen whole fields of Onions grown with soot and salt dug into the soil. Long beds 4 feet wide were made, the alleys being deepish, and the surface of the beds was raised a little in the centre, in order to throw the water off quickly during excessive rains. These beds were sown liberally with seed broadcast, and the work of weeding and thinning out was done by boys and girls. Onions can never be grown successfully on a light sandy soil—they always grub off; but there is a very large Shallot now grown, of a reddish colour, which yields an immense crop, and which can be grown successfully in any light garden soil well manured; and the Potato Onion and the Tree Onion will also grow in rich light soils. Let the bed be gently trodden down, and then raked level: lay on the garden line close to the soil for the whole length of the bed, beginning at one side; then with the back part of the rake, the head of which should be straight, make a very shallow trench close to the line, by pushing away a little soil for the whole length of the garden line; after which move your line about 7 or 8 inches for the next drill, and, in the same manner, make another drill by pushing away a little soil with the back part of your rake-head. In this manner go on until three or four trenches or drills are made, which must be very shallow; then sow your seed, and proceed to make more drills and sow again, until your 5-foot bed is all drilled; cover up your drills with the rake, and pat the bed down gently; then finish off with the making a pathway on each side of your bed.

H. T.

CULTURE OF HORSERADISH.

DID you ever plant Horseradish with an iron bar? No; what a singular question to ask. Well, my friend, you may think so, but such is, in fact, not the case. You may say, perhaps, that Horseradish, like many common plants, will grow anywhere, and so it will. But to have it good it must be grown well. Some years ago, when I was in the West of England, I had charge of a very old and a very productive garden, in which was a large bed of Horseradish, situated in a prominent position, and yet it contained no useful piece longer than from 4 to 6 inches. The first winter I was there, I had a bed made in the least frequented part of the garden. I trenched the spot selected for the bed about 2 feet deep, adding a good dressing of dung, and allowed the bed to settle down well before planting. I then trenched the old bed fully two feet deep, and carefully picked out every bit of the Horseradish. There being plenty of crowns, we saved the best of them, and cut away every bit of side root; some of these crowns had pretty firm bits attached to them of from 2 to 6 inches long. These were allowed to remain, and the strongest were selected for planting. After the crowns were gone, we used some of the best of the roots, the longest, strongest, and straightest; these had no crowns, but, Horseradish cares little about being beheaded, and when the genial influence of summer begins to act on it, it soon pushes forth a new head. When our freshly-made bed had become pretty well settled down, we took an iron bar, and with it made holes in the bed about 15 inches deep, leaving about as much between the rows, and about one-half that distance hole from hole. These holes were made to remain open, at least, for a time, and, in order that they might be a little wider at the top than at the bottom, the bar was made to play round about once or twice before it was withdrawn. This also firmed the sides. Into these holes we dropped the sets of Horseradish; enough of loose earth is sure to sink down in the operation to keep the young rootlets all right; and the open hole assists vegetation. It was said the new man had destroyed all the good old bed in which one always found some Radish; and, moreover, the new bed was planted so deeply that it was believed the plants and cuttings would never see daylight. Before, however, the roast beef graced the next Christmas dinner-table, there was in this new bed plenty of good and cleanly-grown Horseradish, more than 1 foot long, and between 2 and 3 inches in girth. As to lifting Horseradish, this should never be done hap-hazard all over the bed, as, by doing so, one never knows where to pitch upon a good root when such is wanted. In taking the Radish from our new bed, we began at the end where we had planted the strongest crowns. In autumn, we had a couple of yards along the bed dug up, from side to side; all the sticks fit for use were carefully put aside into a convenient place, amongst some mould in an open shed. This portion of the bed was levelled down into its former place, and planted afresh, and thus we went along the bed, lifting according to the demand, and no more gnarled and twisted Horseradish, of 2 or 3 inches long, was to be found.

GEORGE DAWSON.

New Road, Barnet.

RUNNER BEANS.

THERE is not in the whole range of summer vegetables a more useful, and, when well cooked, a more delicious dish of green food than the Scarlet Runner Bean. Its great cropping powers are proverbial, and the more its pods are gathered the more abundantly are they produced, and the plants continue to furnish an unfailing supply until early winter frosts come and destroy them. I do not, however, intend to place the Scarlet Runner before the White Dutch, which differs from the Scarlet only in having its flowers and seed white, and in the latter, not being so large as that of the Scarlet. The Beans of the White Dutch are also cheaper, and rather earlier than those of the Scarlet. These Runner Beans deserve a better degree of selection than they usually obtain, but where great breadths are grown, whether for market or for seed, it is difficult to give them the requisite attention. Acres of them might be continually examined, and yet not a single plant or pod be found that appears to be more than

ordinarily fine; yet, if time and care can be bestowed, without doubt, it would be amply repaid. It was in this way that a valuable selection of the Scarlet, known as the Champion Runner, originated; and, I believe, that it has well maintained its original character of being a very fine podded kind. In the hands of ordinary growers, a fine Bean of this kind is apt to speedily degenerate, especially when all the best pods are gathered for table use, and the worst left for seed. To maintain its true character, a short row should be left to furnish a seed supply, and of these, when ripe, the finest pods and the finest seed should always be selected to furnish the seed stock of the ensuing year; thus, by care and attention, no deterioration would ensue. The finest samples of any Runner Bean that I have yet seen originated in a selection from the White Dutch, one pod alone having been found larger and broader than usual, and its produce of four seeds were saved and grown last summer. These produced a good crop of remarkably fine pods, averaging six inches in length, and an inch in width, very flat and straight. If this selection should again, next year, keep up to its fine form, it will, without doubt, prove to be an acquisition. We hear a good deal at times about new things, vegetables especially, being simply old faces under new names, and that this reproach attaches to a large number of so-called new vegetables there can be little doubt. In some cases, however, we find amongst novelties really superior forms of old things that have been obtained only by careful selection, and these often well deserve some special designation, and an enhanced price—the only meed of reward offered to the careful grower. There are some excellent kinds of Runner Beans that are by no means commonly grown, but are yet of great special merit, and afford, also, differences in quality and flavour that make them specially acceptable. Let the Scarlet Runner be ever so delicious, yet one may tire of eating it every day for weeks in succession, but if the gardener can furnish alternately dishes of other equally good kinds that differ in character, the pleasure of partaking frequently of Runner Beans is enhanced. Two of the very best of these runners are the Eclipse and the Premier, both little known, but when known much appreciated. The Eclipse is a tall strong-growing kind, having vine and foliage resembling those of the old Caseknife. The pods are long, flat, and straight, and are quite tender even when old. It is a heavy cropper, and furnishes a very abundant supply. It is also earlier than the Scarlet Runner, and thus assists to lengthen out the Bean season. Ripe seed of Eclipse is medium-sized, flat, and in colour dull green flaked with dark red. Premier differs entirely from Eclipse, inasmuch as it is really a Runner form of the dwarf trench Bean, and as its character has been, in this respect, well maintained for the past ten years, it is, therefore, perfectly reliable. A few years since, when grown with a large number of other kinds at Chiswick, it was considered sufficiently meritorious to receive a first-class certificate, and since then in its peculiar form it has not been excelled. The ripe seed is, in size and shape, similar to that of the Early Dun Dwarf, but it is, in colour, deep red and marked with dark spots. The plant grows to a height of about 5 feet, and does best on ordinary Pea-sticks. It commences to crop close to the ground, and continues to bear heavily until the winter. The green pods are very tender and delicious when cooked, and it is altogether a really useful garden vegetable. The coloured-podded Beans are more novel in appearance than useful as table vegetables. The purple-podded kind partakes of the old Caseknife habit of growth and foliage. The pods are long, but soon fill with the seed. They are, as the name implies, purple in colour, and, therefore, not at all desirable at table. The blooms are also purple, and, for a short time, look pleasing and attractive. This Bean may be useful, and possibly ornamental, to grow as an ordinary climber; but it has no useful place in the kitchen garden. The latest novelties among Runner Beans are the Wax-podded and Yellow-podded, or Butter Beans, the latter name being given more out of compliment to the colour of the pod than to its table quality. These are termed skinless; or, rather, like the pods of the Sugar Pea, they have no lining, and are to be cooked and eaten whole. The colour is most objectionable; however, whilst, in flavour, the Bean is not equal to our green kinds.

A. D.

AUSTRALIAN SPINACH.

At the commencement of last year, Mr. Ramel, who introduced into the French colony of Algiers the *Eucalyptus globulus*, received from Australia this new vegetable. His friend Baron Mueller, of Melbourne, had it sent to him as a substitute for Spinach. He called it New Queenslaud Spinach. The New Australian Spinach is, however, a better name for it. It belongs to a group in which is comprised our common Spinach; it answers botanically to the *Chenopodium auricomum* of Lindley, who described it in a few words in Mitchell's "Journal on Tropical Australia." It grows abundantly in the east part, following the course of the River Narrau, and it is again found in Queensland. The *Chenopodium auricomum* resembles in general appearance *Chenopodium hybridum*, that troublesome weed which overruns our fields, except in certain points, especially in the inflorescence. The stalk is erect, robust, angular, fluted, and streaked with a violet kind of red. Mr. Barron, who tried it fairly at Chiswick, says:—"The quantity of leaves that can be gathered from a few yards of it is enormous. When cooked in the summer time it was found to be somewhat strong-flavoured and fibry, but, on again trying it, it proved much more tender, not unlike 'gude kail' in Scotland when well frosted, with a smack of the Spinach flavour in it. It lacks the mild flavour of the true Spinach so much relished by some, but will prove a very good substitute, in times of scarcity, and is very easily cultivated." It may be sown in the open ground in March, April, or May. Baron Mueller states, that this *Chenopodium* "is very palatable and wholesome, and remarkable, also, as a perennial plant among allied species. It grows taller than most kinds of *Chenopodium*. In England, it would die down to the root in winter, but it would be, with the return of warm weather, likely to spring again from the root; on early sowing it would likely produce seeds in the first autumn." Messrs. Stuart & Mein, of Kelso, who introduced this Spinach into this country, some few years ago, say, that the seed may be sown in the open border in April and May, but in March under glass; and, when the plants are strong enough, they put them out about 9 inches apart. They state that they have now plants in seed-pans about 1 inch in height, with stems like the finest needles. These, a few weeks after transplanting, will attain to the height of 6 feet, and will yield abundance of leaves. In appearance, this Spinach resembles what is called in this country "Fat Hen" (*Chenopodium album*).

Vitality of Cabbage and Melon Seeds.—In an article on germination (see p. 164), Cabbage seed is put down as not being to be depended on after five years, and Melon seed is set down the same. Now, lest anybody might be induced to throw away valuable seeds on that information, I beg to give my own experience in the matter of Cabbage seed. I have possessed, for many years, a very valuable kind known as the McEwen's Cabbage, and have been in the habit of using seed of it which had been kept as long as twelve years, saved by myself. I find, however, that when sown on a hot-bed, like Cauliflowers, the percentage of germination is three-fold what it is when sown in the open ground. I keep the seed in the pod. As regards Melons, I have eaten Melons grown from seed known to be more than forty years old; it was found in a drawer after the death of a former proprietor, carefully labelled and described, so as to preclude any chance of a mistake.—L. W.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Centranthus macrocephalus as a Salad Plant.—This is described as resembling Corn-salad or Lamb's Lettuce in flavour, but is said to be "less insipid." As a matter of course, it must be cut over when young if required as a salad.

Good Ground for Early Potatoes.—Jonathan Talcott, the well-known Potato-grower of Rome, N.Y., tells the *Boston Cultivator* that repeated experiments have taught him "that early sorts require richer land to give their best yield, as they grow in less time, and, consequently, must be better fed, or they are, of course, small, and the crop will not be remunerating."

Turnip and Onion Drill.—What is the best drill for sowing Turnips and Onions on a level surface, to be drawn by one horse? I want one that would draw and sow six rows of Turnips at one time, 14 inches apart, so that it could be regulated to sow six more drills of Onions at 7 inches apart; if there is such an implement, it would be very useful for market-gardeners.—W. C., *Whitehaven*.

THE ARBORETUM.

HARDY TREES AND SHRUBS.

By GEORGE GORDON, A.L.S.

THE THICK-LEAVED MAPLE (*ACER CORIACEUM*).

THIS kind forms a branching tufted tree from 20 to 30 feet high, with opposite, short, stiff branchlets, thickly clothed with foliage; the shoots, when young, are downy, but, when fully matured, quite smooth, and, when leafless, of a chestnut-brown colour, furnished with small obtuse, smooth, imbricated buds. It is a native of the French Alps, and was introduced in 1812. The leaves are mostly three-lobed, but sometimes they are slightly five-lobed; they are thick and somewhat leathery in texture, quite smooth on both surfaces, deep green above, light green beneath, nearly square, or slightly cordate at the base, on rather long foot-stalks, and three-ribbed beneath. The lobes are broadly ovate, a little pointed, bluntly and irregularly toothed on the edges, and nearly equal in size. The flowers are small and in loose corymbs. The fruit or keys are smooth and about one-third the size of those of the common Sycamore, with rather narrow cultriform wings, rounded at



The Thick-leaved Maple. (Leaf natural size.)

the ends, and somewhat spreading. This kind is frequently named *Acer opulifolium* in the nurseries, and is the kind described in the abridged edition of Loudon's "Arboretum," under the names of *Acer Pseudo-platanus opulifolium*, *A. obtusatum coriaceum*, and *A. Opulus coriaceum*. The length of the leaf is from 4 to 4½ inches, including the foot-stalk (which is from 1½ to 1¾ inches), and the breadth from point to point of the lateral lobes 3½ to 4 inches.

LEYCESTERIA FORMOSA.

THIS useful free-flowering shrub, a native of Nepal, is sufficiently hardy to withstand our English winters, if not very severe, without protection. If, however, the stems happen to get cut down to the ground, they usually push up again in spring, a circumstance which suggests the advantage of mulching the soil over the roots in severe winters, as is often done in the case of Fuchsias. The flowers of the *Leycesteria* are produced in pendent racemes, the scales or bracts of which are more showy than the flowers themselves. They are in greatest perfection in autumn, associating in this respect with herbaceous Asters and Chrysanthemums, but remaining longer in beauty than either of these. The *Leycesteria* does not attain a great height; on the contrary, from 3 to 5 feet is its

common altitude, but I have seen it grow in the Isle of Wight as high as 7 feet, the upper half of the stalks being bent down by the weight of inflorescence which they bore. Although this plant grows well in shrubberies, against walls, as isolated specimens on lawns, and in other positions, I consider an open but sheltered situation, well-drained, and fully exposed to the sun, best for it. Under such circumstances the wood gets thoroughly ripened early, and the chances of its succumbing to the winter's severity are less than they otherwise would be, whereas its flowering properties are enhanced. It is not particular as to soil, for I have seen it do well in soils of almost every kind, but it dislikes a wet stagnant sub-soil. It is also, as far as known, rabbit-proof. It may be increased by means of seeds, cuttings, and division. Seeds, however, do not ripen well in this country, except, perhaps, under a sash. When ripe, gather the clusters, or, better still, perhaps, cut over the points of the shoots, clusters and all, and hang them up in a light and airy room or Vinery at rest, until the seeds become hard. Sow the seeds in February, in pans of peaty soil, placing the pans in a greenhouse, and afterwards transferring them to a frame. A temperature of about 50° is essential until they germinate, soon after which they should be pricked off into other pans of similar soil, but not committed finally to the open ground until they are one or nearly two years old. The common way of increasing the *Leycesteria* is, however, by means of cuttings. For this purpose, in October or November select the best-ripened shoots, strip them of leaves and flowers, and cut them up into pieces, each having two or three joints, their entire length being about 5 or 6 inches. Select a warm border, dig it rather deeply, and incorporate with it a good deal of sand and leaf-soil. Insert the cuttings in clumps, keeping each cutting about 1½ or 2 inches apart, and not more in each clump than can be easily covered with a hand-glass. Here allow them to remain till spring, but cover them up at night and during frosty weather. In spring, when they begin to grow, all dead ones must be picked out, in order to give the others more room. In June most of them will require shifting, therefore, prepare a border for them as before; lift all the plants, select the strongest, and plant them in rows 9 inches apart and 3 inches asunder in the row; the weaker ones may also be transplanted in the same way, but at a less distance apart. Introduce a few twigs of evergreens amongst them for a few days until they recruit themselves. Here they may be left until fit for permanent transplantation. The cuttings might have been put in cold frames, and, if taken in time, they may be struck in the open border and protected with branches. Division consists in separating the large root-stocks into two or more separate plants, when good specimens are at once secured.

W. F.

NEW CONIFERS.

THE following new Conifers have been recently introduced by T. C. Maxwell & Co., of Geneva, N.Y., and have decidedly valuable characteristics.

***Thuja occidentalis argentea*.**—A very curious and beautiful dwarf form of *Arbor-Vitæ*, and wholly unlike any hitherto described. It is of a fresh green colour, with the branchlets distinctly tipped with white. It is believed to be entirely hardy, having been exposed as thoroughly as the *George Peabody*, and with no injury. It is very attractive and pleasing in appearance, and has the same parentage as *T. o. lutea*.

Maxwell's Dwarf Spruce (*Abies excelsa Maxwellii*).—A seedling, which originated on the grounds of T. C. Maxwell & Bros.; leaves, short, rigid, dark green. Its habit is very compact, full, and regular, and, without trimming, its tendency is to form a dense hemispherical mass. The original plant is fifteen years old, and measures 24 inches in height and 38 inches in diameter. It is more vigorous than *Pygmaea*, and somewhat larger. For novelty, this little tree is curious and interesting, and as a beautiful low evergreen, this dark green regularly rounded dwarf is exceedingly valuable.

Glory of the Spruces (*Abies alba aurea*).—This tree has a unique beauty of more than ordinary character. In size and habit, it resembles the common American, from which it is a chance seedling; leaves, long, curved, of a soft, glaucous colour, and very thickly set upon the branches. A rich golden-yellow distinctly marks and dorns the tips of the leaves upon the upper side of each shoot. Nora

is this colour faint and undecided, but reliable, pronounced, and striking; so that this silvery-green and gold foliage at once attracts and fixes attention. Standing in front of a group of darker and larger evergreens, the effect is remarkable.—*Agriculturist*.

Effect of Lightning on Trees.—The comparative immunity of different kinds of trees varies considerably. It is stated that the Oak and Italian Poplar have great susceptibility to injury, while other trees, especially the Birch, most frequently escape; but much of the difference may be otherwise accounted for than by difference of susceptibility, which, however, gives probably a partial explanation. Oaks and Poplars are generally taller trees than Birches, and electric clouds must, therefore, more frequently come within striking distance of their tops; such trees are more numerous than Birches, and more frequently grow apart from other trees, and when apart are more exposed to lightning. Again, the upper branches of those trees are larger in proportion to their trunks than those of the feathery Birch, and can conduct stronger shocks than its slender spray can; their roots also strike deeper into the soil, so that more electricity may pass through their trunks in the same time than through the trunks of those whose roots, being in shallow and dry soil, are partially insulated, or, rather, imperfectly connected; if they were perfectly insulated they could not convey a shock at all. Further, a tree, when struck with lightning, is less likely to be injured if its trunk and large branches be wet, than if dry. But trees with heavy foliage, like Oaks and Poplars, will be longer in getting wet than Birch trees with light foliage, and be on that account more likely to be injured. From these, and other considerations, we do not think that the comparative immunity of Birch trees from injury by lightning (and it is comparative only) proves Birch-wood to be less susceptible to injury than other wood, if other circumstances were similar. It very possibly may be so; it is not unlikely that, being a quick-growing tree, with many sap-vessels, it is so, but that is not proved by the mere fact that Birches are but seldom destroyed by lightning, which is generally believed to be the case.—*Q*.

Tree-planting in Nebraska.—Only on the banks of rivers and streams is there natural wood in Nebraska. But forest trees take kindly to the prairie soil, and are being planted by millions. The Hon. J. Sterling Morton, of Nebraska City, who has been one of the foremost in the tree-planting movement, suggested the expediency of setting apart a day in the spring-time every year to the special work of tree-planting. The first "Arbor-day," as it is called, was in 1871, and on that day two million trees were planted. Next year, and the year after, Arbor-day was dropped; but the month of April was recommended to all to choose a day for themselves. This year, however, the State Agricultural Board has determined to go back upon the original idea, which is that, upon one special day in the year, each person owning land shall plant at least one tree. It was resolved that the time should be the second Wednesday in April, and that the State Legislature should be asked to make the day a legal holiday. Nebraska will thus get a spring-tide holiday, the main recreation of which will be tree-planting and attendant festivities. A premium will be awarded for the most trees planted on that day. It is now the custom of the State Board of Agriculture to present a premium for the largest number of trees planted any day in the month of April, and, at a meeting of the Board last January, the prize was awarded to a farmer, who planted 27,800 trees on April 28, 1873.—*CORRESPONDENT*.

Idesia Polycarpa.—This fine hardy plant comes from Japan, and appears to have been distributed from the Botanic Garden of St. Petersburg. It was exhibited in 1867 at the Paris Exhibition, by M. Lindau, as a fruit tree from Japan, and was afterwards put into commerce under the names of *Polycarpa Maximowiczii* and *Flacourtia japonica*. The generic name *Idesia* was given to it by Maximowicz, and is now adopted by all botanists. A figure of it published in the *Revue Horticole* (1872, 174) represents a specimen bearing only ripe fruits, sent by Maximowicz to the Paris Museum, and which was described as coming from a cultivated tree, 40 feet high, growing on the island of Nippon, in the neighbourhood of Mount Fusi, while other specimens, probably wild, bearing only male flowers, were from the forests of Kinosaui, in the island of Kiusiu. Whether or not it is likely to become a useful fruit-bearing tree may be questioned, but there can be no doubt it is a fine ornamental plant, and thoroughly hardy. Its trunk is said to be straight and robust, its branches spreading, and its leave caducous. The latter are alternate, cordiform, acuminate, deeply toothed, having cylindrical red petioles, 8 to 12 inches long, and bearing, at some distance from the base, two stout projecting glands, two, or often three, others occurring at the point of insertion of the limb, which is thin, soft, 10 inches long, 8 inches broad, of a glaucous-green, whitish beneath, with reddish

venation. The flowers are dioecious and apetalous, while the fruits are bacciform, about the size of a large Pea, fleshy, of a fawn-red, or reddish-orange colour. This species, M. Carrière observes, presents a rather rare peculiarity in its growth, which is, also, met with in *Magnolia grandiflora*, namely, the development of a lower bud, which takes much larger proportions than the others, and tends to widen the head, to the damage of the central axis. Hence, if the plants are wished to grow up, pruning will be necessary. It prefers warm calcareo-silicious soils, and is found to propagate freely by means of root-cuttings.—*Florist*.

Pruning Shrubs.—The "Gardeners' Monthly" gives a list of such shrubs as flower on the wood of the preceding year; and another list of those which bear flowers on the present season's growth—the former to be sparingly pruned in winter, so as not to cut away the flower-buds; the latter bearing more severe pruning. Those bearing flowers on last year's growth are, Dwarf Almond, Snowy Mespilus, the Andromedas, Azaleas, and Kalmias, Rhododendrons, Calycanthus, Corechorus, Leatherwood, Pothergilla, Cornelian Cherry, Philadelphus, Deutzia, Mezereon, Hydrangea, Itea, Jasmine, Privet, Bush Honey-suckles, most of the early Spiræas, the ornamental Currants, Weigela, Snowberry, Lilacs, and Annual Roses. Shrubs that flower in the present season's growth, are *Ceanothus*, *Amorpha*, *Colutea*, *Euonymus*, *Genista*, Shrubby *Hypericums*, *Coronilla*, Scotch Broom, *Althæa*, Flowering Locust, *Tamarix*, and late Spiræas. Our own opinion is, that these, and all other shrubs and flowering trees, are much better without systematic pruning of any kind, than with it.

Oldest Worked Wood in the World.—Probably the oldest timber in the world, which has been subjected to the use of man, is that which is found in the ancient temples of Egypt. It is found in connection with stone-work, which is known to be at least 4,000 years old. The wood, and the only wood used in the construction of their temples, is in the form of ties, holding the end of one stone to another in its upper surface. When two blocks were laid in place, then it appears that an excavation about an inch deep was made in each block, into which an hour-glass-shaped tie was driven. It is, therefore, very difficult to force any stone from its position. The ties appear to have been the Tamarisk, or Shittim wood, of which the ark was constructed, a sacred tree in ancient Egypt, and now very rarely found in the valley of the Nile. These dove-tailed ties are just as sound now as on the day of their insertion. Although fuel is extremely scarce in that country, these bits of wood are not large enough to make it an object with the Arabs to heave off layer after layer of heavy stone for so small a prize. Had they been of bronze, half the old temples would have been destroyed ages ago, so precious would they have been for various purposes.

THE PINE.

THE mountain owes its oread, and the stream
Its naiad; lo, the dryad of the Pine!
How stern and lofty! sorrow, how divine
Its murmurings speak! but let the lightnings gleam
Around it, and the storm hold fearful reign,
Lo, the proud warrior! with what calm disdain
He braves the utmost fury! all forgot
His sorrow, for great souls remember not
Their trials when great troubles come; they call
The poised soul up; and great hearts do not bow
To tempests, but with calm uplifted brow
Dare the wild worst; dark stormy troubles fall
Upon the strong to try them; weakness bends,
Strength grows mere strong, and vain the storm its fury spends.

—ALFRED B. STREET.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Hardiness of the Chinese Arbor-vitæ.—Mr. Sergeant, of Boston, informs us that while thousands of the Virginian bedders were killed in the Northern States, of which it is a native, in the frost of 1871, the Chinese Arbor-vitæ everywhere escaped.

Rate of Growth of the *Adansonia* in India.—The following are measurements of a tree in a garden at Alipore (Calcutta), Dec. 3, 1873:—Girth at base, 49 ft. 6 in.; girth 4 ft. up, 46 ft. 6 in.; girth above lower branch, 38 ft.; girth of lowest branch at base, 22 ft.; height, above 80 ft. Mr. Grote, in whose garden the tree grew, measured it March 23rd, 1850. Girth 1 ft. from the ground, 42 ft.; girth about 6 ft. up the stem, 38 ft. The base-measurement gives an increase of 7 ft. in the twenty-three years.—*Journal of Botany*.

Zenobia (*Andromeda*) *speciosa*.—No planter should forget *Zenobia speciosa*, better known, perhaps, as *Andromeda speciosa*, whose flowers grow in clusters, and are of the same shape as those of the Lily of the Valley, but much larger, and of the purest transparent waxy-white. There are several varieties, differing in the shape of the leaves, and in the size of the flowers. One variety, called *pulverulenta*, from the glaucous under-surface of the leaves, perhaps, surpasses the others in beauty.—*Florist*.

GARDEN DESTROYERS.

THE WHITE THORN MOTH.

(YPONOMEUTA PADELLA.)

FOR many years past no one can have passed in spring through the suburban lanes around London without observing that the Thorn hedges seemed in many places entirely destroyed, the plants covered with webs as if an army of spiders had passed over them, and the leaves almost entirely gone. This destruction is early, but not coeval with the expansion of the leaf. When the leaf first appears, the hedges rejoice the soil by their fresh green beauty. Return in a fortnight, and everything is blasted. This blast is not confined to London. It will be found all over the country, but, whether it is that it is really worst in the neighbourhood of great cities, or that observation is more rife or more acute there, it is certainly at Paris, London, Edinburgh, Birmingham, and such places that we have most noticed the prevalence of this scourge. It is the work of a small moth, *Yponomeuta Padella*, closely allied to another species—*Yponomeuta cognatella*, also one of our insect enemies, which has been already described and figured at p. 357, vol. IV., of THE GARDEN. Their habits, manners, and mode of life are similar, with the exception that the trees the present species devastates are the Thorn, the *Prunus Padus*, and sometimes the Cherry. The larva is of a brownish hue, marked on the back with two rows of spots of velvet-black. The head is shiny black, the under-side pale dirty green. The perfect insect differs from *Y. cognatella* in having the ground colour of the upper wings of a leaden hue, the internal margin alone approaching white.



The White Thorn Moth.

The plan suggested for the destruction of the *Y. cognatella* may also be applied to this species, viz., sweeping the hedges with a stiff broom, but it is a feeble attack on a powerful enemy.

A. M.

Effect of Feeding on the Colour of Cocoons.—The art of silk culture is likely to be materially advanced by the discovery of *Taillia* (if it be true) that when the worms are fed on Vine leaves the Cocoons are of a magnificent red, and if Lettuce be used, they become an emerald green. Another experimenter has obtained silk of a beautiful yellow, a fine green, and then again violet, by feeding with Lettuce or white Nettle. *Taillia* remarks, however, that the worms must be fed on Mulberry leaves when young, following with other leaves during the last twenty days of the larval stage of life.

Great Swarm of Insects.—In a letter to the *American Journal of Science and Arts*, dated Cordoba, September 18, 1873, Dr. Gould gives an account of a remarkable swarm of large grasshoppers, or locusts, recently witnessed there. Myriads filled the air, invaded the houses, and covered the ground, from which they rose like thick clouds of dust, on approach of man or beast. These, however, seem to have been merely the stragglers of the main body. Going out to observe the phenomenon more closely, Dr. Gould saw, to the eastward, what looked like a long trail of dense black smoke, extending over 160° of the horizon, and to an altitude of about 5°. A strong field-glass showed that it was no smoke, but a swarm of locusts. Its width there was no means of determining, but from the position of the focus needed for resolving the cloud at its point of nearest approach, Dr. Gould estimated that none of the swarm passed within less than three or four miles. The insects were evidently transported with the wind, which blew from the north.

Crickets.—My glass-houses are greatly infested with crickets, which injure my plants. I have tried every means I know of to destroy them, but without success. Can you give me any information in the matter?—E. J. [Crickets are often troublesome in plant-houses, especially amongst soft-wooded cuttings or young seedlings; but they are somewhat eccentric as to food. In some places they will devour greedily a particular plant; and, in others, they may exist in quantities, and not even touch the same plant. I have even had crickets in some houses, and not been able to detect their molesting anything; although, at the same time, there were numbers of things which they usually eat. Where troublesome, they can easily be destroyed by means of beetle-poison, laid down in the same way as for the beetles.]—T. BAINES.]

THE GARDEN IN THE HOUSE.

MONEYWORT AS A WINDOW PLANT.

(LYSIMACHIA NUMMULARIA.)

THIS favourite British creeper (commonly known as Creeping Jenny, Moneywort, and Herb Twopence) is alike useful for the decoration of windows, herbaceous borders, rockeries, and rooteries. It flourishes as well in bright sunshine as in shade, producing abundance of long trailing shoots, thickly clad with opposite roundish shining green leaves, and, from early in summer till late in autumn, it presents a mass of bright yellow flowers, about as large as a shilling, set on short foot-stalks. For pot-culture, use strong plants and an open turfy soil, well enriched with rotten manure—particularly cow-dung—and, after the plants begin to flower, supply them liberally with liquid-manure. When grown in pots, suspended like baskets, the shoots hang down long and gracefully, and completely hide the pots, but even then the plants exhibit a flat-headedness that is rather objectionable. This may be obviated by the following plan, which we saw carried out in a garden in Somersetshire, and which we thought extremely effective: Pots rather wider in proportion to their depth than we commonly use, and about 9 inches in diameter at top, had an inch deep of crocks in their bottom, and resting on these in the centre of each pot was a nice stubby plant of the common or narrow-leaved Myrtle, in large 60-sized pots. Good turfy loam, mixed with decayed and dried cow-dung, was then filled in all round, and in this the Creeping Jenny had been planted in March, and grown on in one of the greenhouses till June, when the pots were fixed on brackets outside on either side of the windows of the house, and when we saw them a month afterwards—in July—the Creeping Jenny had hidden the pots, and was in full flower and leaf. The fresh and green Myrtles were pictures of health. Unless the plants in pots can get a good place free from drip in a frame window, or greenhouse throughout the winter, the safest way of preserving their vitality it to turn them out of their pots and plant them in the border for that season, and lift or re-pot them in March. They have a grand effect when planted near the edge of a window-box or vase, and permitted to scramble over the edge and hang down; but, under no circumstances should they be subjected to drought. In the open border or rockery they soon make a home for themselves, provided they are kept out of the reach of other rank-growing plants, which might overgrow and choke them. As its shoots travel along the surface of the ground, the Creeping Jenny sends forth roots from every joint; consequently, it is readily propagated; for every bit of a shoot will form a plant if pricked into open soil moderately damp and shaded. Whole tufts or stocks of it, too, may be lifted in spring, just when growth begins, divided into as many little pieces as have roots, and every one of them will make a nice plant before summer arrives. It must not be expected that every plant will fill a pot; it will take a few small ones or one large one to do that. Plants may be gathered from hedge-banks or moist meadows, for naturalisation in the garden. We have now a valuable variety of the Creeping Jenny with yellow leaves; but it is scarcely so strong or vigorous in constitution as the green-leaved kind. It is very useful in the flower-garden, and particularly so for small cultivators, as it requires no protection in winter, being quite hardy, and making a good subject for an edging in the spring. It may remain in this position during the succeeding summer. It retains its colour well, and, should it become over vigorous, it can be easily cut in. It is propagated as easily as the common kind.

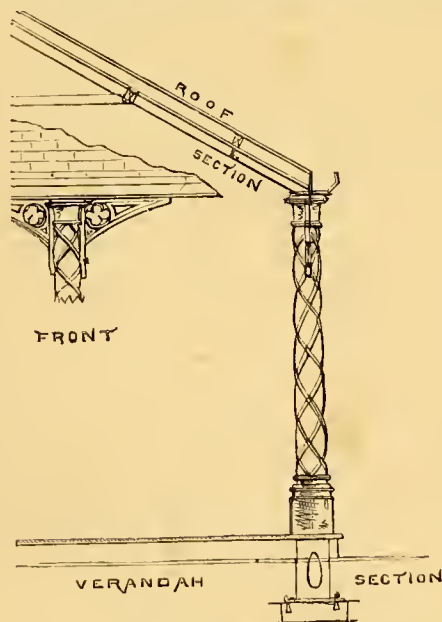
W. F.

A Spruce Cone Ornament.—One of the prettiest objects I ever beheld is a Spruce cone, filled with sand and Grass-seed, which sprouted and grew out of the scales. It is now as large as a Cocoa-nut with the husk on, and of the most vivid green colour. The Grass grows with a luxuriance that is remarkable. To produce this charming specimen, the cone was baked in an oven till the scales opened out equally. It was then carefully filled with equal parts of sand and Grass-seed, a string tied to the tuft, and the whole suspended in the dark, in a jar with water enough to come half way over the cone. In a week it was placed in the sunlight, when the seed sprouted rapidly, and in a month filled a gallon jar completely. It has been taken out and hung in the window exposed to the air of the room. Every morning it is thoroughly soaked in tepid water.—*Tribune*.

GARDEN STRUCTURES.

RIBBON POSTS FOR CONSERVATORIES.

THE Ribbon Post Company have recently introduced a light and elegant form of iron pillar, which will be found better adapted for conservatories than the pillars usually used in the construction of such erections. The ribbons are made around a mandrel, which is provided on its exterior with spiral intersecting grooves. The latter form a receptacle for the ribbons, which are wound on by machinery, without twist or strain, and in such a manner that the gradual decrease of the pole is compensated for. The first series is put on from right to left, beginning at the bottom; the next, in the reverse direction, commencing at the top. The latter ribbons, of course, overlap, and are, at this stage of the operation, temporarily secured to those beneath them by bolts fitted in holes previously punched in both, so as to coincide exactly at the points of intersection. The core of the mandrel is then removed, causing it to collapse, when the pole is withdrawn and placed upon a cylindrical bar, ready for the insertion of the angle irons. These, previously punched, are secured by rivets to the intersections of the ribbons, the temporary fastenings being taken out. The cap, the nature of which depends necessarily upon the uses to which the post is to be devoted, is then put on; and the base, consisting of various forms, strengthened with extra iron and inserted, for some little distance, with the ribbon, and



Ribbon Posts.

secured to a plate, which affords a strong support, is added. The strength of posts, thus constructed, is said to be very great. Two, without angle irons, measuring 10 feet by 8 inches, supported a weight of 10 tons without sinkage, deflection, or collapse. The total weight of a telegraph post, 31 feet long, is about 43½ pounds, and such posts are ornamental and durable; while, as supports for pillar-plants, their advantage over ordinary posts will be at once apparent.

GLASS-HOUSES IN AMERICA.

Your correspondent's, "A. M.," picture of American glass-houses (see p. 20) is considerably overdrawn. Having lived in the city of Philadelphia for more than a year, and in its immediate vicinity for rather better than a year more, I am well acquainted with the establishments to which he alludes. His description of one nursery is, alas! too true, with the exception of the statement that there were no tables or staging in the green-houses; for, having visited them several times, and once a few days ago, I am prepared to say that there are tables in nearly all the houses, excepting such as are devoted to the cultivation of plants for supplying cut flowers; in those the stock is planted out. I may state, however, that the proprietor of that establishment commenced business under adverse circumstances, and when stern necessity compelled him to build his first houses in the primeval style described. Now, however, although he has acquired means, he, unfortunately, has not changed his ancient

system. This case is, however, rather an exception than the general way in which green-houses are erected here. In another establishment "A. M." states he saw the roof stuffed with Sphagnum Moss; in reply, I would say that we frequently have to resort to such means, even in the case of new houses, for the hot sun here so warps the timbers of a house that during the first year the ventilators often get twisted out of place, and we have to look out for small cracks in a country where the mercury frequently sinks below zero. There are now a younger set of men in the nursery business, whose establishments go to show that they have an eye to taste as well as to making money. I could name several nurseries where the green-houses are put up as well as you will find them in many London establishments. "A. M." must have been singularly unfortunate to have fallen into the very roughest of the many establishments about Philadelphia. The firm with which I am engaged as foreman has lately erected five new propagating-houses, and the plan on which they are built is so neat and economic that I will try to describe them. They are 100 ft. long by 8 ft. wide, a 2 ft.-walk runs through each, and on each side is a 3-ft. table. There is only one wall on one side, the other being merely boarded up to admit of extension. The sash, 5 ft. by 3½ ft., rests upon solid oaken gutters, 1 ft. wide, and these are supported by stout posts of the same material. The whole is nicely planed and painted, and presents as neat and attractive an appearance as any five houses could do in England erected for the same purpose. In two of these houses we have 200,000 Conifer cuttings, and we are about to fill the other three with young Roses from the propagating-bed in order to establish them preparatory to planting in open ground. My employers propose to cover a large space with houses like those just described, and, I have no doubt, the most modern improvements will be added to them. It will thus be seen that American horticulturists are not such an antediluvian set as my countrymen in England may imagine them to be.

WALTER C. FANCOURT.

West Chester, Pa., U.S.A.

WORK FOR THE WEEK.

Flower Garden.

Sweep and roll lawns and walks as soon as the weather becomes favourable. Judiciously prune evergreen shrubs, such as Aucubas, Hollies, Bays, Box, Yews, Portugal and common Laurels, Junipers, Thujas, Cypresses, Ivies, &c., which may be out-growing the spaces allotted to them, keeping symmetry and gracefulness of form as much as possible in view. The knife is better than shears for such an operation, the latter being apt to mutilate the leaves. Roses should now be pruned, the plants having in many cases already made shoots nearly an inch in length. As soon as the snow has left us, herbaceous plants should be trimmed, and the crowns should be lifted, divided, and re-planted in deeply-worked well-manured soil; some of the more tender kinds may, however, be left a little longer before being disturbed. Lilies of various sorts, and other bulbous plants, as a rule, thrive best and flower most satisfactorily when left for some years undisturbed. The stock of bedding plants may be increased as expeditiously as possible from cuttings, roots, and seeds.

Greenhouses.

Indoor plants have almost invariably started into growth, therefore, such as require a shift must at once receive that attention. Borders in which plants are growing should be lightly forked up, and if the soil is exhausted a dressing of loam, leaf-mould, rotten-manure, or good peat, may be added, according to requirements. Some plants need more water than others, and, in such cases, neatly-formed basins of soil should be made around them, so as to retain sufficient for their wants without overflowing. This is an excellent time for transferring plants from pots to conservatory borders, and, in doing so, disentangle and spread out the roots as much as possible. This may check growth for a time, but, eventually, other circumstances being favourable, plants so treated will succeed better than such as are planted with the roots coiled up in a ball. Camellias, Rhododendrons, Acacias, &c., when grown in pots, are more under control than such as are planted out; but the latter are generally the most satisfactory, both as regards growth and bloom. Ceanothus puniceus, if too thick, should have its shoots thinned out a little, so as to give sufficient light to the flowers. Passion-flowers should be pruned well in, and the soil in which they are growing should be thoroughly saturated with water, so as to induce them to start freely into growth. Cut in the branches of Habrothamnuses. Several of the free-growing Fuchsias are well suited for conservatory-roof decoration, or that of pillars, especially when planted out in borders. If trained to the rafters from the middle of April until they are completely denuded of side branches in the end of October or November, or for the purpose

of resting them and admitting light to the other inmates of the house; they form objects of interest, being richly laden during all that time with both flowers and foliage.

Forcing-houses.

These, when not wanted for flower-forcing, may be usefully employed for Cucurbit-growing. At present, however, keep them supplied with successions of Lilacs, Spiræas, Deutzias, and similar plants. Cuttings of Coleus struck early should be potted as they require it, pinched at the third joint, and the plants should be kept near the light. Iresines form attractive summer objects in conservatories; therefore, treat them like Coleuses. The general stock of Begonias should now be potted and started into growth. Caladiums started in small pots should be shifted into larger ones before their roots become entangled. Continue to force Lily of the Valley; place the plants that have been forced under the stages of the greenhouse for a time, and, after that, plant them out, where, if they are well cared for, they will, in two years, make good plants for forcing again. Some plants of *Lilium auratum* should be introduced into this house for blooming in May. In making up baskets for suspending in the conservatory, keep them in the forcing-house until they are in active growth, when they may be gradually hardened off, so as to withstand the cooler temperature to which they are to be subjected. Bring on plants of *Dendrobium nobile* where an early bloom is required, and place those for late use in the greenhouse. Keep up a young and healthy stock of Fuchsias, Heliotropes, Petunias, Balsams, Cockscombs, Hebecliniums, Callas, Schizanthuses, and other plants for early blooming; those treated more hardily flower later.

Frames.

Where bedding plants are largely grown, these must be extensively used, but the frames are not of so much importance as the protecting material. In all cases, the bottom should be dry, or at least incapable of retaining any considerable amount of moisture. The sides may be of turf, bricks, or wood, with rafters or transverse bars for the support of sashes, or for bearing up longitudinal spars or boards, to support mats, canvas, or other covering. Under all circumstances, sashes are the best and most convenient, and these should be drip-proof, and cleanly washed. The material on which the plants stand inside may be sifted coal-ashes, clean gravel, or wood; or a hard bottom, such as a walk, may be covered with 6 or 8 inches of light mould, into which dwarf-growing fibrous-rooted plants may be transplanted six weeks or so prior to being bedded out, after which the soil may be cast out, and a layer of ashes placed in the bottom for the reception of Fuchsias, Cincarias, and other greenhouse plants. Where frames are the only receptacles for bedding-plants, the exclusion of frost is often indifferently effected, fire-heat, when used, being sometimes of a parching character next the pipes, and only moderate at the other extreme, and coverings necessitate a long period of darkness just when the plants are most liable to damp off, and the atmosphere least drying. An excellent means of obviating so much darkness and damping, and, at the same time, of preserving the plants in health, is practised by Mr. Cannell, of Woolwich, who, with two rows of 1-inch pipe, run along the inside of the rafters of narrow frames, and three rows in the case of wide frames, manages to have the whole interior atmosphere equally heated, and the greatest winter enemy of soft-wooded plants—damp, kept in abeyance. These pipes can easily be heated from any adjoining boiler, or by means of one purposely set for the frames, if the latter are extensive.

The Kitchen Garden.

This is a busy month in the kitchen garden, and one on which the year's success, or otherwise, to a great extent, depends; for if matters having reference to cropping are not systematically performed in proper time, when the soil is in the right condition to receive the plants or seeds, little else but failure need be expected. In matters of cropping, do not stick to any certain rule as to the day of sowing or planting, whether the soil and weather are suitable or not, but first make a good and kindly preparation, by thorough deep culture and turning over of the soil in as rough and open a manner as possible to admit sun and air. In short, turn and return the soil till it falls to pieces like slaked lime, and is in every way so sweetened and pulverised that, by watching the opportunity for a fine day, a large portion of work may be performed. Having all things in order and in good condition is the very keystone of success. It is even better to be a little out of season than to begin cropping in the midst of disorder.

Artichokes.—Finish planting Jerusalem kinds, and from the Globe varieties pull away decayed leaves, if any, in order to admit air to the stools and crowns, and set about early thinning out the weakest shoots.

Asparagus.—Continue to get strong roots into gentle heat; sow seed, and prepare for planting new beds at the end of the month. I always like to see the buds pushing forth before I take up the plants; after which, do not allow them to lie about, but re-plant at once in rows two feet apart, and let the plants stand one foot asunder in the rows. A good deep drill drawn on each side of the line, and the roots spread astride of the drill, will be the right way to plant them, and after two years' time every other row will furnish rare plants to take up for forcing.

Beet.—Sow red for salad use for the whole year, and a small portion of white sugar Beet, for use in place of Spinach—should it be dry and hot in July and August, when Spinach is hard to be got.

Beans.—Of these, plant a full successional crop of Long-pod, Broad Windsor, or some other approved kind.

Broccoli.—Sow all favorite late kinds at once.

Brussels Sprouts.—If not already done, make a full sowing of these without delay; prick out and plant early, in order to ensure large, seasoned, well-ripened plants by autumn, so as to have good solid little heads all up the stems; young, free-growing, late-sown plants will not button or head in to be depended on; a hard-trodden, heavy soil suits them best.

Cabbage.—Sow a small quantity of the Matchless, Nonpareil, Little Pixie, and London Colewort.

Capsicum and Chillies.—Pot off; place them in moderate bottom-heat, and stop at 8 or 9 inches.

Cauliflower.—Plant out now a full crop of winter-stored plants; sow Veitch's Giant and other late kinds, and prick off, as soon as they can be handled, all early sown plants, first in boxes or frames, then on warm borders.

Carrots.—Of these, sow a full crop on some open quarters from this time to the end of the month, in drills one foot apart, using fresh slaked lime as a dressing. This, and a slight dredging of dry chimney soot, applied in showery weather in May, suits Carrots perfectly.

Celery.—Sow a pinch in succession; but we never succeeded so well in the way of obtaining a splendid crisp, solid, lasting crop as when we sowed the first week in April, on a gentle bottom-heat, thinly pricking out again on some gentle hot-bed. In this way some of the plants are soon ready for early planting out; a batch is then pricked out on half-decayed leaf-mould or rotten dung, which can be easily removed with the roots in the form of good balls. In this way no check takes place, and the result is most satisfactory.

Chervil.—Of this sow a pinch of curled, first in a warm situation, and, for succession, in a fortnight, on a north aspect, on account of its starting propensities in hot weather.

Mustard and Cress.—Sow common and curled Cress as well as Mustard, on a warm border out of doors; and Land Cress on a north border for summer and autumn use. Of Watercress make new plantings in shallow streams or damp cold spots, for summer and autumn use.

Lettuces.—Plant out a full crop, and sow, once a fortnight, a pinch of summer kinds, both Cabbage and Cos.

Onions.—Sow a full crop in drills, 1 foot apart, on well-prepared, thoroughly pulverised soil; if light, make it firm by treading or hard rolling.

Vegetable Marrow.—Sow in a little beat, in order to have sturdy strong plants for turning out under hand-glasses when four or five weeks old.

Sweet and other Herbs.—Sow in a gentle heat Basil and Marjoram, and on healthy borders, Thyme, Winter Savory, Marigold, Parslane, Parsley, in full crop, Skirret, Hyssop, Fennel, Carraway, Borage, Balm, Burnet, &c.

Radishes.—Of all kinds of these sow a full crop.

Rhubarb.—Seed of this should now be sown, and large crowned roots divided, to make new plantations.

Parsnips.—Sow a full crop in drills, 1 foot apart, on deeply-trenched, pulverised land.

Peas.—Sow throughout this month on well-trenched, deeply-cultivated, thoroughly-pulverised soil, all the late kinds and the tall sorts, 12 to 14 feet apart; which is not only a convenient distance, but ensures a full supply of light and air to the crop, which is doubled by this treatment; and it forms a partial shade for such summer crops as are planted between the rows. Champion of England, Dixon's Favourite, Harrison's Glory, Laxton's Prolific and Quality, Maclean's Best of All, Prince of Wales, Wonderful, Nonpareil, and Veitch's Perfection are all good Peas for succession; and for the last or latest crop of all, British Queen, Premier, and Ne Plus Ultra. Early Peas, stick and protect against cutting winds, and

dredge with dry dust the base of all crops now up on dry evenings, to prevent canker and shanking.

Savoy.—Sow a full crop now, and then again at the end of the month.

Salsify.—Sow in drills 1 foot apart.

Scorzonera.—Sow after the middle of the month.

Seakale.—Sow in drills, or dibble 1 foot apart each way, in order to have strong plants for forcing next winter; if sown on well-prepared, pulverised, rich soil, and well attended to through the summer, strong clean plants will be the result.

Spinach.—Sow the round summer variety in drills, between Peas, or other ways, once a fortnight. Sow New Zealand Spinach in heat.

Turnips.—Sow in drills, a few, once a fortnight, of any small short-topped early kind, in order to have Turnips young, sweet, and tender.

THE LINNÆAN SOCIETY.

THE special general meeting of this Society, convened by the council to consider certain alterations in the bye-laws, was held on Thursday evening (March 5), at the Society's rooms at Burlington House, when the attendance of fellows was unusually large. Mr. George Busk, F.R.S., one of the vice-presidents, occupied the chair, and opened the proceedings with a conciliatory speech. He concluded with a suggestion founded upon a resolution of the council at its last meeting; that, if a committee, to be appointed by those who differed in opinion from the council, would prepare and forward to it a report embodying their objections, and suggesting any amendments in the bye-laws which might seem to them desirable, that report would receive the fullest consideration of the council. In order to meet fully this conciliatory suggestion, Mr. Carruthers formally moved, that a committee be appointed to consider the bye-laws, and suggest to the council such alterations as they might consider desirable. This motion was duly seconded by Mr. Dallas. As an amendment, it was moved by General Strachey, that, in lieu of this amicable arrangement, the opinions of some counsel of eminence should be taken as to the legality, or otherwise, of the recent alterations made in the bye-laws, and, in the event of such opinion being adverse to the council, steps should be taken to repeal such alterations accordingly. Contrary to what might have been expected, this amendment, which was duly seconded, appeared to meet with approval from the chairman; and, after an animated discussion, in which, however, we are glad to say, nothing of a personal or objectionable nature occurred, the amendment was carried by a considerable majority. A resolution, moved by Sir John Lubbock and seconded by Mr. Carruthers, was then carried, expressing the obligations of the Society to the late president, Mr. Bentham; and a vote of thanks to the chairman terminated the proceedings. As it transpired during the evening that the opinions of two eminent counsel had already been taken as to the legality, or otherwise, of the recent changes made in the bye-laws, which opinions were, in some respects, at variance, the proposal to submit to the opinion of a third may, to some extent, be of advantage. But, inasmuch as it is generally admitted that the whole of the existing bye-laws are in an unsatisfactory condition, which cannot be ameliorated by counsel's opinion on past proceedings, we think it is to be regretted that the suggestion of the council, as expressed by the chairman, was not accepted by the meeting, inasmuch as such an acceptance would have relieved the society of much embarrassment. The council assuredly took their defeat with complacency. The reason for this it is difficult to perceive, except upon the supposition that, subsequent to the meeting at which the resolution of the council, to which we have referred, and which was read to the meeting, was passed, they must have allowed themselves to be influenced by communications with the supporters of the amendment.

Plants as Weather Guides.—A writer in the *Field* says:—It is well-known that certain plants are very sensitive to changes in the atmosphere, and by their behaviour, the opening and closing of their leaves and flowers, serve as natural barometers to indicate the coming weather. A Prussian horticulturist—M. Hannemann, of Proskau—gives the signs he has found reliable with respect to the following plants. The small Bindweed (*Convolvulus arvensis*), and the Corn Pimpernel, or Poor Man's Weatherglass (*Anagallis arvensis*), expand their flowers at the approach of wet weather, whilst, on the other hand, the different varieties of Clover contract their leaves before rain. If fine bright weather is in prospect, the leaves of the Chickweed (*Stellaria media*) unfold, and its flowers remain awake and erect until mid-day. When the plant droops, and its flowers do

not expand, rain may be expected. The half-opening of the flowers is a sign that wet will not last long. The Burnet Saxifrage (*Pimpinella Saxifraga*), indicates the coming weather in the same manner. As to the small Cape Marigold (*Calendula pluvialis*), should it open at 6 to 7 a.m., and not close till 4 p.m., we may reckon on settled weather; if the flower continues sleeping after 7, it betokens rain. In the case of the Corn and common Sow Thistle (*Sonchus arvensis* and *oleraceus*), the non-closing of the flower-heads, warns us that it will rain the next day; whilst the closing of them denotes fine weather. Respecting the weather indications of Bladder Ketmia (*Hibiscus Trionum*), the Stemless Ground Thistle (*Carduus acaulis*), Marsh Marigold (*Caltha palustris*), Creeping Crowfoot (*Ranunculus repens*), Wood Sorrel (*Oxalis acetosella*), and other species of the *Oxalis* genus, rain may confidently be expected when the flowers of the first do not open, when the calyx of the second closes, and when the rest fold their leaves. We may also look for wet weather if the leaves of the Whitlow Grass (*Draba verna*) droop, and Lady's Bedstraw (*Galium verum*) becomes inflated and gives out a strong odour. Finally, the approach of rain is indicated in the case of the yellow Wood Anemone (*Anemone ranunculoides*) by the closing of the flowers, and in that of the Windflowers (*Anemone nemorosa*) by their drooping.

Castor Oil Seed.—The Castor-oil plant is extensively cultivated all over India. The oil is extracted by bruising the seed and then boiling it in water, the oil being afterwards skimmed off. This is the only seed out of which the oil is extracted by boiling, as, in this case, it is found cheaper than the method used for other seeds, which is by pressure. The cost of the seed is one rupee (2s.) per maund (about 56 lbs.), and the price of the oil is from two to five seers per rupee, according to the abundance of the crop in the season. The proportion of the oil yielded is about half the weight of the seeds boiled; it is only used for burning. In Outtack, the plant is grown all over the province, a good deal in patches of newly cleared land in the jungles of the Tributary States and Sumbulpore. The oil is extracted in two ways. It is used for burning and culinary purposes, and, also, medicinally. Both the native methods of extracting oil are wasteful and tedious, and, therefore, expensive. European oil-presses, and a knowledge of some methods of clarifying the expressed oil, seem only to be required to render the oil-seed crops of this extensive division of great value. The large seeds of *Ricinus communis* major are employed for lamp-oil, and the small seeds of the variety *Ricinus communis* minor yield the medicinal castor-oil.

Paper Material.—Some of the American newspapers are now printed upon paper which is made from a reed-like Grass (*Arundinaria macrosperma*). The way in which this material is prepared for the manufacture by the Fibre Disintegrating Company would be too improbable for a hoax if it were not known to be a fact. The bundles of reeds are crammed into a metal cylinder, in which they are exposed to the action of steam at a high pressure, with which accordingly they become thoroughly permeated. They are then suddenly released, and, by the expansion of the steam, are not merely violently projected *en masse* against a sort of target placed to receive them, but at the same time are thoroughly disintegrated by the instantaneous dilatation of the compressed steam which has penetrated every part. A bundle of reeds is in this way converted into a disc of fibrous paper-pulp. There is something delightfully millennial in the utilising of artillery practice for literary purposes.

A White Coal.—Our antipedes, that fragment of the most ancient of existent Continents, that land of paradoxes, which would not allow the poor schoolboy his pet phrase of *rara avis in terris, nigroque simillima cygno*, but must fain turn out a black swan, make animals with birds' beaks (*Ornithorynchus paradoxus*), and put the stones of Cherries outside of the fruit, has just revealed a new mineral—a white coal—which is fibrous, easily combustible, and burns with a light flame and no smoke. Nor is the material rare; large districts are covered with it, and it lies on or very near the surface. The coal is a species of lignite, and the colour is, most likely, due to the absence of bitumen.

The Tree of Knowledge.—There is in America a physiologist who, unlighted, perhaps, as to his intellect by the lamp of a fish diet, proclaims to mankind that Apples are the proper food, after all, of the sedentary brain-workers. The Apple, according to this observer, who obviously investigates things to the core, contains more phosphorous, or brain sustenance, than any other member of the vegetable republic; therefore, it is conducive to mental activity. This makes it clear that the Apple tree is, just as Eve thought, a "tree to be desired to make men wise." We can also now understand how it is that Apple sauce is always eaten with that foolish bird, the goose.—*Fun.*

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

NOTES ON PEAS.

THE recent publication in the columns of THE GARDEN of the combined reports on the Peas grown at Chiswick during the past two years, comes to us at a convenient time, and, not the least service rendered to growers by these reports is the way in which the varieties are classified, so that by reference thereto it is now easy to ascertain to what particular section of Peas any particular kind belongs. There are, however, some sections omitted that might have been added with advantage, such as early, medium, and late, and there would have been some interest attached to an arrangement of the whole number into dwarf, medium height, and tall; also, as to the comparative hardiness, or otherwise, of the earliest Marrows, in contra-distinction to the old white or blue round kinds. This latter point is one of particular interest, as, now that we have Wrinkled Marrow Peas that produce a crop but a very few days later than Dillistone's Early Round, it is evident that the latter kind and its congeners must soon give place to the sweeter and better-flavoured Marrows, if these prove to be perfectly hardy. Of not less value would have been some practical information as to the difference in crop produced by a Pea that grows only 2 feet in height, and one that grows to a height of 6 feet. Gardeners have long favoured tall kinds, believing that these produce the heaviest crops, and probably where they do well, that is the case; but it must not be overlooked that all tall Peas grow to a height of from 3 to 3½ feet before they produce pods, and therefore seldom have, after all, a larger space of fruitful haulm than such kinds as grow only to that height. We are sometimes favoured with woodcut illustrations of tall Peas podding from the ground upwards, but everyone knows that such, in reality, is not the case. Some of our best dwarf Peas will, on the other hand, begin to bear pods very near the base of the haulm, and then they give quite as large a pod-surface as the best tall kinds do; then there is less danger of the haulm of dwarf Peas exhausting the soil, and becoming unproductive in dry weather, than is the case with tall Peas, which have so much more work for the roots to perform before a crop is borne. Another point of interest is the relative amount of support in the shape of sticks required by the two classes of dwarf and tall Peas, as Pea sticks are, in some places, dear and difficult to obtain. A few stout sticks will give support to robust dwarf Peas, but tall ones need assistance to keep them in proper position. There is another evil in connection with tall Peas, which has come under my observation, when grown in bulk together, viz., that when great heat prevails, so far from one row shading another, and thus promoting a cool temperature, the reverse seems to be the case, as the air between the rows, not being renewed by a quick circulation, becomes exceedingly hot, and the blooms suffer materially in consequence. Tall Peas should always be grown in rows several yards apart, with crops of Potatoes, Onions, or any other dwarf crops between them, and, under these conditions, a much better crop is obtainable than when grown in rows close together. Whatever may be the belief prevalent amongst gardeners as to the value, or otherwise, of dwarf Peas, it is, at least, certain that this section is eminently adapted for small gardens; nevertheless, in the face of this fact, tall Peas will continue to be largely grown. I have gone carefully through the Pea report and collated therefrom a list of twelve kinds, all of which are classed with the tall-growing sections, adding also their average height of growth and date of bearing pods fit for the table. The early section here do not exceed 4 feet in height, and are not tall in reality, but then they grow to twice the height that the earliest of the dwarf section do, and are, therefore, tall, by comparison.

Tall Kinds.

The whole of these Peas were sown on the same date, Feb. 23, and their successive periods of fitness spread over three weeks. They present a list of the very best of the tall

kinds, being, in all respects, good croppers, fairly hardy, and of the best quality. It is obvious that no one would care to make a selection of the whole dozen for any one garden, but, whilst some growers will favour a couple of the first earlies, others will prefer a different couple.

	FIT FOR TABLE.				HEIGHT.
	June	9	...	...
Dillistone's Early	3 feet.
Sangster's No. 1	12	...	...	3½ "
Easte's Kentish Invicta	13	...	...	3½ "
Emerald Gem	13	...	...	4 "
William the First	14	...	...	4½ "
Prizetaker	23	...	...	5 "
Paradise Marrow	24	...	...	5 "
Laxton's Supremo	24	...	...	5 "
Champion of England	25	...	...	6 "
Ne Plus Ultra	29	...	...	6 "
British Queen	30	...	...	6 "
Tall Green Marrow	July	1	...	...	6 "

Except in its particular earliness, Dillistone's Early is the least satisfactory one of the lot, as it is a poor cropper, but Sangster's No. 1 is a reliable kind, and William the First, although a day or two later, will beat it hollow, both for colour and quality. Kentish Invicta I find is this year being largely grown as a market Pea, a proof that it is a good thing, and I am much surprised to meet with it so seldom in private gardens. My impression of it, when seen at Chiswick, was greatly in its favour as an early Pea. Emerald Gem (grown at Chiswick both in 1872 and 1873), notwithstanding all that has been said about it, is a capital garden variety. All the others are too well-known to need further comment.

Dwarf Kinds.

Dwarf Peas present a wider, and, possibly, a richer field for selection, as there are few that are not good, and the bulk are excellent. There is here, also, no difficulty in selecting twelve sorts, all of which class as Marrowfats, even the earliest having, in this respect, the advantage of the earliest of the tall kinds, scarcely any of which have such excellent quality. I find the best here to be:—

	FIT FOR TABLE.				HEIGHT.
	June	16	...	...
Little Gem	16	...	...	1½ feet.
Blue Peter	18	...	...	1½ "
Nutting's No. 1	18	...	...	2 "
First-crop Blue	19	...	...	2 "
Multum-in-Parvo	19	...	...	1½ "
Dean's Dwarf Marrow	24	...	...	2 "
Princess Royal	25	...	...	2½ "
Wonderful	26	...	...	3 "
Fillbasket	26	...	...	3 "
James's Prolific	30	...	...	3 "
Omega	30	...	...	2½ "
Veitoh's Perfection	July	4	...	...	3 "

The bulk of this selection can be grown well without the use of sticks or supports of any kind, and can be specially commended to persons who have town gardens, or reside where stakes and spray are difficult to obtain. The first half-dozen can be sown in rows at intervals of 2 feet apart; the remainder should have a space 6 inches wider. Grown in this way, they present no obstacles to the planting and growth of a winter crop of Cabbages or Kale; and, as soon as the Pea crop is gathered, the haulm can be pulled and the space between the rows of Winter Greens, either forked or deeply hoed through, and thus a second crop is well established, a result that could not possibly follow, were tall Peas grown. If I were about to grow any six kinds for succession in this list, I should select Blue Peter, Multum-in-Parvo, Dean's Dwarf Marrow, James's Prolific, Fillbasket, and Omega; and a selection of three for villa or small gardens would include Multum-in-Parvo, Dean's Dwarf Marrow, and Omega. Multum-in-Parvo is known as an improved Little Gem, as it has a larger pod and finer Peas. Dean's Dwarf Marrow has a remarkable robust erect growth, with branching habit. It represents a cross between Multum-in-Parvo and Premier, has fine pods, is exceedingly productive, and the Peas are of delicious flavour. Omega is the finest of all the late dwarf Peas, and presents one of the most serviceable forms that Mr. Laxton has raised. It has been well described as a dwarf Ne Plus Ultra, but more hardy; and higher praise could not be rendered. A. D.

NOTES OF THE WEEK.

— MR. JOHN WATERER'S annual exhibition of *Rhododendrons* will take place this year in Russell Square, Bloomsbury, instead of in the Royal Botanic Gardens, Regent's Park, where it has been so striking a feature for these last twenty-three years. The transference of the floral glories of Bagshot to one of the largest and best of our town squares is an event on which Londoners may congratulate themselves.

— MR. ANDERSON informs us that the first portion of the Meadow Bank Orchids will be sold there by auction on the 6th and 7th of May, and that at that sale will be offered some of the rarest and best specimens in the collection, which is well known to be one of the finest in Europe.

— It is proposed to present Mr. Abraham Stansfield, of Todmorden, with a testimonial, as an acknowledgment of the services which he has rendered to the cause of education and the advancement of science, particularly botanical science. The Todmorden Botanical Society owes its origin and continued success entirely to his unwearied efforts. A committee has been formed for promoting this object, in furtherance of which upwards of £50 has already been collected.

— NEAR Erigné (Maine et Loire), says the *Revue Horticole*, is a curious Oak about sixty years old, whose parent acorn was deposited, probably by some bird, in a cavity in the trunk of a Willow, at the height of about 8 feet from the ground. The young Oak, pushing its roots downwards, has since killed the Willow, of which very little now remains, while the roots of the Oak have obtained a firm hold in the soil. The singularity of the case is that the base of the Oak, for a height of nearly 8 feet, consists of a collection of roots, which are fast becoming covered with alburnum or sap-wood.

— We observe that several lots of the new *Masdevallia polysticta* are to be sold at Stevens's on Monday next. Of this species Mr. Roezl says that when he first met with it at a certain distance off, he believed it to be *Odontoglossum navium*, so much alike is the general appearance of the inflorescences of these two otherwise very different Orchids. The flowers have a light ground, richly dotted with dark purple, and are arranged in dense spikes. It is a free flowering graceful species of robust habit, and will form a striking contrast when associated with some of the high-coloured kinds.

— A VINE, says the *Boston Journal of Chemistry*, situated about three miles and a half from the town of Santa Barbara, California, has a trunk 4 feet 4 inches in circumference in the largest part. It begins to branch out at about 6 or 8 feet from the ground, and is then supported on framework, which it covers as a roof. The whole Vine thus supported now covers over an acre of ground. Several of the limbs are as much as 10 inches in circumference at a distance of 25 or 30 feet from the trunk. The annual yield of Grapes from this mammoth Vine is from 10,000 to 12,000 pounds. The clusters average, when ripe, from 2 to 2½ pounds each. This Vine, which is about forty years old, is on rather high ground, and, it is stated, that the soil about it has never been manured at all. This Vine, curiously enough, as in the case of Messrs. Lane's Vinery at Berkhamstead, has a small stream of water running near it, which probably assists its growth.

— We have received from MM. Huber & Co., of Hyères, coloured plates of *Dahlia arborea*, a species quite distinct from *Dahlia imperialis*. In a circular, issued by MM. Huber, they say:—"It attains the height of about 7 feet, and forms a well-branched clump, with large leaves of a dark green, which contrast agreeably with the foliage of other plants. This inferiority of height makes it take up less room in the conservatory than the *D. imperialis*, and enables it to resist the wind better in the open air. From the end of December it produces an innumerable quantity of well-formed mauve-coloured flowers, the successive development of which does not suffer from a temperature below freezing point. The form of the plant is, moreover, quite new in the genus, for it can only be compared to a gigantic Anemone; and its peculiarity of flowering copiously at a low temperature is a rare occurrence among succulent herbaceous plants."

— From the report of the council of the Royal Dublin Society we learn that "For several years the state of the iron shed, used for the Museum of Botany, at the gardens, has been brought under the notice of the authorities. It is fast falling into decay, and, in a short time, will cease to be a sufficient protection to the interesting series of specimens temporarily placed there. The Science and Art Department, impressed with the importance of having a Museum of Economic Botany established in connection with the Botanic Gardens, succeeded in obtaining a grant from Parliament amounting to £4,000, for the erection of an appropriate building for the purpose, and, although the site was chosen, yet the Council failed to induce the authorities to take any step towards the erection of the building, and the vote was eventually withdrawn." A Museum of Science

and Art has recently been erected at Edinburgh, at a cost of nearly £90,000, but, it appears that an "iron shed, fast falling into decay," is considered good enough to form the Museum of Botany, which will supply instruction to the citizens of Dublin!

— THERE will, it is said, be no provincial exhibition this year in connection with the Royal Horticultural Society.

— MR. PEACOCK writes to us to say that *Agave univittata*, which we stated last week was throwing up a flower-stem at Kew, is also now showing for flower with him at Sudbury House, Hammersmith; it has grown a foot in three days.

— THE display of Persian *Cyclamens* at the Victoria Nursery, Holloway, where Mr. Williams has made this flower a speciality, is now quite striking. *Cyclamens* of this class must ever be favourites for greenhouse or conservatory decoration at this season of the year.

— MESSRS. MAULE, of Bristol, have sent us a coloured plate of a new Japanese Apple, named *Pyrus Maulei*. Of its origin we cannot speak, as Messrs. Maule have omitted to supply us with any account of it. From the appearance which it presents, however, as shown in the plate, we should think it a variety of *P. japonica*, with very spiny branches and almost spatulate leaves.

— THE *Charleston News* says, that the steamship "Manhattan," which left that port for New York February 25, had on board the first new Strawberries of the season, being a consignment consisting of about 100 quarts; she also took a parcel of new green Peas, both being among the earliest shipments known. They were the growth of Florida, and indicate that the semi-tropical climate of that state is able to furnish fresh fruits and vegetables nearly all the year round.

— THE extension of the *Cinchona* cultivation in Darjeeling continues. Every year additional land is brought under *Cinchona* culture and it is calculated that 2,000 acres more will be cleared and planted within the next four years. With regard to *Ipecacuanha*, upwards of 20,000 plants and cuttings are now in hand, all of which promise well. Another interesting fact relating to the introduction of useful plants into India, is that of the success in the Terai of the Cacao (*Theobroma Cacao*, L.). The plants that were planted out about a year ago, were sent from Kew at the suggestion of Dr. Hooker, and they are now in a most healthy and satisfactory condition.

— At a meeting of the Royal Botanic Society, the other day, Professor Bentley delivered a lecture on the Fever Gum tree (*Eucalyptus globulus*). This tree, which is a native of Australia, grows to the height of 350 feet, and a plantation of it is exceedingly useful in sucking up and dissipating moisture from marshy land. The wood makes excellent building timber; the bark furnishes a powerful astringent, which is prepared in Australia in the form of lozenges and syrup. A preparation, known as eucalyptol, is efficacious as an antiseptic, stimulant, and disinfectant. Gums are obtained from it, and among other unexpected uses it is employed for flavouring soup and making cigarettes, which afford alleviation in asthma. It has been successfully cultivated in many parts of the world, but the climate of England is not favourable to it. Sixty plants of it were planted in the Royal Horticultural Society's Garden at Chiswick in the spring of 1847, the plants being two years old and 3 feet in height. They grew rapidly, and were not in the least injured by the winters of 1847-8 and 1848-9, but were totally destroyed by the severe frost in January, 1850, when they had attained a height of from 18 to 25 feet. All, too, suffered alike.

— SCOTLAND is said to be, year by year, becoming less productive in the matter of fruit. At a meeting of the Botanical Society of Edinburgh last week, Mr. McNab read a paper on "Further evidences of Climatal Changes in Scotland," and mentioned that several old Scotch gardeners, as well as amateur cultivators, concurred with his opinion that many varieties of fruit now cultivated in that country were by no means equal to what they were from thirty to fifty years ago. Ribston Pippins and Nonpareil Apples are alleged to be inferior in size and flavour as well as number to the specimens formerly seen. The Jargonelle Pear, once extensively grown and thoroughly ripened on standard trees in various districts of Scotland, is now exceedingly scarce. The famous Carse of Gowrie orchards, which half a century ago were so remunerative, and in which seventy varieties of Apples and thirty-six varieties of Pears were cultivated as standards, still exist, but with a sadly diminished production of fruit. The Clydesdale orchards are in the same failing condition. The Damson shows signs of becoming extinct, and the common Black Sloe and Bramble Berries are in like manner on the decline. From the old minute books of the Caledonian Horticultural Society, it appears that from 1810 they offered prizes for Peaches grown on open walls without the aid of fire flues; but, after 1837, these were discontinued, and the generality of the competition Peaches sent are grown on flued walls or in Peach-houses. Similar evidence was given with regard to Cherries, Gooseberries, and Scotch-grown American Cranberries, and even the Filbert and Hazel Nuts are, it is stated, not by any means so flourishing as formerly.

THE FLOWER GARDEN.

SAXIFRAGES.

By J. C. NIVEN, Botanic Gardens, Hull.

The Crustacean Group.

THERE is, perhaps, hardly a single genus of plants that presents so great a diversity of aspect as the Saxifrages. Hence, it is not at all surprising that the uninitiated seem somewhat dubious, when you assure them that our common Mossy Saxifrage and the old London Pride are so intimately related as to come under one generic title. How much greater then must their astonishment be, when you further assure them that the same slender-leaved trailing plant is related, in an equal degree, to *S. crassifolia*, that coarse-looking species usually consigned to the back settlements of old shrubberies?

not that I wish, for a moment, to disparage even it, though its leaves put one a good deal more in mind of a Rhubarb than a Moss; yet, this is really the case, and, what is more, they possess such well-marked structural peculiarities in common, that, though separate generic titles have been given to the more important groups, the old genus *Saxifraga* reigns supreme, and holds its head high above the influence of any revolutionary monographs that may be published. The question then, naturally, arises are we to endorse the monopoly and stick to the old patronymic? or, are we to resuscitate the sectional genera, such as *Robertsonia*, *Boykinia*, *Bergenia*, and others? For my part, I am, in this case, decidedly disposed to be conservative, and purpose retaining the old familiar title of Saxifrage, which, being literally interpreted, means "stone-breaker," an admirable title, by the way, as, growing amongst rocks and spreading over the surface of large masses of stone, they insert their delicate roots into every crack and crevice, thus assisting, materially, in the slow, but sure, eroding process by which the hardest rocks are transformed into the first elements of soil. Taking then the genus *Saxifraga*, as our text, it will be obvious that it naturally divides itself into groups, and under the following groups we shall consider them. Thus we have the Crustacean, including all those with silvery cartilaginous excretory formations occurring on the margins of the leaves; the Mossy group, of which our own native *S. hypnoides* may be taken as the type, forming cushions of bright-green foliage; the ligulate, or ciliated, group, with large fleshy leaves producing their rosy flowers in dense panicles, of which *S. crassifolia* is the type; the London Pride, or None so Pretty, group, with which all are familiar, and for whose typical representative we shall take *S. umbrosa*; the samentose group, with their long straggling runners and prettily-marked foliage, of which we can select no better representative than the *S. samentosa*, or Wandering Jew; the opposite-leaved group, whose lovely crimson flowers are amongst the earliest of the whole family, for which no better sponsor can be found than *S. oppositifolia*; and finally a somewhat heterogeneous assemblage that we shall call the yellow-flowered group, of which we may take *S. aizoides* as typical.

Pyramidal Saxifrage (*S. pyramidalis*).

Having thus enumerated the several groups under which I purpose passing in review the various well-defined species of Saxifrage that are at present in general cultivation, I am quite sure no one will challenge me with attempting a botanical memoir; I merely take their outward characteristics, and deal with them from a popular, not a technical, point of view. I may as well, at the outset, state that I once wrote a monograph on the genus, viewing it from a sort of combined botanical and horticultural stand-point, but a long experience in raising Saxifrages from seed has sadly shaken my faith in the matter of specific distinctions, and I see, in the elaborate monograph recently prepared by Dr. Engler, of Breslau, that most of the fifteen groups into which he divides the genus are supplemented with a list of hybrids, or presumed hybrids, which lists might, in truth, be largely increased. To anyone who is desirous to go thoroughly into the botanical characters of all

the described species of Saxifrages, the doctor's monograph will be found invaluable. Though I gladly avail myself of it as a sort of text-book in the matter of nomenclature, I may say there are points, and those not a few, in which my practical experience will not permit me to endorse the ruling of the learned doctor. The Crustacean group, which I have selected as the most appropriate to begin with, commends itself for the premier position by the very fact that to this group belongs the veritable Queen of Saxifrages—*S. longifolia*. No one who has seen the plant in vigorous growth will begrudge it the regal dignity which it so well deserves, but the mere mention of this species must suffice at present, seeing that I take as the typical plant of this section *S. pyramidalis*, so admirably delineated in the accompanying illustration. It will be recognised by many as an old friend and favourite. Usually speaking, it is said to be synonymous with Linnaeus's old *S. Cotyledon*, but I have a decided notion that these two names really belong to two distinct species, or, if not, that the former is, at least, a well-defined variety of the latter, giving, of course, precedence to the older name. Wherein, then, rests the distinction? Let us briefly compare their general characteristics. In *S. Cotyledon* the individual radical leaves, that form the large rosette which precedes the blooming process,

are slightly glaucous and somewhat grey in colour; they are scarcely obovate, whereas, in the pyramidal plant, they are markedly obovate, and of a very deep green; the floral axis, which, terminated by the first expanded bloom, constitutes an admirable illustration of the form of inflorescence known as a compound cyme, rises to a height of 2 to 3 feet in the former whereas, in the latter, it rarely exceeds 18 inches; the true, leaves, though somewhat modified in size, being, in this case, continued up the stem for a considerable distance. The secondary branches of the inflorescence of *S. Cotyledon* are erect, and they, as well as the primary axis and calyxes, are green in colour, whereas, in *S. pyramidalis*, the floral branches are drooping, and the whole of the stalks are covered with purplish glandular hairs. The calyx, also, has a crimson tint, and the flowers have narrower petals, and a far greater purity of whiteness. Another important distinction consists in the fact, that, whereas *S. pyramidalis* seeds freely, I have never yet

succeeded in getting perfect seeds from *S. Cotyledon*. The distinctions I have enumerated may appear somewhat trivial, but they are wonderfully constant; and, further, an excellent authority, who has seen the two species growing side by side on the Swiss Alps, informs me that their distinctive characteristics are even more marked in a state of nature than under cultivation. Engler, I see, admits that there is a form of *S. Cotyledon* with purple hairs and most abundant flowers, which form is, no doubt, the same as our *S. pyramidalis*. Be they, however, species, varieties, or mere forms, they are both worthy, in the highest degree, of being cultivated—nay, more, of being well cultivated—and amply will they repay the extra attention bestowed on them. Occasionally, they may be seen under ordinary rock-garden treatment, producing large and perfectly pyramidal cymes; for, be it noted, the pyramidal character is common to both, but, if you want to grow them to perfection, give them the benefit of liberal treatment. No better place for the experiment can be selected than the sunny south border of a kitchen garden, rich in all the good things for plant life, as such borders usually are. Let such portion as you purpose devoting to *Flora—versus Cauliflora*—be on a dry spring day, well trodden down and consolidated; select the strongest off-shoot rosettes from the parent plants, such as show no indications of bloom any time during the latter part of March or beginning of April; plant these in rows, at distances of 15 inches apart, and 12 inches in the row. A little water and attention may be requisite till they get root-hold of the soil; having done this, by the autumn you will find they have formed rosettes, 9 inches or more across, and, possibly, in some cases, a considerable number of offsets as well; these, however, should all be carefully removed, so as to concentrate the entire energies of the plant into the blooming rosette. Leave them during the winter following fully exposed, and by the month of May you will be enabled to realise, to perfection, the beauties which both species are capable of affording. Pyramids of blossom will result from each rosette with a regularity of outline and symmetry of shape that once seen are never to be forgotten; and, if the two forms are cultivated in this way, under exactly similar circumstances, you will be able to draw your own conclusions as to whether I am correct in my surmise, that *Saxifraga Cotyledon* and *S. pyramidalis* are distinct species, or the same. I venture to think, without hesitation, you will adjudge them as being, if not distinct species, at least worthy of distinct names. Geographically speaking, both plants have a wide European range, and are met with in abundance on the Swiss Alps, on the mountains in Dalmatia and Carinthia, in Lapland and Norway, even as far west as Iceland, the only instance in which they are recorded as occurring beyond the bounds of their European home.

HALF-HARDY SUCCULENTS.

(PACHYPHYTUMS.)

PACHYPHYTUMS are fleshy-leaved plants, suitable for green-houses, frames, or windows, or for flower-garden decoration in summer, where they have a striking effect, either grouped with other succulents, or used as carpet-bedding plants. They may also be usefully employed as edgings to small beds containing plants of a low-growing character. They will endure a degree or two of frost without injury, if previously well-hardened, but it is safest to take them indoors about the middle of October, or thereabouts. When taken up, after removing a few of their lower leaves, pot them a little deeper than they previously stood in the flower garden, and use for the purpose as small pots as will conveniently hold the roots. This has a tendency to keep them dwarf. It matters little even if the old roots are considerably reduced in this operation, as fresh ones will be thrown out freely from the portion of the stem that is buried. During winter, keep them on the side of dryness, rather than wet. A good loamy soil mixed with some pounded brickbats suits these plants when lifted better than rich material. The leaves taken off when the plants were lifted from the open ground may be used as cuttings. Get some clean pans or 4-inch pots, drain them well and fill them up with sandy loam mixed with some finely-ground brickbats, and, around the edges of these pots or pans, insert the leaves thickly

and firmly; also, fill up the central space with them, but not thickly. In preparing the leaves, cut them clean across at the base with a sharp knife, and then spread them out on a shelf, where they will not dry too quickly, but where their ends will become, to some extent, healed over. I have seen such leaves lie about in this manner for a fortnight, and then, when their ends were inserted in soil, roots were soon emitted. If the leaves were inserted in soil immediately after being removed from the parent plant, they would probably all rot off at the base. At one time leaf-cuttings of succulents used to be treated as follows:—After the cuttings were made they were inserted, top downwards, in sandy soil, merely keeping the cut part above ground, in order that it might become well dried, and, consequently, not apt to rot; they were then lifted out and inserted in the proper manner. In this way a well-dried cut end was secured, and shrivelling from evaporation was prevented. There is no necessity, however, for treating *Pachyphytums* so carefully, as they do quite as well when dried—as has been mentioned—on shelves or stages. When the cuttings have been put in, the pots containing them should be placed on a shelf as near the glass as possible; they should be kept only moderately moist, free from drip, which is destructive to them, and never shaded unless the sun shines very brightly. They should be frequently looked over in order to remove any portions that may happen to be damping off, and, if the temperature of their winter quarters be a few degrees higher than 40°, they will form eyes much sooner than they otherwise would do, and be nice little plants before spring. In February, pot the strongest of them in thumb-pots, and prick off the others about 2 inches apart into boxes, and, if convenient, place them in an intermediate house till April, and they will form good plants for bedding-out the first year. Such warm quarters, however, are not necessary; for a dry frame would suit them quite as well. In that case, however, the plants would be too small for use in the flower-garden during the coming year. *Pachyphytums* may be increased, by means of leaves, at any season; but from February to October is the best time for that operation, and for that purpose good, well-matured, and firm leaves should always be chosen. If struck in spring, a little shading will be necessary in bright weather, and they should be potted or pricked off as soon as good young plants are formed. In this way, strong plants may be secured for next summer's outdoor display. *Pachyphytums* may also be raised from seed; indeed, this is the readiest mode of increasing them, and the one attended with least trouble. The seeds should be sown in autumn, as soon as they are ripe, or in the succeeding spring; but, if delayed longer, they come up badly, some being ready to prick off before the others have germinated. For seeds, prepare pots or pans filled to within 2 inches of the surface with crocks, then with sandy loam and very finely-crushed crocks or bricks; sow regularly, and rather thinly; cover slightly with a finely-sifted portion of the soil, and place a pane of glass over the surface of each pot. Place the pots in an intermediate house, near the light, and shade well until germination takes place, after which gradually inure the young plants to light; let the pane of glass be tilted up a little, and after a short time let it be entirely removed. The seedlings will soon gain strength and burst into the rough leaf, when they should be pricked off into other pots, pans, or boxes, and finally potted singly. If the produce of autumn-sown seeds, it is safest to keep them in the seed-pots till spring; but, if spring-sown, prick them off as soon as they are large enough for handling. For seed-bearers, the tallest plants should be chosen, divested of many of their base leaves in autumn, kept as dry as is consistent with their safety in winter, and started into growth in spring. This invariably induces them to flower, and that early, which is advisable, as the seeds have, in that case, a better chance of ripening in perfection than they otherwise would have. Flowering plants should be kept in pots, indoors, in a dry airy house, and the seeds, when ripe, should be gathered and spread out to dry. When grown in pots in summer, and used for conservatory decoration, some rotten manure should be mixed with the soil. *Pachyphytum bracteosum*, or “Silver-bracts,” a striking plant with silvery leaves, forms an excellent subject for the centres of raised circular beds during the bedding season.

WM. FALCONER.

BROMELIA-LEAVED SEA-HOLLY

(ERYNGIUM BROMELLEFOLIUM).

THIS is a very interesting plant, and one of the most distinct and striking of this attractive family. It forms a dense Yucca-like tuft, composed of numerous, long, channelled leaves, margined with slender spines. The radical leaves are from 2 to 3 feet in length, and the plant, without the flower-spike, is about the same height. The flowers are whitish, and not so showy as many others of the family; but the graceful habit and elegant foliage of the plant entitle it to a place in every collection. It is a fine subject for the sub-tropical garden, for dry commanding positions on rock-work, for ordi-



Bromelia-leaved Sea-Holly (Eryngium Bromellefolium).

nary borders, or as an isolated tuft on lawns. It is perfectly hardy, and an easily grown perennial. A. J. PERRY.

Culture of Ixias, Sparaxis, &c.—Grown under glass, these flower in March and April; out-of-doors, in May, June, and July. They are amongst the most graceful, attractive, and beautiful of Cape flowering bulbs. They differ considerably in style and habit of growth, but, being closely allied, they require the same cultural treatment. For in-doors, plant, from September to December, five or six bulbs in a 5-inch pot, using a compost of turfy loam, leaf-soil, and a little silver-sand. Make the soil firm about the bulbs, then place them in a cold pit or frame, plunging the pot in ashes, and withhold water till the plants appear, then give sparingly at first. The lights should not be kept on except during very wet or frosty weather. Early in March, when the plants have made some growth, they may be removed to the greenhouse, or where there is a very gentle warmth, and placed on a shelf close to the glass till in bloom. For out-doors, choose, if possible, a light loamy soil, thoroughly drained, and with a due south aspect; if backed by a wall or greenhouse, all the better. Plant the bulbs from September to February, at a depth of from 4 to 6 inches, and 1 to 3 inches apart. The early plantings must be the full depth, and the later plantings need not be covered quite so heavily. As the roots should be kept as dry as possible during winter, the early plantings must be protected either with litter, or with 2 or 3 inches of dry leaves; or the beds hooped over and protected with mats. The January or February plantings seldom require protection.—P. BARR.

Pelargonium Endlicherianum.—I have some doubts as to the general hardiness of this Pelargonium, of which an interesting notice appeared in your columns the other day. I have grown it for

several years, and it certainly will not stand the winter here. It flowers freely, but does not ripen its seed with me. I do not find it easy to strike from cuttings, which are apt to damp off. I have at present only one old plant of it. I find the same difficulty in propagating another interesting plant belonging to the same family, viz., *Erodium incarnatum*, of which I am seldom or ever able to preserve more than one plant through the winter. Cuttings of this strike freely, but, when potted, damp off. Can anyone supply me with a small plant of *Erodium pelargonieformum*? I have hitherto failed to procure it. Messrs. E. G. Henderson's foreman, Mr. Jennings, has often told me of a very beautiful *Erodium* with large yellow flowers, which they once had under the name of *E. olympicum*, but was soon lost. What was this? and where did it come from? Could it be the same as *E. chrysanthum* of Boissier's "Flora Orientalis." Has anyone ever grown *E. gruinum* of the same author? which, from his description, must be a very beautiful plant. Has anyone now the true *Geranium Lambertianum*? It is not so beautiful as its congener—*G. armenum*—but still a most desirable plant. Some six years ago, I saw it growing luxuriantly in Lord Rathdonnell's Garden, at Green Mount, Co. Louth, and also at Glasnevin. I have not seen it since. Does anyone now grow those two lovely plants—*Monsonia speciosa* and *lobata*?—H. HARPUR CREWE, Drayton-Beauchamp Rectory, Tring.

Worm-casts on Lawns.—These are often troublesome, especially during wet weather. I am of opinion that their entire eradication is impossible, but they may be kept in check as follows:—Sweep the lawn with a birch or other rough broom, so as to disperse the casts, then strew the surface with common salt at the rate of eight bushels to an acre, choosing a moist day for the operation. Less than eight bushels would do good, and a bushel or two more would do no harm. This dressing not only banishes the worms from the surface, but, when used in the quantities just indicated, it has a beneficial influence on the Grass. The salt may be dissolved in water, and applied in a liquid state, but the labour and waste of time thus incurred are needlessly spent, as no better results are experienced by this method than when common dry salt is employed. Six bushels of salt and six or eight of soot well mixed together, and applied either in a liquid or solid form to a lawn of, say, an acre in extent, is not only an invaluable safeguard against worm casts, but is, also, a good dressing for the Grass; even soot alone, applied at the rate of from twelve to sixteen bushels to the acre, is equally serviceable for both purposes. Air-slaked lime, used at the rate of from twenty to thirty bushels to the acre, or mixed with soot, or salt, or both, also forms a good dressing, especially for Mossy lawns, and it likewise destroys worms and grubs.—Q.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Hardiness of Alpine Plants.—I have lost several of my Alpine plants this winter, owing, as I believe, to the absence of snow, which forms their natural protection from frost and cutting winds on their native mountains. On the other hand, my herbaceous plants have not suffered in the least. Is the supposed greater hardiness of the former, because they are found at high altitudes, really to be explained by the fact, that they are always effectually protected in winter by a deep warm covering of snow, which only disappears under the hot sunshine of the advanced spring?—W. E., Leek.

Night-scented Stock (Matthiola tristis).—Can you tell me where this deliciously-scented dower can be had? What is its mode of culture and duration? I met with it once at the gardens at Wardie Lodge, but since then have looked for it in vain in seedsmen's lists; besides having lost a few offsets which were kindly given me at Wardie.—SALMONICKERS. [We are not surprised that you have failed to meet with this plant in seedsmen's lists. It is increased only by means of cuttings, and is really a frame-suffrutescent species, possibly hardy on dry rock-work or walls. It may, we think, be had of the leading London nurserymen, and, though not common, is less rare than you seem to imagine.—Ed.]

Portulacas.—The single Portulacas, in brilliancy, delicacy, diversity, and beauty of colour, surpass all other out-door plants, thriving where most other plants get burnt up. They delight in sunny situations and light soils, rapidly carpeting the ground with flowers and foliage. They are quite at home on rock-work exposed to the sun, on stumps of trees, in rustic vases, on banks, and wherever plants of a spreading or drooping habit are required. The double Portulacas are of the same brilliant and diversified colours as the single. Their saucer-shaped flowers being filled with petals, greatly enhance their general effect, so that wherever beds can be formed of these, they will surpass in brilliancy all other dwarf bedding plants.—P. B.

Night-blooming Hardy Plants.—The following enumeration of hardy plants, which bloom only during the night, appears in a late number of the *Belgique Horticole*, viz., *Mesembryanthemum noctiflorum*, *Silene nocturna*, *Gladiolus tristis*, *Pelargonium triste*, and *Hesperis tristis*. The flowers of the three last-named plants are usually of a dingy-yellow colour. The Marvel of Peru (*Mirabilis Jalapa*) and the long-flowered species (*M. longiflora*), both begin to unfold their flowers at sunset. Another, now little known, although old-fashioned, night-bloomer, is the *Petunia longiflora*, an annual from Chili, which bears an immense corymb of large tubular pure white flowers. The Evening Primroses complete the list; and, of these (*Oenothera biennis*, *E. longiflora*, and *E. stricta*), are mentioned as particularly deserving of notice.

THE INDOOR GARDEN.

TENDER BULBS FOR SPRING-FLOWERING.

BULBOUS plants are among the most useful of all flowering plants, as their general culture is of the simplest possible description, and many of them, as the *Amaryllises*, may be dried off for a considerable period, and can then be forced into bloom any time, as required. Many of the bulbous plants bear very large and richly-tinted flowers in great abundance, and these are useful for cutting and arranging along with fresh green foliage in the drawing-room vases. *Amaryllises* are especially adapted for the latter purpose, their bell-shaped flowers being of great substance, and, in most cases, gorgeously coloured. We have a whole host of varieties of Dutch bulbs that flower at this season, such as *Hyacinths*, *Tulips*, *Crocuses*, and *Jonquils*, but, at present, we propose to deal with a few less common species that are, nevertheless, equally well adapted for culture in the greenhouse or plant-stove.

***Eucharis amazonica*.**—This is, in all probability, one of the finest and most generally useful of all stove bulbs when well-grown, and it can be had in bloom every month of the year, with but little difficulty. It is readily propagated by means of off-sets, which are freely produced by established bulbs, and these, if potted separately in a rich sandy compost, in their turn soon make strong-blooming plants. A good compost for this plant is one composed of half fibrous peat, a quarter leaf-mould, or rotten manure, and a quarter coarse well-washed river-sand. The pot should be thoroughly well-drained, and the plant liberally watered when growing. When the pot becomes filled with hungry roots, a little weak manure-water is an excellent stimulant. It is a plant that requires growing on rapidly, and then resting for a week or two in a dry sunny house, in order to induce it to bloom freely. By resting, we do not mean that the plant should be starved until the leaves fall; this would ruin it, for one season at least. When liberally treated in a warm moist stove, plants of this charming exotic will bear two or three crops of flowers every year. Some growers plunge the pots in a warm bed of tan when the plants are making their growth, and this helps the formation of roots very considerably; frequent syringings are very beneficial to the growth and fresh appearance of the foliage. These flowers are even more valuable than white *Camellias*, for entering either for bridal bouquets or vase decorations, while, for ladies' hair, they are unrivalled even by the chastest and purest of white *Orchids*.

***Griffinia parviflora*.**—This is a pretty little evergreen bulb, having leaves somewhat like those of the *Eucharis* in shape, but beautifully netted with dark green. It bears clusters of bright blue flowers on scapes 5 or 6 inches high, and is a very ornate stove-plant, well worth growing for variety in every collection. It does well in a light, rich, well-drained compost.

***Amaryllises*.**—These plants ought to be universal favourites in every garden, as they are very readily grown, while the flowers of some varieties are most gorgeously coloured. Nearly all the varieties are deciduous, and may be dried off for months together, so as to take up but little space. The great point in their successful culture is to induce them to grow vigorously immediately after flowering, so as to get the bulbs plump and well-ripened for the next season's bloom. We have the following showy varieties now in flower, viz:—*Amaryllis vittatum* var. *Harrisonia*, a profuse bloomer, and one which bears numerous long Lily-shaped flowers of a creamy-white, each segment having two bold crimson stripes down its centre, while its scapes bear more flowers than the other varieties; *A. Ackermannii pulcherrima*, one of the finest of all the varieties, bearing a fine bold flower of the deepest velvety crimson imaginable, and should be included in every selection of these beautiful plants; *A. Le Zouave*, a bright reddish-crimson variety, profusely speckled with white, distinct and bright, well worth growing; *A. Spotted Gem*, creamy-white, speckled with vermilion; *A. Ariadne*, a very beautiful and distinct form, bearing pure white flowers, heavily streaked with crimson; *A. Leopold*, a very large fully-expanded flower, of a creamy-white colour, the lower parts of each segment being of a rich maroon-crimson; *A. Sultana*, a crimson-streaked kind of great size and substance. Besides the above, there are at least a hundred other varieties and seedlings, which, carefully raised, often turn out remarkably handsome for ordinary purposes of decoration.

***Crinum amabile*.**—This is a stately species, almost worth growing for its bright green foliage, apart from the beauty of its flowers. The latter are borne on tall scapes, and are as large as those of the common White Lily; but even more beautiful, being delicately tinted with soft flesh-colour. This, and all its congeners, grow well in a compost of fibrous loam, leaf-mould, and sand.

***Pancratium fragrans*.**—This is a robust plant, bearing long-

petalled white delicately-perfumed flowers, on scapes 1 foot to 15 inches in height. It has thick leathery foliage, of a deep green tint, and flowers very freely. Like the *Eucharis*, it blooms at different periods of the year; and, if a dozen plants are grown, their flowers will be found very useful for the centres of bouquets, or other floral decorations. They like a hearty compost of fibrous loam and well-rotted manure or leaf-mould, while a little weak liquid-manure is very beneficial when the pots become filled with roots.

***Triteleia uniflora*.**—This is not a tender bulb; on the contrary, it is perfectly hardy; still, it is one of the prettiest of all greenhouse pot-plants at this season of the year, and, together with its blue-flowered narrow-leaved variety (which is generally met with under the name of *Leucocoryne alliacea*, the specific name being given in reference to its evolving a strong odour of Garlic when bruised), the plant requires no special treatment. Bulbs potted in the autumn flower regularly in the following spring.

***Urecolina pendula*.**—Of all stove bulbs this is one of the most graceful, but, unfortunately, it is deciduous, and its elegant canary-coloured drooping flowers are borne before the glossy green foliage makes its appearance; still, the drawback can be remedied to a great extent by associating it, when in bloom, with fresh Palms and Ferns.

***Imantophyllum miniatum*.**—This is an excellent subject either for the greenhouse or conservatory, its fresh green foliage being always interesting, even when the plant itself is not in bloom. It flowers very profusely when thoroughly well established, but, like most other bulbs, the pots must be well filled with roots before it will make any effort to bloom. The flowers are of a bright orange tint, borne on stout two-edged scapes just above the deep glossy leaves. A few plants of this should find a place in every good collection, however select. B.

HYBRIDISING ZONAL PELARGONIUMS.

By Dr. John Denny's article in *THE GARDEN* of 7th February, and that of Mr. Laxton, of 14th February, I am invited to answer certain questions respecting the hybridisation of Zonal Pelargoniums. I am very willing to reply, as far as lays in my power, and I am the more disposed to do so, as I am of opinion that horticulture, as well as all other arts and sciences, can be benefited by the international and friendly communications of all those who have the same devotion to progress.

Aline Sisley is, as Dr. Denny supposes, an isolated result out of many seedlings from the same cross. The seeds (seventeen in number, of which only eleven came up) were sown the 16th January, 1872. The mother-plant originated from Madame Vaucher, impregnated in 1869 by Gloire de Nancy, which produced single whites. These were again impregnated by Gloire de Nancy, and, till 1871, produced single whites, and a few pinks (also singles). I kept these seedlings, and, in 1871, impregnated one of the single whites with a double red of my own raising, which, also proceeded from Madame Vaucher, fecundated, in 1868, by Triomphe de Dumesnil (double red), and, in 1869, produced a single white, which was, in 1870, impregnated by Cottingham (semi-double red), and produced, in 1871, this double red, the father of Aline Sisley; mother and father being, thus, grandchildren of Madame Vaucher. Out of the eleven seedlings of 16th January, 1872, I lost four. The seven remaining were:—One double white (Aline Sisley), two single white, one single pink, one double pink, two semi-double cherry.

Till then, Madame Vaucher had repeatedly produced single white, although fecundated by double red; and several horticulturalists here have told me, that they have not been able to obtain a double flower from her. As to the raising of Gloire de Nancy by M. Victor Lemoine, by impregnation of Beauté de Suresnes by Auguste Ferrier, there can be no doubt, M. Victor Lemoine being a most honourable horticulturist, and made no mystery of it when he sold it in 1865. As to the difficulty of crossing Beauté de Suresnes with any other variety, I have experienced it myself, although I have persevered in the attempt for the last five years. To ascertain whether this difficulty was general, I have written to MM. Victor Lemoine and Crousse, of Nancy; Emile Chaté, of Paris; Bruant, of Poitiers; and Cassier, of Suresnes. The latter, who is the raiser of Beauté de Suresnes, answered, that he obtained, in 1856, a pink Zonal, which he named *Roseum nanum*, and which produced in 1858, Madame Cassier. In 1862, Madame Cassier produced Beauté de Suresnes, which, again produced, in 1866, Surpasse

Beauté de Suresnes. All these were raised without artificial fecundation.

The four other horticulturists replied that they have never experienced any difficulty in fertilising Beauté de Suresnes with the old double varieties, Auguste Ferrier and Martial Champflour, and also with their offspring Gloire de Nancy and Madame Lemoine, and that it was from Beauté de Suresnes that they have obtained all their double pinks and reds. They also say, that if I, and other cross-breeders, have not succeeded, they think that we do not possess the true Beauté de Suresnes, and, M. Cassier is of opinion that we possess Surpasse Beauté de Suresnes, which is very shy in producing seeds. All this is very likely, but may proceed from other causes, and, probably, from the male parent chosen by Dr. Denny and myself; for my own part, I have constantly fecundated Beauté de Suresnes with doubles of my own seedlings; and, I am the more disposed to think this to be the cause of my failures, that Boule des Hespérides, which produced with me a great number of double varieties like Victoire de Lyon and Charles Darwin, refused last year to be impregnated by my new double whites, salmons, and other yellowish shades, although I operated on more than twenty plants. This seems to show that some plants of the same family are not congenial, and have dislikes. The consequence of all this for me is, that there are great uncertainties and mysteries, which

I do not feel myself competent to solve. I have not yet found a criterion to guide me or a rule to follow. The only thing, I think, beyond doubt is the influence of the male parent; and I, therefore, have, till last year, always impregnated single flowers by double ones, to obtain new double varieties. But, as I also think that to all rules there are exceptions, I last year changed my proceedings, and fecundated singles by doubles, doubles by singles, and doubles by doubles. I will publish the result next autumn. My only rule (if it may be called so), is to suppress all the old single varieties, when I find among my seedlings one equal to them. Amongst about 200 single varieties I grow to obtain seed, I have only kept, of the old varieties, Beauté de Suresnes, Jean Sisley, Oracle, Darkness, Mina Hahu, Corsair, Donald

Beaton, Crimson Nosegay, Virgo Maria, Madame Vaucher, White Tom Thumb, Tricolor, Marie Mézard, Alba grandiflora, Eugène Buenzod, Lady Cullum, Boule des Hespérides, Arlequin, Madame Jules Smith, Chant National; and, amongst those with double flowers, Gloire de Nancy and Madame Lemoine. All the others are new seedlings of my raising.

As to the existence of a double Zonal Pelargonium in Belgium about fifty years ago, I have written to M. Louis Van Houtte, and M. Edward Morren, but they know nothing about it. Respecting Rose-Charmeux, it has proved that all sports have a tendency to reversion. I suppressed it two years ago, because it had become quite single. I do not know the origin of Cottington, but am disposed to think, like Mr. Laxton, that it is also a sport, because for the last two years it has produced with me nothing but single flowers. I hope that I have replied satisfactorily to the questions of Dr. Denny and Mr. Laxton. If not, I am quite at their disposal for any other information they may require.

JEAN SISLEY.

Lyons.

Eucharis amazonica.—One small house at Eaton Hall is entirely devoted to this lovely plant, and the display made by it is simply magnificent. When I saw it, the other day, no fewer than 437 spikes were in full beauty. The plants were plunged in beds on

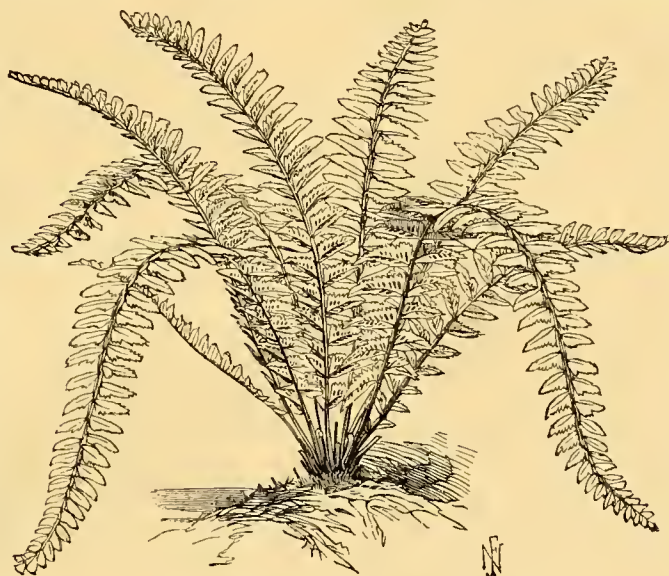
each side of the pathway, thirteen plants being on each side. Another house is also devoted to the culture of this useful plant; but, in this instance, it is grown in small pots, for decorative purposes. Here I counted 330 spikes, four and five being on each plant in an 8-inch pot, and one which I noticed, in the same sized pot, was bearing six spikes. I also learned from Mr. Selwood, the gardener, that this was the second time of flowering this winter; the same plants, large ones, having thrown up 380 spikes, and, small plants, 221 spikes, in the latter end of October and the beginning of November last, making a total of 1,368 spikes during the season, averaging five flowers on a spike. These have furnished an abundant supply all through the winter.—A VISITOR.

THE WINGED SPLEENWORT.

(*ASPLENIUM ALATUM*.)

THIS, by no means an uncommon species in collections, grows freely in an ordinary plant-stove treated like its congeners. When well developed, it produces a vasiform tuft of fronds which measure, individually, from a foot to 18 inches in length, and are of a pale green tint, in some cases almost glaucous. This variety is very suitable for a hanging basket or Warden case. The accompanying illustration, though much reduced in size, is a faithful representation of a plant of it which we

lately saw in Mr. Williams's Nursery at Holloway. It is a native of tropical America, and should be included in every collection, however small, of stove Ferns. G.



The Winged Spleenwort (*Asplenium alatum*).

Phalænopsis Schilleriana.

—This magnificent plant is the finest of the genus, and requires the treatment of Epiphytal East Indian Orchids. One characteristic of this species, which is not peculiar to any of the others, is, that if the flower-spikes are pinched out before the blooms are expanded, in the hope that they will, eventually, reproduce them a little later, disappointment will be the result. *P. Schilleriana*, as well as the other kinds, frequently produces flower-spikes in autumn, and may continue to do so throughout the winter; so that many, especially exhibitors, are inclined to pinch them, that they may yield them stronger and more abundantly in spring. This treatment, sometimes, answers

admirably for *P. amabilis*, *grandiflora*, *rosea*, &c., but for *P. Schilleriana* it is inadmissible, as the plants refuse to reproduce their flower-spikes until another year's growth is completed. F.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Asparagus racemosus.—This, which is one of the most beautiful of all the half-dozen ornamental species of *Asparagus* now in cultivation, is at present throwing up its feathery growths most vigorously at Kew. Its leaves are an inch in length, and about a line in width, and of the brightest green imaginable. If grown in quantity it would be most useful for bouquets, button-holes, and indoor decorations of all kinds; while the culture of the plant is easy in any ordinary greenhouse, or even in windows.—B.

Merendera caucasica.—This curious plant is now in flower with me in a pot in the greenhouse. The flower-buds rise from the centre of four or five green leaves, much like those of *Orchis fusca*. The petals, which are singularly narrow and long, are at first white, changing to lilac-rose, with a white stripe down the centre. It was sent to me under the name of *Colchicum Bisignani*. I have also *M. Bulboeodium*, *M. sobolifera*, and a single bulb of *M. Aitchisoni*, but have not at present succeeded in flowering any of them.—H. H. CREWE.

Chamedorea Martiana.—This is a dwarf and highly-ornamental species of Palm, well deserving of general cultivation for all kinds of indoor decoration. Its fronds are pinnate, gracefully arched, and not borne on a stem so high as most of its congeners. All the species are useful in plant-stoves when young, or in the tropical conservatory when they attain a considerable height, and they grow well in a compost of fibrous loam and sand. The pot should be well drained, and the plants must have a copious supply of tepid water at the root. If the pots are set in pans filled with water during the hot portion of the year, so much the better.—B.

THE PROPAGATOR.

MENZIESIAS.

THESE hardy and free-flowering little plants, commonly called Irish Heaths, may be increased by means of seeds, cuttings, layers, and division.

Seeds.

Raising *Menziesias* from seeds is a tedious undertaking, and therefore, seldom practised. Any one wishing to try the experiment, however, should get clean shallow pans, half fill them with broken crocks, over which place a layer of rough peat, and fill up with finely-sifted peat and silver-sand, three parts of the former to one of the latter. Sow the seeds, and merely dust a portion of the finest siftings over them, and over all lay a thin layer of damp *Sphagnum*. Place the pans in cold frames, and sprinkle the *Sphagnum* now and then by means of a very fine syringe, until the seeds begin to vegetate, when the *Sphagnum* may be removed. If they come up well, but not too thickly, leave them in the seed-pans undisturbed for a year, then prepare other pans precisely in the same way as for seed sowing, and into these prick off the seedlings about an inch-and-a-half apart each way. Here, too, they should remain for another year, at first kept in the frames, but afterwards quite exposed to the weather, being only sheltered from heavy rain, snow, and hard frost. After they are two years old, they may be transplanted into beds out of doors, thickly at first; but, on the next removal, to any place desirable. A peaty soil must be prepared for them in the beds into which they are first pricked out, but, afterwards, when they have gained some strength, the ordinary garden soil will be sufficient for them; if some peat, however, is mixed with it, they will appreciate the admixture.

Cuttings.

These afford the readiest means of increasing *Menziesias*, and they may be put in indoors or out-of-doors, and in spring or autumn. Out-of-door propagation by means of cuttings requires the assistance of a bell-glass or hand-light, and a shady and sheltered place, such as a border at the base of a wall, close wooden fence, or hedge. Excavate the soil where the cuttings are to be inserted to the depth of 3 inches, and replace it with peat as in the case of seedlings. In April or May, when the plants begin to grow, take some of the young shoots, make them into cuttings, and insert them under the hand-lights, which must be kept close and well shaded until the plants have struck root. Much dependence, however, should not be placed on these spring cuttings, reared out of doors, as many of them often fail, but those put in in autumn strike remarkably well, and just require the same preparation in soil as those inserted in spring. Autumn cuttings should consist of nice firm half-ripened wood of the current year, avoiding flowering points, and from an inch to an inch-and-a-half in length. Insert them firmly and thickly under hand-lights, which should be kept close, and covered over at night, if chilly, with a mat, using the same precaution against frost in winter. They may be inserted any time after the middle of July, provided they are obtained from plants grown in open and exposed situations. Next spring, if well rooted, they may be pricked out on a bed of peat, and some evergreen twigs stuck amongst them for temporary protection. Spring cuttings for indoor propagation may be obtained by using young growths from the out-door plants, or by having a few old plants in pots, and subjecting them to a little increased warmth, when they will start into growth, and yield quantities of soft young shoots, at least two months before those in the open border. These young growths, if used when about an inch in length, strike very readily. Prepare 6-in. pots for them by more than half filling them with crocks, then with half peat and sand, finishing off the surface with a layer of pure white sand. Insert the cuttings thickly, cover them with bell-glasses, place them in a gently-heated pit, and shade heavily. They may remain in these pots until they have become rooted and begun to grow, when they may be pricked off into pans, and, when too large for them, after full exposure in frames, they may be planted in the open border. Autumn cuttings consist of half or wholly-ripened

wood from out-door plants, and are generally rooted indoors for the sake of convenience or when it is too late for inserting them out-of-doors. From July to nearly the end of the year they may be struck in this way, which is just the same as that practised in the case of spring-cuttings, but shading is not quite so necessary, and the cuttings take a longer time to root than those do which are put in in spring.

Layers and Division.

Layers take two years to root well, after which they form good plants. Make a little incision lengthwise in the stem, near its middle, peg it into the earth, and cover it with some sandy peat. Division is the most natural of all modes of propagation, and the one most practised in gardens. It merely consists in lifting good many-branched plants and separating them with a sharp knife into as many pieces as have plenty of good roots attached to them, and planting each division separately. Old plants seldom flower so freely or grow so vigorously as strong young ones; therefore, breaking them up is attended with good results, both in increase of stock and improvement of quality.

W. FALCONER.

THE FRUIT GARDEN.

THE RASPBERRY.

ALLOW me to relate my experience as regards the hardiness of this fruit. In the gardens at Brodie Castle, in the far north of Scotland, we had a fine plantation of Raspberries trained to upright stakes, and also over arches. They were growing in good alluvial soil, but in a portion of the garden much shaded by trees. During the night of the 31st of January, 1866, the thermometer indicated 10° of frost, and for a week about that time the frost varied from 12° to 30° each night. Notwithstanding this, however, I can positively assert that not a single cane of the Raspberries suffered. At Dalvey, not far distant from Brodie, where the climate is generally good and genial, Raspberries occupy a portion of the kitchen garden that is so much shaded by trees as to be almost useless for any other crop, and the soil, though light, is damp, therefore the wood was never thoroughly well ripened. We always made it a point to have them pruned, staked, and tied before the winter set in, say in the end of October, and though some of the winters were so mild that we could scarcely get ice enough to fill our ice-house, still, some of them were very severe. One winter when I was there the frost came on in November, and lasted till March, varying in intensity from the freezing point to 30° below it. Even after thaw had set in, the frost lasted three weeks longer in the Raspberry ground than in any other portion of the garden. Notwithstanding all this, however, we never lost a cane through frost. Points of suckers and unpruned wood I have seen killed, but these are of no use, as they would have to be pruned back below the frost-nipped portions. In Lancashire, Cheshire, the hills of Derbyshire, Hampshire, Surrey, Middlesex, and other places, I have seen Raspberries grown under a variety of circumstances, but I never yet saw fruiting canes injured by frost. As regards the age of plants before they begin to fruit, I have always found them to bear freely the second year after planting. I never yet found autumn fruiting of the summer varieties to be detrimental to the next year's crop, but, as we have such excellent sorts for that purpose as the October Red and Yellow, there is no necessity for prolonging the bearing season of the summer kinds beyond August or the first week in September, and a few bushes pruned back in the previous May will yield sufficient fruit for the dessert. The quality of autumn Raspberries, although certainly not quite so good as that of July fruit, is, nevertheless, so good that they are eagerly sought after. As regards soil and situation, the Raspberry is one of the most accommodating of fruits; it will grow almost anywhere, and, indeed, I should always reserve for this crop, and some Monarch Gooseberries, positions in the garden, which, owing to their shaded character, would be almost useless for other crops, unless I required a few choice fruits for the dessert or for exhibition purposes, when I would treat them more kindly. Market-gardeners about London grow Raspberries without

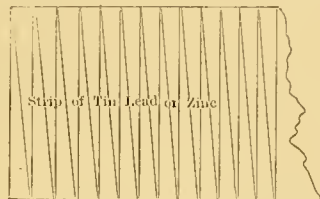
stakes, but I have always found them to bear the finest fruits when supported, and I have always found the quality the same, whether spread out and tied to trellises, trained to upright stakes, or in arches. F.

SELF-ADJUSTING LABELS.

In nearly all the descriptions which we see for labels to hang on fruit and other trees, a separate wire loop is recommended, to pass through a hole in the metallic label, for attaching it to the branch. This contrivance has the disadvantages of being complex, of wearing loose at the hole by swaying in the wind, and of cutting the limb to which it is attached, if not watched and loosened. A plan which we recommended and described some twenty years ago, we have found much simpler, cheaper, and, at the same time, self-adjusting. We have now some such labels which have been attached to side branches eight or ten years, without any attention, and which still retain their places without cutting into the bark. They are simply and wholly long strips of zinc or tin, narrow at one end and wider at the other—the narrow end being passed around the limb a little more than one turn; as the limb expands by growth, the elastic strip of metal yields to the growth. The name is written on the wider end. The metal may be either tin, and the letters



Label in use.



Showing a system of cutting without waste.

scratched in with a hard steel point; or zinc plate, written on with a pencil, according to the mode recommended by President Wilder.—*Cultivator*.

PROPER MODE OF POTTING VINES.

WE have to-day (February 13) passed through our hands a considerable number of fruiting pot-Vines that were struck from eyes last year. Before filling a span-roofed house 80 feet long with these, each plant was turned out of its pot and the drainage examined. The majority of these Vines were potted in very fibry but rather strong loam, packed very firmly into the pots. The drainage was ample and very carefully arranged: first a layer of larger crocks was put into the bottom of the pots, and it was finished off to the depth of 2½ inches with finely-broken crocks free from dust. All the plants thus potted and crocked were a perfect mass of fine healthy fibrous roots; so fresh and nice were they that one of our assistants remarked that the roots had begun to grow. The fact is that the roots are just now in the same fresh state as when they ceased growing last autumn. It was not necessary to turn them upside down to get the balls out of the pots; they are such a mass of fibrous roots that all that was necessary was to take hold of the Vine-stem and lift the whole out of the pot *en masse*. The remaining number were grown in a more sandy loam, and potted much less firmly. The drainage, by some oversight, consisted of just a piece of broken pot over the holes in the bottom of the pot. We tried to lift these out of their pots in the same way, but found that instead of a lift of ball and roots from the bottom of the pot, they were only liftable little more than half-way. The layer of soil at the bottom of the pots was soured and pasty-like, and with next to no roots in it. As a whole, there is not half the amount of roots in the same sized pot, and the young fibres there are not so healthy and sound. Here, then, we have the result of a violation of one point of culture making attention to other points of no avail. We have no hesitation in saying that the difference of these two sets of roots arose from the difference of drainage chiefly, and of potting partly, and, as a contingent consequence, the difference of watering. The want of sufficient drainage prevented the water from passing away sufficiently freely, and the loose potting held more in suspension than the pot full of firmly-packed soil did. And wherever these conditions exist, we have in all our practice found fewer rootlets or feeders, and these few of a different order from those in well-drained pot. In the case of Vines this is especially the case; the roots are few in number, dropsical-like, and never ripen or survive

the winter or period of rest in proper condition. Not only is this the case, but a pot firmly filled holds more soil, and, as a consequence, more nourishment. It also holds less water, for a pot with a given quantity of soil has room for less water than another with less and looser soil in it. Nor is this the only advantage; the very resistance offered to the root of a plant by a firm body of soil causes it to make more rootlets and of a better quality than takes place in a loose soil. It is a fact, too, that a soil holding less water in suspension induces a plant to multiply its feeders and take more complete possession of the feeding ground afforded it. A plant in the open ground will make more twiggy roots in a season of drought than in a wet one. The same holds good of plants in a pot. This is a point in plant culture generally that must be regarded as of great importance. Now for the deceptive part of the business in regard to Vines. A Vine in the circumstances as to potting and watering pointed out above as undesirable and injurious, may, and often does, make a stronger cane than another Vine under contrary and better conditions does. But I need not tell the expert that the cane or growth is of a different character. It is longer jointed, there is more pith in the wood, there are less compact and less symmetrical bunches formed in embryo in its buds; its roots do not come so rapidly into action as those of a fine fresh fibry character do. A word as to our mode of placing such Vines in their fruiting quarters. We have an objection to turning them entirely out of their pots into a border of soil, but think it desirable that the feeders should have more scope than is afforded in an 11 or 12-inch pot. We transfer the ball entire into Orchid-pots of the same size, with three tiers of large holes in them, and plunge them in the borders; the roots, of course, get out freely all round the balls into the fresh soil—and for midsummer fruiters this is a great advantage. Too much water at the roots is a great evil in the case of young growing Vines, but it is one that is scarcely possible with perfect drainage and thoroughly firm potting.—*The Gardener*.

Influence of the Stock on Pears.—One of the richest of Christmas Pears is *Joséphine de Malines*, and it is also one of the hardiest, ripening here—a very exposed situation in Norfolk, not far from the coast—on bushes in the open ground. It seems, however, to be a Pear peculiarly susceptible of influence from the stock on which it is worked. It is here on the Quince, grafted on the common Pear stock, on the Hawthorn, and on its own roots, a pendant bough, which touched the earth, having become layered and thrown out roots. In the first form (on the Quince) it bears early; but the fruit, luscious, is somewhat under-sized. The wasps attack it first of all. On the ordinary Pear stock at ten years old it has not fruited. On the Hawthorn the shoots are thinner than on either of the preceding; it has had fruit twice, but they did not become soft; so far it is not a success. On its own roots it has fruited three times (same age as others) and the fruit is very unlike that of the parents from which the bough rooted. The fruit is somewhat larger, less covered with russet, greener in hue, more vinous, and less honey-sweet. It is also later in ripening. This day (March 2) I have been examining the trees; on the ordinary Pear stock, if there be blossom buds, they are so backward that they cannot be easily discerned; on the Hawthorn, ditto; on the Quince the knots of bloom are very perceptible—as forward as *Doyenne d'Été*, the earliest Pear on its own roots; but the blossoms are almost ready to expand—the forwardest in a collection of about thirty kinds—very abundant too, which is the first time they have been so. In the previous nine years of its separate existence, the blossoms have been sparse, but have set fairly. Our trial goes to show *Joséphine de Malines* is best left to itself—i.e., on its own roots—but is a good Pear on the Quince.—G. G.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Keeping Grapes.—A correspondent of the *Rural Press* keeps Grapes fresh and in good condition till April, as follows:—Gather carefully, handle little, break none, and then pack very carefully in alternate layers, with clean dry Wheat chaff, not over three layers to a box; close the lid and keep the box in a dry apartment, where the Grapes may be as cool as practicable without freezing. The dry chaff absorbs all moisture, and imparts no bad flavour.

Fruit Crops and the late Frosts.—On the morning of the 11th inst. 15° of frost were registered here, and all the early blossoms of Apricots, Peaches, and Nectarines, were cut off where not well protected. I am afraid the earliest Pear blossoms, although not expanded, will have likewise suffered, especially on south aspects. The show of blossom buds this year on Pears, Apples, Plums, and Cherries, is very great, owing to the partial crops during the last two years, and the fine summer of last year having ripened the wood well.—WILLIAM TILBERT, *Welbeck, Notts.*

The seasons alter: hoary-headed frosts
Fall in the fresh lap of the crimson Rose.—Shakespeare.

We have had a rough week of it here. The thermometer on Tuesday and Wednesday mornings (10th and 11th) indicated respectively 14° and 15° of frost. Some damage has, I fear, been done to Peaches and Apricots on the walls, in spite of protection; but the blossoms this season were so numerous, and looked so strong, that I hope we shall save a crop.—E. HOBDAY, *Ramsey Abbey, Hants.*

A HOLIDAY TOUR.

By THE EDITOR.

PARIS, March 12.—Devoted to his institutions, the Briton is very hard on his climate. If anything remarkable in the way of vegetable produce comes out of other lands, the merit is not sought in the system or the cultivator, while all our own shortcomings are accounted for by the climate, so that even those who heap most abuse upon it should be grateful to it for settling so many questions. But if here, on this 12th day of March, with a heavy fall of snow under foot, and a most bitter north-east wind raking the street, some would probably begin to suspect that there was, at least, one other climate in the world as little like that of Paradise as is our own. In such weather, however, the southward-bound traveller may go farther and fare even worse than in this famous city. The spring flowers in the public gardens only peep here and there through their white blanket; yet there is even now something to interest the lover of gardens. Let us, then, in passing, enjoy it for a day. The Garden of Plants is, perhaps, the ugliest in the world as a botanic-garden; the Grand Trianon, at Versailles, being quite its equal for ugliness, as a palatial one. But it has some interest, in spite of its management and design, both of which are bad, and will repay us for visiting the houses on this wintry day. The house represented on the opposite page is one devoted to plants that endure ordinary greenhouse temperature, and it contains a few specimens of a type which we most require for use in our large cool-houses, not that all of these are in any sense peculiar to it, as, of late, the cool conservatories of our large plant-growing nurserymen contain numbers of fine species suited for the purpose. First, to arrest attention by its grace is a Bamboo, not the large tender Bamboo which requires heat, but one of those hardy sorts (*Bambusa viridi-glaucescens*) which come from cool regions in India and China. In a cool-house, planted in a bed or border, and not in a pot or tub of any kind, and with not less than 12 feet of head-room, these are indeed beautiful plants. In a niche, in the back wall of the house, there is a bust of Victor Jacquemont, the young naturalist, who perished in India, when there as a collector for the Garden of Plants, and author of those charming letters reviewed so favourably in the "Edinburgh" some time ago. Immediately in front of the niche, springs up a plant of the slender hardy Bamboo (*B. gracilis*), the shoots of which rush up by the fine bust, gracing it with long fairy wands, clustered over with leaves that toss from their branches as gracefully as the falling spray from a mountain rock. There are no plants more worthy the attention of those who have to plant and arrange conservatories than these Bamboos. Another family, the *Chamædoreas*, also, possess extraordinary merit for the same purpose. A specimen of *C. elatior*, here planted out in a bed, at the first glance reminds one of a Bamboo, in consequence of having sent up many stems; seen thus, this handsome Palm looks much more graceful than when grown to a single stem in a pot or tub. The fine effect is owing to the fact that the foliage is so compact, that no confusion is produced by a number of stems. It is probable that all the Mexican *Chamædoreas* will prove equally valuable for planting out in conservatories. Other plants here, suited for the planting of like structures, are *Cocos australis*, *Jubæa spectabilis*, *Rhapis Sirotsik*, *Livistona australis*, *Chamærops Martiana*, *C. Hystrix*, *C. Griffithiana*, and *C. Palmetto*, several kinds of *Phoenix*, and *Areca sapida*, not to name others more frequently employed. This house suffered much during the bombardment of Paris, the whole end, nearly 40 feet high, being smashed in, one wintry day, by a shell. It was a sad time for those in charge; starving themselves, they had the additional misery of seeing their favourite plants perish from cold; and, as soon as the holes and rents made by the German shells were patched up in the spring of 1871, came the Commune and its bullets, several of which are now imbedded in a fine *Beaucarnea*. Later still, fourteen of the defenders of the Commune were ranged against the terrace-wall on which the house is built and shot dead. Under circumstances like these who could expect good cultivation? So the plants look about as poorly as possible, but the real cause of this, and of the disgraceful state of the gardens generally, is not the Commune, nor the war, nor any number of wars—but, because the chief of the

horticultural department is simply a botanist, and, in no sense, a cultivator; he is "professor of culture" without any knowledge of culture. There are excellent horticulturists employed in the garden, whose efforts, however, are paralysed. The result of all this is, the ugliest garden and some of the worst-grown plants in Europe. The management of this place has such an important bearing on the proper management of public gardens generally, that we shall, probably, again take an opportunity of alluding to it.

The Paris Fruit and Vegetable Market in March.

With its merry clatter of ten thousand tongues, and the many striking faces of the market-women, the Central Market of Paris offers, particularly in the early morning, a never-failing source of interest, even to those who confine themselves to the study of the human species. But we, who love Violets and those precious little fresh Rose-buds, that look as if born in May and gathered before they were kissed by the noonday sun, and on whom, perhaps, the brightness of some of the eyes and faces set in these snowy caps is not, in consequence, wholly lost, may be permitted another stroll along the well-known stalls. Many who see this market in perfection in summer and autumn do not know it in early spring. The bitter cold of the early March morning has no noticeable effect in reducing the numbers who usually throng the market, though it certainly must mar their comfort. The large extent of the Great Hall, however, saves them from such drenchings as the people suffer in Covent Garden on a wet morning. The piles of Mushrooms are, perhaps, the most striking things in the market. These are not in punnets, as in Covent Garden, but thrown out on wide benches, and heaped up as London hawkers heap up their barrows with Oranges when plentiful. As to quality, these Mushrooms are excellent indeed; nearly round, on an average about the size of a Horse Chestnut, perfectly white, fresh and delicate in texture and flavour, they look as if each was selected by a good judge from the myriads that are often seen on a hill pasture on an autumnal morning. These Mushrooms all come from the profound depths and darkness of the old stone mines beneath Paris and its environs. Almost equally round, and chubby, and tender, are the little Carrots, so plump and small, indeed, that they are not bunched, but tumbled into barrels like Nuts. Piles of large Pumpkins strew the ground; these have been kept through the winter, and form, when green vegetables are scarce, an important article of food. In the United States, long-keeping Gourds are quite as important a crop as the Turnip with us, if not more so. It would, therefore, seem desirable that their value should be better known in England, where they are as easily grown as the Vegetable Marrow, the only Gourd really popular with us. As compared with the large Gourd of the Paris market and the best Squashes of the Americans, it is of little importance as a food supply. The common garden Turnips are seen here, but are not so abundant as the Navet, which many think better, and which is pretty regularly supplied to Covent Garden from the Paris gardeners. But there is another very curious Turnip here—the Navet de Meaux. This is a singular-looking kind, usually more than a foot long, frequently curled in form, and only as thick as a Cucumber. These are sent to market in a peculiar manner. The top is cut clean off, a hole pierced an inch below the cut, through which a few straws are passed, which permit of a dozen roots or so being united in a bundle together. These Turnips remind one of the huge white Radishes that one sees in the Chinese quarter of San Francisco, but are not nearly so well-grown as the snowy and tender roots of the careful Chinese gardeners. Passing by many vegetables common to London and Paris markets, we observe that the Shallot offered everywhere here is the true kind, a distinct species with a slender bulb and a grey coat, whereas the Shallot now commonly sold in Covent Garden, and evidently a small variety of the common Onion, is a roundish bulb, with a shining dark brown coat. Some not very important vegetables, almost out of date with us, are here yet seen in abundance, such, for example, as the Rampion, with its long and slender creamy-white roots, which are grown to perfection in the light rich soil of the market-gardens. Quantities of Green Peas, from the south, and piles of Globe



COOL CONSERVATORY IN THE GARDEN OF PLANTS, PARIS.

Artichokes, do not interest us much, because they are obviously products of a fairer clime; but the great feature of the market is the quantity of excellent saladings of every kind, from the long and graceful tufts of Chicory (blanched in caves), to the fresh green rosettes of the tender Lettuce, which Paris is never without. Those sent from Paris to the London market, however good in quality, are never seen there to such advantage as here; their spotless verdure is tarnished by packing and the journey. Though the whole process of growing these saladings is carried on within the very walls of Paris, there are many who suppose them to be (like the Green Peas and the Artichokes from Africa) the produce of a warmer climate. Let us see how they are grown, and glance at

The Paris Market-gardens in Early Spring.

The market-gardens immediately round Paris are now, for the most part, covered with glass—large clear bell-glasses, about 18 inches high, and small shallow frames. The gardens are very small; seldom more than an acre, often less, and usually an oblong piece of ground, enclosed by white walls, with a house, sheds, &c., in one corner. There is no space for walks; the ground is too precious and too dear. Small paths between the crops suffice; the place is rarely seen by anybody except those who cultivate it. The large bell-glasses first strike the eye, from the healthy and beautifully green verdure with which each is filled. A huge Cos Lettuce rises to near the top of the glass; while, at its feet—pigmy round a giant—there is a ring of those dwarf tender Cabbage Lettuces so much seen in Covent Garden in winter and early spring. The icy breath of the north is blowing over the garden, as over all France and England to-day; but the plants are cut off from it, and sitting in the sun within. We have all laughed at Smith's bottled sunbeams; but bottled sunbeams are, fortunately for lovers of tender green-meat, among the actualities. Sometimes these glasses are thickly placed on shallow hot-beds, when used for winter and early spring crops; sometimes on slightly-sloping beds of rich light soil. In frosty weather they are covered with straw mats, which are taken off during the day-time. The bell-glasses are used, for the most part, for the production of Cos Lettuces; the shallow frames for the Noire Lettuce, so much in demand in winter. Among these Lettuces are, in some cases, already planted and thriving, the Cauli-flowers that will replace them by and bye, and come in for use early in the season. Whole frames are occupied with seedling Melons and with seedling Tomatoes, with which the rich ground will be cropped before this day two months, and which will yield an abundant return. Radishes and many other saladings are gathered from these frames in like manner, and, in this way, the market is rendered almost independent of the season or the weather. The opinion prevails widely that the smaller the holding the worse the culture. It may be so in some cases; very small holdings and very high culture are the rule here. The owners are certainly as hard-working and, apparently, as poor men as any independent workers can well be, but they appear to gain, at least, as good a livelihood as the farmers who try to cultivate a hundred or more acres in the best parts of Canada. This Paris market-gardening is, however, so essentially peculiar and special that it would be unsafe to deduce any broad conclusions from it alone. The culture in the open fields round Paris is much inferior, and very scratchy and imperfect. Hence, the Parsnips and various other vegetables raised in that way seem very inferior to those seen in the London market. In and near Paris one rarely sees much variety in one garden; the tendency is to special culture. Thus, one whole town and its environs is devoted to Asparagus, another district to Navet and Turnip culture. Mushrooms form a speciality, and even the forcing of Asparagus is sometimes made the main effort of a life. One may look in vain in any of these gardens for either Rhubarb or Seakale. It is odd to reflect how slowly and curiously ideas sometimes travel. Go into the deserts of Utah and enter the garden of a Mormon elder; or, farther still, six or seven thousand miles away on the coast range of the Pacific, and visit a Californian fond of his garden, and you will find Pic plant (Rhubarb) and Seakale as well known as the Potato. Cross the Channel, and in two hours we are in a land where they are seen no more, except, perhaps, in very rare cases as curiosities, or in a public garden in their places in the botanical arrangement.

COTTAGE GARDENING.

By J. MAIN.

It is universally admitted that a piece of garden-ground attached to a labourer's cottage is the greatest boon that can be afforded him, more especially if he has a young family to support. This object has always been recommended by the societies instituted for devising means for bettering the condition of the labouring poor of this kingdom; and on the recommendation of these societies the present allotment system was founded. The produce of even a very limited spot of garden-ground, if well managed, not only adds greatly to the domestic comfort of a working man, but is actually the means of improving his moral character, by giving him employment in his hours of leisure, and an amusing and profitable occupation on a spot which he can truly, and with pride, call his own. But the occupation of a piece of ground is not sufficient unless accompanied with plain directions for the guidance of the labourer in his management thereof; for, although a majority of our rural population are pretty good gardeners in their own homely way, many there are who need advice, and almost all are ignorant of the most economical methods of culture. This information is so plainly detailed that the directions can hardly be misunderstood. When a labourer is so fortunate as to have a garden attached to his cottage—or if he be equally fortunate in having an allotment in some neighbouring field—his first care should be to ascertain whether his piece requires draining, and next, to be sure that it is properly and securely fenced, if fencing be at all necessary.

Draining and Fencing.

Land is frequently liable to be too wet for the successful cultivation of kitchen vegetables, from various causes. It may be too damp from its being situated on the lowest dip of the surrounding surface, to which rain or melted snow naturally flows; or the soil may be constantly too moist from its disposition to retain water like a sponge, such as is met with in bogs. It may be in the same drenched state from having a thick bed of clay beneath the staple, or from having land-springs oozing out of a bed of gravel above it. Now, from whatever cause land becomes too moist for the purposes of the cultivator, its improvement can only be accomplished by thorough draining; and, unless this be effectually done, the crops will not only be deficient or inferior, but the manure bestowed will be quickly consumed, and washed, as it were, out of the soil. Although a cottager should be apprised of the necessity and effects of drainage, it is but seldom that he need be at much trouble in laying his ground dry; for, even in the worst cases, a ditch round the outside will generally be sufficient, taking care to make at the lowest corner some kind of outlet, either into a common and lower ditch, or sinking a swallow through the holding soil, from which the water may soak away into some lower and more porous layer of the ground. Few cottagers need very much advice as to fences. Simple boundary lines are often all that is necessary. In allotment pieces, a footpath all round is a sufficient mark, and better than any kind of hedge, which is usually a harbour for slugs and hurtful insects. But if the cottage-garden abuts upon a waste or common field, then a good fence is necessary. This should either be a ditch and hedge, or a deep ditch and paling—the former is the most common and most lasting.

Trenching and Manuring.

When a labourer enters upon the tenancy of a piece of ground, whether it be an old enclosure or a new allotment, he should, in the first place, resolve to trench the whole plot, unless it has been very recently done to his hand. This, however, he need not think of doing all at once, because he will find it more convenient for him to do it piecemeal; for, at whatever time he may get possession, it behoves him to see what may be done on the instant in the way of getting some kind of crop on part of the ground, and for which simple digging may suffice. The trenching, however, should always be kept in mind, and executed as opportunity allows, and immediately cropped. Trenching is useful to the most shallow rooting plants; and for deep-rooting kinds it is indispensable. It deepens the staple, and renders all subsequent operations more easily performed; it buries weeds and a weedy surface, turning what is useless into the food of succeeding crops. Trenching not only allows a greater range for roots, and permits the sinking away of heavy rain from the surface, but in dry weather allows the ascent of moisture from below to keep the loose surface more moist. The depth to which trenching may be done depends on the natural depth of the staple, and on the nature of the sub-soil, or underlayer. If the latter be pure gravel or strong clay, too much of these must not be brought to the surface at once, unless the clay be of that kind which falls to powder by the action of the weather. If the sub-soil as well as the surface be loam, there is no fear of trenching too deep, even as far as 2 feet; and, in respect of a clay or a gravelly undersoil, though not brought to the surface,

the bottom of each trench should be deeply broken up with the mattock, in order to move and deepen the staple. Whatever the nature and character of the staple may be, it is certain that all and every description may be improved. Manuring as frequently as possible assists and betters every kind of land. Clay is improved by any lighter kind of earth or decayed litter, or sand, ashes, and the like; because these break the tenacity or toughness of the clay, and render it easier to cultivate, and allow the roots of plants greater scope, besides admitting a freer passage to both air and rain-water. A light sandy soil is improved by the heaviest kind of manure, or by dressings of clay or loam, because manure laid upon sand sinks into the ground, and, being quickly absorbed, of course requires more frequent application. Loam of any kind or colour is the best for gardening purposes; it only requires to be well laboured by occasional trenching, dug at least once in the season, and hoed frequently to keep the surface loose. But as it is, like other kinds of soil, liable to be exhausted by cropping, it must be kept in heart by occasional dressings of manure. Obtaining sufficient supplies of manure is one of the greatest difficulties which the cottager has to encounter, especially if he keep neither cow nor pig; and unless he lives by the side of a free common it is not in his power, nor is it worth his while to trouble himself with either, except under circumstances hereafter alluded to. But an industrious man may collect as many matters of one kind or other as may be sufficient to dress one-third, or at least one-fourth, of his ground once-a-year. For this special purpose he should have a hollow pit or place between his house and garden, into which every kind of drainage from the former and refuse from the latter should be thrown. To this may be added all sorts of litter and cattle-droppings from the lanes, roads, or commons, together with ashes, lime rubbish, marl, or chalk—all which, when thrown together and turned once or twice till sufficiently rotten, will be found excellent manure. As the success of a cottager's garden depends solely on his ability to keep his ground in heart, every exertion must be made to secure this advantage; and if, at any time, he happens to have more of any kind of crop than he wants for the immediate use of himself and family, this he should exchange for some kind of dressing; or, if he sells it, the sum should be laid out in the purchase of good manure for his garden, for, by such exchange or purchase, he will be sure to reap a double advantage. Another thing which the cottager who is short of dressing should be aware of is, that manure in a liquid state is most effective. When single plants, as Cabbage, or a bed of seedlings of the same, or of any other kind, require watering, manured water—that is, such as had some kind of dung steeped in it—should be used. The drainage from dung-hills is most valuable for such purpose, if not too strong; but its strength is easily reduced by the addition of a portion of clear water. In some countries, where the soil is dry sand, the cultivators have cess-pools sunk on purpose for making this liquid-dressing, which answers the intention admirably. By the knowledge and application of such means, fine crops of kitchen vegetables may be produced, while, if they are neglected, a very different result will be the consequence.

Rotation of Crops.

Another means of keeping ground in good heart is by following a judicious rotation of cropping. It is bad management to grow the same kind of crops repeatedly on the same spot, and, therefore, the crops must be made to change places every year. This will be practically explained hereafter. The proportion of crops to the whole garden and to each other is a material affair for the consideration of the cottager. That crop which remains longest in use, and which, consequently, is most serviceable in a family, will, of course, command the greatest share of the ground. In all cases, Potatoes will have, undoubtedly, the preference, not only because they are a good substitute for bread, but because a safely-secured winter-store of them is of the greatest importance to the labourer. Supposing, then, that the principal part of the ground is occupied with Potatoes, the remainder will receive those that are the next valuable as eatables, namely, Cabbages and their varieties, Carrots, Parsnips, Onions, Turnips, common Beans, and, above most of the latter, the useful rough Runner Kidney Bean, so extremely useful in a cottager's family. There are some other vegetables which may be recommended for a labourer's garden, but they will be noticed hereafter. There is one circumstance which every manager of a garden, especially those who are confined to a limited spot of ground, should ever be well aware of—and that is, the practicability of having a constantly recurring succession of crops on the same piece of ground. This is a practice which farm or rural labourers in general are but little acquainted with, though, when judiciously planned and executed, it is of the greatest advantage. Mixed crops are allowable in cottage gardening—for instance, a sprinkling of Radish and Cos Lettuce seeds may be sown with the Onions, and when the Radish and Lettuce are drawn, being ready for use, the

Onions suffer no injury. Broad Beans are sometimes planted at the same time and in the same drill with Potatoes, and without any very visible damage to the latter crop. But, in order to keep the ground in full employment, all the crops, that is, the standing crops, must be sowed or planted in drills or rows, with the intention that, before the first crop is off, another shall be put into the intermediate spaces to follow in succession. This is quite practicable with all the Cabbage tribe, or with any other kind of vegetable which may be used in any stage of their growth. Of this description are the Cabbage, Savoy, Onion, Lettuce, &c.; and when such are planted alternately with others, which must stand to acquire full perfection, the first may be used out of the way as soon as they press injuriously upon the second. In this way many more useful vegetables may be raised on a given portion of land than by the old-fashioned custom of sowing broadcast, only one patch of each of the common sorts occupying the ground for the whole summer. Even the Onion-ground may be planted with Cabbages just before the former are fit to pull, which plants, whether Savoys or common Cabbage, become fine useful stuff before Christmas. This constant routine of cropping and re-cropping may be considered as out of the power of a day-labourer to perform; but, whether he may have time or not, it is highly proper that he should be made acquainted with every practical matter which he may endeavour to turn to his advantage.

First Year's Arrangement of Crops.

The management of a cottager's garden must commence when he takes possession. As Michaelmas is the usual term at which cottagers shift their quarters, and, moreover, the most suitable period at which to begin any system of gardening, we shall therefore commence our series of instructions from this said quarter-day, and proceed onwards with the season. The very first thing requiring attention, as already mentioned, is to see that the fence, if one be necessary, is in sufficient order; and the next, to get ready a hollow near the house to receive all the drainage, slops, ashes, and offal therefrom, together with any rank herbage or weeds which may be cleared off the surface. Then, beginning at the bottom of the upper half of the garden, let a good large piece be dug on which to plant two or three hundred early York or Battersea Cabbage in rows one foot apart. The plants should be examined to see if there be any knots or clubbing on the root or bottom of the stem, in which case the affected plants should be rejected. Dib in the plants as deep as the lower leaves, and fix them tightly in the soil—now the labourer need not be afraid of planting too many in this order, because every alternate row must be used as soon as wanted, so that the intermediate space may be dug or not, and planted with long-podded Beans about the end of January. The rows which are left for the principal crop of Spring Cabbage will be in use during May and June, and they should be gathered by rows in succession. When the first row is used, begin the second, clearing off completely as the Cabbages are wanted. The advantage of this mode of taking the crop is, that it allows the cleared ground to be dug and re-cropped if requisite. From the time the Cabbages are planted until the Beans are put in, the ground should be frequently hoed between when the surface is moderately dry, but not at all if wet. When the Cabbages are planted, there is nothing more to be done in planting or sowing till the spring—but, before that season, the cottager must be getting the rest of his ground ready for the spring crops. As much of it as possible should be trenched; and, if he can manage to trench the whole, it would be a good job out of hand. Every labourer knows how trenching is done, and, therefore, advice on this point is needless; it may just be observed, however, that the trenches may be made 2½ or 3 feet wide, and as deep as the staple allows—the first is wheeled to the other end to fill the last trench. The top-spit or spadeful of the second is turned to the bottom of the first, and the remainder is raised to form the new surface, this being repeated over the whole piece. In the autumn or winter-fallowing of garden-ground the surface is either laid flat or in ridges. If the soil be light and sandy, it can hardly be laid too level, because such soil requires no amelioration by frost, nor any exposure to the sun and drying winds to exhale away its moist riches. But if the soil be naturally heavy and clayey, then the surface should certainly be laid in ridges, not only that it may be mellowed by frost, but that it may be rendered as dry as possible before seed-time. These last observations are applicable to digging as well as trenching, for strong land should always be laid in ridges during winter. There is another advantage of ridging land to a cottager who may have an opportunity of getting it into this state during the autumn; it is, that in the spring, when so much business is going on in the fields, any portion of the cottage-garden is much more readily got in order for either seeds or plants than if it had to be dug at that busy time, when every hour of the labourer's time is so valuable to his master and himself. During the winter the cottager must also set his head to work about proportioning his

ground to the quantities of vegetables which he may wish to cultivate for himself and family. This he ought to arrange for himself, because, without knowing the size of the garden, a writer can hardly give advice that would be useful on this part of the subject; but, that he may not be left without some kind of guide in this affair, we shall presume that he has half-a-rood or twenty poles of garden, which is not more than is really necessary for a married couple having three or four children. Calculating, then, upon this quantity of ground, we shall set down what we think should be the proportions of the crops respectively, and which will serve as a scale to direct every cottager who may have either more or less of the supposed quantity of twenty poles. We may next suppose that the piece of ground is in the shape of a long square, 38 yards long and 16 yards wide or over. This area will contain about 20 poles; of this, 19 yards in length must be marked off at one end for Potatoes, and which should be either trenched or dug in autumn or winter, to be ready for planting in the ensuing spring. This division will therefore lie fallow till April. Next to this, mark off 7 yards in length for Cabbage, which should be dug and planted, as already directed, as soon after Michaelmas as possible. About the middle of January, let us suppose that the second, fourth, sixth, and eighth rows of the young Cabbage have been used, point over with the spade the spaces where they stood, and immediately thereon dib in by line six rows of long-pod Beans at 4 inches apart, and cover in. If the ground be loose and puffy, tread it well before the Beans are dibbed in, as they strike root best in firm soil. Thus there are 19 yards left for Potatoes, and 7 in length occupied by Cabbage, leaving 12 yards to be cropped in March and April. This reserved portion may be divided into four parallel beds of nearly 3 yards each:—the first Parsnips, then Carrots, next Onions, and last a bed which may be a seed-bed of Cabbage sown with Radish, Lettuce, and early Dutch Turnip. A narrow slip of this last or uppermost bed may be parted off for potherbs, flowers, &c. We have now set forth how the garden may be cropped in the first year, and mentioned what we consider the most profitable kinds; but it is necessary to revert to the manner of sowing and management during their growth, and here we may repeat that all will be the better for a sprinkling of manure, but, as it is not likely that this will abound, whatever can be got together must be reserved for the Potatoes. The other crops about to be particularly noticed, may be assisted in their early growth by manured water as already alluded to.

The Parsnip.

This very nutritious root is luckily easily cultivated, and when sown in drills on deeply dug or trenched ground, yields a bulky return, which, when stored in dry earth or sand, remains long useful. The drills may be 14 inches apart, the seed sown thinly on shallow furrows opened by line with the corner of a Turnip-hoe and lightly covered with the same. When the seedlings have risen 2 inches high, they should be thinned to 5-inch distances, and the ground always kept well hoed between the rows to kill weeds and benefit the plants. The seed is very light and cheap, 1 ounce being as much as a cottager will require. There are two sorts; the common long one suitable for deep soils, and the short hollow-crowned sort, which is of superior quality, and best fitted for shallow soils. Parsnips may be sown either in March or April, and they will be fit to take up in October. When dry and freed from earth and remains of the leaves, they may be stored among dry earth in any corner of a shed, or other place safe from air and damp.

The Carrot.

This well-known and extremely useful vegetable is, in every respect, except in qualities, very much like the Parsnip, requiring the same treatment as to sowing in drills, thinning, hoeing among during the summer, and taking up and storing in October or November. In thinning the seedlings, they should be left 2 inches apart, and when they have gained a useful size, every other one may be drawn for the pot, leaving the main crop at 4 or 5 inches asunder. There are several sorts of Carrots, but the Short-horn and the Altringham are the best for the cottager. A clayey soil is unsuitable for Carrots; but we have known ingenious labourers, whose gardens were a stiff clay, grow very fine Carrots notwithstanding. Their method was this: the ground was prepared by deep digging, and, at seed-time, ranks of deep holes were made by line along the bed with a crutch-headed taper-pointed dibber; the holes were filled with rich, mellow compost, and on the surface of each two or three single seeds were dropped and slightly covered with a little more of the compost. When the seedlings appear, one only (the strongest) is left, which grows rapidly, and gains a perfect natural form and good size. The ground intended for Carrots had better be sown at twice, one half in March and the other half in April, because it is found that if the worm (a pest we know not how to banish) attacks the crop, the

earliest sown suffer most. Carrots may be sown at other times than in spring, but these sowings are never a profitable crop. The seed requires to be well rubbed between the hands over a cloth before it is sown, otherwise it cannot be distributed equally, the seeds being apt to cling together if not well rubbed.

The Onion.

This is one of the most useful of all cultivated garden vegetables to a cottager; it gives an agreeable relish to almost everything else, and therefore requires the especial attention of the labourer. The ground should be well prepared by manuring (if possible) and careful digging. Sow in drills, 10 inches asunder, about the middle of March, rather thickly, because, as they are useful as soon as they are of the size of a crowquill, the drills may be thinned regularly as they are wanted either to use or sell, taking care that all the strongest are left 4 inches apart to come to perfection. The bottom of the shallow furrow made to receive the seed should be firmly trodden with the foot before sowing, and slightly covered with the rake. The intervals must be kept free from weeds by the hoe, and the drills by the hand throughout the growing season; and, in August, sooner or later, the Onions will be ready to pull. When pulled, they should be laid together upon a bare part of the ground for a week or ten days to harden. After this, the greater part of them should be roped, as the most convenient way for a cottager to keep them, or otherwise kept in a dry loft. There are many different sorts of Onions, but the Spanish and Deptford are two of the best for the cottager's purpose. Onions are also sown in the autumn to draw young for spring use; but this will be again mentioned at the proper time.

Radish, Lettuce, Turnips, Peas, and Herbs.

On the remaining bed, to be cropped in March (it being about three yards lengthwise and the whole breadth of the garden) room may be found for a small seed-bed of Cabbage and Savoy mixed, another for white Silesia Cos Lettuce, another for Short-top Radish, and the remainder for early Dutch Turnip. All these are sown broadcast, but regularly, over the fresh-dug surface and raked in. The Turnip-seed should be sown last, as early sowings soon run to flower. If it be advantageous to the cottager to raise a crop of early Radishes for sale, he may take a bed off the Potato ground; sow at Christmas, or soon after, pretty thickly on the fresh-stirred bed, rake the seed well in, and smooth the surface with the back of a spade, and cover the whole bed with dry Fern or short littering straw 6 inches thick. The covering is kept on till the seedlings are above ground, and then the covering is drawn off every mild day, but always kept over at night till all fear of frost is past. The labour and care of raising early Radishes is of little use to a cottager unless he is sure of having a ready sale for them. We have, as yet, said nothing of Peas, because we do not think they are profitable to the cottager; but, if he resolves to have a few, one row only of Knight's Marrow will be enough. They may be sown any time in February below the Cabbage across the garden, and, if sown thinly, earthed up once, and staked when 5 inches high, are very productive, but, as already said, not profitable. When the beds of Parsnips, Carrots, and Onions are sown, the alleys between should be immediately planted with Cabbage, if plants can be had, for every foot of the ground should be cropped. At this time (March) the narrow slip at the upper end of the garden may be furnished with a few herbs for seasoning soup or broth; namely, a plant or two of Thyme, Mint, Sage, Savory, and Marjoram, with a drill of Parsley sown as an edging. Above all, half-a-dozen or more roots of Rhubarb for the leaf-stalks, which will be found most useful in the family. Seedling plants or odd roots may be had of any market-gardener.

Potatoes.

Preparations must now be made to get in, next month (April), this, the cottager's principal crop. Much of his domestic comfort during winter will depend on his having from ten to fifteen bushels of good sound Potatoes pitted near or well-covered up in some safe corner within his house. We have allowed one-half of his ground for this crop; and if the sets be properly planted, and the crop properly cultivated during the summer, we calculate that the yield will be at the very least fifteen bushels, besides those used in summer. This is a fine store for a labourer to look forward to, saying nothing of his store of Parsnips, Carrots, and Onions, all most useful additions; but he may rest assured that unless they are used with economy, twice the quantities would be of little use to him. We have been much among labourers who had gardens; but with all the authority of a master, and with all the best advice of a friend, we never could prevail with many of them to make the best use of the advantages they possessed. To begin on the Potatoes as soon as they were of the size of Walnuts, thus devouring bushels at a meal, was a common

piece of extravagance! Selling the whole crop for one-fourth of the value, to save the trouble of taking up and storing, was a frequent occurrence; and great waste in the cooking was, in many cases, too visible. But, on the other hand, some, who husbanded their resources lived comfortably, and showed the manifold advantages they and their families derived from possessing a small piece of garden. The ground reserved for Potatoes will hold ten rows at 2 feet apart, and will require about $1\frac{1}{2}$ bushels cut into sets to plant the same, placing the sets about 8 inches asunder in the drill, covering full 8 inches deep. The sets should be as large as the size of the Potatoes will allow, each having at least one eye, rejecting, or not counting on that at the bottom, as no shoots spring from it. The best way of cutting the sets is first to split the Potato down the middle; each half may be divided into two or three sets, according to the number of good eyes, taking as much of the substance of the Potato with each eye as possible. Some curious growers make sets of the crowns, which they keep and plant by themselves, for the purpose of being first used, as the tubers from these sets always come earlier than those of the other sets; but this is a refinement in the culture with which a cottager need not trouble himself. There are a great many varieties of the Potato; some are very early ready for use, such is the Frame; others finely-flavoured and handsome in shape, as the Lapstone Kidney. These, however, from their scanty yield, are unfit for the provident cottager. The best for his purpose, as uniting quality with quantity, are the Champion and the Early Shaw; these are best for immediate use as soon as their tops decay; but for long keeping and storing, the Devonshire Apple and Yorkshire Red should certainly be preferred. Two-thirds of the whole piece should be planted with Reds, and the other third with the Shaws and Champions; and, as soon as the tops of these last decay, they should be taken up and the ground immediately re-planted with Cabbages; Savoy, or other Winter Greens. When the tops have raised 5 or 6 inches high, they should be earthed up for good, for once earthing up is enough; but the vacant spaces between the rows should always be kept well-broken up and loose, by a heavy hoe, fork, or mattock, taking care not to go too near the roots to disturb the runners. When the flowers appear, let them be picked off, for this adds as well to the size as to the number of the tubers. In choosing the kind or kinds for planting, procure, if possible, those which have been named above, and which have been grown on a different kind of soil and in some distant place; for no kind of Potato succeeds long together in the same garden or district. Much has been said and written as to whether Potatoes should be planted whole or cut into sets; but it is now settled that a bushel cut into sets yields a much greater return than if they were planted whole. The yield, however, depends greatly on the quantity of manure bestowed; if dressed as thickly as a farmer dungs for Wheat or Turnips, it may be dug in before planting; but if manure is scarce, the next best plan is strewing it along the bottom of open trenches, on which the sets are placed and covered with loose earth. Where there is no shed or outhouse for storing Potatoes from the air and frost, pitting them in the garden is the most convenient way. A narrow pit about 10 inches deep should be made on a dry spot, in this a bed of dry Fern or straw is first put, then the Potatoes are laid in a ridge of the required length, and covered with a good coat of straw. Over this, earth dug from the sides and ends is piled over a foot thick, forming it like a ridge, and patted smooth with the spade to throw off rain; a trench being left open all round prevents all surface-flow from soaking in. Parsnips, Carrots, &c., may be pitted in the same way.

Scarlet Runners and other Beans.

When the garden is all cropped, as above directed, the next object demanding attention is thinning the rising crops, and keeping the whole free from weeds by the hoe and hand. About the 1st of May, a row of Rough Runners—or Scarlet Runners, as they are more commonly called—must be put in, next to the Peas, if they are sown, between the Cabbages and Parsnips, pulling up a row of the former to make room. The ground for the Runners must be dug; and a drill or furrow opened by line, in which the Beans are dropped, 2 inches apart, and covered about 1 inch. When the plants have risen 2 or 3 inches they must be earthed up as high as the lower leaves. If rods can be had for this crop 6 or 7 feet in length, so much the better; but long rods are not absolutely necessary; low branches, stuck regularly along the row, about 3 feet high, are quite sufficient, providing the leading shoots are kept stopped—that is, pinching the points off—this causing a branchy growth and great fruitfulness. But the Runner is not nice as to station; they climb up the side of a hedge or paling, cover a porch or arbour, with very little assistance. There is one thing relative to the Rough Runner which behoves every grower to know; it is, that if the pods be not regularly gathered as they become fit for use, the plants cease to be fruitful; or if they get too dry at the root, the topmost flowers drop without setting pods. But a few of the first pods should always be

allowed to ripen as seed for the next year. Attention to these particulars will render the plants fruitful for the whole season. A handful more may be planted about the middle of June, and will grow till they are killed by the frost. The dwarf sort of Kidney Bean are not worth the cottager's notice, unless he grows them to sell for pickling. The Broad Beans that were sown in January or February, among the Cabbage, may now want topping, especially if the black fly has attacked them; this will at once encourage the pods to fill, and get rid of the insects. The seed-bed of Cabbage, which was sown in March, must be looked to; and as the pieces of Radish and Turnip, which were sown at the same time, will now be used, a harrowful or two of dung should be laid on and dug in, and immediately planted with Cabbage-plants from the seed-bed. The Silesia Lettuce, sown in March, should be thinned by drawing part, to be stuck in round the edge of the Onion-bed. The plants will be ready for the purpose about the 1st of May; those left in the bed should not be nearer than 12 inches from each other, it being a very large growing sort. No directions are required by the cottager concerning Cauliflower, Broccoli, Celery, &c., these not being either necessary or profitable to him. In April, however, he may sow a small bed of Scotch Kail; which, if planted on the Onion-ground, without digging, in July, will be very useful stuff, if the winter happens to be severe. Two or three rows of Savoy may be dibbed in among or between other crops about the same time.

When the various Crops come into Use.

The crops above specified will come into use in the following order, viz., every intermediate row of the Cabbage planted in October may be used for Greens during the winter, and their places taken by Broad Beans and Peas, according as the Greens are cleared off. Next, every intermediate plant of the rows of Cabbage intended to stand to head may be pulled as wanted, to serve till the prime Cabbage come in during May and June. The Christmas-sown Radish (if any were sown) will be ready in April; and in May there will be also the thinning of Onions, Carrots, Turnips, and Lettuce, to eke out a meal or give a relish to the rasher. Cabbage will be plentiful in May; and soon afterwards a row or two of Potatoes may be taken up; not that we would advise beginning on the Potatoes so soon, but that the ground they occupy may be had to get in upon it another crop of Cabbage, Savoy, or any other sort of Winter Greens. Another seed-bed of the Sugar-loaf or Battersea Cabbage should be sown in June, to supply Coleworts (that is, open Cabbage) during the autumn and winter; and if any piece of ground is empty at the same time, it may be sown with Turnips for winter use. If a little Leek-seed was sown among the Onions, the plants may be drawn and planted in a drill by themselves in some vacant spot, 4 or 5 inches apart, to stand for good. But if the Leek be preferred to Onions as a pottage-plant, a little bed should be sown in March, to furnish plants for putting out in rows about Midsummer. It is lucky that, in June and July, the labourer has not much to do in his garden, except gathering some of the crops, destroying weeds, and collecting everything which can be turned into manure for the service of the next season; but, in the last week of July, or in the first of August, he must not forget to sow a seed-bed of early York Cabbage, to raise plants for putting out in October and the following months. If sown a week or two before the times stated, many run to flower without forming heads; and, if sown later than the last-mentioned date, they do not come into use soon enough. About the end of August, if the duties of harvest allow, a bit of ground must be got ready at the upper end of the Potatoe ground—which crops are supposed to be taken out of the way for this purpose—three small beds, one for Onions, another for Spinach and Lettuce, and the third for Radishes. The Onions should be sown pretty thick; and, unless the winter prove very severe, the crop will be very useful in the spring, either for present use or for transplanting into an open spot of ground to bulb in the summer. The Spinach and Lettuce, if they survive the winter, will be acceptable at a time when Greens are scarce. Radishes sown in August, if the autumn is not too dry, are in fine perfection in October and November, and are then a kind of dainty. In August, too, the principal crop of Onions must be pulled and laid together thinly to dry, previously to their being roped and stored. And, when October arrives, there will be both Carrots and Parsnips, as well as the Potatoes, to be taken up and stored in safety, either in pits or otherwise; besides getting part of the same ground dunged and dug ready for Cabbages to be planted, as directed in the autumn of last year.

Plan of Garden.

Having sketched a plan for cropping twenty poles of ground with the most useful kinds of kitchen garden vegetables for a labourer or mechanic, we may now make a moderate estimate of the principal products, to show the benefits accruing to the tenant for his expenses,

time, and labour. We have supposed that the form of the garden is a long square, 38 yards in length and 16 yards wide. This area contains 608 square yards, being somewhat more than one-eight of an acre, or twenty poles. The ground is divided into seven portions, and marked by yards lengthwise, in order to make the division easier for the tenant. The following plan shows the divisions of the garden for the first year's cropping, which are arranged as follows:—

	Yds.	Sq. Yds.
No. 1. One yard for pot-herbs and Rhubarb, &c.	1	16
2. Two yards for seed-beds and Radish	2	32
3. Three yards for Onions, with a pinch of Leek	3	48
4. Three yards for Carrots	3	48
5. Three yards for Parsnips	3	48
6. Seven yards for Cabbage	7	112
7. Nineteen yards for Potatoes	19	304
	38	608



Supposing the above crops are sown or planted at the proper seasons, as directed—the soil being previously prepared by digging or trenching, and manured, if possible—the crops may be expected to turn out as follows:—

- Potatoes, 20 bushels, besides two or three rows taken up in summer.
- Onions, 4 ditto, besides the thinnings for summer use.
- Carrots, 3 ditto, besides the thinnings.
- Parsnips, 4 ditto.
- Cabbage, 250 full-grown, besides twice as many used as Greens.

The roots, together, make above thirty bushels of excellent vegetable-feed for winter use; allowing that the bushels, one with another, weigh 60 lbs., there will be an amount of 1,800 lbs., or above 9 lbs. per day for the winter half-year. And, besides this winter store, there are Cabbages in use, either as open Greens or as full-headed, from January until June; saying nothing of Radishes, Lettuce, common Beans, Peas—all of which will be in use before the end of that period, and soon followed by early Potatoes and the Runner Kidney Beans, one of the most profitable crops a cottager can raise.

The cropping for the next year will be arranged according as is represented on the diagram, or sketch, No. 2, and which will be the easiest change; and in the third year another change may be made by placing the Potatoes in the middle, and the other crops at each end.



1. Herb border—2. Seed-beds, &c.—3. Potatoes—4. Onions—5. Carrots—6. Parsnips—7. Cabbage and Beans, same as preceding year.

The above plan of cropping twenty poles of ground will serve as a scale to the cottager who may have either more or less than the quantity mentioned. For instance, if he has but ten poles, then he has only half the measurement, and only half the amount of produce; and, so of any other proportionate quantity. It is to be observed that twenty poles of good ground, well cultivated, will yield a greater quantity of vegetables than can be economically used by a labourer, his wife, and three or four children. In which case the overplust must either be sold or employed in fattening a porker for Michaelmas, and a baconer for Christmas. This, with such a garden, a labourer may attempt to do, provided he has the convenience for a sty, an inclosed yard, hog-tubs, bins, &c.; and provided, also, he has a little ready-money to buy his pigs, bran and pollard to mix with the boiled vegetables, and Barley-meal to fatten off with. A pig-sty and a garden assist each other greatly; and, at the same time, a cock and two hens, of a good breed, may be kept for their eggs—a pleasant addition to the household fare.

General Rules as to Culture.

To the foregoing directions and remarks may now be added a few general rules, of which no cultivator of a garden should be ignorant,

as success depends on circumstances which are often unheeded or neglected:—First. Never work the soil, by spade or hoe, if heavy and drenched with rain, for, if moved in that state, it naturally settles down too closely together again, and remains in the worst condition for encouraging the spread of roots. Soil cannot be too dry for working; and moving it in dry weather causes it to attract moisture from the air.—Second. Always sow in time and upon freshly-stirred soil, and while it is loose and moderately moist. Some seeds, as the common Bean and Onion, affect a firm bed to strike root in, and, consequently, the first are dibbed, and the last trodden into the soil.—Third. Always plant in newly-dug ground, unless the surface be already occupied with a crop shortly to be cleared off, in which case strong plants of a succeeding crop may be profitably introduced.—Fourth. Destroy weeds before they come into flower; and when any kind of earth or rank herbage of Grass or weeds is collected for the compost heap, see that the whole is well fermented, and turned once or twice to kill the seeds of weeds, or promote their germination before the compost is used in the garden.—Fifth. Never allow a single square yard to remain vacant during the growing season; and that this may never be, the cottager should always have seed-beds of Lettuce, and particularly Cabbage or some one or another of the Cabbage tribe, to supply plants for both regular and irregular cropping. Although the cottager may amuse himself by cultivating a greater variety of vegetables than we have mentioned, he must not neglect the more useful kinds, for they require unceasing attention. He may, to be sure, grow Cucumbers and Pumpkins; the first are already an agreeable relish to the bacon in warm weather; and the second make an excellent family pie or pudding in autumn, mixed with Wildings or Crabs gathered from the hedges. A labourer may grow Cucumbers plentifully in the simplest way; about the beginning of May he digs a pit 3 feet square, on a border lying well to the sun, making it 1 foot deep, and laying the broken earth round the sides; this pit he fills with any rank growing weeds, Nettles, Flags, or long Grass, from the sides of ditches; let these weeds be somewhat withered before they are shaken and trodden into the pit; the weeds are then covered with about 10 inches of loose rich mould; when the heat rises to the surface (if the labourer can neither beg nor buy a pot of plants from a neighbour) he may drop a few seeds in the centre of his little bed; when the seedlings rise and have produced one rough leaf, they will require a little fresh and dry compost put round and among the stems, and the little bud at the bottom of the rough leaf pinched off. The pit is hooped over and covered every night with a mat or old sack to keep in the heat, which will continue till that of the season is sufficient. Pumpkins may be grown in the same way; but they require the richest soil that can be got to swell the fruit to a good size.

No directions have been given about growing Cauliflower, Broccoli, Celery, Endive, Asparagus, Artichokes, and several other kitchen-garden vegetables, because these should never encumber the garden of a cottager, being to him unprofitable plants. There are, however, a few more particulars which may be of use to the cottager in the management of his garden; and first, of saving seeds. The only seeds worth his while to save are those of Onion, Scarlet Runners, Radish, and Cos Lettuce; as to Cabbage, Savoy, Carrot, Parsnip, &c., there is such risk in saving them true, and they cost so little if bought, that the amount can be no object to the buyer. When attempted, however, the finest and truest specimens of the crop should be chosen to produce seed. A few plants of Radish and Lettuce may stand where they were sown; a score of the first pods may be left on the Runners, and half-a-dozen of the best Onions planted in a row, on an open spot of the garden, in the month of February, will yield seed enough for the following season. Indeed, saving Onion-seed should be a particular object with the cottager; as having a few ounces to sell will enable him not only to buy all his other seeds, but a load or two of dung besides.

Quantities of seeds required in a small garden, viz. :—

One pint of Peas is enough for a row of 20 yards in length.	
One do. of Beans	27 do.
One do. Runners	36 do.
One do. Dwarf Kidney do.	26 do.
One do. Marrowfat Peas do.	32 do.

1 oz. Onion seed sows 15 square yards; $\frac{1}{2}$ oz., 7 square yards; 1 oz. Carrot, 15 square yards; 1 oz. Parsnip, 15 square yards; $\frac{1}{2}$ oz. of Cabbage, Savoy, Borecole, Broccoli, Cauliflower, is enough for a seed-bed of 4 square yards; $\frac{1}{2}$ oz. of Turnip sows 11 square yards; of Radish, 2 or 3 oz. for spring sowings, and $1\frac{1}{2}$ oz. for autumn; a bed of Asparagus, 5 feet by 30, requires 160 plants; an acre of Potatoes requires from 15 to 20 bushels of sets.

The above particulars will serve as rules for apportioning other kinds of seeds, according to their size and the extent of the ground to be sown or planted. We have not mentioned fruit trees; as there is not room in a cottage-garden for anything of the kind, except,

perhaps, a row of upright-growing Gooseberry trees, to be planted across the lower end of the garden; these should not be too much thinned in the pruning, but be kept in a thick bush-like form for the sake of having an abundance of fruit; all of which is to be used green for puddings and pies in the season. Ripe Gooseberries, or any other fruit, are of but little use in a labourer's family. A few Red and White Currant trees may be mixed with the Gooseberries, if desirable.

—*Journal of the Royal Agricultural Society.*

THE ARBORETUM.

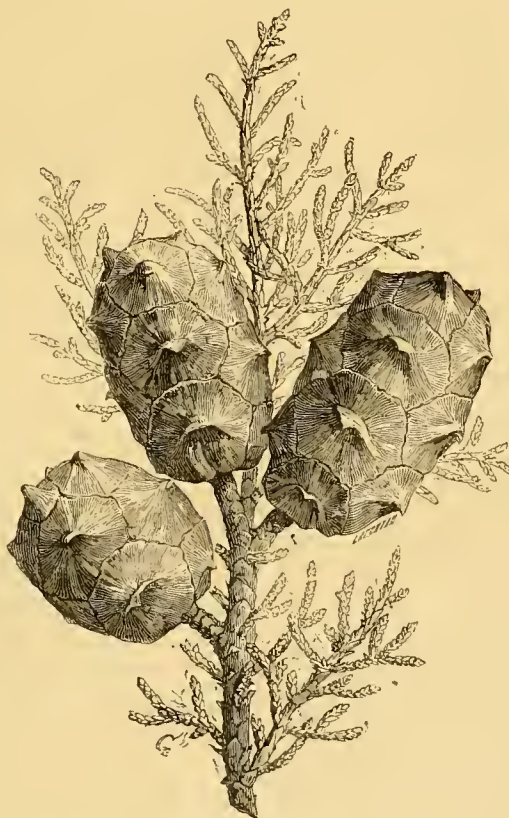
THE MONTEREY CYPRESS.

(*CUPRESSUS MACROCARPA*.)

THIS species may be regarded as the representative or equivalent of our largest European Cypress (the *Cupressus sempervirens*) on the Pacific coast of North America. Like it, it reaches a great age and a great size; its foliage is similar, and, as in it, the fruit is large and hard, differently shaped, indeed, being oblong instead of round, but of the same character, and nearer it than any other well-defined type of Cypress. It has been known since 1838, when Mr. Lambert gave the Horticultural Society a few seeds of it, without name or indication of locality. It then received the manuscript name of *Cupressus Lambertiana*, and, as it was easily propagated by cuttings, it soon got pretty widely distributed in gardens in England under that name. It was afterwards received, through Dr. Fischer, of St. Petersburg, as a new species of Cypress from California, but still unnamed and undescribed. It was next introduced in greater numbers by Mr. Hartweg, who had been sent out to Mexico and California by the Horticultural Society to collect plants for them. In sending it, he gave it the name of *C. macrocarpa*, from its large seeds, and it was described and published under that name, in 1849, by Mr. Gordon, in the *Journal of the Horticultural Society*. So it stood for a number of years, those who may be styled the old holders calling it *C. Lambertiana*, and the new holders calling it *C. macrocarpa*. But, like many other plants—we had almost said, more than most other plants—the Cypresses indulge in individual variations, every seed-bed producing peculiar modifications; and, as with other species so with this, it was soon observed that varieties showed themselves, among which the most remarkable, from their opposition of habit, were two, one growing straight and narrow, more or less pyramidal, or approaching the fashion of the Lombardy Poplar—the other more spreading, and like the Beech or the Cedar. Horticulturists, finding that they had two names and two marked varieties of this Cypress, forgetting the origin of the names, naturally set themselves to apply them to the two varieties. At first, of course, confusion became worse confounded, but gradually the gardening world have got to distinguish the two varieties, and habitually to apply the name *C. macrocarpa* to the upright-growing plants, and *C. Lambertiana* to the more spreading plants. Mr. Gordon has ascribed this difference to the first plants having been chiefly cuttings; but it is beyond doubt that the upright and horizontal varieties are both found as seedlings in beds raised from seeds of the same tree. As these two forms are generally so well marked as to

make it an easy task to assign any plants either to one or the other, it would seem that there can be no harm—nay, that it is rather desirable—that they should continue to be known by separate titles; and as it is never desirable to disturb accepted titles when it can be avoided, we should suggest that the horizontal-growing form should continue to be known by the title of *C. macrocarpa*, var. *Lambertiana*, and the upright-growing one by that of *C. macrocarpa*, var. *fastigiata*. The tree is fast-growing and beautiful at every stage of its growth, and in every form. Its verdure is exceedingly rich, dark, and luxuriant; its branches reddish; and the long whip-like shoots impart a peculiar grace to it. Unfortunately, it cannot be absolutely depended on as hardy in every position or district in this country. Notwithstanding, however, its liability to be cut off when a bad year comes, the beauty and grace of this tree, even in its young stage, are so great that we may be sure it will always hold a place around our English country houses. When killed it must be replaced. It should,

perhaps, be noted that a variety of *Cupressus Lawsoniana* (a much bardier plant) has been met with, possessing exactly the same habit and port as the *fastigiata* variety of *C. macrocarpa*; its colour, however, is not equal to that of the latter, although very beautiful in its own way; but the green of *C. macrocarpa* is peculiarly rich, and we remember no other Cypress which possesses it. It is particularly distinguished from other species of Cypress by the great size of its cones, which are nearly two inches long, and are borne in clusters of three or four. The shape and arrangement of these are well represented in the accompanying illustration. There is, we believe, a variegated variety of this Cypress; but the green form is that to which planters will, probably, attach most value.



Cones of the Monterey Cypress (*C. macrocarpa*).

Profitable Hedges.—By substituting Willow for Thorn, hedges can be made profitable; they are, it is said, more effective as a shelter, quite as strong, reared in a much shorter time, and at less than half the cost. The Willow has been recommended for hedges by Linnaeus, Loudon, Miller, and other writers of note; and the only way in which the neglect of such advice can be accounted for is simply that the matter has never been sufficiently brought under notice. A Willow hedge, 200 yards long, planted in ground well dug over, cleaned, and manured—planted with cuttings 12 inches long

and 6 inches apart, requiring 1,200 cuttings, value about 25s.—became in two years a good strong hedge, capable of resisting any pressure an ordinary hedge would be subject to. The Willows being crossed diagonally, rendered it almost impossible for anything to break through. The dressings or spray of the first two years were coarse and worthless, but in the three succeeding years the dressing has sold to basket-makers for 20s. each year, which has paid the entire cost of planting, labour, and rent of land which the hedge occupies. Another hedge planted upon the same principle has, at the second year's dressing, paid the cost of the plants. The above hedges were planted with the Bitter Willow, which neither cattle, game, nor vermin will often materially injure.—*Florist.*

Spring-Flowering Shrubs.—The common Almond is now very showy in many gardens around London. *Cydonia japonica* is also blooming freely on warm sunny walls, and, its white-flowered variety is deserving of culture for the sake of variety. One of the prettiest of hardy-flowering trees, *Prunus (cerasifera) divaricata*, is now covered with milk-white sloe-like blossoms, in the grounds at Kew; and, we have likewise seen odd flowers of the richly-scented *Magnolia Soulangeana* opening their delicately-tinted petals in warm sheltered positions.

THE LIBRARY.

FLORE DES SERRES.*

IN fulfilment of the promise made in your last issue, I shall now proceed to examine and comment on the twenty-seven plates contained in the remaining triple part of this beautifully illustrated work.—Plate 1. “*Stapelia Planti*.” This is a most beautifully executed portrait of this remarkably striking and handsome species. For anything like a complete collection of portraits of the varieties of this family, many of which are extremely curious and ornamental, I must refer your readers to a magnificently illustrated book in twelve volumes, imperial folio, only to be found in the library of the British Museum, and entitled “*Hortus Sempervirens Kernerii*,” in which, if I remember rightly, about thirty varieties are figured. The variety here figured is said to be the most vigorous growing, and easily cultivated, of the family, and is a native of Natal, it was first figured and described by Professor Decaisne, in the “*Botanical Magazine*.”—Plate 2. “*Caragana jubata*,” also known as *Robinia jubata*. A most curious black-stemmed small shrub from Siberia, profusely armed at all points by innumerable long and sharp thorns, and producing small Acacia-like foliage, and Pea-shaped flowers of a dallish shaded white, with a brownish veining towards centre of upper petal, and a blush of light rose-colour towards centre of lower one. This is, of course, quite hardy in this country.—Plates 3, 4, 5, and 6, are devoted to four varieties of Provence Roses, named respectively, Alexandre Laqueant, Ciceron, Duc D’Enghien, and Peron de Gossart. These Roses are all, more or less, dark-shaded varieties, and three of them are medium-sized, and the fourth decidedly a small flower. They are apparently (from the remarks accompanying them in the work), published by M. Van Houtte as a sort of protest against what he seems to consider the unfair preponderance of admiration and attention bestowed by the horticultural world on the Roses known as Hybrid Perpetuals, almost to the exclusion of the Provence family, which he seems to think entitled to a considerably larger share of attention than they at present receive. I do not think that the publication of portraits of these four varieties will do much, if anything, to induce the horticultural world to alter its opinion, as (independently of the Provence Roses only blooming once in the year, whereas, their rivals bloom twice, and for prolonged periods, in both summer and autumn), the blooms of the finer varieties of the Hybrid Perpetuals far exceed in beauty and brilliancy of colour, as well as in size of bloom, those of the varieties here figured, which, being put forward for a special purpose, may be presumed to be among the newest and most remarkable of the family to which they belong.—Plate 7. “*Combretum micropetalum*.” From Paraguay; a very handsome free-blooming golden-flowered variety of this family, with conspicuous red-tipped stamens, which, as in *Stiftia chrysantha*, seem to form the most attractive portion of the flower. As this variety is said to do well in a cool greenhouse, it will be more welcome, to those who do not possess stoves or hot-houses, than the more generally known *Combretum purpureum*, which requires artificial heat.—Plate 8. Hardy Ghent Azalea, “*Louis Hellebuyck*.” This is a most beautifully executed plate of a most lovely novelty in this ornamental family of hardy plants, raised from seed by the celebrated Belgian hybridiser after whom this variety is named, who devoted his whole life to the cultivation and improvement of this class of plants, and from whose widow the stock of this, and the five following varieties here figured, has been acquired by M. Van Houtte, who is now distributing them to the public. This variety produces fine large trusses of blooms, each of which is of unusually large size, and of a beautifully clear rose-colour on the four lower petals, with a broad and distinct white band running down the centre of each. The upper or middle petal is a most beautiful and striking contrast to the others, being of a bright and clear gold colour, tipped and edged with white. It is altogether an exceedingly fine variety, and a great acquisition to all collections of hardy plants.—Plate 9. Hardy Ghent Azalea, “*Madame Alex*.” Hardy. A lovely and delicately shaded variety, producing large trusses of light rose-coloured flowers, each petal being suffused with white intensifying towards the centre.—Plate 10. Hardy Ghent Azalea, “*Mina Van Houtte*.” A lovely double-flowered variety, producing rather smaller trusses of bright and clear rose-coloured flowers.—Plate 11. Hardy Ghent Azalea, “*Louis Aimé Van Houtte*.” A deep carmine form of the last-named variety, producing medium-sized trusses of double flowers.—Plate 12. Hardy Ghent Azalea, “*François de Tave*.” A pretty semi-double light pink flower, produced in larger trusses than either of the two last-named.—Plate 13. Hardy Ghent Azalea, “*Bijou de Gendbrugge*.” A most curious and beautiful variety, producing medium-sized trusses of semi-double flowers, the outside and inside edge of the petals of which are a deep

rose-colour, and the centres and duplicature petals pure white, producing a most striking and remarkably novel appearance.—Plate 14. “*Liriodendron tulipiferum*, fol. aur. marg.” A most beautifully and evenly gold-margined variety of the well-known Saddle-leaf Tulip-tree, raised from seed by Mr. F. E. Gay, of Bollwiller, on the Upper Rhine, from whom M. Van Houtte has purchased the stock. The variegation in this variety is said to be perfectly and evenly constant.—Plate 15. “*Macuna pruriens*.” A curious climbing plant, from the East Indies and Antilles, requiring the temperature of a stove, and producing immense bunches of deep purple flowers, somewhat resembling a large *Clanthus*, with red inside, and conspicuous green calices. The husks of this plant are used in Barbadoes as a substitute for sinapisms, and also when infused in beer as a remedy for dropsy.—Plate 16. “*Robinia Pseud-acacia Decaisneana*.” An exceedingly delicate and pretty variety of this well-known hardy flowering tree, raised about two years ago from seed by Monsieur Villevielle, jun., of Manosque in the department of the lower Alps, who named it after the celebrated Professor Decaisne of Paris. Its flowers are produced in racemes, and are of a delicate white, shaded with pink; it is said to be free-flowering, and also perfectly hardy in this country.—Plate 17. “*Thymus Serpyllum*, fol. aur. marg.” A pretty variety of golden-variegated Thyme, much resembling the variety sent out last season by Messrs. E. G. Henderson, under the name of Golden Fleece.—Plate 18. “*Hardenbergia ovata rosea*.” A pretty little trailing plant, from South Australia, and requiring the temperature of a cool greenhouse. Its flowers are produced in small bunches from the axils of the leaves, the two upper petals being pure white, and the two lower ones deep pink. This plant has already been figured in the “*Botanical Magazine*,” tab. 2, 169, under the name of *Kennedya* species?, and also in Edward’s “*Botanical Register*,” tab. 298, under the name of *Glycine* species?; it was introduced into Europe by M. A. Van Geert.—Plate 19. *Trizonate Pelargonium*, “*Achievement*” (Turner), one of the finest and brightest coloured of Mr. Turner’s many introductions in this once popular, but now, considerably overdone family of ornamental-leaved plants, which commenced with Mrs. Pollock, which created so great a sensation when sent out by Mr. Grieve.—Plate 20. “*Pelargonium Endlicherianum*,” a curious dull-red flowered variety, from Mount Taurus, of purely botanical and no horticultural interest. Why such plants are ever figured in such a work as this, I am quite at a loss to understand.—Plates 21, 22, 23, 24, and 25, represent in one fine double, and three single plates, four varieties of a most beautiful set of hardy hybrid Azaleas now being sent out by M. Van Houtte, and belonging to the variety known as *Azalea mollis glabrior*. The entire set consists of twenty named varieties of the most varied and beautiful colours, and producing flowers of large size, almost, if not quite, rivaling those of the greenhouse or Indian Azalea in beauty. Owing to the names of some of the original plants of this set having gone astray through some mischance or other, M. Van Houtte is unable at present to give the separate distinctive names of the four varieties here figured, but, as he originally possessed only a single plant of each variety, and the young plants propagated from them are kept in separate batches, he can guarantee purchasers of the set obtaining a plant of each separate variety. The first variety figured on the double plate is of a clear golden-yellow, with a distinct punctuation of bright orange on the upper petal, which adds immensely to the appearance of the flower. The second variety figured is a most perfectly-formed flower, of a beautifully clear and deep rose colour, quite the finest thing of the kind I have yet seen among hardy Azaleas. The third variety figured is a pure white, with distinct yellow spotting on the upper petal, but with a rather smaller individual flower than the last-named variety, but equally perfect in shape. The fourth variety figured is of a beautiful deep fiery-orange colour, with a lighter shading towards the centre of the flower. This flower is not quite so large in size or so perfect in form as the first-named varieties of this lovely group, but, for brightness of colour, will be a great acquisition to any collection of these plants.—Plates 26, 27. “*Malus baccata flore roseo pleno*.” A most beautifully executed plate of an exceedingly ornamental and very large flowered variety of semi-double Apple, apparently most free-flowering, the outside of the petals being of deep rose-colour, while the inside and central petals are almost white. This fine variety was imported from the extreme east of Siberia; so, is perfectly hardy in this country, coming into bloom at beginning of May, and of easy propagation by grafting on the Paradise stock. This plant will be a great acquisition to every collection of hardy flowering trees.

These remarks bring to a conclusion our notice of the nineteenth volume of this beautiful work, and we have only now to look forward with pleasant expectation for the first quarter of the twentieth volume promised by M. Van Houtte towards the end of the present month.

Junior Carlton Club.

W. E. G.

* “*Flore des Serres et Jardins de l’Europe*,” Parts X., XI., and XII., of Vol. XIX., Van Houtte, Ghent.

WORK FOR THE WEEK.

Flower Garden.

By means of neatness and order endeavour to render all ornamental grounds as enjoyable as possible. Walks and Grass must be frequently rolled when there is no frost, and no greater improvement could be undertaken than to make Grass verges and lawns perfectly level. We do not mean like a billiard-table or croquet-ground, but, where the ground naturally slopes, the fall should be uniform and regular. Where verges are irregular it is easy to turn back the turf and to make the ground quite level, and then re-turf, beating quite firmly with iron rammers; but do not give the edges the final trimming until such time as the Grass has taken root, and all danger from hard frost is over. Smoothness, we need scarcely remark, is one of the main constituents of beauty; therefore, a lawn which is not tolerably smooth, can never please. Turn up vacant flower-beds to the ameliorating influence of frost, and renew the soil in such as may require that being done; turn gravel walks, surface-dressing them with a coating of fresh gravel, and lay box-edgings. Frequently examine half-hardy plants protected during severe weather, and endeavour to render their covering efficient by giving additional protection when necessary; also protect bulbs during severe frost. Plant and re-arrange flowering deciduous shrubs, keeping in view ultimate effect; and, so dispose of the stronger-growing varieties as not to overgrow the more delicate kinds. Even Hawthorns, beautiful and desirable though they are, frequently occupy the front rank of mixed shrubberies when they would have been better placed further back, or set in groups; but all the stronger-growing kinds are in better keeping as park ornaments. The best for dress grounds are the different varieties of *Crataegus Oxycantha*, as, for example, Paul's New Double Scarlet. This is a splendid variety that merits extensive cultivation. *C. O. multiplex*, the best double white, *C. O. punicea*, the finest single scarlet, and *C. O. rosea superba*, may be accepted as fair types of the kinds that will give most satisfaction. The double varieties just named are splendid subjects for pot-culture. If not already done, mulch all newly-planted trees with leaf-soil, dung, or spent tan; top-dress *Hellies*, *Rhododendrons*, and such plants as may require stimulating with rotten manure and soil. Prune deciduous plants and climbers, and train such as may require it. Mulch dwarf Roses of every description. More particularly is this necessary with such varieties as are worked on the Manetti stock. In planting Roses on this stock it is important to see that the place of union of the bud with the stock be underground. The great propensity of this Italian Briar to produce suckers, together with its tenderness, is, in our opinion, an objection to its use. We give the preference to such Roses as are grown on their own roots; these, when well-established, give less trouble and produce the best results. The more delicate varieties should be budded on the Briar stock, which is hardier in constitution than the Manetti; and we would advise the inexperienced to plant the most vigorous growers. Prune climbing and hardy pillar Roses. By pruning, we do not, however, mean the whole to be clipped over with the shears; on the contrary, use discernment in the execution of this operation. Strong-growing Roses, such as the Boursault, require well thinning out, shortening the young wood but little. Prune Moss Roses by cutting out the old wood and shortening back the young, pegging down the shoots on the beds which afford the best means of growing this Rose. Austrian Roses should have all weakly wood cut clean out and the head thinned, but do not shorten the shoots at all. Provence Roses may now be pruned, but the pruning of Reses in general had better be deferred for some time to come.

Pits and Frames.

In such as are heated, give no more fire-heat than is absolutely necessary to expel the frost, and give air as early in the morning as the state of the atmosphere will admit. Towards the middle of the month the stock of bedding-plants should be looked over; and soft-wooded plants, of which there is a scarcity, should at once be placed in a growing temperature to produce cuttings for propagation. The *Heliotrope* is well deserving of extended cultivation, and is very desirable in mixed arrangements. The finest varieties for bedding are *Etoile de Marseilles*—a star, indeed!—*Surprise*, and *Jersey Beauty*, the last very dwarf, and one of the best for bedding. As regards *Geraniums* in boxes and store-pots, a portion of the variegated sorts may be placed in heat when cuttings are required, but we would warn the inexperienced not to be in undue haste, as the loss of a week or two is often more than regained by the superiority of the cuttings put in later. Water carefully but effectually, so as to thoroughly moisten the ball. Cold frames containing comparatively hardy plants, such as *Gazania*s, *Centaureas*, *Echeverias*, and *Veronica*s, &c., must be attended to as regards covering when the weather is frosty. For those who have not the advantage of a propagating-pit,

employed next it, over which a sufficiency of Fern or litter may be strewed to keep out frost; during the prevalence of severe frosts and snow there is no necessity to remove the covering, as it will stand for a month, if needs be, in perfect safety; but, in such a case, inure them afterwards to light by degrees, so that the transition is not too and who have to depend on heating material, now is a good time to get dung and leaves together, and thoroughly mixed, so as to become of a uniform moisture. Take advantage of wet weather to make labels and procure stakes of various sizes; trim and tie them into bundles. Wash flower-pots and store them away for potting, and see that soils are procured in sufficient quantities, and in proper condition, for potting.

Greenhouses.

At present, conservatories everywhere are gay with *Camellias*, *Heaths*, *Azaleas*, *Acacias*, *Cytisus*, *Daphnes*, *Epacris*es, *Hyacinths*, and other bulbs, *Cyclamens*, *Primulas*, *Mignonette*, *Cinerarias*, *Violets*, *Callas*, *Bouvardias*, and many other things, the whole being intermixed with fine-foliaged plants, which serve to set these in flower off to good advantage. The temperature of these structures may be kept at about 45° or 50° at night, allowing a rise of 10° by sun-heat. To plants started into growth give more liberal supplies of water, and keep the atmosphere moist by sprinkling from the syringe. Introduce flowering plants from the forcing pit to take the place of those done flowering. Give air plentifully in the morning, shutting up early in the afternoon, and begin the re-potting of greenhouse plants; and, such as intend to exhibit their plants, must now be busy training, accelerating, or retarding them. Shade a little from bright sunshine *Azaleas* and *Camellias* that are in flower, and such as have done flowering, place in an intermediate temperature, and encourage them to make growth.

Ferns.

The general potting of these should have been done last month; but, if the operation has been delayed until now, it ought to be at once accomplished. If the plants have begun to grow, they will be more liable to suffer from shifting than they otherwise would be; but with careful attention in the way of shading, maintaining an equable but gradually-increasing temperature, and supplying a moderate amount of moisture, both to root and top, little danger need be apprehended. Ferns whose fronds spring directly from the soil require a richer compost than such sorts as *Davallia canariensis*, whose rhizomes grow above ground. To the former give a mixture of equal parts of good fibrous peat and loam, with the addition of some leaf-mould, plenty of silver-sand, and some small chips of fine sandstone. If the plants be required, however, for furnishing purposes, a little more loam and a little less peat will induce a hardier growth, and one better adapted for house-work than the luxuriant growth promoted by the first-named soil. Those with rhizomes above ground may be potted in fibrous peat and a little leaf-mould, pegging the rhizomes down on the soil. Some of the *Davallias*, *Polypodiums*, *Phymatodes*, *Drynaria*, and others, grow well on old stumps of Tree-Ferns, affixing themselves thereto like *Orchids*; if the stumps are in the vicinity of other Ferns, spores of different species are sure to vegetate in their crevices, more particularly those of *Adiantums*, *Gymnogrammas*, *Aspleniums*, and *Pterises*. Syringing Ferns is an operation requiring skill and care; for, although some genera are partial to such treatment, others are particularly averse to it, more especially the *Adiantums*, *Gymnogrammas*, *Cheilanthes*, and other delicate and farinose kinds. Filmy Ferns are best grown in glass cases, or under hand-lights or bell-glasses, or a division of the Fernery may be specially set apart for their culture. Most of the small delicate species thrive well on blocks of decaying wood, pieces of Tree-Fern stumps, or in pots; whilst, for strong-growing kinds, like the *Todeas*, pot-culture is the best and most convenient. For pot-culture, fibrous peat, chopped *Sphagnum*, and some fine sandstone chips make a good compost; and, for *Todeas*, the surface may be mulched with live *Sphagnum*. The smaller kinds of Ferns thrive well on little mounds composed of fibrous peat and sandstone chips, or on a block of wood embedded in turfy peat, from which they can emerge and scramble over the wood. These Ferns like a steady moist atmosphere, but too much artificial heat is detrimental to them; in fact, a greenhouse temperature is almost sufficient for the whole of them. In watering, let the water fall lightly upon the fronds; but, in addition to these slight sprinklings, water must also be given to the roots, more especially during the growing season. Hanging-baskets should now be replenished with Ferns and *Selaginellas*, and Wardian cases should be examined and re-filled if necessary.

A RURAL Vermont newspaper announces that its minimum charge for a first-class marriage notice will be 15 lbs. of dried Apples. Notices with "poetry" cost 12 lbs. of Onions more.

SOCIETIES, EXHIBITIONS, &c.

ROYAL HORTICULTURAL SOCIETY.

MARCH 18, 1874.

THOUGH early-flowering bulbous plants formed the chief feature of this show many miscellaneous subjects of great interest were, also, exhibited, and the display, taken as a whole, was unusually good. Cyclamens were shown in fine condition by Mr. Goddard, and Crocuses in pots by Messrs. Veitch.

Hyacinths.—Class 1. Fifty distinct varieties. First prize to Messrs. James Veitch & Sons for a fine collection of strong, healthy, well-grown, bells. Among them the following were well worthy of notice—Single whites, La Grandesse, very fine spike; Snowball, short compact spike, pure white, massive bells; Baroness van Tuyl, silvery-white, good habit and spike; Queen of the Netherlands, very fine spike. Single blue; Prince Albert, fine purple-blue, good spike; Moltke, fine bright blue, stout spike; Baron van Tuyl, fine spike, silvery-blue; Argus, fine velvety purplish-blue, with white eye; Admiral de Ruyter, fine massive bells, strong spike. Single reds, Ornament de la Nature, fine light-rose; Solfaterre, bright-crimson, white eye; La Joyeuse, fine spike, robust habit; Garibaldi, bright shining crimson. Messrs. Cutbush and Carter, also, furnished good collections. In the class of eighteen distinct varieties, Messrs. Veitch were first with some very fine even well-grown bulbs—Czar Peter, fine blue; De Candolle, good spike, lilac; L'Innocence, fine spike, white; and others equally good. Various fine collections were also shown by private growers. In the class of six new varieties, Messrs. Veitch, who were first, furnished Cavaignac, fine robust single blue, good spike, large flowers; Grande Maître, fine single blue; Anna, robust spike of pure white flowers, of great size and substance. This variety was a gem.

Tulips.—Six kinds in twelve pots.—First prize. Messrs. J. Veitch, who had fine well-grown examples of Prosperine, fine flower, deep rosy-crimson; Rouge Luisant, yellow and crimson, flaked with rosy-lilac; Wouverman, fine violet-purple; Vermilion, brilliant fiery scarlet-yellow centre; White Pottebakker, fine white; and Keizer Kroon, golden-yellow, flaked with deep scarlet. Second, Messrs. Cutbush, who showed Queen of Violets, fine light purple; Rose Grise de Lin, fine light rose; Prosperine Mohère, fine violet; Rosa Mundi, fine rose. In the collections from private growers were also some fine flowers.

Miscellaneous Subjects.—Messrs. J. Standish & Co. received an extra prize for a group of decorative plants, including the white Abutilon Boule de Neige; white forcing Pink, Lady Blanche, a most profuse and deliciously-fragrant variety, well worth culture, and several semi-double varieties of Azalea, which are much more durable for cutting than the single kinds. The same firm also exhibited a pan of the beautiful blue Lithospermum prostratum, well adapted for forcing; and the beautiful white Tea-scented Rose Niphetos showing it to be a valuable kind for bnds. A few Cinerarias with large flowers, and plants of *Æchmea miniata splendens*, a fine Bromeliad, having curved glossy leaves and spikes of coral-coloured bnds. Mr. B. S. Williams staged a fine group of rare Orchids, Palms, and Ferns, and other decorative plants, to which an extra prize was awarded. The same award was given to Mr. Bull for a miscellaneous group of choice Ferns, Palms, Orchids, and Cycads. Mr. Denning exhibited a nice group of winter-blooming Orchids, from Londesborough Lodge, including specimens of *Cymbidium eburneum*. Messrs. Veitch staged a remarkably choice group of Orchids, including many rare and valuable species; *Odontoglossum Caradeni*, pale yellow sepals and petals, and lip narrow, spotted with brown; *Miltomia Warszewiczii*; *Odontoglossum Pescatorei*; *O. Andersonianum*, a profuse purple-spotted form of *O. Alexandra*; a nice plant of *Angracum sesquipedale*, bearing eight of its white wax-like flowers; *Miltomia cuneata*, with sepals and petals of a dark brown colour, the heart-shaped lip pure white; a fine plant of the rare and beautiful *Dendrobium Wardianum*, with two fine flowering-bulbs; *Vanda cœrulescens*, a pretty little blue-flowered species, well worth general culture; *Cymbidium eburneum*, and other species; together with plants of *Odontoglossum triumphans* and the brown-speckled *O. odoratum*. An extra prize was deservedly awarded to this fine group. In class 10, for six distinct Orchids, Mr. B. S. Williams was first with fine specimens of *Dendrobium Wardianum*, *Renanthera coccinea*, *Dendrochilum glumaceum*, *Phalenopsis Schilleriana*, *P. grandiflora*, and a yellow *Oncidium*. Mr. W. Bull was second with *Masdevallia Lindenii*, *Phalenopsis grandiflora*, *Cypripedium villosum*, *Lycaste Skinneri*, and others. Class 9, six Orchids.—First, Mr. Denny, gardener to Lord Londesborough, with *Odontoglossum Andersonianum*, a fine sub-variety, differing in the spots being conglomerated in the centre of each segment; *Dendrochilum glumaceum*, a very fine well-grown specimen, profusely bloomed. A remarkably well-grown specimen of *Cymbidium eburneum*, with thirteen fine flowers. The rare *Odontoglossum coronarium*, bearing a robust spike of eighteen flowers, sepals and petals of a bright reddish-brown, looking as if varnished; margined with yellow; lip, pale yellow; and a small but well-bloomed plant of *Cœlogyne cristata*. Mr. W. Paul, of Waltham Cross, staged six boxes of ent Roses of remarkably fine quality for the season, and an equal number of stands of Camellias. The effect of these two popular flowers being shown in the same manner and together was very remarkable, and is a convincing instance of the manner in which nature's times and seasons are controlled by art. For the prizes offered by Messrs. Barr & Sugden, there was only one exhibitor, Rev. W. Kendal, East Sulworth, Dorset, but Messrs. Barr & Sugden set up a neat box containing a dozen varieties. Messrs. H. Lane & Sons, Berkhemstead, staged a dozen fine specimen Ivies in pots, including the following varieties: Golden, creamy variegation; Digitata, slender-growing green-leaved variety; Rægneriana large,

glossy, heart-shaped leaves, very distinct; Caenwoodiana, fine slender palmate-leaved variety, green, with silvery veins; Maculata, green, blotched with creamy white; Himalaica, distinct green-leaved form with jagged margins; and Canariensis maculata, green, splashed with creamy white. Messrs. W. Rolleston, of Tooting, staged a very interesting group of stove and greenhouse decorative plants, including Palms, Ferns, Dracænas, Orchids, succulents, and Ericas. In this group the plants of *Erica elegans*, *Adiantum cristatum*, *Brainea insignis*, and a pair of *Dieffenbachia Bauseii*, were well worth notice. Mr. R. Dean, of Ealing, staged a fine collection of hardy Primroses, including varieties with crimson, white, purple, yellow, sulphur, lilac, and violet flowers, and a miscellaneous selection of spring-blooming herbaceous plants, including Scillas, Pansies, Hepaticas, *Myosotis dissitiflora*, *Arabis alba* var. *præcox*, *Narcissus Trumpet-major*. Mr. Robert Parker, of Tooting, staged a fine group of spring-blooming herbaceous plants, amongst which the following were specially worth notice:—*Erythronium Dens-canis*, with nodding lilac flowers among its brown spotted leaves; *Polygonatum multiflorum*, remarkably well adapted for spring forcing; and, as a plant for furnishing cut flowers, *Anemone Pulsatilla* verna, with feathery deep green leaves, silvery bracts, and deep purple flowers; the deep blue *Scilla sibirica*, *Dielytra spectabilis*, *Muscari botryoides*, with flowers of the brightest cœrulean blue, together with its pure white variety—*M. racemosa*, *Iris reticulata*, and many others. Many herbaceous plants are so well adapted for decorative purposes in pots, and are so easily grown that it is a matter of wonder that we so seldom see them cultivated for this purpose. Mr. Ware, Mr. Parker, and Mr. Barr have often shown us how easy this is to do, but we are slow to follow even such excellent examples.

Fruit.—In the class for two bunches of black Grapes, Mr. W. Wildsmith, gardener to Viscount Eversley, Heckfield Place, Winchester, was first, with two clusters of Lady Downes, in fine condition; second, Mr. W. Cole, gardener to J. Budgett, Esq., Ealing Park. Mr. J. Douglas staged Lady Downes in this class, with fine berries. In Class 30, for three kinds of dessert Apples, there was spirited competition, and the first prize was obtained by Mr. C. Roe, Welford Park, Newbury, with fine specimens of Cox's Orange Pippin, Scarlet Nonpareil, and Cornish Aromatic; second, Mr. T. Jones, Royal Gardens, Frogmore, with Cox's Orange, Blenheim Orange, Claygate Pearmain. In the class for kitchen varieties, Mr. F. Parsons, gardener to R. Attenborough, Esq., Turnham Green, W., was first, with fine Wellington, Blenheim Orange, and Alfriston; second, Mr. W. Gardiner, gardener to E. P. Shirley, Esq., Stratford-on-Avon, with Blenheim Orange, Yorkshire Greening, and Gloria Mundi. In Class 32, for Pears, Mr. T. Jones, of Frogmore, was first, with Beurré Rance, Chaumontel, and Shobden Court; second, Mr. A. Parsons, gardener to W. J. Blake, Esq., Danesbury, Welwyn, with Fondante de Mons and Uvedale St. Germans. A collection of dessert and Kitchen Apples, sixty-five varieties shown by Mr. S. Ford, gardener to W. E. Hubbard, Esq., Leonard's-lee, Horsham, deservedly gained an extra prize. This collection was very remarkable for the time of the year.

Vegetables.—Vegetables, including Mushrooms, Cucumbers, Asparagus, and Broccoli, were limited in quantity, but of fair average quality. Mr. E. Cooling, of Bath, was first for Broccoli; Mr. T. Record first for Mushrooms; Mr. J. Douglas for Cucumbers; Mr. E. Clarke, of Sutton, Surrey, for Seakale; and Mr. James was the only exhibitor of Asparagus, the quality being excellent.

First-class Certificates were awarded to the following:—

Polyanthus The Bride (Dean), a very smooth pure white variety, valuable for spring bedding.

Primrose Splendour (Dean), a very profuse-blooming variety, well worth general culture.

Chysis Chelsoni (Veitch).—This is a very interesting cross between *C. bracteata* (a white-flowered species) and *C. Limminghii*, a rosy-petalled species, with a crimson-veined lip. It has been raised by Mr. Seden, and bears great yellow salmon-shaded flowers.

Cypripedium Argus (Veitch).—This is from the Philippines, and is possibly a natural hybrid between *C. barbatum* and *C. venustum*, but it is more profusely blotched than either. It has the slender-edged petals and foliage of *C. barbatum*, while the sepals are green-striped, like *C. venustum*.

Hyacinth Cavaignac (Veitch), a fine porcelain blue flower, closely set on a fine stout spike.

H. Sir S. Plimsol (Veitch), fine spike with finely-formed waxy bells, white, slightly suffused with blush.

H. Anna (Veitch).—This was the finest variety shown, with great waxy bells, fully 2 inches across, borne on a stout spike with good foliage.

H. Quisne Christine (Veitch).

Polyanthus Narcissus (Veitch), a very robust form, distinct from the Roman, bearing nine to ten sweet-scented flowers on a scape.

Cattleya Veitchiana (Veitch), a very beautiful hybrid, raised by Mr. Dominy, between *C. crispa* and *C. labiata*. It has a fresh and vigorous habit, and large showy flowers, in shape like *C. crispa*, but with rosy-lilac segments, and a crimson-blotched lip, like *C. labiata*.

Rose Madame François Janin (Bennett).—This is something like *Madame Falcot*, of a golden-yellow, shaded with salmon, and is very beautiful in the bud for cutting. The foliage is perfect.

Rose Madame Lacharme (Bennett).—This is a fine Rose, of robust habit; but it must rather have disappointed those who have so often heard it described as pure white. It is the colour of the Maiden's Blush, and undoubtedly a fine variety that will be largely grown.

Messrs. J. Bromwich exhibited a very interesting assortment of plant-cases and aquaria, made on improved principles, and well worth notice.

ERRATUM.—By a clerical error of one of our transcribers, our last week's note, headed "Hardiness of the Chinese Arbor-vitæ" (see p. 232), misrepresents what we intended to convey. It should read thus:—"Mr. Sargent, of Boston, informs us that while thousands of the *Juniperus virginiana*, or Red Cedar, were killed in the Northern States by the frost of 1871, the Chinese *Juniper* (*J. chinensis*) everywhere escaped."

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE BEST VARIETIES OF STRAWBERRIES, AND THEIR CULTURE.

By WILLIAM TILLERY, Welbeck.

HAVING grown an immense quantity of both old and new varieties of Strawberries, perhaps a list of those which I consider the best, accompanied by some remarks concerning their culture, may be of use to intending planters. Let us commence with the Black Prince, which is one of the earliest; although it possesses but little flavour it is a great bearer, and useful for gathering for preserving. Viscomtesse de Fleury is another prolific and early sort, and I find the old Scarlet still one of the very best for growing in quantities for preserving, and, being a very early ripener, it often comes in for that purpose, when the later sorts are spoiled by heavy thunder showers in July and August. As regards mid-season varieties, Sir J. Paxton is a first-rate kind, and carries well. The old Keen's Seedling is still not superseded as a good early kind for forcing, but it requires a careful selection of the plants, as they often get quite barren in plantations of more than three years' growth. Rivers's Eliza is a prodigious bearer, and I find it is a kind that produces better crops in light soils than many other Strawberries; it, likewise, comes in very useful for preserving. During the past season, President has been one of the very best bearing kinds in our collection, the beds being literally paved with trusses of its fruit. The trusses of this kind, too, are so heavy that they require extra care in propping them up, for, if this is not done, the fruit rots when covered by the foliage. Sir Charles Napier is still one of the most profitable varieties for the market-gardener to grow, for, though a little acid in flavour for the dessert, it is good for preserving, carries well, and is likewise a sure bearer. La Constante is a very dwarf grower and makes few runners, but the fruit has a peculiarly rich flavour, and is very good either for dessert or preserving. In the strong loamy soil of the garden here this variety always bears well, without renewing the beds so often as others. Ingram's Prince of Wales has medium-sized deep crimson fruit, which are of the most juicy and refreshing flavour of any kind I grow, and the plants, likewise, bear well. Lucas, a new Belgium variety, is, I find, an excellent bearer, the fruit, very large and of a fine conical shape, with very good flavour. Rifleman, a variety raised by the late Mr. Ingram, is an excellent large-fruited sort of good flavour, and carries well. Marguerite, a French kind, I have discarded, for, although its fruit is very large, the texture of the flesh is watery, with little flavour. Empress Eugénie is another large coarse-fruited kind, which I have likewise discarded, on account of its want of flavour, but it forces well, and is showy in a collection. Of the latest-fruited section of Strawberries, Dr. Hogg is still the best, both as regards size and flavour, and it is closely followed by British Queen and Mr. Radcliffe. On the strong loamy-soil, mixed with burnt red clay, in the kitchen garden here, these three varieties always bear well, and the plants seem healthier than in lighter soils. Cockscumb is another very large new kind that does well in strong soil, but its flavour is not first-rate. The Amateur is a new kind of the Sir Charles Napier type; it is a prodigious cropper, and its fruit large and of good flavour, and, as it travels well, it will make a first-rate kind for growing for the market. Comte de Paris is a French late variety, the fruit very large and handsome, but rather acid in flavour, though excellent for preserving. Frogmore late Pine is the best flavoured of all the late sorts, but it is only a shy grower, and requires good rich soil to make it bear well. The Elton is still the latest sort grown, and is one of the very best for preserving, its flesh being very red and firm, and the fruit large.

Culture.

In the culture of Strawberries, the best results will generally be obtained where the soil has been trenched or deeply dug, and enriched with plenty of good rotten manure; and the beds or rows are not profitable when allowed to remain longer than

three years on the same soil. A good strong loamy soil is the most suitable for the plant, but as this is not found in every garden, a mixture of stronger soil can be added to a light soil, where good crops of Strawberries are a desideratum. Plants of Strawberries which have been forced in pots, will, if planted out in a rich sandy soil, produce excellent crops, for the ball of strong soil at their roots will make them bear well for, at least, two years after being planted out. I raise all my best crops from pot plants when planted out, as early as possible after the fruit is gathered. In general, the plants, after forcing, are huddled together, and often neglected in dry weather as regards water, and not planted out till the pots are wanted again for the newly-laid young batch of runners. This does not give the old plants so good a chance of rooting into the new soil as when they are planted out early. When the weather is favourable in autumn, some of the varieties, when planted out early from pots, produce good second crops of fruit. In planting young plantations of Strawberries from runners, they will be found to succeed best when planted in July or August, for then they have time to root well before the winter sets in; and, if the runners have been strong when planted, they will produce some fine fruit the year following. When the planting of the runners is delayed till the spring, dry weather often prevails in March or April before the roots have progressed much, and a year is lost as regards getting much fruit from them. Late autumn-planting is, likewise, wrong in practice, for the early frosts heave the plants out of the ground unless well protected with litter. I find that a top-dressing of litter put on in the autumn as a protection against severe winter frosts is requisite for Strawberry beds, whether newly planted or not. In the spring the young leaves grow through it, and the strawy litter keeps the fruit clean after the heavy rains or showers. This is better than using tan, short Grass, or hay, for this purpose, as seeds are shed in the ground, and take labour to eradicate them again. In dry summers, Strawberry plants, when swelling their fruits, will enjoy any amount of liquid manure.

French Mode of Culture.

The varieties of Strawberry chiefly grown in France are those known as the Quatre-saisons and the Caprons. The former is a highly-developed form of the common wild Strawberry of our woods (*Fragaria vesca*), which, under cultivation, has acquired the character of producing a long-continued succession of fruit of excellent quality. The Caprons, in like manner, have sprung from the equally well-known, if rarer, Hautboy (*Fragaria elatior*), and exhibit, in a marked degree, the influence of carefully-directed cultivation in ameliorating the wild products of nature. The Caprons are distinguished from all other species or varieties of Strawberry by their strong peculiar musky flavour and perfume; and, it may be remarked, are to other kinds of Strawberry what the Muscats are to other kinds of Grapes. In the neighbourhood of Paris the variety most grown is the Quatre-saisons, and the following account of its culture at Versailles, extracted from the Count de Lambert's treatise on the Strawberry, will be found interesting:—"The plants are all raised from seed, which is sown early in March under frames. In the beginning of May the seedlings are pricked out in lines in the open air, with a distance of 8 inches from plant to plant. The runners which issue from these are separated and transplanted into a bed, from the middle to the end of August, the same distance being maintained from plant to plant. In both cases the soil is well mulched. The flower-stems and runners of the plants in the bed are rigidly suppressed. The final transplanting is made in the middle of October, when the plants are removed into a moderately-manured well-dug bed, in an airy position. Four lines are drawn in the bed, at a distance of 14 inches from each other, and in these the plants are inserted alternately, with a space of 16 inches between them. In the following spring, the surface of the bed is well hoed, and then mulched; the flower-stems are not suppressed, but the runners are removed now, and again in the autumn, after the crop has been gathered. Each bed is allowed to bear only for a year and a half, and the plants are dug up and thrown away in the autumn of the second year. It is remarked that the plants raised from seed are not so productive as those raised from runners, but the fruit has a much finer flavour."

NOTES OF THE WEEK.

— WE learn, from the *Revue Horticole*, that seeds of that charming hardy ornamental shrub, *Xanthoceras sorbifolia*, have been freely distributed by the authorities at the Muséum. We may, therefore, expect that the time is not very distant when we shall see its lovely flowers add a new grace to the gardens and pleasure-grounds of this country.

— MR. NOBLE, of Bagshot, has obtained permission to hold an exhibition of Clematises this season in the Royal Horticultural Society's Gardens, at South Kensington. The exhibition will consist of some 2,000 plants, and, as a large number of these will be seedlings, flowering for the first time, great variety may be expected. The exhibition will remain open about a month.

— At the Royal Botanic Society's Exhibition, held on Wednesday last, Mr. Needle, gardener to H.R.H. the Comte de Paris, at Twickenham, exhibited a fine collection of hardy Orchids, some of which were British species of *Orchis* and *Ophrys*, others came from Spain, southern France, and the Alps. Though not very showy in the ordinary acceptance of the term, still such plants are highly interesting to those who examine closely the smaller and more curious vegetable forms. We were pleased to see that these little plants were greatly admired, especially by lady visitors.

— At a sale of Orchids, imported and established, which took place at Stevens's the other day, plants of *Odontoglossum Roezlii*, just received in excellent condition from Messrs. Backhouse's collector in South America, fetched £7 7s. each; a strong plant of *O. vexillarium*, £11; *Oncidium macranthum*, unusually fine, £10 10s.; *Cattleya exoniensis*, £10; a fine mass of *C. citrina*, £10 10s.; a fine plant of *Cypripedium levigatum*, £12; *C. Parishii*, £11 11s.; *C. caudatum*, £9 10s.; *Lælia elegans* Turneri, £16 5s. 6d. Other lots, of which there were some 424, fetched from 10s. to £5 per lot.

— WE (*Tribune*) are informed that the Assembly of Iowa has appropriated 1,000 dols. (£200) for the best new Apple that will keep in good condition until after April 1, and for a superior Plum improved from native stock, the same to be a variety not now in existence, and superior to any in hardiness, productiveness, and quality of fruit. The seedlings must be exhibited from year to year before the State Horticultural Society, and the premium is to be awarded in 1886 by a competent committee appointed by that association.

— THE *Scientific Press* of San Francisco gives a picture, taken from a photograph, of a Rose bush in Santa Rosa, which is 25 feet high, 22 feet across, with 4,000 full-blown Roses, and 20,000 buds upon it. It was planted in 1858, and is of the Lamarque variety, one of the most beautiful of white Roses. The stem, near the root, is 24 inches in circumference, and just above the ground it divides into three principal stems that grow over 12 feet without lateral branches. These main branches pass between a strong support and the eave of the cottage against which the bush is trained. If the queen of flowers flourishes in that way in Santa Rosa, that city has by no means an inappropriate name.

— THE last number of the *Revue Horticole* contains a coloured plate and a description of a very handsome *Clerodendron*, called *C. imperiale*, of which M. Carrière is in doubt as to whether it is a species, a hybrid, a variety, or simply an old plant re-juvenised. It forms a pretty and very distinct shrub from 6 to 7 feet high, with a bare stem which seldom branches. The leaves, which are almost whorled, are borne on long petioles, and are about 1½ feet in diameter, broadly ovate, pointed, and of the tenderest green. Above them rises the thyrsoid panicle of Poppy-red flowers, some 3 feet in length, the effect of which must be seen to be properly appreciated. The figure of the plant in the *Revue* recommends it strongly to the notice of cultivators.

— THE Royal Commission on Scientific Instruction and the Advancement of Science has issued its fourth report, which deals with the national museums, and contains a series of valuable suggestions for making these institutions more serviceable. In view of the removal of the natural history collections of the British Museum to South Kensington, the commissioners recommend the appointment of a director of these collections who should be responsible to a Minister of State. The botanical department of the museum, they think, should be arranged with reference to the geographical distribution of plants, while Kew Gardens are to remain as they are. They recommend, however, that increased opportunities for the study of physiological botany should be afforded in the Royal Gardens at Kew. Perhaps the most important suggestions of the commissioners are the two following:—"That, in connection with the Science and Art section of the Education Department, qualified naturalists be appointed to direct the collection of specimens in order to supply whatever deficiencies exist in the more important provincial museums; and, also, in order to organise typical museums, to be sent by the Department

of Science and Art into the provinces, to such science schools as may be reported as likely to make them efficient instruments of scientific instruction." And "that the establishment of lectures on science, accessible to all classes, on the payment of a small fee, should be promoted by the government in the great centres of population."

— IN the gardens of the Muséum, at Paris, a little-known species of *Amaryllis* (*A. calyptrata*) has recently flowered. This plant is a native of Brazil, and bears a flower-stem about 2 feet high, terminating in two opposite yellowish-green flowers, at the base of each of which are two bracts of the same colour as the flowers. The plant has little in itself to recommend it, but may prove useful to hybridisers.

— M. GRANGE, of Orleans, has recently sent out two new plants, namely, *Clematis lanuginosa purpurea* (a cross between *C. lanuginosa* and *C. Vitiella*), which has quite a new and distinct shade of colour, with flowers nearly 5 inches across. The other plant is a very free-flowering *Phlox*, named by the raiser *Boulevard-fen*. It grows about 2 feet high, and bears a profusion of large fiery-red flowers.

— WE notice that an attempt is being made to improve Soho Square. Anything is better than the neglect which it has hitherto displayed, but we are sorry to see that the march of improvement has taken the ill-advised step of planting the inevitable Privet-hedge inside the railings. Soho Square might be made attractive, but, until our city squares are thrown open to the public, their internal decoration is not so important as it otherwise would be.

— PLANTS of a Grass, or rather Reed, called in South America *Taquarussa*, are living fountains. They grow, says Dr. Schomburgk, from 30 to 40 feet high, with a diameter of 6 inches, form thorny impenetrable thickets, and are exceedingly grateful to travellers and hunters; for, on cutting such reeds below a joint, the skin of the younger shoots is found to be full of a cool liquid, which quenches the most burning thirst.

— AMONG the new plants advertised by MM. Frébel & Co., Neumünster, Zurich (Switzerland), is *Begonia octopetala*, a species recently introduced from the Andes of Peru. It is very robust in habit, and has large orbicular leaves, and flowers over 3 inches across, with eight broad white petals, the backs of which are of a bright carmine-red. This plant is said to be sufficiently hardy to be planted out-of-doors in summer.

— VARIOUS *Hyacinth* shows are now being held in different places. One, in all respects excellent, may be seen at Messrs. Veitch's, in the King's Road; another at Messrs. Cutbush's, Highgate; and a third at the Crystal Palace, where, besides *Hyacinths*, Messrs. Downie, Laird, and Laing have a fine display of other plants, occupying staging 100 feet in length. The centre consists of *Palms*, *Azaleas*, the variegated *Acer Negundo*, *Spiræas*, and *Dielytras*, supported by such plants as *Cyclamens*, *Chinese*, and other *Primroses*, and *Tulips*, the whole making a display well worth inspection.

— NO FEWER than four new hybrid Orchids were exhibited by Messrs. Veitch & Sons at the Royal Botanic Society, on the 25th inst. These were *Dendrobium Dominii*, *Cattleya Veitchiana*, *Lælia Veitchii*, and *Chysis Chelsonii*. It may interest some of our readers to know that *Cattleya Veitchiana* was raised by Mr. Dominy no less than sixteen years ago, and has now only just opened its richly-tinted flowers for the first time. *Dendrobium Dominii* is specially interesting as the first hybrid *Dendrobe* raised, and all the others are distinct and equal, if not superior, in one or two cases, to existing forms.

— A MR. CAMPBELL, says the *New York Tribune*, claims to be able to ascertain in advance the qualities of seedling Grapes. He says that "in the taste or flavour of the green tendrils of the Vine may be found a true index of the character of its prospective fruit." He further declares that the tendrils of each variety possess a distinguishing flavour, by which it may always be detected from any other, and a seedling with this peculiar character may be at once set down as good, even in advance of its crop. His predictions are said to have been verified in every instance, and frequently, too, when the appearance of the foliage would lead him to an opposite conclusion.

— SEVERAL winters of late years, says Mr. McNab, have been remarkable for their mildness, but more particularly the last one, many parties hoasting of the bouquets which they have been able to collect from their open gardens. The *Gloire de Dijon* and other *Roses* have been flowering freely both on walls and in the open ground, and during the whole winter, even up to the present time, many scarlet *Pelargoniums* and other summer bedding plants, planted last spring, are still alive. From the reports laid before the spring meetings of the Botanical Society of Edinburgh, it will be observed that the past winter and spring, up to this date (March 12), have produced more open-air flowering-plants than any previous season known to me, showing that, if our summers are not so warm as they used to be, our winters are, seemingly, much milder.

THE INDOOR GARDEN.

SEAFORTHIA ELEGANS.

FEW of the larger-growing Palms equal this species in beauty; and it has, what is in many cases a great advantage, the property of being a rapid grower. Its proper place is planted out in a conservatory that is cool in summer, and kept regularly a few degrees above freezing in winter. Planted out in such a position in a bed of rich loam, and abundantly supplied with moisture, it soon makes a noble plant. Although a native of tropical Australia, it is sufficiently robust in constitution to succeed out of doors as a sub-tropical plant during our summer season, when it should be plunged on a well-drained bottom. Our illustration, showing the way in which it is used in French gardens, exhibits the graceful port of this species at a glance, and also the singularly effective character of the plant when associated with Yuccas and other fine-foliaged subjects in the open air. Scarcely any other Palm is better adapted than this for a centre plant in any well-arranged group of foliage or flowering plants; and small specimens are useful for this purpose, as well as for the decoration of apartments and reception-rooms. It is readily propagated from seeds sown in light soil in pots plunged in a gentle moist bottom-heat, and the plants are ornamental from the time they attain 9 or 10 inches in height until they outgrow the quarters allotted to them. Frequent syringings overhead are beneficial to them, especially during hot weather, in order to keep down red spider, and as soon as the pot or tub becomes filled with roots, a little manure-water is advantageous to them. Being readily propagated, it is reasonable in price; no one, therefore, need be without it on that score. We have noted several small plants doing well in apartments, but they require a plentiful and regular supply of water at the root, and the hard foliage should be washed at least once a week with a soft sponge and clean tepid water. If soap is used, be particularly careful to remove every particle of it from the plant afterwards, by either syringing or sponging with clean water. If only one Palm is required for either pot culture or for planting out in the conservatory, we should recommend this before all others, on account of its graceful habit and easy culture.

Q.

THE FLAMINGO PLANT.

(ANTHURIUM SCHERZERIANUM).

NEARLY every plant-grower is tolerably well acquainted with the many excellencies possessed by this beautiful decorative plant, and it deserves even more extended cultivation than it now receives. Few decorative plants have improved under culture so much as this singular Arad. It is a native of Guatemala and Costa Rica, growing in moist positions, and

bearing very small spathes, rarely over an inch long, among the dwarf herbage by which it is surrounded. Indeed, so inconspicuous is the plant in its native habitat, that collectors have passed it time after time, not considering it showy enough to be worth introduction. It was exhibited at South Kensington by M. Wenland early in the summer of 1862, but did not receive much attention at the time, and the figure in the "Botanical Magazine," of June, for the same year, is a correct representation of the inflorescence as it first developed itself under cultivation in this country. Liberal culture has, however, worked wonders, and, instead of the little "brick-red" spathes, only an inch in length, accompanied by foliage small in proportion, we now have fine forms bearing spathes from 5 to 7½ inches in length, and 3 to 5 inches in breadth, the colour being of the brightest shining scarlet or vermilion colour imaginable. Instead of taking the horticultural world by storm at first, and gradually sinking in public estimation, after the manner of many other new plants, this has gradually, but surely, won its way into popular favour, and is now to be found by the dozen in many private gardens, while some of our leading nurserymen have it in stock by the thousand, to meet the ever-increasing demand from amateur cultivators.

Propagation.

One thing likely to make this plant popular amongst small growers and amateurs is the ease with which it is multiplied, either by seed or division. Old and

well-established specimens frequently bear abundance of seed without any assistance from the cultivator; and, seed so produced rarely fails to germinate very freely, sown in shallow well-drained pans of light sandy compost. If placed in a close case, on a gentle bottom-heat, germination will take place much sooner, and the pan should not be disturbed, for the young plants will continue to make their appearance for a year or two after the seeds are sown. The young seedlings may be removed as they develop themselves, and, if pricked off into other pans,



Seaforthia elegans.

or potted singly in small pots, they soon increase in size and vigour. Sometimes it is necessary to assist the plants by artificial fertilisation in order to obtain seed, while in other cases plants seed themselves spontaneously, without any assistance at all from the cultivator. In order to induce fruitfulness, all that is required is to remove the pollen from the spadix of one plant to that of another, and the best way of effecting this is by the use of a camel's-hair pencil, slightly moistened in honey so as to cause the pollen grains to adhere. After fertilisation, the seeds are, at least, a year in arriving at maturity, and, when ripe, the scarlet berries start from the flower-spike and hang down at the sides, being held by two or three little white filaments. When they are ripe it is best to sow them at once, treating them as above recommended. The plant can, also, be propagated by the division of large specimens, or by removing the offsets, which are somewhat freely produced around the base of the old stools.

Culture.

This plant can be grown by everyone who has a plant-stove; or, even in a warm greenhouse, it does remarkably well if liberally treated. It likes a warm temperature and plenty of moisture at the root all the year round; indeed, any attempt to induce the plant to rest in order to promote the production of its bright spathes is sure to result in failure. The compost best suited to this plant is the same as that used for many sub-terrestrial Orchids, viz., fibrous-peat, in lumps as large as pigeon's eggs, living Sphagnum Moss, mixed with broken crocks, leaf-mould, and sufficient coarse well-washed sand-stone grit, to keep the whole open and porous. The plant must be well-drained, and, if possible, induce the Moss to grow freely on the surface of the compost. In potting, take care to elevate the plant well above the rim of the pot, and the addition of a little more compost and Moss is desirable, as the plant roots out above the pot. The plant is not subject to many insect pests, but, like all other hard-leaved plants, it should be repeatedly sponged with clean water, to remove dust and other impurities, while frequent and regular syringings with tepid water promote its healthy growth and vigour. The plant grows very freely when its requirements are duly attended to, and, in the case of vigorous specimens a little stimulant, in the way of weak liquid manure, is beneficial.

Varieties.

We know that most plants raised from seed vary considerably, not only in the shape and size of their foliage and floral organs, but, also, in constitutional vigour. This is especially the case with the plant in question, for we have several distinct varieties readily distinguished, at a glance, by minor differences in size or colour of the scape and leaves. In the case of Roses, Pelargoniums, or other florist's flowers, these would have received distinctive names ere this, but, at present, we have only one or two so honoured.

A. SCHERZERIANUM, var. DIXONII.—This is a peculiar abnormal variety, tolerably free in its growth, differing from the other forms in having a curious double spathe. It does not come true from seed, but can be readily multiplied by division.

A. S. ALBA.—The white-spathed variety of this plant is not yet distributed by its fortunate possessor, but it cannot fail to become a general favourite when generally known. In habit, the plant is like the normal forms, but the spathe is of milky whiteness, with a bright orange-coloured spadix. As an exhibition plant it cannot fail to be invaluable as a striking contrast to the scarlet-bracted forms. I can readily imagine many things as likely to occur in horticultural philosophy, but the advent of this snowy beauty took me quite by surprise, since I never heard a whisper as to its existence until I was ushered into the presence of a flowering plant by its lucky introducer.

A. S. MAGNIFICA.—This is the best variety, having very large, thick, deep green leaves, deflexed from the petiole, and it bears spathes 6 to 7 inches long, and of a proportionate width, while, in colour, they are of the most brilliant scarlet imaginable. Fine specimens of this noble variety have repeatedly been exhibited by Mr. T. Baines, Messrs. Cole, of Withington, and many other noted exhibitors. There is no comparison between

this variety and some of the others which have erect, narrow, dry-looking foliage, and small dull-coloured bracts. Good plants of this variety frequently bear from twenty to fifty great scarlet spathes, forming one of the finest and most effective of all exhibition plants in cultivation. There is another excellent variety with narrower leaves and smaller spathes, about 4 inches long by $2\frac{1}{2}$ to 3 inches wide. This plant, like the last-named form, has a robust and vigorous constitution, and is very profuse in the production of spathes. I once saw a plant of this nearly a yard across in the collection of Mr. Sigismund Schloss, Bowdon, Cheshire, and this plant bore upwards of a hundred of its showy bracts. At least one plant of each of the above should be grown in every collection of choice stove plants, however select.

F. W. BURBIDGE.

Dendrobium Boxallii (Rehb.)—The more we know of Orchids, the more are we perplexed by their affinities, and, in some cases, shadowy differences. The present plant, however, is quite distinct enough to constitute a species, though, in most respects, it closely resembles others already generally in cultivation; still, its chaste beauty cannot fail to make it a favourite when better known, especially as it flowers most profusely. I received notice of its having flowered in three collections nearly simultaneously, viz., with O. O. Wrigley, Esq., Bridge Hall, Bury; Messrs. Low & Co., Clapton; and with Messrs. Veitch, Chelsea, the last being the first to exhibit blooming specimens of it at South Kensington on the 18th February last. In general habit it most nearly resembles *D. Wardianum*, having stont knotted bulbs, which vary from 1 to 3 feet in length, and which are pendulous. The flowers are borne on the leafless bulbs of the preceding year, and generally in clusters of two, rarely three, together. The individual flowers vary in size on different specimens, the largest being about $2\frac{1}{2}$ inches across. Sepals and petals, pure white, tipped with bright rosy-lilac or pale magenta. The lip is nearly round, with a large circular blotch of pale orange-yellow in the centre, the apex tipped with pale magenta. In general appearance the flowers are nearly exactly intermediate between *D. crystallinum* and the knottystemmed *D. crassinode*, but they are, in most cases, larger and more brighter coloured than those of either of those species. I have counted fourteen flowers on a bulb 15 inches long in the Clapton Nursery, and it flowers equally freely elsewhere.—F. W. B.

Orchids now in Flower at Oakley House, Gledhow, Leeds.—*Angraecum eburneum*, *Calanthe Masuca*, *C. nivalis*, *C. Turneri*, *Cattleya labiata*, *C. Trianae*, *C. T. albidia*, *Cœlogyne cristata*, *C. alba*, *Cypripedium birsutissimum*, *C. Hookeræ*, *C. Lowii*, *C. Roezli*, *C. Schlimii*, *C. venustum*, *C. villosum*, *Dendrobium Boxallii*, *D. Dayanum*, *D. heterocarpum*, *D. Infundibulum*, *D. Jenkinsii*, *D. litiflorum*, *D. macrophyllum*, *D. moniliforme*, *D. nobile*, *D. n. pendulum*, *D. Primulinum*, *Epidendrum atro-purpureum roseum*, *E. Ibaguense*, *Lycaste Skinneri* (many varieties), *Masdevallia Veitchii*, *Mesepinidium sanguineum*, *Odontoglossum Bictonense*, *O. Cervantesii* resenm, *O. crispum*, *O. cordatum*, *O. Ehrenbergii*, *O. gloriosum*, *O. Hallii*, *O. luteo-purpureum*, *O. maculatum*, *O. nebulosum*, *O. Pescatorei*, *O. pulchellum majus*, *O. Rossii*, *O. triumphans*, *Oncidium cucullatum*, *O. Kramerianum*, *O. luridum*, *O. Ornithoryncum*, *O. sarcedes*, *Phalænopsis amabilis*, *P. grandiflora*, *Trichopilia suavis*, *Vanda tricolor amabilis*, *Warscewiczella velata*.—W. H.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Dendrobium Wardianum.—This is now flowering in many collections near London, and several fine plants of it were exhibited the other day at South Kensington. A specimen of it at Alton Towers is also now bearing twenty-five large richly-tinted flowers. It is one of the finest of all known Dendrobies, and is deservedly a general favourite.

Dracæna congesta.—Of all the varieties of the Dragon tree, this is certainly one of the best for indoor culture. Its habit is extremely graceful, its foliage being borne on an erect slender stem, each leaf gracefully recurved, and of a fresh green colour. Like all other hard-leaved plants, it requires regularly sponging to keep it in good health, and, if the plants are laid on their sides and sprinkled with soft tepid-water, it freshens them up very much. My plants, a nice pair, were purchased in the autumn, and have never ceased growing all through the winter. I bought a plant of *D. terminalis* at the same time, but it seems more delicate and difficult to manage.—H. A., *Sydenham*.

Clematis indivisa.—I have three plants of this free-blooming species, and consider it to be the best of all for cut-flowers. In habit it is quite distinct from any other *Clematis* with which I am acquainted, having smooth glossy foliage, that contrasts well with its pearly flowers. Each bloom is about the size of a crown piece, composed of about eight white wax-like lance-shaped segments, with a cluster of lilac-tinted anthers in the centre. It is rather too large for button-holes, but for bouquets it is one of the most distinct and beautiful of all winter flowers. I used some of its blooms and buds the other evening in making a wreath for a lady's hair, and it was very much admired. I find Mr. Standish uses it extensively for floral decorations.—J. W. S.

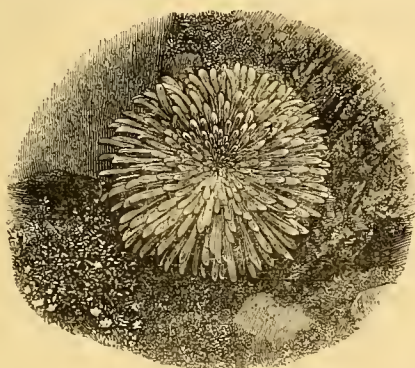
THE FLOWER GARDEN.

SAXIFRAGES.

By J. C. NIVEN, Botanic Gardens, Hull.

The Crustaceous Group.

SAXIFRAGA LONGIFOLIA.—I have already alluded (see p. 239) to this as the "Queen of Saxifrages," nor could a more appropriate title be found for this lovely plant; but, before I say more as to wherein those elements of beauty consist that entitle it to that rank, let me ask—what is *S. longifolia*? Some twenty years ago, under the same name, a plant was grown that clearly did not carry out the original distinctive character of this lovely species: its leaves were nearly as broad as *S. Cotyledon*, but devoid of any tendency to an obovate character; it formed rosettes of an equal, if not greater, diameter than this species; its flowers were much fewer and more scattered, and the inflorescence altogether larger. I have myself seen an exceptionally well-developed cyme of the so-called *S. longifolia* acquire the height of 3 feet 2 inches, each petal being dotted with numerous minute crimson spots. These, though in the distance unobservable, added much to the beauty of the individual flowers on a closer investigation. I had long before satisfied my own mind that this was not the true *S. longifolia*, but that it must be referred to Sternberg's variety of the same, to which he gave the name of *S. longifolia* var. *elator*. So different, however, is the plant from the true species, that I was always disposed to look upon it as worthy of sailing under its own name; and I think there need be no

*Saxifraga longifolia* on rock-work.

hesitation in referring it to Kerner's *S. altissima*, recognised as a distinct species by Engler in his "Monograph," under which title I shall presently deal with it. Returning, therefore, to the true *S. longifolia*—for whose introduction into cultivation in this country we are indebted to our indefatigable Alpine-growers, Messrs. Backhouse, of York—we find it, as regards the rosette previous to blooming, distinguished by its narrow linear slightly-spathulate leaves, being much recurved, and nearly convex on the surface, by the presence of a large amount of the calcareous incrustation, and a total absence of offsets from the base of the plant (one form produces these freely; but, as I have not yet seen it in bloom, I can say no more than that it is not the true species). When grown in good well-favoured soil, the rosette will attain a diameter of 9 to 12 inches, composed of considerably over 200 leaves, and, under these circumstances, has a charming effect—so much so as to cause one to wish that it might continue to retain, through a series of years, its juvenile character. When it does bloom, it sends up a dense spike of whitish flowers, whose petals towards the base acquire a crimson tinge from the immense number of minute dots of that colour, the beauty of the tinting being much enhanced by the contrast presented in the yellow-coloured anthers that occupy a varying relationship to the crimson of the petals, according as the stamens retain their normal position, or approximate towards the styles, which they alternately completely surround—a peculiarity, by the way, not confined to this species only, to which I would invite the attention of my readers, at least such of them as may be interested in the singularly complete arrangements by which nature occasionally assists in the process of fertilisation.

As I have before said, the tendency of any plant of this species to throw out offsets indicates at once a divergence from its true typical character; therefore, that mode of increase is not to be depended on. It is, however, to be got true from seed, in a degree, at least, judging from my own experience, of about one in five; the typical plants may readily be selected the second year, and to this somewhat erratic source those who possess the plant must look for increase. The gracefully-curved lines that the leaves present, their exquisitely symmetrical arrangement, accompanied by the well-defined marginal line of white along the sides of each leaf, render this plant, in its true form, fully entitled to the queenly title it has received; and possibly the rich and varied flora of the Pyrenees has never contributed a more charming addition to our rock-gardens than *S. longifolia*, to which mountain range, so far as our present knowledge goes, it appears to be confined.

S. ALTISSIMA, of Kerner, is so closely allied to the preceding species, that it unquestionably claims our attention next. I have already stated that, possessing, as it does, a much taller inflorescence, accompanied by a sparser arrangement of the flowers, it appears to lay claim to a distinct specific title. I believe the plant, which is often seen in cultivation under the name of *S. nepalensis*—a name in the highest degree inappropriate, seeing that we have no record of a crustaceous species occurring in the Himalayas at all—is identical with this species. Its geographical habitat is in the Tyrol; and, if I am not mistaken, it was originally introduced into this country, under the old name of *longifolia*, from the Botanic Gardens at Munich.

S. LINGULATA.—The tongue-leaved Saxifrage is one of the freest-growing border-plants of the large-foliaged section of this group; its rosettes are of considerable size, but lack that symmetrical regularity that characterises the preceding species. The surface of each leaf is slightly channelled, and, being of a greyish colour, the marginal markings do not present the same distinct appearance; nevertheless, as a border or rock plant, it is by no means to be despised. It grows so freely, especially on a cold damp soil, that a small tuft will, in a few years, become a dense irregular patch of nearly a yard in diameter. The flowers are of a creamy-white, quite devoid of any pink colour, and are produced on irregularly-panicked cymes, densely arranged at the termination of the secondary branches. The weight of the bloom usually causes the whole inflorescence to incline to one side, and, after a shower of rain, they are generally prostrate on the ground; nor do they readily assume the perpendicular after having been once bent down. So freely does this plant send out offsets, that, though I have saved large quantities of seeds, I have never deemed it worth the trouble of raising from seed. It is a native of the Alps, Apennines, Pyrenees, and the islands of the Mediterranean, but does not appear to have penetrated into northern Europe at all. According to Engler, *S. lantoscana* and *cochlearis* are looked upon as varieties of this species; but, as I fail to see the relationship, I shall deal with them hereafter as distinct species.

S. HOSTU—said to be synonymous with *S. elator*, though that which I have cultivated for many years as *S. elator* is evidently more nearly related to *S. aizoon* than to the species under consideration—is very distinct in its general appearance; its rosettes are comparatively small, not more than 2 or 3 inches across; their leaves are bluntly and broadly linear, recurved at the points, and always of a light yellowish-green colour; the marginal markings assume a distinctly separate and serrated character; it rarely produces flower-stems, and, when it does so, they scarcely ever rise to a height of even 12 inches; the flowers, similar in colour to the last species, form tasselly groups at the ends of the secondary branches. It is a native of the Apennines and the southern slopes of the Alps, but is generally confined to the Dolomitic Mountains.

S. PECTINATA is a compact-growing plant, with leaves about an inch long, gradually tapering from the base to a somewhat acute point. There is, perhaps no species that shows so distinctly those white marginal markings as this; hence, its extreme value as an element recently imported into the flower-garden, and, unquestionably, a line of it has a wonderfully pretty effect, especially in the early spring. When the first push of active vital growth appears, then the frosted silvery character of the leaf-markings comes out to perfection. Its flowers are white, produced in dense compact thyrsoïd cymes,

and rising to a height of about 9 inches. How is it that this plant does not appear to be recognised, even in the subordinate capacity of a variety? In Engler's "Monograph" the very name is completely ignored, and yet, not only has it a perfectly distinct general appearance, but it also retains its character when grown from seed much more perfectly than many of our recognised species. It is a native of Carinthia, extending into Asia Minor, and pretty abundant on the Caucasus.

S. ROSULARIS.—Under this specific title—given to it by Schleicher, a Swiss botanist—a plant has long been cultivated, and so familiar will all my Saxifrage-growing readers be with it, that I feel sure they will agree with me when I hesitate to consider it merely a form of *S. Aizoon*, but look upon it as a good, constant, and most appropriately-named species. Its chief distinctive characters consist in its forming a mass of somewhat lax circular rosettes, varying from 1 to 2 inches in diameter, each rosette formed by a limited number of almost orbicular leaves, whose margins, on close examination, present a set of beautifully-regular cartilaginous serratures, inside of which occur the large crustaceous dots, each being well separated from its adjacent neighbour; the body of each leaf assumes a concave or cup-like character, and is of a deep green. The floral axis rises from 9 to 12 inches high, and its flowers are white, of larger size, and possessing a larger development of disk than occurs in any of the *Aizoon* group. The very fact of its having been cultivated for thirty years, to my knowledge, and that it at the present day retains as perfectly those well-pronounced characters that it did at the first, give it, in my opinion, full and ample claims to the specifically distinct status which I here recognise. It is a native of the Swiss Alps, and grows freely in any dry sandy soil, but, in a damp situation, becomes sickly and loses nearly all its beauty.

PRIMROSES AND POLYANTHUSES.

WITH the wild Primrose all of us are familiar; nevertheless, the true lover of nature, walking abroad in early spring, stoops with delight over a patch of it in full bloom, and not improbably plucks the flowers in admiration of its beauty. But what would he think if, instead of patches of the unpretentious wild Primrose flowers, he suddenly lighted upon a bit of woodland, or some shady glen, the whole of which was carpeted with the richest and loveliest hues—white, yellow, lilac, mauve, red, purple, crimson, and other intermediate shades—all Primroses, and all growing as freely and blooming as abundantly as our old familiar wild kind could possibly do in like circumstances? This conception may be treated as an absurdity. And yet, if Primroses of the most lovely hues of colour, having habits exactly like that of vulgaris, and endowed with constitutions as hardy, can be easily and freely grown in our gardens, why may they not be found in abundance in woods and wild gardens? How is the wild Primrose propagated so freely? Of course, chiefly by seed, although, from the grassy nature of the seed-bed, perhaps not one-tenth of all that nature sows germinates. What nature does so imperfectly, and yet so well, surely may be improved upon by the gardener's art; and whilst no one would advise the indiscriminate casting of choice seed in all directions, in the hope that some may grow, it is safe to assert that if holes were here and there scooped out in banks or dells, or beneath the shady trees, and anywhere about the wild garden or woody glades of an estate, and then filled up with fine soil, and just a few seeds of rich-coloured kinds sown, nearly all would grow, and then the transformation would soon be accomplished. There can be no doubt that in the past few years we have made great strides in the production of really good and beautiful forms of the Primrose. The true habit is retained, but the flowers now have a good rounded form, and have substance, and, indeed, possess that refinement of appearance that charms the eye, and, at the same time, satisfies the judgment of a true florist. This is great gain; for, with the recurring desire in the public taste for old favourites, and especially for early spring flowers, it is most pleasing to have these gems to offer as specially adapted to suit the demand that is now arising. One or two kinds have of late been made prominent in the floral world for their diverse, but particular, beauties. These are *Primula altaica*, a

true single primrose, the flowers of which are of a delicate mauve-lilac tint, which is also extremely early to bloom; and *Primula auriculæflora*, a rich crimson single Primrose that blooms most profusely and early, and which has such recognised merits that it has received a first-class certificate from the Royal Horticultural Society. These kinds are in commerce, and are, therefore, obtainable. In the spring of last year a very lovely seedling kind, named *Violet Gem*, also received a first-class certificate, because of its novelty, the rich violet-purple hue of its flowers, and the neat bouquet-like form in which they were borne on the plant. This kind is, however, but the *avant-courier* of many others equally beautiful, and of the same strain, but having great variety of colour, and with most of which the lovers of Primroses will have a better acquaintance as soon as their stocks become abundant. *Fairy Queen* is pure white; *Sulphurea*, large sulphur-yellow; *Magenta Beauty*, a rich tint of magenta colour, and very pleasing; *Rosy Morn*, large, in colour, bright rosy-scarlet; *Lilacina*, delicate mauve-lilac; *Crimson King*, deep rich crimson; *Sunrise*, large rich red; *Queen of Violets*, a charming violet tint in colour, good form, and robust grower; *Marguata*, blooms large, bright red, and edged white; *Glowworm*, deep blood crimson; *Violacea*, very early, distinct, and pleasing; and *Splendour*, large, crimson-scarlet. All of these are quite distinct from each other, and form a lovely selection that few can realise the beauties of till they have seen for themselves. Until they become plentiful they amply repay for pot-culture, and, indeed, when kept under glass during the winter, will bloom early in the new year, whilst their beauties are protected from the rude storms and frost of the open air. With the rising taste for Primroses, of course the double kinds are not forgotten—these being specially favoured, because their flowers are so solid, and are valuable, when gathered, either for button-holes or bouquets, or for that kind of indoor decoration for which all flowers are alike acceptable. With the old *Double White* and the *Lilac*, nearly all persons who have gardens are familiar; they are common and constantly met with, especially in places where spring-flower gardening constitutes a prime feature. They are, also, favourite cottagers' plants, and, in some market and flower-gardens around London are very extensively grown, that the flowers they produce so abundantly in the early spring may be gathered for market sale. In some old gardens huge patches of these kinds are found, the bottoms, probably, not having been moved or divided for many years. As a rule, however, the plants should be lifted and divided every two or three years, as the blooms are then much finer and more freely produced. In order of abundance, the *Double Sulphur* comes next, and it is an exceedingly early kind, and a strong grower. Plants of this sort, if they have done well during the summer, will commence to bloom early in November; and, if kept under glass, will carry flowers all through the winter. Very equal to this, both in habit of growth and early flowering, is the *Crimson Purple*, or, as it is sometimes called, "The Scotch." The foliage of both these latter kinds is narrow and tapering, and very smooth. By these peculiarities these sorts are easily distinguishable. The finest yellow is known as the *Giant Yellow*, producing very large double blooms, in colour, straw-yellow, borne upon long stout stems; and it makes a capital variety to gather from for bunching. The richest-coloured, however, is the *Late Yellow*, a distinct kind, more resembling the *White* in habit and size of bloom. Very choice and scarce is the *Rose Double*, a beautiful kind, and one deserving a much wider cultivation; the flowers are in colour rosy-red, of medium size, and freely borne. Then there is the *Purple*, which is a deep-coloured form, and by no means common; and last, though not least, the *Double Crimson*, the richest and most effectively coloured one of the list. This kind is exceedingly rare—so much so that it is difficult to get half-a-dozen plants anywhere, those who have stock clinging to them with great tenacity. As far as my knowledge extends, I believe that these nine kinds constitute the whole of the varieties of double Primroses to be found in cultivation. I have also added to my stock a very pleasing kind called the *Blush*. It is white, shaded with mauve; evidently a sport from the old *White*, and a robust grower. I have examined growers' lists, and can find none others, and but one or two persons offer the whole of them

for sale. This comparative scarcity is due to two causes: careless cultivation and popular negligence. The latter reason, especially, has operated largely to restrict the growth of these Primroses, as of late years the mania for gorgeous summer bedding-plants has acted most disastrously in causing the neglect of many of our hardy border gems. We are gradually creeping out from under the crushing influence of this mania, and there are healthy signs in various directions, that almost forgotten hardy spring plants are once more coming into favour. The Polyanthus forms of the Primrose present many different types, varying from rugged and colourless kinds, scarcely superior to the common Cowslip, to the beautiful gold-laced section, the florists' pet flowers, the markings of which must be as perfect and as evenly defined as it is possible to have them. This is the section of the Polyanthus so popular as exhibition flowers—especially in the north—and named kinds of these are abundant. It is, however, a remarkable feature of this strain, that the very best named kinds of the present day do not present one single feature of advance over the kinds that were popular forty years since. The old florists' rules have "cribbed, cabined, and confined" these show Polyanthuses within such restricted space for improvement, that actually many fine old kinds have been entirely lost, and inferior ones have taken their places. Charming as are a few nice well-bloomed plants of the gold-laced kinds, it is nevertheless particularly noticeable that they all present features of real similarity; so much so, in fact, that it requires the eyes and knowledge of an expert to discover the difference. Still, these have their worshippers, and they are not a few—men who will go into raptures over a laced flower, but will turn with contemptuous indifference from a kind that, however beautiful, is yet without the prescribed pale of show flowers. The richest-coloured, most varied, and finest forms of the Polyanthus are what is now known, for lacking a better name, as the fancy section—these presenting features specially adapted for border decoration, being strong, robust, and standing drought well. Many have blooms as large and rounded as a florin, and, if but admissible as exhibition plants, would soon supersede the laced kinds. Some have very clear and decided colours, and, when in bloom, carry the trusses in dense even bunches, so that they may well become specially useful for spring bedding. The colours range from pure white, sulphur, yellow, mauve, red, purple, and crimson, with many intermediate shades and varied markings, all extremely beautiful. I grew a large mixed bed of these last spring, and think I never saw any mass of spring flowers more attractive and gay than they were, and they only require to be universally known to be as universally admired. There are some particular kinds of the Polyanthus grown specially for market, that differ from any of the before-mentioned sorts, as they have, in some respects, the habit and character of the laced kinds, and are yet devoid of edging, being simply very dark self-flowers with good substance and blooms of medium size; they are peculiar to the London market trade, but present little variety. These are usually sold as roots, large quantities being grown. For

bunching, kinds that have the merit of being dark in colour, and have large trusses on long stems, are most favoured, and any sorts that come well up to these merits are in great request. Of course, any grower for market has need of very large quantities of any one kind, and to obtain these from new ones is a work of great time. The market flower-gardens present many features of interest in the spring, not a few of which are found in the varieties of the Polyanthus. Few plants are more easily grown and increased than the Primrose family, as all the single kinds will seed freely, and reproduce themselves in abundance by that means. Propagation by division of the roots is also simple, the plan being to lift the plants about November, and carefully pull or cut the roots into several parts, and then replant again in good well-dug soil; these young plants will carry good heads of bloom the next spring, and should be allowed to remain untouched for two years at least. The

greatest enemy of the Primrose is drought; it likes a little shade, but specially delights in a nice cool deeply-worked soil, into which it can send its roots freely. A dressing of old pot earth around the stools during the summer, especially after a soaking rain, is most serviceable, and adds not a little to the growth of the summer crowns. When these are strong, autumn blooms will always follow, and thus the flowering period is prolonged. Choice new or scarce kinds are best kept in pots for a year or two until their stocks are increased, when they may be planted out at discretion. A. D.



Lilium speciosum.

JAPAN LILIES.

Among the species of Lilies, introduced into this country from Japan, the varieties of the lance-leaved kinds are most valuable summer-blooming plants, either for conservatory decoration or for beds and shrubbery borders in sheltered positions. Bulbs of this class are now cheap, and easily procured, while their culture is so easy that failure need scarcely be apprehended. For conservatory or balcony culture they are best grown in pots, and, as they are gross feeders, a rich compost should be used for them, such as fresh fibrous loam and leaf-mould, with a sufficient quantity of coarse sandstone-grit in it, to keep the whole in a porous condition; and, after the pots have become filled with roots, repeated doses of clear liquid-manure will be found to be beneficial. By clear liquid-manure I mean that from which all coarse sediment has been removed. Unless this is done, this sediment forms a close layer on the surface of the compost, clogging it up, and preventing the circulation of air, which is so essential to the roots of all plants in active growth. In potting Lilies I use 12-inch pots, place three bulbs in each on a well-drained bottom, and make it a rule to plant the bulbs low down in the pot, so that, when they are covered with an inch or two of compost, the pot is little more than half-full of soil. Thus, when the roots appear above the soil, fresh material is easily applied to them, which infuses fresh vigour into the young growths, and, as a matter of course, finer blooms are the result. As soon as all danger from late spring frosts is over, I take the Lilies from the pits or greenhouse, and plunge them in coal-ashes outside, in a sheltered situation, at the

same time giving them the protection of a tiffany awning, which not only breaks the force of the sun's rays, but also shelters the young growths from high winds. A border under a north wall suits them admirably, as I find that they do not like the full glare of the summer's sun. Grown in this way, I have had fine specimens, from 4 to 5 feet high, and nearly as much through, bearing from 100 to 200 fully-expanded flowers and buds. When in this state of perfection, they are invaluable for indoor decoration, and are also useful for conservatory ornamentation or exhibition purposes.

Out-door Culture.

Lilies of this class will also succeed in beds and borders for several seasons. For this purpose I start the smallest bulbs two or three in a 32-sized pot at the same time as those for pot-culture, viz., in February or March; but, instead of potting them on like the others, I simply turn them out of the pots into the positions which they are to occupy about the beginning of June, after which they require no attention, except staking, and occasional waterings in dry weather. A great point in the way of securing success is to plant deep in the following manner. First, take out the soil of the bed 18 inches deep, forming a hole about the same width. "Imagine a hole half-a-yard deep in which to plant a Lily"—it may be said; but this is my system, and I must be blamed, after having tried it and failed to experience its advantages over sticking in the bulbs to be half-roasted by the scorching sun, if success is not the result. In some cases I have taken out a hole 2 feet deep, but the depth above mentioned is generally sufficient. At the bottom of this hole I place 3 or 4 inches of broken bricks, or lime-rubbish, to act as drainage, or some rough littery manure from the stable-yard does nearly as well, and upon this I place about 4 inches of a rich soil, composed of ordinary garden loam and well-rotted hot-bed manure in equal proportions, and on this I turn out the Lilies, as above stated, in June. The ball need not be broken, and fill up round the sides with the loam and manure, giving a good watering to settle them in their places. Only just cover the ball. Now, it will be seen, that each plant is in a little well, or hollow, the sides of which serve to protect it from rough winds until the roots are firmly established in their new quarters. As the plants increase in height, fill up the hollow with rich sandy earth, and water as required. It will thus be seen, that when the hollows are filled level with the surface of the bed or border, the roots are at least a foot below the surface of the soil, and, no matter how hot and dry the season may be, Lilies thus planted will have plenty of moisture below in which their roots will luxuriate in spite of the hot burning crust of dry earth which surrounds the stems above. Our out-door Lilies, thus managed, have invariably been greatly admired.

I will now give a short list of the varieties which I cultivate in the manner just described, and, may remark, that on warm dry soils in some favoured localities, the bulbs need not be taken up in the autumn, as they are hardy enough to withstand the most severe winter, if mulched with a thick coat of stable dung or leaves, covering the whole with a thin layer of soil to prevent its having an untidy appearance.

L. SPECIOSUM.—This is a showy form, having reflexed, wax-like, pure white segments suffused and spotted with crimson. The brightly-coloured anthers also add to the beauty of the flower; but if they are cut off before the pollen-cells burst, the flowers keep much longer in good condition than they do if left undisturbed.

L. SPECIOSUM ALBUM.—This is like the preceding in all respects, except that the flower is of the purest white, and, if anything, rather smaller in size. It is distinct, and well deserves cultivation as a variety.

L. SPECIOSUM PUNCTATUM.—This is as nearly as possible intermediate between the above, the segments being of pearly-whiteness, delicately suffused with soft flesh-colour, with a few deeper-coloured rosy spots.

L. AURATUM.—This, "the Golden-rayed Lily of Japan," as it is called, grows well and blooms profusely, treated as has just been described. It is generally grown as a pot or house-plant, but it is very nearly hardy—quite so in positions as far

north as Leeds, and when this fact becomes fully recognised, it will prove to be one of the best, most easily-grown, and showy of hardy bulbs. Seedlings vary much in the size and colour of their flowers, but all are beautiful. This variety can now be had very cheap, bulbs being imported from Japan every autumn and winter by the thousand.

Many other kinds of Lilies also, may be grown as has just been recommended, and will amply repay the little extra trouble which they receive.

J. B.

Hardiness of Eryngium bromeliæfolium and Pelargonium Endlicherianum.—Mr. Perry notes the complete hardiness of *Eryngium bromeliæfolium* (p. 241), and Mr. Harpur Crewe notes the non-hardiness of *Pelargonium Endlicherianum*. Here the case is exactly the contrary; the *Pelargonium* seems quite uninjured by the winter, while I have never been able to keep *Eryngium bromeliæfolium*. The first frost kills it, while the very similar *E. yuccæfolium* survives. This leads me to remark that the term "hardiness" is very misleading. A plant dies during the winter, and it is at once pronounced not to be hardy; but this is certainly not proved; it may not even be true of that particular garden, and it may be quite untrue of a garden not a quarter of a mile distant. Plants die from many other causes than cold; from weakness, old age, slugs, mice, carelessness, or unsuitable soil. Plants, again, are often pronounced not hardy simply because the owner has no patience. Very many plants, after flowering or after transplanting, rest completely for a year or even more; the owner pronounces them dead and they are dug up and thrown away. In this winter I shall lose a great many plants of whose hardiness there is no doubt, yet which have certainly been killed by the winter. They have not been killed by the cold but partly by the wet, and partly by the alternation of mild with frequent, though not severe, frosts. The plants that have suffered are chiefly herbaceous plants, which do not die down beneath the surface, but which show an exposed growth of green.—H. N. ELLACOMBE, *Bitton Vicarage*.

Winter Cress (Barbarea vulgaris variegata).—This is one of the hardest of decorative plants, and one which is exceedingly useful for spring bedding, for which purpose it should be sown in August. If sown a month or six weeks earlier, however, the young plants have a pretty appearance throughout the winter months. The plants from these sowings should be cleared away the following summer, and something else substituted, as their liability to run to seed makes them objectionable. If sown now, they will prove useful in the flower-garden in summer. They grow freely, and the leaves are beautifully variegated with yellow, which is quite permanent. They are well adapted for edgings to flower-beds and borders, and they enjoy a moderately damp and rich soil. Self-sown seeds come up freely where plants that have been allowed to seed have been growing.—W. FALCONER.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

A fine Rose Hedge.—In Lord Middleton's garden at Applecross is one of the finest Rose hedges in the kingdom, which, last season, was one sheet of flowers. The variety is *Gloire de Dijon*, and the hedge is used as a screen, which simply consists of a neat wire fence with five strands, to which the plants are fastened. This hedge is 5 feet in height, and over 200 feet in length.

Lonicera Standishii.—For several years we have noticed this sweetly-perfumed white-flowered Honeysuckle blooming in front of the Museum at Kew. It is not showy, but its foliage looks fresh and green during the summer months, and its grateful odour and habit of flowering early, entitle it to a place in every garden.

The Early Bulbous Iris.—One of the most singularly beautiful of spring flowers, is the early bulbous *Iris* (*I. reticulata*), which is now flowering freely in several establishments in the neighbourhood of London. Its flowers are of a violet-purple, veined and beautifully stained with orange, and deliciously fragrant. In well-drained sandy soils this plant is thoroughly hardy, and on account of its early flowering deserves a place in every garden.

Night-flowering Plants.—You must add to the list of these (p. 241) the *Yuccas*. They rank in this respect with the Evening Primrose. The flowers begin to expand at dusk—they fully expand during the night, and though soon fully expanded during the day following, they are then beginning to close. It is partly owing to this arrangement that the flowers are so seldom fertilised in Europe. Those of your readers who wish to know more of this subject should consult Dr. Engelmann's interesting paper on the Genus *Yucca*, in the "Transactions of the Academy of Science of St. Louis," April, 1873.—HENRY N. ELLACOMBE, *Bitton Vicarage*.

Origin of Double-flowered Pelargoniums.—The following extract from the journal of a horticultural tour through some parts of Flanders, Holland, and the north of France, in the autumn of 1817, by a deputation of the Caledonian Horticultural Society, may be interesting to M. Sisley, as it appears to be what he has been looking for in vain in the very town where the plant was common at about the time he mentions:—"We may here notice that an ornamental variety of *Pelargonium inquinans*, with double flowers, is very common at Ghent, no fewer than ten different competitors having exhibited flowering specimens of it at the last festival. This variety, we believe, has not yet reached Scotland."—J. G. NELSON.

GARDEN DESTROYERS.

GARDEN PESTS.

By THOMAS BAINES, Southgate.

Woodlice.

THESE are exceedingly troublesome when they exist in large quantities. Being almost omnivorous, nothing comes wrong for them. They seem to equally enjoy a juicy Peach or Melon, a nice fresh Mushroom, the roots of an Orchid, or the most putrid animal or vegetable matter, if in a sufficiently dry state. Where they exist in large numbers in the Orchid-house, they do great damage by eating the young feeding points of the roots, especially of such things as Cattleyas, that require to be kept dry when not in active growth, but which, nevertheless, make a good deal of roots during that season. If the woodlice are numerous at this time, they will destroy almost every root that is made on the surface of the pots, rendering the growth which follows small and weak. They are extremely partial to horse-droppings in a half-dry state; where they exist in quantities, a number of 10-inch or 12-inch pots may be kept, filled with droppings, and placed amongst the plants, near the pipes, or wherever they congregate. If these are taken out and emptied once a week, the insects destroyed, and more droppings put in, they may be soon reduced in number, so as to be incapable of much harm. Sweet Apples or Potatoes, scooped hollow and placed upon the pots will attract them; if these are looked over every day, considerable numbers of the insects will be found underneath. Melon-frames and pits are their favourite haunts, especially the latter, if the brick-work is out of order, affording them means to secrete themselves. In the winter, whilst the pits are empty, point up all defects in the mortar, lime-wash, and remove all old soil or other material in which they can find shelter; and, as soon as the young plants are started, commence placing traps for them at once—do not wait until they exist in large numbers. It is the delay in taking means for their destruction until the place is swarming with them that renders them capable of so much mischief. Nothing is better than boiled Potatoes cut in two, the pieces put simply in small flower-pots, and over these a little dry Moss. If the traps are examined once a day, the insects will be prevented from ever existing in sufficient numbers to do harm. In the Mushroom-house they are a very great nuisance, for here everything exists congenial to their taste—warmth, food, and material in which to lodge. If they exist in great numbers, boiling water poured down the sides of the beds up to the wall will destroy all it comes in contact with. The little pots with the Potato baits can be used with advantage; but here, as with the Melons, taking time by the forelock in destroying them, before they exist in numbers sufficient to do much harm, is the right way. They sometimes are a source of annoyance on the Peach-wall, by eating holes in the ripe fruit; it is not the quantity they eat, but the number of fruit they disfigure. Here they exist where the mortar in the joints is defective, and more especially under the coping, where they meet with suitable lodgings. The best remedy is keeping the walls well pointed, so as not to allow them any place to secrete themselves; without this they cannot exist, for all the soft-billed birds, such as robins and hedge-sparrows, devour them eagerly if they can get at them.

Wireworms.

These are the worst of all the earth worms, their ravages on the corn crops of the country in some seasons being such as to affect the price of the staff of life, and frequently necessitating the ploughing up of large breadths of corn through the destruction of the plant. In gardens they are equally destructive, especially in such as are newly-made, or where there has been new soil added from Grass-land. The wireworm is not at all fastidious as to any particular description of food, being equally at home feeding on the roots of a choice Ranunculus, Pink, or Carnation, or in the kitchen garden on the more homely fare of Potatoes or Beet. In some parts it exists in much greater numbers than in others. In the south of the kingdom it is much more plentiful than in the north. There is nothing that suffers more from its attacks than that now much and undeservedly-neglected flower, the Ranunculus.

Its equally beautiful companion, the Anemone, suffers by the attacks of this insect in a somewhat less degree. The old Ranunculus grower finds it necessary to pass through the hand the whole of the new soil he yearly adds to his beds, breaking every piece that is sufficiently large to conceal any of these unwelcome visitors; and, after the soil is consigned to the beds, it is necessary to resort to the further precaution of inserting slices of Potatoes thickly an inch below the surface of the soil, looking over them every day. When any addition of new loam has been made to Pink, Carnation, or Pansy beds, the placing of these Potato traps is necessary, or the mortification most likely will have to be endured of seeing many a fine pair of plants destroyed. In newly-made kitchen gardens for two or three years they are very troublesome. I have seen them attack the crops of early-sown Peas, especially when the season is such as to delay their coming up for a considerable time, eating three-fourths of the seed by the time the plants had made their appearance above ground, and were, consequently, in a great measure dependent upon the seed for support. Potatoes they completely destroy the quality of; if a tuber is pierced even to only the depth of a quarter of an inch by wireworm, the texture of the Potato is spoiled, being, when cooked, devoid of the dry sparkling starch, and more like a piece of soap. French Beans, Runners, and Broad Beans also suffer from their attacks. They frequently are very destructive to the different members of the Cabbage family, often being mistaken for the ordinary Cabbage grub or clubbing. I have found with this, as with other garden pests, that in some parts of the country it is more partial to one particular crop than in others. The most effectual means I have ever tried on new broken-up land was, at the beginning of March, to sow the whole over with a thin crop of Mustard, letting it grow until it was just coming into flower, and then digging it under, just covering it with the soil. It would appear that the plant so treated has the effect of killing the wireworms which feed upon it. Objection may be taken to the loss of time which this measure necessitates; but it frequently happens that the ravages of the insect are such as to render it impossible to obtain any crop until something is done to destroy them. Rape-cake crushed fine, and sown on the surface of the ground, which they devour, will kill them. The time occupied from the eggs being deposited in the earth until the insect assumes the winged state and takes flight, is much longer than with the generality of insects nearly allied, and during such times its depredations extend.

American Blight.

This insect, which is most destructive to Apple trees, breeds fast, and spreads with great rapidity. In the garden or orchard, where it makes its appearance on a single tree, if left unmolested it will soon be found in quantity on the surrounding trees, even at a considerable distance. It establishes itself in any crack or inequality in the bark, and breeds in quantity, giving the trees for a portion of the year the appearance of being partially coated with cotton-wool. Like most other insects that attack the bark of plants, the injury it effects is not so soon apparent as in the case of such insects as confine their depredations almost exclusively to the leaves. It causes unsightly protuberances on the bark, and ultimately reduces the trees which it attacks to a stunted unhealthy condition. It is difficult to completely eradicate it, its destruction being well-nigh impossible, where it once gets established in large orchards. The amount of labour it would require to eradicate it when it attacks large trees, would preclude the possibility of attempting the experiment; but in moderate-sized gardens, where the trees are small, it can be destroyed, especially if there is no delay in taking means for its destruction as soon as its presence is discovered. Some years ago it made its appearance on half-a-dozen trained Apple trees at one corner of the garden. One of these was of an inferior kind, consequently I determined to experiment upon it. First, I procured from the gasworks some ammoniacal liquid; one-half of the tree I painted over with the liquor, full-strength, the other half with it diluted with water to the extent of one-half. The application was made as soon as the leaves had fallen in autumn. The destruction of the insects was complete, as also the tree on the side dressed with the liquor in its undiluted state: the

other side painted over with the liquor diluted was not injured in the least; nevertheless, I would advise anyone using this remedy, not to use the liquor in a stronger state than from one-third to two-thirds water, for, although on several subsequent occasions, I used it at the strength of half-water with the most effectual results without injury to the trees, yet I believe the liquor obtainable in some places is much stronger than in others. It should be applied as soon as the trees are out of leaf in the autumn, as if delayed further in the winter, the buds begin to swell, endangering their falling-off. I have tried washing the trees over with a mixture of lime-wash, and lime and soot combined; of Gishurst and soft-soap; but none of these were of much avail, the insect soon re-appearing afterwards, and necessitating a continued repetition of the remedies which had been employed.

Lilies Injured by Insects.—My gardener has not been able to succeed satisfactorily in the culture of Lilies and other bulbs grown in the hot-houses and greenhouses for the last year or two. In turning out pots of *Eucharis amazonica* and *Vallota* the other day, he observed on the bulbs and on the roots what appeared at first to be minute grains of silver-sand; but, on observation through a pocket lens, he discovered that these apparent grains of sand were small insects, with transparent bodies, and brown legs and heads, of more than one variety, some with round bodies, and others with long bodies of various lengths. Further investigation showed that the roots of some of the sickly bulbs had been perforated by these insects, which had also eaten holes in the body of the bulbs themselves, and are to be found, even when the bulbs are not eaten, between each layer of scales. In his somewhat lengthened experience of insect enemies, my gardener had never met with this sort of foe before, and is in ignorance how to get rid of it. I have sent you portions of the *Eucharis* and *Vallota* bulbs, on which the insects abound. Will you be so good as to inform me what insect it is which has destroyed our Lilies, and what we ought to do to get rid of it? The bulbs have been shaken out and powdered with lime as an experiment; but sufficient time has not elapsed to prove whether this mode of treatment will succeed or not.—W. P. S. [The insect is one of the snake-millipedes, named *Julus punctatus* by Fabricius, and *Julus pulchellus* by Leach. It is both carnivorous and herbivorous, and is often very destructive to the garden. My belief is, that they are general feeders or scavengers, and that they are often introduced into pots and beds along with insufficiently-decayed manure. Once introduced, however, it is most difficult to get rid of them. Curtis recommended what your correspondent has thought of—the application of lime. He says, "Whether lime would answer the purpose I have no means of ascertaining, but I am inclined to think it might; for, I believe, they cannot endure heat, and I am certain they are not able to exist without humidity, for, if confined in a box deprived of moist earth or damp Moss, they die in a few hours." Unhappily, they will live as long as the root or bulb they are attacking. The specimens sent along with some fragments of bulbs, in a wooden box, are fresh and lively, although, after two days drying in the box, the portions of bulb cannot be said to be so. Among the remedies suggested are watering the soil with lime-water, spreading soot on it, sprinkling nitrate of soda round the plants; applying salt, and enticing the insects away by traps of slices of Potatoes, Cabbage leaves, &c., to be afterwards examined, and the insects destroyed. Among the Millipedes there are also small Acari, which will, doubtless, succumb to the same treatment. Your correspondent will confer a favour upon many if he will communicate the result of his experiments to you, whether they prove successful or failures.—A. M.]

Penalties for Destroying Small Birds.—Having seen in THE GARDEN a correspondence relative to the destruction of birds in gardens by way of protecting Peas and other crops, I beg to remind your readers that, by the 35th and 36th V., c. 78, anyone destroying any of the birds therein mentioned, from 15th March to 1st August in every year, is liable to a very heavy penalty. I would, therefore, strongly recommend that no traps be set, as it is not possible at all times to catch the right bird, and, in case of the wrong bird being killed, the penalty is incurred.—J.

Apple-tree Aphides.—What is the black incrustation on the accompanying Apple shoots? I suppose it to be an embryo form of some aphid, but do not remember to have met with it before.—E. D. [The incrustation in question consists of the eggs of *Aphis mali*.—A. M.]

Cure for Greenfly.—Greenfly, especially on Roses, may be kept under by using the following mixture:—Dissolve 8 lbs. of the best soft-soap in 12 gallons of warm rain-water; then, when the water is cold, add a gallon of strong tobacco-juice. The use of sulphur and daily syringing with soft-water is the best cure for red spider on plants or fruit-trees, where the soap mixture cannot be used.—W. T.

A HOLIDAY TOUR.

By THE EDITOR.

FERRIERES.

It has long been a fashion with continental lovers of gardening to employ Englishmen to form their gardens, and, among those so formed, there is none more remarkable than Paxton's work at Ferrières, the princely seat of Baron Rothschild, and none which will better repay a visit from the traveller traversing the dreary fields of this part of France. The house, as well as the grounds, and almost everything about the place, was the work of Englishmen, and the gardens show an instructive mixture of the best features of the horticulture of both countries. As a garden, or any part of it, is only really worth describing, in so far as it is instructive or suggestive to those for whom it is written, we will only allude to those features that possess some interest for the English reader. It is at once distinguished from nearly all French château gardens by having Grapes, and other indoor fruits and hot-house plants, generally quite as well-grown as in the best English gardens. The design of the grounds, too, is far above the average degree of merit, though the fairly well-formed sheet of water is somewhat too near the mansion, which, as our illustration shows, is a very large one. An unhappy feature, and one which cannot be denounced too much, is a formal margin of stones around it, somewhat similar to, but smaller than, that which now disfigures a part of the ornamental water in the Regent's Park. The individual, who causes a neat little barricade of stone to be built around a piece of ornamental water may have genius, but it certainly is not for landscape-gardening. The very line of beauty, so to say, where the turf might slope easily down to kiss the water, or the wavelet play amongst a fringe of Forget-me-nots or Arrow-heads, to be finished off like a manure-tank! It is too bad. The line of kerb-stones, placed along the margin of the Serpentine, is another "improvement" of the same type, and a little worse, because even more formal. It is an instance of money thrown away to produce a needless eye-sore. As a protection to the edge from the action of the water such things are never of any real use, and, in the case of the Serpentine, the water is frequently below the kerb-stones. The best margins for artificial water are sand or turf, and, if these are disturbed by the action of the water, they will certainly be more fitting in their worst condition than cement, bricks, flints, or kerb-stones. The house is, of course, fortified with a terrace-garden, but this is not over extensive or overdone with bedding-out. On its steps, one day, Jules Favre met Bismarck, when he went to plead in vain the cause of beaten France. The king and Bismarck had their quarters here when the Germans overran the plains around, and gave orders that not a finger was to be laid on anything. Had it been otherwise, the specimen *Wellingtonias* might have proved useful under the soldier's pot, or suffered some equally ignoble fate, as did many thousands of specimen trees around Paris during the siege. Probably the finest Orangery in any private garden in France is here, and the Orangery system of cultivating plants is here seen in its best aspect. Nothing can exceed the health and beauty of the specimens grown in enormous, but well-designed, tubs, and standing so close together that the dense heads touch, and one seems in an Orange grove. In addition to the many Orange trees, there are superb pyramidal Myrtles, nearly 20 feet high, in tubs; numbers of tubs of the New Zealand Flax and large specimens of the Australasian *Araucarias*, which do well treated thus. The Orangery system, well carried out, is perfect protection during winter; but there is no growth at all till the plants are placed in the open air in May, or whenever their various degrees of hardiness will admit of it. The darkened roof and back-wall, and the absence of all heat beyond that afforded by the walls, secure these ends. In English gardens, the Orangery system is of little or no consequence; it may have been otherwise when we had few or no evergreens but those preserved by its aid; now-a-days, we have so many that few gardens do justice to the half of them. The troublesome and expensive system of tubbing and moving the plants in and out of these structures is also highly against the system, particularly as the plants possess no peculiarity of form and colour that are not afforded better by hardy subjects requiring



VIEW IN BARON ROTHSCHILD'S GARDENS AT FERRIERES (SEINE ET MARNE).

none of these costly attentions. The system of planting-out Palms and many other fine-foliaged plants in a large house, and with an eye to picturesque effect, is here well carried out, and the effect very good at all seasons. The fresh green *Lycopodium denticulatum* forms, as usual, the turf of the small but beautiful landscape. In addition to the many Palms and other plants recommended for this purpose, *Theophrasta imperialis* may be named. Specimens here planted out exceed any seen at our exhibitions, and are tall imposing columns of noble leaves. Among trees, good specimens of the Weeping *Sophora* are employed with fine effect near the water at Ferrières. Perhaps its slow growth with us prevents it from being more frequently seen in our gardens. A large extent of the pleasure-grounds at Ferrières, very well planted and designed in all its parts, is devoted to extensive, well-built, and richly-stored aviaries, menageries, &c.; but, as these are somewhat out of our province, we will step into the

Hardy Fruit Garden.

This is the finest we have seen in any private place in France; and, though certain kinds of fruit may be grown better in places specially devoted to their culture, on the whole, this is as good a garden for hardy fruits as we have seen in France. The first thing that strikes the eye are the splendidly-formed espaliers. They are more than twice as high as those usually seen in our gardens, being about 10 feet high; but not a square foot of the whole surface of a trellis several hundred feet long is without the portion of branch which the fruit-grower originally intended it to carry. The form mostly employed is the *Palmette Verrier*, of which an illustration will be found in page 271; and, of this, there are scores of specimens as regularly formed as if the shoots pushed and sap flowed at the bidding of the gardener. Walks, running the length and breadth of the garden, are planted regularly with these high trellises, the effect of which is very striking. Other kinds of espalier trees, of which the branches do not turn up at the ends, but run obliquely their whole length, are abundant here, and are preferred to the *Palmette Verrier*, which, once formed, does not admit of increase in size. Trellises for espalier trees are very much more common than with us. The reason is that the autumnal winds are very destructive to large finely-grown Pears on pyramidal trees; on trees fixed to espaliers the fruit does not tumble off before the strongest September gale. This is, indeed, an important consideration, for those who are thinking of growing the finest kinds of keeping Pears. This garden contains hundreds of the finest pyramidal Pear trees I have ever seen, tall, stoutly and regularly set with branches, each, in its turn, furnished, from top to bottom, with plump fruit-buds. Each is a picture in itself in the eyes of a lover of fruit culture. Yet, beautiful as they are, there remains the objection that fruit grown in this way and carefully looked after, in all respects, is liable to be dashed to the ground by an autumnal wind; and, hence, the grower cannot depend on them as on an espalier. Cordons of the various fruit trees, mostly simple cordons, are employed, when the aim is to cover the wall quickly and get an early return. Ground cordons of the Apple form a continuous and frequently inter-grafted line by the side of the walls, and are very useful in the production of fine specimen fruit of the more esteemed kinds. There is a deep, a too deep, permanent coping to the walls, and, beneath, iron stays to support a temporary coping, not less than 2 feet wide during the blooming season. This, as a rule, will not be applied till the trees are in flower next month. It is particularly to be observed that good growers of the finer winter Pears, in this country of fine Pears, insist on the necessity of having a wide coping over the Easter *Beurré*, not only when in flower, but throughout the season. They hold that, in a climate so changeable, and frequently so severe, spotting, cracking, and various other maladies, are best guarded against by a deep coping. Happy the Virginians and Californians, who, in their generous and never capricious climate, grow the finest Pears in the world!

It is impossible to give the reader a fuller idea of the contents of this garden, except by the aid of elaborate engravings, which it would take long to prepare. All who are much interested in fruit culture should take an opportunity of seeing it when the trees are in bloom, or in fruit; and, if a

little late in the fruiting season, the richly-filled fruit-room will show that the garden is as remarkable for the quality and abundance of its fruit as for the perfect training and general good health of the trees.

THE KITCHEN GARDEN.

FORCING VEGETABLES.

Rhubarb.

RHUBARB may be forced in an early Peach-house, in a Vinery, under pots or boxes, and, in all cases, successfully, but I find the following simple method best, inasmuch as it produces plants which are more easily gathered, and superior in quality to those produced by any of the methods just named. About 3 feet of the soil in which the crowns are growing are left as a bed, on each side of which a trench 2 feet deep and 2 feet wide is dug out, and filled with half-decomposed horse-dung firmly compressed. When this is done, in order to form a span-roof, three, four, or six equilateral triangles are put over the bed, the bases of which are supported on bricks, or are driven into the ground on the outer edges of the bed, and held together at convenient distances by means of a beam or plank run along their tops. Short narrow boards are then laid (about 3 or 4 inches apart), sloping from the outer edges of the ridge to the top beam, and, finally, the whole is covered with a sufficient quantity of dung or leaves to raise a good heat. A few 4-inch drain pipes passing through the dung serve as ventilators, and are useful. As the stems become rather drawn when the temperature exceeds 60°, one end may be built up with litter, the other used as a door, and a truss of straw will be most suitable for that purpose, provided it is sufficiently large to fill the aperture. The dung may be turned, and supplemented with more to keep up the temperature, but such is seldom necessary.

Seakale.

The treatment which suits Rhubarb also answers well for Seakale, only, for the latter, less heat is necessary than for Rhubarb. A temperature of 50° is sufficient for Seakale, or even less, if it is kept close. Seakale forces well in a Melon or Cucumber bed, with a little soil in the bottom for the roots to grow in, and about a foot of space for head-room. The soil and roots, when planted, should receive a good watering; then, fill up the space mentioned with leaves, free from slugs or woodlice, and on the leaves set French Beans or other plants. This plan is no better than forcing in the open ground, under boxes or pots covered with litter; but, being always to be depended upon, a first crop can be obtained very early in this way. We force Seakale successfully here on ridges 2 feet high, by 2 feet in width. The ridge, which is forced one year, rests the next; and is again forced the following year. The crowns are set 2 feet apart. On the decayed leaves being cleared away, the ground is slightly forked; a liberal dressing of salt and finely-sifted coal-ashes is spread on the surface; and these help to keep the slugs at bay. Over each crown is placed a box, corresponding in size to the crown. The sides of the bed are then built up with 2 feet in thickness of heating material, and over the boxes about a foot of the same is spread. Three weeks later, excellent Seakale may be gathered; the boxes are then shifted to fresh crowns, and the same operation is repeated. A succession is easily obtained, but, of course, the quantity forced is in proportion to the consumption. Should more come in than is required, it will keep for weeks, by setting the bases of the heads in platters of water, in a cool cellar.

Asparagus.

Nothing gives greater satisfaction than a good dish of Asparagus in mid-winter, and this may be easily obtained. Crowns three years old and upwards are best adapted for forcing. A close frame, 4 feet deep, is filled close to the glass with brisk fermenting dung, firmly trodden, and this receives a good watering; after which, inverted turves are laid over the surface, the lights put on, and the whole allowed a few days to settle, and for the heat to rise. A three-year-old Asparagus-bed is then selected, and beginning at one end the crowns are carefully lifted with a fork, at two, three, or four

different times, as they may be required. In re-planting, they are placed as thick as they can lie on the turves, which, by this time, will have acquired a very genial heat; and they are covered over with sufficient coal-ashes to conceal the roots; coal-ashes I find to be better for the purpose than soil, as slugs are not so liable to harbour in them. It is better to lift a whole bed than a crown here and there, as the bed can be prepared again and sown afresh. After going over all the plantation, taking one or more beds in a season, according to circumstances, the first bed will again be ready for forcing, provided the Asparagus ground is large enough to furnish one or two beds every four or five years. The frame should be kept rather close (if the steam is not too great) until the buds appear; after which, air may be freely given at the back, especially if green Asparagus is required, but if blanched heads are wanted, little air and no light are necessary; and the quicker they are got up the more juicy and crisp they will be found to be. When the crowns become exhausted, they may be thrown away, to give place to others, as they are of little or no use afterwards. As the dung will have sunk a foot or 18 inches in the beds, the deficiency may be made up with fresh material; but, for a third batch, the frame should be cleared out altogether.

Potatoes.

Potatoes seldom repay the trouble of forcing them. It is a common practice to force them in pots in an early Vinery; but I have always seen them attain a much greater degree of perfection in a dung-frame than in pots. A moveable three-light frame, placed over a pit dug in the ground to suit it, answers well. It should be from 3 to 4 feet deep, and filled with fermenting dung, over which should be spread about 6 inches of soil. When the latter has become sufficiently hot, the tubers may be planted in it 6 inches asunder, in lines 12 inches apart. Should the tops grow faster than the dung subsides, the frame may be raised about a brick in depth at a time. Livings must be attended to, and protecting material should be at hand in case of frost. Tepid water should be given if the soil gets too dry; but one good watering is generally sufficient in the winter months. For pot culture, Potatoes are best planted in 4-inch pots, in which they should become rather pot-bound; then shift them into 10-inch pots, in which they will ripen.

French Beans.

These may be forced in pots and boxes, or they may be planted on Vine-borders or Melon-beds; the principal points, as regards success, being heat and proximity to the glass. Red spider is a troublesome enemy to French Beans, and should be checked, on its first appearance, by consigning all affected plants to the rubbish-heap. Six-inch pots are the best in which to grow them. One piece of crock should be put in the pot, and over that a handful of half-inch bones, which serves for drainage as well as for manure. The pots are then half-filled with good yellow loam, and five seeds are planted in each pot. They are then placed near the glass, in a dung-frame or forcing-pit, in a temperature of from 65° to 70°. They are then watered freely, and the points are stopped at the third bud. When the flowers begin to appear, the pot is filled up (leaving plenty of room for water) with equal proportions of loam and old Mushroom-manure. This is of more service to them, at this stage of their growth, than filling it up at first. The bones over the crock are also a great stimulus to them; for, on turning out the ball, they will be found surrounded by roots. Staking must be attended to; and, for this purpose, nothing answers better than pieces from a worn-out Birch-broom. After the flowers have set, manure-water will be found very beneficial to them. When grown on an inside Vine-border, it is best to start them in large 60-sized pots, and to plant them out in drills, running from back to front, a foot apart. In the case of a Melon or Cucumber bed, one line on a raised ridge in the centre does well; but I prefer pot-culture, inasmuch as they are easily shifted from place to place; for instance, when set, they can be moved to a shelf at the back to make room for others.

Parsley.

It is seldom necessary to force this, but in the case of an emergency it may be done successfully. Lift good strong roots, cut off the under part about 2 or 3 inches from the top,

pot them in 4-inch pots, and place them near the glass, in a temperature from 60° to 70°, keep them rather moist, and, in a fortnight from the time of introduction into heat, excellent Parsley may be gathered. A stock of Parsley may be kept up all winter by planting a dry cold frame with good strong roots in the month of October.

Carrots and Radishes.

A gentle hot-bed close to the glass is best suited for these. About 4 inches of rather light soil should be spread over the dung, on which the seeds should be sown broadcast. They should then be lightly covered and watered with a fine rose. Thin them to the required distance apart when large enough to handle, and protect them with mats during frosty nights.

Wotton Gardens, Aylesbury, Bucks.

JAMES MORRISON.

THE GLOBE ARTICHOKE.

In most establishments this Artichoke is highly esteemed; and it is important that every cultural arrangement that will tend to extend the season of bearing should receive due attention. Years ago it was the custom in most gardens at the approach of winter to cover the plants entirely, or nearly, with litter, and then to bank them up with earth, in which condition they remained through the winter. I believe, however, that the Globe Artichoke is much hardier than was at that time supposed. Four years ago I planted a few plants, with the view of testing their hardiness, in a plot of land not at all favourable for their growth, and they have never had any protection at all; nevertheless, they have never suffered injury from exposure to the weather. In the southern and midland counties, all the protection they require is, in severe weather, to place a small forkful of litter over and round the crown of each plant, to be removed when the weather changes. Globe Artichokes are often allowed to remain too long in one spot, and, where this occurs, it has the effect of inducing a large production of heads in July, whilst later in the season there will probably be a scarcity. The best way of managing them, according to my experience, is to re-plant about a fourth of the whole crop every year. The crop will thus occupy fresh ground every four years. One of the principal advantages of this system of culture will be the extension of the season of bearing. The old-established plants will come into bearing first, whilst those that are transplanted in March will, in consequence of their removal, come into use much later, and, so form a desirable succession. In making new plantations, with a view to autumn production, I do not think it is desirable to plant very small bits, and neither is it necessary, as, in removing a fourth of the crop, good strong off-sets, with a good root attached to them, can be selected for re-planting. I need scarcely say that the ground should be in good heart and have been previously deeply-worked. They may be planted in rows, 3 ft. apart in the rows, and 4 ft. row from row. In very hot dry weather, they will be much benefited by being mulched with half-decayed manure, and, as the heads are cut for use, the stalks that bore them should also be removed, as they only help to exhaust the plants. There are several varieties in cultivation, but the best we have here bears a dull purplish-coloured head, with the scales turning in at the top. They may be raised from seed, and in the course of the last fifteen years I think I have raised two batches of seedlings; but, they are not to be relied on. Many of the seedlings will produce small worthless heads, and they are so easily increased by division of the roots, that raising plants from seeds is unnecessary, unless for the sake of experiment. E. HOBDAV.

A New Salad.—A correspondent (M. D. Guinéneuf) informs us that last year he observed in the market gardens in the neighbourhood of Brussels a vegetable which he had never previously seen in cultivation. He describes it as a sort of Chicory, which forms a neat little head about 5 inches long and 3 inches across, very much like a dwarf Cos Lettuce. It is very extensively used by the people of Brussels during the winter and spring months, the blanched leaves resembling the Barbe de Capucin in flavour, while it is as easily grown as the Dandelion. The following is the mode of culture pursued at Brussels:—It is sown in spring, either in lines or broadcast; the seedlings are either thinned or transplanted, and, during the summer, require no other care than hoeing and weeding. In autumn, the plants are taken up and replanted in a deep trench or in rows, so as to have about 10 inches of soil above the neck of each plant. In this way the leaves are blanched, and, before they have reached the surface of the soil, the plants should be taken up for use. The plants are also forced in the open air by digging alleys between the trenches and filling them with fresh manure. Our correspondent recommends this excellent winter salad very strongly to the notice of our London market-gardeners.

THE FRUIT GARDEN.

THE PEACH ON OPEN WALLS.

By T. BAINES, Southgate.

THE frequent recurrence of severe spring frosts, which we have experienced within the last twenty-five years, have led many to come to the conclusion that the climate of England (so far, at least, as extreme low temperature during the months of April and May is concerned) has undergone a change, such as Mr. McNab supposes has occurred in the climate of Scotland. The observations now carefully taken and recorded in almost every county in the kingdom, will, in years to come, be of some assistance in determining the extremes of temperature occurring in each locality. So far as my own observations have extended in different parts of the kingdom in which I have happened to reside, there has been greater local difference in the extreme low temperatures that have occurred in the spring months than during the winters, and this independent of low-lying situations, the character of soils, or other local circumstances which are generally accepted as exercising an influence over temperature. The ability of any given species or variety of plant to withstand the effects of the weather for a series of years, sufficiently long to enable us to draw a comparison with how it fared in a corresponding period previously, is urged by some as a fair means of comparatively estimating the weather we now experience with that which occurred in years preceding. This test I look upon as uncertain in the case of plants under artificial cultivation, inasmuch as the treatment they at present receive may be somewhat different from that to which they were subject during the time compared with the present. The frequency with which our hardy fruits (or such as are usually grown with the protection of a wall) suffer from spring frosts, is often held up as proof of our springs being more severe than they used to be; but, will a conclusion, based on this assumption, bear investigation? Are our hardy fruits, or more particularly such as we grow with the assistance of a wall (especially Peaches and Nectarines), so well calculated by the treatment they now receive, to withstand the effects of spring frosts as they were in years past? I am not speaking of places where wall fruits receive all the attention necessary or possible, but I am alluding to the far greater number of places where they do not receive such attention as they used to get in times past. Within the last thirty years a partial revolution has been brought about in gardening through cheap glass, and the more general use of hot water as a medium for heating glass structures. In any place, large or small, where a hundred plants of all descriptions were required twenty years ago, a thousand are wanted now, and in most places without additional hands to meet the increased labour involved. Is it then to be wondered at if the attention to wall fruits, as well as other things, falls off to the lowest point? Consequently, this most important branch of gardening is left neglected.

Frost-resisting Power of Bloom.

From close observation, I feel convinced that the state in which a fruit tree is found in the autumn, when the leaves fall, has a good deal to do with the power which its bloom has to withstand a low temperature whilst in flower the following spring. I am aware that this is opposed to the ideas entertained by some who maintain that a certain amount of frost occurring whilst a tree is in bloom will destroy the crop, no matter under what condition its bloom buds have been formed. It is now some twenty-five years since I was first led to notice the partial effects of frost on fruit bloom. During some alterations that were in progress, in the autumn, a number of full-sized Gooseberry and Currant bushes, along with some Apple trees that had been planted seven years, had to be removed; they were taken up with care, all the roots possible were preserved, and they were transferred to a quarter already partially occupied with similar trees. They were removed early in October, whilst there was yet considerable heat in the soil, and I have no doubt their roots would begin to act at once; but, from their size and the length of time they had stood in the place from which they were removed, it will be easily supposed

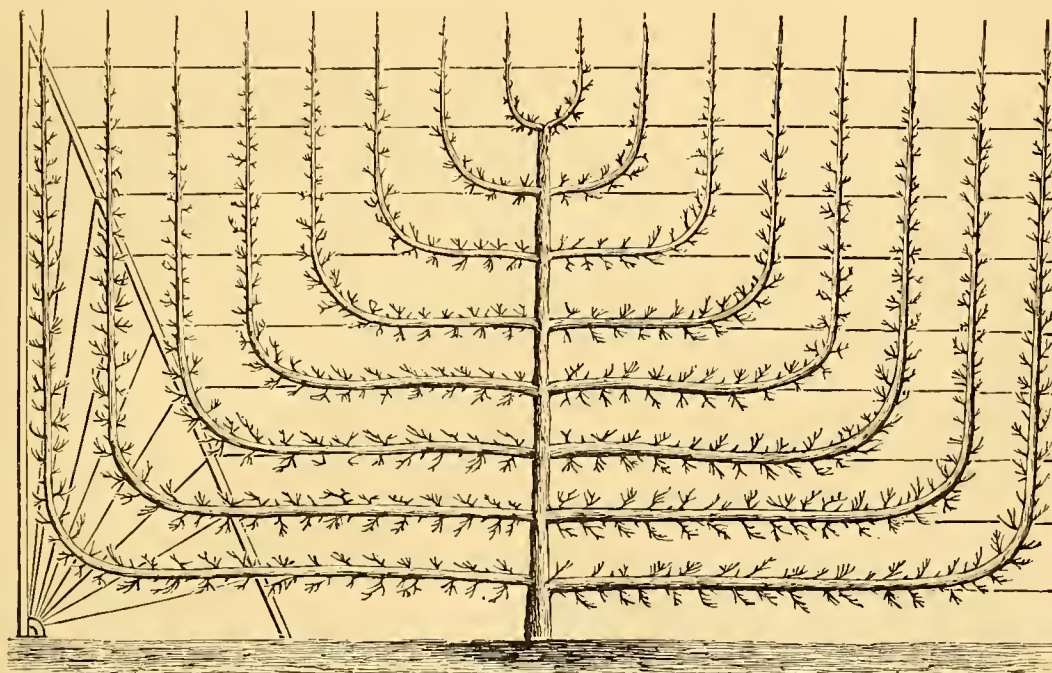
that they made very little growth the following summer. Their efforts were almost wholly confined to forming fruit buds, which they did to such an extent as to present in the autumn, when the leaves fell, which they did a fortnight earlier than the surrounding trees that had not been moved, a mass of plump buds to the extremity of the branches. The spring following we had a repetition of severe frosts, accompanied by cutting east winds, during the blooming season. Fruit of all description was a failure in the neighbourhood; yet the trees that had been removed bore good crops, more especially Currants and Gooseberries. We had more fruit on one of these bushes than on twenty that had not been moved. Now, what were the conditions under which the bloom buds of these trees were formed and matured the preceding summer? Just simply such as pre-disposed the trees to a fruit-bearing state; all their energies were directed to forming and maturing the embryo fruits, which, consequently, possessed a vigour and vitality such as made them capable of withstanding a lower temperature than trees that were more disposed to the formation of wood. Since that time I have had many opportunities of confirming the conclusions I then arrived at, and from that time I have been a firm believer in either root-pruning, or re-planting, according to the nature of the trees and the circumstances under which they exist. There are other causes that exert a similar influence on the cold-resisting powers of the bloom. I am now speaking of fruits in general, whenever we have an exceedingly dry time early in the summer, so that growth gets checked somewhat prematurely, and afterwards we get copious rainfall early enough for the trees to push growth freely again—this growth coming at a time when the energies of the trees should have been at rest, and the ripening process proceeding, never has the chance of getting fully matured; and, I have noticed, without exception, that the following spring it takes a less amount of frost to destroy the fruit crop than after an autumn when the trees were enabled more fully to mature their wood and bloom buds. Anyone who takes the trouble to observe, will see that this badly-ripened bloom, when it is expanded, is much smaller, according to its kind respectively, than the same variety of tree produces when it has been well ripened, and it is often structurally deficient. Strawberries, after a dry season, do something to confirm this view. If, immediately after the crop is ripe, they suffer severely for want of water, they frequently have no bloom the following spring; if they suffer in a less degree, they will throw up flowers, but they are at all times weak and puny, and the least frost, whenever it may occur, destroys them.

Importance of Water at the Root.

But it is the Peach that has done more to confirm the views I have formed on this subject than all other fruits. Indigenous to those districts of Persia where the atmosphere is considerably moist, and the soil knows no drought; it suffers under cultivation in this country from a want of water, especially at the root, to an extent to which no other fruit is subject. The quantity of water that it will bear, and which it absolutely requires to do justice to it, is not understood by all who attempt its cultivation, and this not confined to any particular portion of the season, but through the whole course of the existence of the plant. If proof of this were needed, it would be found in the magnificent old Peach at Chatsworth, which grows in a situation where there is an impossibility of its roots ever being in a state even approaching to dryness. It is now some years since I saw it, but in the number of things to be met with there, of an extraordinary character, there was nothing with which I was so much struck as this tree, and I understand that it is now in as fine condition as ever it was. The cultivation of Peaches under glass, in such parts of the country where they refuse to grow in the open air, is simply a necessity; even where they will do without such assistance, it gives us the advantage of having them some three months earlier than they can be had on open walls, and, consequently, lengthens their season that much. With this fruit, as with other things, where the cost is incurred of providing a glass covering, wherein to grow it, the chances are that all the attention necessary to ensure success will be bestowed upon it. Yet, even here, in the matter of water, it is often allowed

to run short, especially with those who think that, during the season in which it is at rest, it may, or ought to, be allowed to become dry at the roots; hence the showers of falling buds, at a time when they are expected to open nicely. But it is on the open walls, in such parts of the kingdom where it will succeed, that I plead for its receiving that attention which it well deserves, but which it frequently does not get. In fact, it has become fashionable for some writers to assert that the time has come when its cultivation in the open air ought to be abandoned. My reply is, when it refuses to bear well after it has received the same amount of attention in the open air that is bestowed upon it under glass, it will be time enough to give up its culture on open walls. What are the conditions under which it is often found to exist? No attempt is made to loosen the branches from the walls, to counteract the effect of the sun acting on the brickwork during the winter, and causing the bloom to open much sooner than it ought to do.—To supply this omission, resort is had to shading—sometimes, overdone—at other times, deficiently. And, if the trees get safely through the blooming-season, where the syringe or garden-engine is used every day on the

sary to resort to thicker moveable covering. During the growing season, whenever the soil gets too dry, I give the whole border a thorough soaking every week, by applying from 100 to 150 gallons of water to each tree. In addition to regular copious washing overhead with the garden-engine, I never allow the trees to get smothered with useless wood, nor yet reduce it to the opposite extreme, or remove it too suddenly—thus, arresting the free development of roots, which are essential to the healthy condition of the trees. I encourage as much foliage as can receive the requisite light and air, without unduly shading the fruit. Trees so treated mature fruit double in size and quality to the starvelings so often met with; and, if in a situation and soil not absolutely unsuited to the growth of the Peach, go on improving, instead of the continual re-planting required where the trees receive an insufficiency of water, with its certain consequences of all the insect pests that will live upon them. Even trees that have been half-killed by a course of bad management, in the way described, will recover surprisingly with good treatment. It is often said, that any weakly Peach or Nectarine will flourish, if it is covered with glass. So they generally do; but, continue



Palmette Verrier (see page 263).

trees in the Peach-houses, those on the walls are operated upon, perhaps, once a week, or seldomer. The result is green fly, red spider, and thrips by the million, draining the trees of their sap; this, of course, produces a crop of fruit deficient in both quantity and quality.

There is yet another cause that is much more fatal to the ensuing year's success. It is the deficiency of water at the roots in June and July, after which we often get a copious rain-fall, which starts the trees off growing again at a time when they should be ripening their wood and bloom-buds. This unseasonable growth never has any chance of ripening, the winter is on before it has time; the result is, an insufficiency of bloom of the most weakly description, totally unable to withstand anything approaching trying weather; often composed of little more than calyx and petals; the pistils and anthers being malformed or absent. As soon as bloom begins to open, I put on the coping-boards (10 inches wide), to which are hung old fishing-nets, fastened to stakes driven into the ground, 18 inches away from the wall; these are never removed until the fruit is set. It is all the protection they receive, but the garden here is on the top of a hill, where there is rarely so much chilly vapour as in lower situations; in such places it is neces-

to treat them with the inattention that too often has brought about their unsatisfactory condition, and there will not be much improvement. Their improved condition is generally traceable to the additional care bestowed upon them after the house is erected over them. I do not mean to ignore the untoward effects which our proverbially fickle climate, frequently has upon our best efforts; but, I demur to more being laid to its charge than it deserves; or to the doctrine that the time has come, when the cultivation of the Peach on open walls should be given up by resorting to its cultivation under glass exclusively.

Cropping Peach Borders.

As to cropping Peach borders being admissible, a difference of opinion exists; some maintain that nothing should be grown over the roots. In this, as in most other matters connected with a garden, circumstances will determine the proper course to follow. Where a sufficiency of warm sheltered borders for all purposes exists without growing anything on the Peach borders, it is a mistake to plant on them; where the reverse is the case, some things with good management may be grown on them with little or no ill effects. The worst circumstances that arise are where there is any deficiency

of water in the summer, the evil is augmented by the additional extraction of moisture from the soil by whatever crop is grown on the border; but, where there is no stint of water, that will not occur. Whatever is grown must be something that will not necessitate any disturbance of the roots of the trees. A row of Lettuce is very useful near the wall, but there is the objection that they generally rear a progeny of green-fly, that finds its way on to the trees as soon as they have any leaves upon them. My own practice is to keep one-half the length of border under Strawberries, the plants being 2 feet 6 inches apart each way. These stand three years; the soil is never dug between them. The hoe is used to keep down weeds, and a good mulching of littery dung, fresh from the stables, is applied in March. The other half border is cropped with early Peas for three seasons; after which it is planted with Strawberries, changing the Peas to the other half. I also plant a row of early Potatoes within 6 inches of the wall. The ground under Peas is never dug so deeply as to interfere with the roots of the trees. We apply here all the old potting-soil, as well as such as has been used for Cucumbers and Melons, with a moderate dressing of manure. The almost unlimited amount of water used prevents the trees from experiencing any ill effects from the Strawberries and Peas, which in their turn are all that can be desired, the water benefiting them equally with the trees. The latter are nailed.

Wiring Walls.

I have had wired walls. There is something to be said both for and against them, but, balancing the good against the evil, I consider them as great a mistake as was ever introduced into gardening in a country like ours subject to spring frosts. The object of wiring is simply to save the wall from the effects of nailing, but, as it lessens the protecting powers of the wall, its existence is simply a mistake. We frequently hear it said the face of the bricks should not be nailed into, only the joints. I say never nail into the joints except where necessary for securing the strong branches in their proper places; nail as far as possible into the bricks alone. Let it be done with care, never driving deeper than is necessary, being equally careful not to splinter the bricks when removing the nails. After fifty years use, the wall, if the bricks are good to commence with, will, in reality, be none the worse, the holes not being such as will harbour insects; whereas, if the joints are nailed into, the mortar is so far displaced as to give shelter to whatever insects will live in it. On wires with the shoots from half-an-inch to an inch away from the wall, as this system necessitates, a severe night's frost will frequently kill every bloom; whereas, the same trees, if nailed with their shoots lying absolutely against the bricks, will have enough of the bloom escape for a crop. If anyone who is not fully aware to what the heat absorbed in the south side of a brick-wall during the sunny days that generally precede these frosty nights in spring amounts to, and which is thence given off by radiation, will procure a couple of registering thermometers; hang one where it will be completely away from any disturbing influence; the other, place face-side to the front of the wall, in fact, with the bulb touching the bricks, as do the shoots when nailed; compare the different temperatures registered by the two thermometers in the different positions, and the influence of a wall in warding off frost from anything in absolute contact with it, will be seen at once, as, also, the difference there is betwixt this absolute contact with the wall, and even the distance of only half-an-inch from it. I have often proved this, but never more fully than in the spring of 1872; in that season we had more Peaches and Nectarines, than all I saw collectively elsewhere on open walls. We had 10°, 11°, and 12° of frost, in one week, during the time in which the trees were in bloom, but enough escaped for a crop, the greater portion of it being on the sides of the shoots lying in contact with the bricks. This was more apparent as the fruit began to swell, necessitating the trees being gone over, un-nailing the shoots so as to admit their being wedged up to allow the fruit to swell. Had the wall been a wired one, fifty fruit would not, in all probability, have escaped. I always fully, but gradually, expose the fruit to the sun, by removing all leaves that intercept it, which, consequently,

gives the fruit a very high colour. In that season, when ripe, they had a somewhat strange appearance, on account of most of them being coloured at the stalk end of the fruit, arising from the position which they occupied on the wall. We have now (March 2) finished nailing, being compelled to bring it to a close on account of the forward state of the trees, which are earlier than I like to see them. The present mild winter has had an influence upon them, unaccountable as compared with other kinds of fruit. I have often seen Apricots, Apples, Pears, and hush fruits, a month earlier than they are with us this season. Peaches and Nectarines alone being too forward.

Stem Roots of Vines.—Will you inform me if the roots on the rods of an early Vinery are in any way injurious to Vines, or if the cause is from the roots outside not being in good health?—W. C. [Stem roots are often produced on forced Vines, and the cause of their appearance has long been a subject of dispute. Some varieties are much more subject to their appearance than others; for example, the Muscat Noir de Jura almost invariably produces them, no matter in what conditions it is placed. They do not appear to exert any direct influence, either for good or harm, and some of our best Grape-growers look on them with indifference. The generally received idea among practical horticulturists is, that they are produced in consequence of the roots being in a cold wet border, and the branches at the same time in a hot and humid atmosphere. These conditions may possibly promote their formation, but in the large conservatory at Chiswick, where many varieties are planted side by side, all enjoying similar soil, temperature, and humidity, one Vine will produce these roots in abundance, while on its next neighbour, perhaps of the same variety, not a stem rootlet is to be seen. This would lead one to infer that their production is owing to some inherent constitutional condition of the individual Vine; doubtless, the due ripening of the wood assists their suppression very materially. This production of adventitious roots is not confined to the cultivated varieties of the Grape Vine alone, for we find the rambling *Vitis gongylioides* invariably producing pendent aerial roots in great quantities, and often 8 to 10 feet in length, while the tendency shows itself in other species throughout the order, but in a less marked degree.—B.]

Orchards in the Carse of Gowrie.—What (says Mr. McNab, in a paper read the other day before the Botanical Society of Edinburgh) has become of all our boasted Carse of Gowrie orchards, which for a long series of years, half a century ago, used to be so remunerative to their proprietors? We find it recorded from the years 1809 to 1813 inclusive, that seventy varieties of Apples were then cultivated as standards in the Carse orchards, including Ribston Pippin, Nonesuch, Yorkshire Greening, &c.; also thirty-six varieties of standard Pears, including Galston Moorfowl's Egg, Swan's Egg, Jargonelle, &c.; also eight varieties of Plums, including white and red Magnum, Orleans, and Dauson. The money produce of the thirty Apple orchards alone, containing in all 126 acres, independent of the Oats, Wheat, Barley, and Grass, frequently grown amongst them, from 1809 to 1813, inclusive, amounting to £10,515. During 1809 the Apples from the 126 acres yielded £2,318; 1810, £2,366; 1811, £1,840; 1812, £2,333; and 1813, £1,668, averaging from £16 to £20 per acre. These orchards still exist, but we hear little or nothing of their remunerative qualities. All that we do learn is that in some years Apples are produced in considerable abundance, and in other years they are exceedingly scarce, but that the average of any five consecutive years is greatly below what it used to be in former times. About the year 1812 it is stated that, in consequence of the remunerative return of these orchards, very large additions were made to them, and all the new varieties of Apples, &c., introduced.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Plum Culture in Oregon.—Dr. Watkins, of Portland, Oregon, informs the *Albany Cultivator* that they have there the finest Plum country in the world—that trees of the Peach Plum, twelve years old the past season, bore 400 lbs.; that every variety ever tried there bears in abundance, the trees breaking down under their loads of fruit, and the insect curculio, which has destroyed the Plum orchards of Eastern America, is unknown.

Grafting-Wax.—How can I make good grafting-wax, and how should it be applied?—S. B. [Grafting-wax is usually made of a mixture of resin, beeswax, and tallow, melted and well-stirred together. The resin tends to make the wax hard and adhesive; the beeswax to impart a durable consistency; and the tallow to make it soft enough for use. A proper quantity of each, to form wax that may be easily applied with some artificial warmth, and that will adhere well, and not melt in the sun, will answer. Sometimes an equal quantity of each is used. Another good mixture is made of three parts of resin, three of beeswax, and two of tallow; but it is cheaper to use more resin, and a common mixture consists of four of resin, two of tallow, and one of beeswax. The resin causes this to adhere a good deal to the hands.]

THE HOUSEHOLD.

Baked Peach Puddings.—Make two pints of sweet cream or new milk boiling hot, and pour it upon a pint and a half of bread crumbs; when half cold, add the juice of a Lemon squeezed upon half-a-pound of powdered sugar and the well-whisked yolks of eight eggs; mix with this two quarts of canned Peaches; put a border of rich paste around a baking dish, and bake from a half to three-quarters of an hour; have ready, whisked to a foam, the whites of the eggs, which, when the pudding is done, spread over its top, and return to the oven for a moment to slightly brown the top.

Preserved Fruit and Vegetables.—Canning fruit has become an extensive industry. The Peach-packing establishments are chiefly in Maryland and Delaware, and there were about 12,000,000 cans packed last year. The Eastern States, New York, New Jersey, and Maryland furnish most of the canned Tomatoes, 18,000,000 cans having been put up from last year's crop. From 6,000,000 to 8,000,000 cans of Corn have been packed. Maine furnishes the best Corn, where also are situated the largest lobster establishments. Pine-apples are largely canned at Nassau, Bahama Islands. In fact, almost any kind of fruit or vegetable may now be obtained for table use in the winter season so canned as to preserve very perfectly the natural fresh flavour.

Lemons wholesome.—When people feel the need of an acid, if they would let vinegar alone, and use Lemons or Apples, they would feel as well satisfied, and receive no injury. A suggestion may not come amiss as to a good plan, when Lemons are cheap in the market, to make good Lemon syrup. Press your hand on the Lemon, and roll it back and forth briskly on the table to make it squeeze more easily; then press the juice into a bowl or tumbler—never into a tin; strain out all the seeds, as they give a bad taste. Remove all the pulp from the peels, and boil in water—a pint for a dozen pulps, to extract the acid. A few minutes boiling is enough; then strain the water with the juice of the Lemons; put a pound of white sugar to a pint of the juice; boil ten minutes, bottle it, and your lemonade is ready. Put a tablespoonful or two of this Lemon syrup in a glass of water, and have a cooling, healthful drink.—F.

Barberries to Preserve.—Boil 2 lbs. of loaf sugar in a quart of water for twenty minutes; then put in your Barberries and let them simmer for an hour; then pour them into a glazed pan. Next day strain the syrup, and add to it another pound of sugar, then let it simmer for half an hour; put in the fruit again, and, when the syrup is about to boil, take it off. When quite cool, put the preserve into proper jars, and tie down with leather or bladder, having brandied paper on the top of the fruit.

Thyme Dumplings.—Well wash some sprigs of Thyme, pick off, singly, a quarter of an ounce of the tender leaves; mix them with the crumb of a penny roll grated, three-quarters of a pound of finely-shred beef suet, a dessert spoonful of sugar, four eggs well beaten, and enough brandy to make it the consistency of paste. Form it into dumplings, flour them well outside, put them into cloths, and boil them for three-quarters of an hour. Serve with wine sauce poured over them.

Black Currant Leaves for Tea.—The *Journal des Connaissances Medicales* contains an article on the virtues of the leaves of Black Currant or Quince berries (*Ribes nigrum*). These leaves, when green, are much used by the country people for tea in cases of difficult digestion. With sugar this beverage is agreeable, aromatic, and possessed of exciting properties. M. Blucher of Point d'Onilly, in the department of the Calvados, has been induced to distil these leaves in the same way as those of Peppermint, Balm, &c., the operation being stopped when the liquid obtained is equal in weight to the substance employed. The leaves should be handled as little as possible, in order not to crush their odoriferous glands. This distilled water is a good vehicle for all stomachic potions, and will keep two years.

Marmalade.—Put 6 lbs. of Oranges (bitter) and six Lemons into a brass pan, cover them completely with water, and boil until soft (about three hours). Lay a plate on the top of the Oranges, to keep them below the water during the boiling. When soft take them out, cut in halves, scoop out the pulp, and throw away the seeds. Scrape the skins free from the white fibre inside, then cut into very thin strips with a silver knife. Strain the water in which the Oranges were boiled—probably now reduced to less than a quart—put it into the pan with 12 lbs. of loaf sugar, another quart of water and the pulp, boil fifteen minutes, add the cut skins, boil ten minutes, and pot.

Carrot Pudding.—One pound of grated Carrot, 6 oz. of bread crumbs, 6 oz. of Raisins, 6 oz. of Currants, 6 oz. of sugar, $\frac{1}{2}$ lb. of suet, half a Nutmeg, half the rind of a Lemon grated, two table-spoonfuls of flour, one egg, and a little salt. Mix all well together, and put into a well-buttered mould. Boil four hours.

THE LIBRARY.

WINDOW GARDENING.*

THE science and art of window gardening, as well as the use of decorative plants in apartments, is, as yet, in its infancy, and its early history seems shrouded in obscurity, although it, doubtless, had its origin in country districts, from whence it found its way into towns. It seems strange that this interesting source of enjoyment should have been neglected for so many years by the horticultural press, but, so it is; while, at the present time, it enjoys no mean amount of literature specially devoted to its progress and advancement. Fifty years ago plants were commonly grown in cottage windows, those more generally employed being *Fuchsia globosa*, *Fair Helen Geranium*, *Musk*, several *Mesembryanthemums*, *Cactuses*, and *crimson China Roses*. More recently, the newer varieties of *Calceolarias*, *Fuchsias*, *Campanulas*, *Balsam*, and *Pelargoniums* have been employed, while, at the present time, we employ *Figs*, *Palms*, *Ferns*, and the very choicest of exotic plants for the indoor decoration of our dwellings, not only in the quiet country, but also amid the dust and bustle of the busy city. We gladly welcome any work that contributes to the wide-spread influence of domestic floriculture, an influence that contributes so much to our comfort and happiness in the smoky atmosphere of a town residence. Looking at the subject from a commercial point of view, we find many large establishments devoted entirely to the culture of decorative plants in small pots, while thousands of pounds are spent yearly in London for the pretty little decorative plants so often met with in the window cases and apartments of town mansions. We look on the decoration of our dwellings with healthy plants and fragrant blossoms as the sign of a more healthy appreciation of nature as the embodiment of all that is beautiful and attainable in art. We have several very flourishing window-gardening societies established, not only in the metropolis, but also in other large cities and towns, as Hull, Manchester, Nottingham, and Sheffield. Window-gardening is evidently becoming quite as fashionable an amusement for ladies in America as it is with us here at home, and the above work seems calculated to forward progress in this direction, and is full of the most varied information with regard to the culture and arrangement of the various plants most generally used for window and room culture. This information, together with the 250 illustrations scattered throughout the work have been derived from various sources, but, in saying this, we do not wish to infer that the work is less valuable for its power of teaching on that account. The instructions throughout are simple, and, in most cases, to the point, while the book is written in a pleasant unaffected manner, likely to suit its American readers, and contains many hints that would be serviceable to our own window gardeners.

THE IVY.†

We cannot congratulate Mr. Hibberd on this work. The list of varieties of our common Ivy (all with new names given by the author) is a long one, and contains much descriptive matter; but, after reading through a succession of them, we are forced to the conviction that, in the majority of instances, it would be absolutely impossible to distinguish one from the other, even with the aid of Mr. Hibberd's descriptions. The historical and descriptive chapters contain a good deal of interesting information. The work is copiously illustrated, but the engravings, especially the views, are by no means in a high style of art. Mr. Hibberd has done useful work in his time, but we do not think that the book under notice will add to his reputation, or be of much service to Ivy-growers.

OUR FLOWER-GARDEN.‡

THIS little shilling work will probably be found usefully suggestive to the owners of small suburban gardens who are at a loss to know how to make the most of, perhaps, a limited space. The author states how he effected this in his own case, and, with the help of diagrams and views, gives a very good idea of the manner in which he succeeded. The same plan is not in all its details applicable to every small garden, but something like it may in every case be worked out. The book concludes with a chapter (with numerous illustrations not, perhaps, so good as they might have been) on the construction of miniature ruins for Fern-cases, &c.

* "Window Gardening." Edited by H. T. Williams, New York.

† "The Ivy; its History, Uses, and Characteristics." By Shirley Hibberd. London: Groombridge, 1872.

‡ "Our Flower-garden: how we made the most of it." By H. Allnutt, London: *Estates Gazette* Office, 200, Fleet Street.

THE ARBORETUM.

HARDY TREES AND SHRUBS.

By GEORGE GORDON, A.L.S.

THE TRUNCATE-LEAVED MAPLE (*ACER TRUNCATUM*).

THIS forms a nice small tree, 30 feet high, with slender, spreading, ash-coloured branches. It is a native of the north of China and Japan, and was first introduced in 1860. The leaves are palmately five-lobed, truncate or slightly cordate at the base, and thin in texture, pale green, quite smooth on both surfaces, entire on the edges, deeply lobed, with the recesses open and rounded, and on very long slender footstalks; lobes ovate, tapering to a long acute point, quite entire, and widely extended; flowers small, yellowish-green, and produced on very long slender footstalks in loose few-flowered terminal corymbs; fruit or keys rather small and quite smooth, with thin flat carpels, and widely extended wings. The length of a full-sized leaf is 7 inches, including the footstalk (which is from $3\frac{1}{2}$ to 4 inches long), and in breadth from $5\frac{1}{2}$ to 6 inches. There is a very handsome Japanese variety of this Maple, called *Acer truncatum pictum*, which has the leaves beautifully marbled with pale yellow. It is the *Acer pictum* of Thunberg's "Flora Japonica," and of the nurseries.

Planting Willows on River Banks.—

I propose, by planting Willows, to consolidate the banks of a winding brook, which are continually being washed away. Which is the best kind of Willow to plant under such circumstances, and which is the best way of planting it? Shall I plant rooted trees or cuttings? if cuttings, shall I plant them upright or in a diamond fashion, like London's Willow hedges? Is Alder as good or better than Willow for the purpose?—**RIVALIS.** [On submitting this question to Mr. Scaling, of Basford, who is a large grower of Willows, he has kindly favoured us with the following reply:—

"After many experiments in the United States, the Department of Agriculture at Washington, has decided that the only effectual way to retain or consolidate the banks of their rapid water-courses is to plant Willows, and that plan is now being adopted. The kind of Willow best suited for that purpose is the *Salix fragilis*, or any of its varieties, or the Huntingdon Willow. Stakes or cuttings are preferable to rooted plants; first, because the banks are not disturbed, or the turf broken by pushing the cuttings into them; and, secondly, all Willows grow better from cuttings than from rooted plants."]

Trees and Shrubs for Sea-coast planting.—In the list which Mr. John Scott gave in your number of the 7th inst. of trees and plants which he has found to succeed in "the most stormy locality . . . on a strong blue Oxford clay, exposed to N.E., E., and S.E. winds, close to the beach, up which the storms often hurled the dashing waves in wild fury, bathing everything in salt and water, and leaving every vestige of vegetation drenched with wet," there occur the names of some which give a widely different result in a similar exposure on the west coast. It is difficult to imagine such plants as *Camellia*, *Rhododendron*, *Escallonia*, *Mahonia*, *Picea Nordmanniana*, and *Horse Chestnuts*, succeeding in the eye of the blast, unless Mr. Scott alludes to small specimens, which are still under the protection of some fence to windward. Probably, the drenching of salt water would not injure these plants; but all experience shows that they cannot stand an unbroken sea blast. *Horse Chestnuts* we have found peculiarly sensitive to exposure, and *Rhododendrons* turn quite brown, although all in the list will stand any amount of frost which can come to them in this climate. It is to be feared that much

disappointment would be experienced if sea-side planters were to take Mr. Scott's list as a guide. On a windward coast, the outermost trees can never be anything but scrub, but it is extraordinary how serviceable the humblest living shelter is in sifting the blast, and how soon trees gradually increase in size behind it, if the soil is genial. The following may be suggested as more serviceable as storm-breakers than Mr. Scott's selection:—*Sea-buckthorn*, *Pinus maritima*, *Pinaster* and, *anstriaca*, *Huntingdon Willow*, *Beech*, *Ash*, and *Sycamore*. They are named in the order of hardihood, and, except perhaps the Willow, are very enduring. The Willow is invaluable as a nurse, for in a favourable season it will make sufficiently long shoots to give material shelter to its neighbours, even though all the life be blown out of the shoots by the following spring.—**SALMONICEPS.**

Best Time to Cut Timber.—Dr. Hartig, who has made numerous experiments to determine the point, states that March and April are the best months in which to cut timber for building purposes, as it then contains its lowest per cent. of moisture, which he states to be forty-seven per cent. During the three previous months it has fifty-one per cent., and the three following ones forty-eight. He further states that properly-seasoned timber should not contain more than twenty to twenty-five per cent. of moisture, and never less than ten per cent. If the moisture is removed to a still greater extent, the wood loses strength and becomes brittle. Another

authority states that if trees are felled as soon as they are in full leaf, and allowed to remain undisturbed until the leaves dry up and fall off, the timber will be found well seasoned, the leaves having exhausted all the moisture.

What is the best Low Evergreen Hedge?—I want to make a low overgreen hedge, on the garden side of a newly-planted Quick hedge. Both hedges will be kept cut down to 4 feet, to allow of our seeing over into a paddock. Yew is too dangerous, so near young horses. If *Thuja Lobbi* bears the knife, and could be cut decently as low as 4 feet, it seems the prettiest green. *Siberian Arbor-vita* is a better natural shape, but turns, in winter, a dirty brown colour, very inferior to *Thuja Lobbi*. *Phillyrea* is a lovely dark colour, but are there any varieties, dwarf enough, to make a low hedge, without becoming all wood? Chinese *Juni*-per has as lovely a green as any of the plants just named, but it seems to make a naked stem quickest of all of them. Will some of your experienced readers help me to decide?—**PLANTER.** [Mr. McNab says—"The plant of all others, for your correspondent's purpose, is the Holly. The Boxwood is also well adapted for such a purpose. If a Conifer is wanted, some of the varieties of *Cupressus Lawsoniana*, particularly the *C. L. viridis* would be superior to the *Thuja Lobbi*."]]

Ancient Yew Trees.—The churchyard at Overton, in Flintshire, says *Science Gossip*, is planted thickly with splendid Yews. One, quite hollow, measured 30 feet in circumference, at 3 feet from the ground. Again, there are twenty large Yew trees in the churchyard at Gresford, in Denbighshire, one of which girths 29 feet in circumference, 5 feet from the ground; it is more than 60 feet high, and is supposed to be about 1,450 years old, planted in the year 426, when the Romans finally left Britain, Wales being at that time a Roman province. These are, however, not so large as the one in the churchyard of Darley, Derbyshire, which measures 33 feet round the trunk, and, though bereft of many of its branches, is still in full vigour. In the churchyard, Tisbury, Dorsetshire, there is now standing an immense Yew tree, which measures 37 feet in circumference. The trunk is quite hollow; it is entered by means of a rustic gate, and seventeen people recently breakfasted in its interior. One in Staines is upwards of 1,000 years old. The great Yew at Fortingal, Perthshire, N.B., is stated by Gilpin, in his "Forest Scenery," vol. i., p. 282, to measure $56\frac{1}{2}$ feet in circumference, and supposed to have existed at the commencement of the Christian era.



The truncate-leaved Maple.

WORK FOR THE WEEK.

Flower Garden.

Where new lawns have to be formed, the preparation of the ground is of the greatest importance, and, except this is attended to in the first place, no after management is likely to be so thoroughly productive of that verdant, close, even, evergreen turf so desirable. Unless good firm turf can be secured, perfectly free from coarse Grasses and weeds of every description, it is best to sow with seeds adapted for the formation of a permanent lawn, being particular that the ground is made evenly solid. Lawns that were top-dressed early in winter, and such as are patchy, will be improved by being sown with Grass seeds and white Dutch clover; afterwards rake and roll over the ground. Finish turfing repairs, and edge the margins of walks. This is a good time, before the ground becomes hard, to grub up Daisies, Dandelions, &c. Sweep and roll the turf; the rolling should be done the day previous to mowing, and lose no time in having the Grass cut with the machine, which will greatly improve the appearance and texture of the turf. Specimen ornamental shrubs should now be pruned. Aucubas, Hollies, Bays, Portugal Laurels, &c., will be greatly improved by going over them with the knife, so as not to lacerate the foliage. The branches may also be regulated, cutting back straggling shoots upon such plants as Junipers, Retinosporas, Yews, Thujas, &c. Unless such plants as the Irish Yew, for instance, are rendered compact by pruning, they break down and often become unsightly. Borders containing herbaceous plants should be manured and dug; and such plants as require it should be divided and replanted. Herbaceous plants are the first to cheer us in spring and the last in autumn; they therefore deserve a little attention. Plant Gladioli either in groups, beds, or lines, keeping the crowns about 3 inches under the surface. That soil is best for them which has been enriched with manure twelve months previously and frequently turned; avoid manure in any form coming in contact with the bulbs, as it is almost certain to generate decay although it gives continuity of bloom. Gladioli should be planted at different times. They are also well adapted for pot culture. Mignonette may now be sown, and also hardy annuals at intervals. Transplant autumn-sown annuals, and thin out those remaining, so as to induce perfect development. Sweet Peas should now be sown.

Greenhouses.

Indoor plants are now starting freely into growth, and must, therefore, be encouraged. Deciduous shrubs and climbers, still unpruned, must now receive that attention, in order to prevent unshapely growth; and all evergreen shrubs may yet be safely pruned, and, if necessary, transplanted or re-potted. Stake plants in pots as requisite, bearing in mind, however, to use as few for that purpose as possible. As the young shoots lengthen, they should be tied out at once to the principal supports. In re-potting, carefully disentangle the outside roots, for plants shifted in a pot-bound condition never succeed satisfactorily. Good substantial loam, skimmed off the surface of a rich pasture, and stacked for twelve months previous to use, with alternate layers of manure, forms an excellent compost for most plants. Wash all sashes requiring that attention, paint any rafters or other wood or iron-work, that seems to need a coat of paint, and scrub off any coniferæ or green slime that may collect on the stages. No dirty pots should be used in potting, and the pots in which plants not to be shifted this spring are growing, should also be well washed, and the surface soil cleaned, and, if necessary, a fresh dressing applied. Newly-potted plants should be kept in the warmest corner of the house for a time, and excluded from cold draughts, but to plants in active growth plenty of air should be admitted, and abundance of water given. Maintain the gaiety of conservatories and other show houses by means of Hoteias, Spireæas, various sorts of Prunuses, Deutzias, Lilacs, Rhododendrons, Weigelas, and Roscs, brought from forcing houses. Keep up a good succession of Hyacinths, Tulips, Narcissi, and Crocuses, and for late bloom remove some of the latest of these to a cool-house or pit, with a north aspect. Introduce Mignonette from frames, and, if necessary, sow a fresh supply in pots for summer blooming. Rhodanthes are charming plants, both for summer and autumn decoration; therefore sow some at once in 4 and 6-inch pots, or in pans, and, when ready, prick the young plants out into pots, keeping them near the light, and pinching them at the third joint.

Stoves.

Finish potting the principal hard-wooded occupants of stoves as early as possible. *Alocasia Veitchii* and *Lowii* are plants which are frequently not well-grown, chiefly through being potted in unsuitable soil. They do not like anything of an adhesive nature; they do best in one-half fibrous peat, one-half chopped Sphagnum, with a liberal

admixture of sand. *Alocasia metallica* enjoys the same materials. The more easily-grown *Alocasia macrorrhiza variegata*, on the other hand, requires a different soil. Good turfy loam two parts, rotten dung one part, with sufficient sand to secure quick and thorough drainage, suits this plant well. Palms may now be potted, using fibrous peat, with a moderate admixture of broken crocks and sand; being water-loving plants, unless well-drained, the roots become unhealthy. With longer days, the temperature of the stove ought to be increased 8° or 10° during the daytime, and 5° at night; closing early so as to shut in the sun's genial warmth, which is much better, as well as more economical than fire-heat. Syringe the plants at the time of closing the house; and always let this be done sufficiently early to allow the foliage to dry before night. Stoves that face the south, or in gardening phraseology stand east and west, will require slight shading during sunny weather; at least some of the occupants will need a little shade, and it is better to place such at one end of the house, and only shade that portion; as the less shade the better, if scorching can be avoided. Stoves that are built north and south do not require shading so early in the season.

Indoor Fruit Department.

Pines are now being cut in good condition; others are swelling, flowering, and coming on in succession. To those ripening fruit, give but little water; whilst, to those in a less advanced state, supply it more liberally. For suckers, maintain a temperature of 65° at night, and to those farther advanced allow 70° by day, with a rise of 10° by means of sun-heat. Keep the bottom-heat at about from 75° to 80°. Give weak manure-water at the root, and also sprinkle the plunging material and paths with it. To late Vines give abundance of air, so as to keep their buds back. Vines that are just started should be kept close and freely syringed, thinning both bunches and shoots as they require it. The farthest advanced Figs should have a night temperature of 60°; these should now receive plenty of water overhead as well as at the root. The second house may now have the same temperature as the first; the third one kept at 55° at night, allowing a rise of 10° by sun-heat. Peaches, Nectarines, Apricots, and other fruits should be well syringed, except when in flower, and due attention should be paid to thinning the fruit, as soon as it is tolerably well set, and again after stoning time.

Kitchen Garden.

The value of trenching and ridging ground in winter has been made fully apparent this spring, for, while plots that were dug only, have been hardly workable, the ridged ground crumbled down like dust, even although there has been little frost; and, indeed, it is upon such ground we depend for our early Cauliflowers, Lettuces, Peas, Potatoes, &c. Sow a little Salsafy, Scorzonera, and Skirret in lines about a foot apart; the first or second week of next month is the general time for sowing these; but in late localities they should be sown earlier. Of the three, Scorzonera is the greatest favourite. Sow a full crop of Savoys, Broccoli, and Brussels Sprouts; sow, also, some seeds of Asparagus in lines 18 inches apart; likewise successional crops of Radishes, and occasionally some Lettuces, both Cabbage and Cos kinds. Also plant out winter-raised or protected Lettuces between Cauliflower plants, or transplant a full crop over Seakale or Horseradish plantations. Finish transplanting Onions, and, if not already done, sow the summer crop at once. Sow Round Spinach between rows of Peas, or, in some other places, in quantity sufficient to meet the demand; sow also some of the New Zealand Spinach in heat for a summer and early autumn crop; this variety often affords fine succulent leaves, when ordinary Spinach cannot be had. Of Carrots sow a full crop in deeply-trenched ground, which should get a good dressing of fresh air-slaked lime. Sow some small kinds of Turnip in lines a foot apart, or in beds 4 feet wide, on warm, light soil. Earth up and stick Peas as they advance in growth; any exposed to cutting winds should have the assistance of a few evergreen branches to break its force. The following are first-rate sorts for sowing about this time, viz., Champion of England, Laxton's Prolific and Quality, Veitch's Perfection, Dixon's Favourite, M'Lean's Best of All, Prince of Wales, Wonderful, Fairheard's Surprise, Victoria Marrow, Knight's Tall Marrow, British Queen, and Ne Plus Ultra. Transplant Cabbages as required. Lift, divide, and transplant pot herbs, and sow in a frame some for planting out in May or June. We have never seen strong loamy soils work better than they have done this year, up to this date, for the rainfall in January and February was below the average; and the months of October, November, and December, in 1873, were, likewise, very dry. All kinds of early vegetable seeds have, therefore, been sown in most cases in good condition, and, should the spring be favourable, there is a good prospect of abundance of both vegetables and hardy fruits.

SOCIETIES, EXHIBITIONS, &c.

ROYAL BOTANIC SOCIETY.

MARCH 25.

THERE was a nice show of stove and greenhouse plants, Hyacinths, Cyclamens, Orchids, Roses, and early spring-flowers on this occasion. Hyacinths were, in many cases, the same as those staged at South Kensington on the 18th. The most interesting portions of the show consisted of the new plants.

New Hyacinths were staged in fine condition by Messrs. Paul, Messrs. Cutbush, and Messrs. Veitch, the latter having twelve very fine varieties. Foremost here, as at Kensington, was Anna, a fine waxy-white (double spike); Ida, soft canary; De Candolle, bronzy-blue; Fabiola, dense spike, rosy-salmon; Lady Palmerston, soft rich rosy-lilac (fine spike); Vuurbak, dense spike, vivid crimson; La Joyeuse, soft rose; Czar Peter, fine single blue; and King of the Blues, a fine spike of deep velvety-blue bells, of good substance. Messrs. Cutbush had two new varieties in their collection, viz., Christine Henderson and George Peabody, both noted above. Amongst private growers, Mr. James Douglas, gardener to J. Whitbourne, Esq., Loxford Hall, Ilford, took the leading position, and staged a dozen fine varieties, the best being De Candolle, La Grandesse, Czar Peter, Vuurbak, Von Schiller, Sir Garnet Wolseley, fine single purple; Lord Byron, fine single blue, with very fine waxy bells; Erebus (new), a deep purplish-black, with a very dense spike. Mr. James Weir, gardener to Mrs. Hodgson, Hampstead, had a nice collection, the best whites being Mont Blanc and Queen of the Netherlands, both single; Baron Von Tuyl, Marie, Hadyn, and Grand Lilas, single blues; and Von Schiller and Macaulay, single reds.

Tulips.—Nice collections, three bulbs in a pot, were staged by Messrs. Veitch, Messrs. Cutbush, Mr. Douglas, and Mr. Weir. The single varieties, as here staged, are very ornamental, and vary in colour, from pure white, through all the shades of lilac, rose, scarlet, and purple, many being either feathered or flaked with rich golden-yellow. Among the best varieties are the following:—Rouge Luisante, fine deep rosy-lilac; Wouwerman, deep purple; Prosperine, silvery-rose; Vermilion Brilliant, scarlet and yellow; White Pottelbakker; White Canary Bird, clear yellow; Princess Helena, white; and Chrysolora, a bright golden-yellow, very effective, contrasted with the deep purple varieties.

Stove and Greenhouse Plants.—Mr. Ward, gardener to F. Wilkins, Esq., of Leyton, staged twelve nicely-grown plants containing good specimens of *Lycaste Skinneri*, one of the most profuse-flowering of winter Orchids; *Odontoglossum Pescatorei*, in fine condition, with five branched spikes, the blooms being larger than ordinary, and one of the strongest plants of *O. triumphans* that we have ever seen. This plant had very large pseudo-bulbs, fresh green foliage, and bore a branched spike nearly a yard long, on which were nineteen fully developed brightly-coloured flowers. This group also contained a well-bloomed plant of *Dendrobium nobile*, one of the oldest and best of its class; and also a fine little specimen of *Cytisus racemosus elegans*, about two feet through; *Eriostemon intermedium*, well bloomed; and a nice plant of *Erica Lindleyana*, a pretty erect-growing variety, much resembling *E. Wilmoreana*, both in growth and flower. Mr. G. Wheeler also had a nicely-flowered group of this class. Azaleas were shown by Mr. J. Ward, well bloomed, the principal varieties being A. Model, fine silvery-rose; A. Borsig, a fine semi-double white, fine for cutting, as the flowers of these do not fall so quickly as the single kinds; A. punctata omnicolor, a pale rosy-striped variety; A. Charmer, a fine large-flowered rosy-lilac form, with waxy petals; and Souvenir Van Peene, a pale rosy-salmon. Mr. G. Wheeler was second with nice-bloomed plants, one or two being rather weak. This group consisted of Marie, pale vermillion; Gautoise, delicate lilac, edged with white; Iveryana, white, striped with bright rose; Perfection, rosy-lilac; and the bright vermillion-scarlet *Chelsonii*, which is now, however, superseded by the still more vivid Stella. In the miscellaneous groups, some interesting plants were staged by Messrs. Veitch, Messrs. Rollisson, Mr. B. S. Williams, Messrs. Jackman, and others. One of the prettiest features in the exhibition was the remarkably well-grown pot-specimens of Clematis, staged by the last-named firm, and to which, as will be seen on reference to our prize-list, a special award was made. Being quite distinct from any other decorative plants, and as they may be had in bloom all the year round with but little trouble, we may anticipate their more general cultivation at no very distant date, especially as they are equally well adapted either for conservatory decoration or summer and autumn bedding. Their great star-shaped flowers vary in colour from pure white through all the shades of soft lilac to the deepest of purples, while as climbing or trailing plants in the cool conservatory or greenhouse they are unrivalled. Messrs. Rollisson & Sons exhibited a very nice group of flowering and foliage plants, consisting of Orchids, bulbs, and choice succulents. In this collection we noticed a fine variety of *Imantophyllum minimum*, with broad petalled and very richly-coloured flowers; also plants of the old, but beautiful, Fern, *Brainea insignis*, similar in habit to a robust *Lomaria gibba*, but much better in every respect. Mr. B. S. Williams had a nice collection of Orchids, foliage plants, and succulents. *Anthurium crystallinum* is a striking plant, with great velvety-green leaves and bright silvery veins. Among the Orchids shown by the same exhibitor we may allude to the old, but little known, *Ornithidium coccineum*. In habit this resembles an *Odontoglossum*, having fresh green leaves and clusters of small, but vivid-scarlet flowers at their base; *Cymbidium Parishii* (?), and the plant of *Renanthera coccinea*, before

alluded to in our columns. Messrs. Lane & Sons staged a collection of small Camellias in pots, very nicely flowered, as well as a miscellaneous group of spring-blooming shrubs. Messrs. Cutbush, Mr. Toms, and Messrs. Veitch, also staged groups of flowering and foliage plants. The latter firm had a nicely-bloomed plant of *Dendrobium Domini*, the first hybrid in the genus and the result of a cross effected between *D. nobile* and *D. moniliforme*. In habit and flower it closely resembles the last-named parent. Mr. Chancellor, The Retreat, Richmond, sent four nicely-grown specimens of *Mignonette*, remarkable for their large flower-spikes, the perfume of which was most grateful throughout the conservatory in which they were placed. Well-grown pots of Lily of the Valley were staged by Mr. J. Douglas, and Mr. G. Wheeler sent a like number with better foliage but far fewer flowers. Deutzias were also staged by Mr. Douglas in beautiful condition. These plants were deservedly awarded the first prize. The most important point about them from a cultural point of view was their being old plants trained into a balloon shape, the result being perfect globular masses of fresh green foliage and snow-white flowers, about 2 feet high. The usual way of growing Deutzias is to cram as many imported or home-grown plants into a pot as possible, but the plan adopted by Mr. Douglas is well worth a trial. Mr. Reeves, nurseryman, Acton, sent six well-grown bush plants, and Mr. James also sent half-a-dozen plants grown in the usual way. Cinerarias were staged in fair condition by Mr. James, and also by Messrs. Dobson & Sons, the prizes being awarded in the order named. The plants staged by both exhibitors were dwarf, compact, and well flowered. Cyclamens were staged by Messrs. Veitch and Mr. B. S. Williams in the miscellaneous classes, and also by other market growers. The principle award was made to Mr. Goddard, whose plants were well-nigh perfect in leaf and flower, Mr. James being second. Both exhibitors had well-grown plants most profusely bloomed. Messrs. Lane also exhibited a new H. P. Rose *Souvenir de Romaine Desprez*, a fine flower, of a rosy-lilac tint. Mr. Needle, gardener to the Comte de Paris, Twickenham, sent between forty and fifty pots of hardy Orchids and *Ophrys*, remarkably fresh and healthy, and well-bloomed. These curious little plants certainly deserve more attention than they at present receive, and their cultural treatment is very simple, all they require being a compost of fibrous loam and lumps of limestone on a well-drained bottom, plenty of water when growing, and a cold frame with an eastern aspect.

Cut Flowers.—A nice collection of Camellia flowers, in fine condition, came from Mr. W. Paul, of Waltham Cross, who also set up some fine stands of cut Roses, of marvellous quality for the time of the year. Among the new varieties we noticed the following:—Madame Lacharme, fine blush white, and a vigorous grower. Princess Christian, a soft rosy flesh-coloured variety, fine in the bud. Derraine Lamy, fine rich crimson, set off by fine wax-like foliage. This is a vivid flower, very full, and of good form. Madame de Ridder, a fine purplish-crimson, with very smooth petals, somewhat resembling Dupuy Jamain, but not quite so full, and more distinctly suffused with purple.

Certificates of Merit were awarded to the following New or Rare Plants:—*Chysis Chelsonii* (Veitch).

Cypripedium Harrisianum (Veitch).—This is a beautiful and free-flowering hybrid, raised by Mr. Dominy, between *C. barbatum* and *C. villosum*. In habit it comes nearest to the latter parent, but is distinct from either, and one of the best Lady's-slippers in cultivation.

C. Roezlii (Veitch).—This is a very robust-growing species, bearing large long-petalled flowers on a stout scape, which is furnished with very large bracts. It differs from *C. longifolium* in its broader leaves and richer tinted flowers.

C. Argus (Veitch), described in our last week's number.

Cutleya Veitchiana (Veitch).—A richly-coloured cross between *C. labiata* and *C. crispata*.

Lelia Veitchii (Veitch).—This is a new and beautiful plant raised in Messrs. Veitch's establishment, between *Lelia Pilcheri* (also a hybrid) and *L. cinnabarina*. In habit it resembles the latter parent, having deep orange-yellow flowers 3 inches across, with a crumpled crimson lip.

Vanda cærulescens (Veitch).—A pretty little blue-flowered species, evidently a very free bloomer. The lateral sepals are curiously incurved, each flower being about an inch across.

Eranthemum aureo-reticulatum (Veitch).—A pretty foliaged plant with pale stems and large oblong leaves, netted with golden-yellow. It is worth growing, and is distinct, most of the other species having red or purple veins.

Adiantum sessilifolium (Veitch).—A fresh green elegant species, having large triangular tripartite fronds 2 feet high, the pinnae being crisped along their upper margins. This is a distinct and free-growing plant.

Asplenium schizodon (Veitch).—A very distinct species which, at first sight, reminds one of *Lomaria gibba serrulata*. Its fronds are broadly bipinnate and of a bright green tint.

Rapateia (Saxo Fredericka) *pendanoides* (Veitch).—A curious plant, nearly related to *Juncus*; each leaf has a sheathing base, and from these the young red-tinted foliage rises like a sword from its sheath. Worth culture as a curiosity.

Boronia megastigma (Veitch).—A slender-growing Heath-like plant, bearing small drooping flowers, golden-yellow within, and of a lurid brown outside. The flowers are very sweet-scented.

Dracena Baptisti (Veitch).—A robust and striking plant, with broad rosy-tinted foliage. One of the best of all the newer varieties of this genus.

Curmorcia picturata (Veitch).—A dwarf foliage plant, having ovate foliage, cordate at the base, of a light velvety-green tint, with a broad irregular silvery blotch or stripe up the centre.

Clematis Vesta (Jackman).—A robust and free pale-flowering variety. Well worth growing.

Clematis Countess of Lovelace (Jackman).—A profuse bloomer. Well worth growing for variety, as are nearly all the plants of this fine genus.

Anthurium hybridum (Williams).—A strong-growing species, having green saddle-shaped leaves. The younger foliage is of a fine deep bronze-like tint, and the whole plant is very ornamental.

Gynogramma decomposita (Williams).

Agave Taylorii (Williams).—An interesting hybrid, and one of the best of the filiferous group.

Cypripedium Roezlii (Williams).—See above.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

GRAFTING DWARF ROSES.

It may not be generally known how very easily dwarf Roses may be increased in spring by grafting in heat under glass. In this way stronger plants may be obtained, in a given time, than by any other method of propagation with which I am acquainted; the chances of success are also more to be depended on; and, when grafted close to the collar of the stock, in the way which I shall presently indicate, they become, in a short time, virtually on their own roots. In February or March, I secure a sufficient number of one-year-old Manetti stocks, with a supply of well-ripened wood for scions of any kinds of Roses; it may be necessary to increase all kinds of Tea Roses do well grafted in this way; but it is important that the shoots selected should be firm, and the buds dormant. If soft sappy wood is used it will damp off to a certainty. The roots may be shortened, and the stock headed back to within 1½ inches of the collar, in fact, leaving only just sufficient room to put on the scion. There are various modes of grafting, but what is termed whip-grafting is that most generally useful for the inexperienced knifeman. This may briefly be described as cutting away a rather large slice from one side of the stock, and, neatly fitting the scion to it, taking especial care that the barks of both stock and scion form a perfect junction on, at least, one side, without which no union can take place, and the whole should be firmly bound together with matting or Roffea Grass (a cheap material, that is now largely sold). As fast as the stocks are worked they should be laid on one side, and the roots covered with damp Moss, or something to check evaporation till a sufficient number are done to fill a hand-light in the propagating-house or any other place, where a steady bottom-heat of 75° can be obtained. The hand-lights should stand on about 6 inches of very light sandy soil, in which the grafted plants should be plunged closely together, or nearly so; at the same time, completely covering the junction of the stock and scion, as this obviates the necessity for using grafting-clay or wax; at least, I have had as much success without its use as with it, but, of course, the air must be excluded in some way, which is done in this case by the plants being plunged above the junction. A hand-light will hold from 50 to 100 plants; and, as each glass is filled, it should receive a watering with tepid water to settle all down. The lights will generally require to be kept close, or if any ventilation is required at all it should be given early in the morning or at night. If all goes on well, in a fortnight or three weeks, the scions will be pushing into growth, and the stocks emitting fresh roots. They should now be taken up and potted separately into 48-sized pots, in about three parts rather strong loam and one part old manure, well broken up, taking care in potting that the stock is completely buried, which, as they are grafted close to the collar, there is no difficulty in doing. Anyone who prefers the common Briar for a stock may raise them from seed, and graft in the same way I have recommended for the Manetti. I have sometimes, when hard pushed for stocks, obtained small Briars from the hedgerows in the neighbourhood, or used some of the old fashioned summer-blooming Roses for stocks; but, of course, the better the stocks in a general way, the more complete will be the success. But, in early spring, when most things are just waking into life, with the growth of the stock just a little in advance of the scion, and a gentle bottom-heat, an inexperienced propagator will obtain a far larger portion of success by this than by any other method. After potting them off, they should be grown on in heat for a time, and then gradually hardened off. As the plants grow, the only care required is to tie up the shoots, and pinch them, so as to form handsome specimens. If they are attacked by aphids, mildew, or the common rose-grub, it will be necessary to use tobacco-water and flowers of sulphur, in the first two cases, and to hand-pick the grubs, as a remedy for the last-named evil.

E. HOBDAY.

LUCULIA GRATISSIMA.

WE seldom meet with a really well-grown specimen of this fine conservatory shrub, although it has been long introduced to our gardens; and, of all plants for the winter decoration of a well-lighted and moderately warm house, this is certainly one of the best. We have often wondered why so many cultivators fail with this plant; but could never satisfy ourselves as to the cause, especially as it is by no means difficult to grow. About twenty years ago a specimen of this *Luculia*, which grew in the large conservatory at Chiswick before it was converted into a Vinery, used to be the admiration of both gardeners and visitors. It is rare to see any stock of young plants of this fine sweet-scented shrub in nurseries; though this cannot make much difference to its more general distribution, since it might soon be propagated by the dozen or hundred; but the fact is, there is at present no demand for it. We, however, never knew anyone with whom it succeeded well once who would ever care to be without it afterwards. Only the other day a noted gardener in the midland counties wrote to us to the effect that his plant of *Luculia* had been a perfect picture; it is 10 feet high, and quite as much through, one dense mass of fresh green foliage, and rosy clusters of fragrant flowers. One of the best specimens of this shrub we have ever seen is at Little Dalby Hall, Leicestershire (the country seat of E. B. Hartopp, Esq.), where it occupies a corner of the conservatory, and forms a glorious bank of flowers and foliage 13 feet high, and 9 or 10 feet through. When seen in such fine condition as this, it is one of the most effective of all decorative plants, and furnishes plenty of spray for drawing-room vases or dinner-table decoration. The plant likes a good body of fresh open compost, in which its roots luxuriate, spreading in all directions; still, one occasionally meets with nice little specimens in tubs, but even these would be far better if planted out. A little weak manure-water is very beneficial to this plant when making its growth, more especially in the case of those plants which have their roots confined. If regularly syringed, and a genial temperature maintained, this plant is rarely troubled with insect pests; while any little extra attention bestowed upon it is amply repaid when its flowers make their appearance. We have no other plant that rivals it as a winter-blooming conservatory plant, and it certainly deserves a fair trial everywhere where choice delicately-perfumed flowers are required for decorative purposes. The plant is readily propagated by means of cuttings or layers inserted in a sandy compost in a genial bottom-heat, and when the young plants are fairly established, they develop themselves very rapidly. The plant does well in a large pot or a tub; but, if it is planted out in a good fresh compost of fibrous peat and turfy loam, it develops itself far more rapidly and requires no further attention than occasional syringings, and a good supply of water at its roots. Its great clusters of sweet-scented flowers are generally produced in December, and this makes the plant doubly valuable, as choice flowers are then generally scarce. The plant should be pruned in about the middle of March, and will soon start into growth, especially if assisted by gentle syringings on warm days. Every encouragement should be given to induce the plant to make its growth early and quickly, so that the young wood may get thoroughly well-ripened in the autumn, as this conduces to large clusters, and a far finer crop of flowers. A warm sunny position should be selected for the plant, and the compost should be placed on a well-drained bottom. We have seen very pretty well-bloomed plants trained along the back-wall of a plant-stove; but a warm conservatory is the proper place for it, and a good specimen should find a place in every garden, however small. The plant is a native of northern India, being found in tolerable abundance throughout Nepaul, forming a beautiful tree. Another species, *L. Pinciana*, still more rare, and it is, if possible, still more beautiful than the last-named, succeeds under the same treatment. It has clusters of white flowers, and is readily distinguished from its congener by a row of small scales around the tube of the corolla. Like the last it is deliciously fragrant, and first flowered in Messrs. Pince's once noted collection of rare exotics; and it was so highly valued that they sent a special messenger with cut flowers for figuring, and a living plant for the Royal Gardens at Kew.

B.

NOTES OF THE WEEK.

— *PUSCHKINIA SCILLOIDES*, a beautiful plant, belonging to the Liliaceæ, is again blooming in Mr. Parker's nursery, at Tooting. It bears a loose spike of pale blue flowers. It is a native of southern Russia, and is, as yet, rare in gardens.

— WE are indebted to Mr. Barr for a sight of the true double Daffodil, a very different plant from that usually so called. Both the true Daffodil and its double variety are plants of medium growth, and bear bright yellow flowers of handsome form, set in a sulphur-coloured perianth. It is a rare and valuable species.

— ONE of the finest specimens of the beautiful *Phloxenopsis Schilleriana* now in cultivation is at Yewfield House, Arbroath. It is furnished with fourteen leaves, which vary from 14 to 18 inches in length, and it has this season borne four spikes, on which there are altogether 209 fully-expanded flowers. In the same collection is a fine specimen of *Angræcum sesquipedale*, having sixteen fine flowers on four spikes. Than these finer specimens could not well be had.

— IN Mr. Barr's trial grounds, at Tooting, may now be seen at least twenty species and numerous varieties of early-flowering Narcissi, many of the forms being exceedingly rare. Of these Narcissi many are well figured in Parkinson's "*Paradisus Terrestis*" as long ago as 1656. Among the more conspicuous of those now in flower may be named *N. obvallaris* and its variety *maximus*, *Telamonius* and its double variety, all fine kinds of Spanish origin.

— IT is in contemplation to secure Brook Green, Hammersmith, permanently, for the public. The Ecclesiastical Commissioners have offered to give up their rights over it for a nominal consideration, if the Metropolitan Board will undertake the charge of it. The Board has expressed its willingness to accept the surrender of the Commissioners' rights, and to put the green in order, provided it is maintained afterwards by the parish to which it belongs.

— DR. MOORE writes to us to say that a fine plant of *Darlingtonia californica*, raised from seed sown in 1868, is now in flower in the Botanic Garden, Glasnevin. It has continued healthy throughout, and has now leaves on it more than 18 inches in length; the flower-stalk is upwards of a foot in height. It may interest our readers to know how long they may expect to wait for seedling plants of this to flower, even under good cultivation. The plant at Glasnevin has been grown, during the last three years, in a cool greenhouse, where it is now flowering. During the first two years after it germinated, it was kept in an intermediate house.

— IN South Australia something effectual is about to be done to secure an adequate supply of timber. A scheme is on foot for laying out no less than 300 square miles with a great variety of timber trees. The first step will be to proclaim the necessary number of reserves. Of these twenty-nine are to be in the northern, thirteen in the southern, and eighteen in the central districts. An officer practically versed in forest culture is to be appointed conservator. The trees selected for cultivation are in all cases to be such as will be useful for manufacturing, building, fencing, and mining purposes. In the list we observe *Eucalypti*, Pines, Oak, Cedar, and other woods. The forests in question are to be formed gradually. At first the trees will be planted in the reserves about 10 feet apart, or 435 to the acre. At the end of five years every second tree is to be removed and sold, and a similar thinning out is to occur five years later. The remainder will consequently have a sufficiently clear space in which to attain the fullest maturity; 7,000 acres are to be at once "reserved" for the reception of 3,000,000 of plants, which it is estimated can be raised during the first season at the principal nurseries of South Australia.

— THE important project of an irrigation canal from the Rhone, in reference to Vineyards and the Phylloxera, set on foot by M. Dumont, has received the approval of the Conseil de G n rale des Pons et Chauss es, and will now be submitted to an inquiry of public utility in the five departments, Is re, Drome, Vaucluse, Gard, and H rault. Thereafter a law will probably be proposed and passed this year. The works will then begin in 1875, and be concluded before 1880. As the scheme now stands, it is to ensure the irrigation or submersion of more than 1,640,000 acres of land. Two-thirds of this surface are planted with Vines, and have been more or less attacked by Phylloxera. The formation of such a canal appears to present the only practical means of saving this source of national wealth, the average product of which at present exceeds 300,000,000 francs (while the canal will cost about the third of this, or 100,000,000). It is expected to increase by half a millard the value of the land. M. Dumont further points out that an immediate consequence of the submersion of 1,640,000 acres will be a change of the climate of this zone, as has been found to be the case with the canals of Marseilles and Suez. It appears to be getting recognised in France that it is hope-

less to think of exterminating Phylloxera thoroughly in Europe. Hence the necessity of a profound modification in cultivation of the Vine, consisting in giving each Vine-cultivating district, as far as possible, the means of artificial irrigation or submersion.

— WEST Ham Park is, we understand, to be opened to the public early in May. The committee of managers is to consist of fifteen members, of whom eight are elected by the Corporation of London, four by Mr. Gurney, and three by the subscribers to the fund.

— BICTON, the seat of Lady Rolle, was, says the *Pall Mall Gazette*, partly destroyed by fire on Monday last. The fire broke out in the laundry and spread with surprising rapidity. The damage is estimated at about £10,000. The conservatory is reported to have sustained considerable injury.

— OUR cultivated plants survive much farther to the north than is usually supposed. M. Adolph Erman, when only eighty-four miles from the Arctic Circle, in North Siberia, found not only woods of Larch, Pine, and Birch, fine and vigorous, but garden vegetables, such as Turnips of large size, and in the woods Blackberries and Roses—probably, says M. Erman, *Rosa calyciflora* of Gmelin—growing luxuriantly.

— AT a meeting of the Helensburgh Horticultural Association, the other day, it was stated that 245 species and varieties of plants, representing eighty-two genera, and illustrating forty-four natural orders, had been in flower in the open border since the new year. A botanical work fully 290 years old, was laid on the table, in which reference is made to the Cyclamen, as being spoken of by Pliny as early as the year 75 of the Christian era.

— MR. PRESTON writes to us as follows, respecting the wireworm:—"I find the temperature of the soil, this season, to be much higher than I have known it for years, and, in consequence of this the wireworm will become a beetle six or seven days earlier than it has been for the last ten years; those who are planting Potatoes and other crops likely to suffer from it will do well to look out for, and destroy, the larva, which is now in a very active state seeking a resting place, in order to become a pupa; this is its third transformation."

— THE arrangements for the forthcoming opening of the Walsall Arboretum on the 4th May are fast approaching completion, when the inhabitants of Walsall and neighbourhood will be provided with a place of healthy recreation. When the arboretum scheme was first laid before the public, many were of opinion that it would be practically impossible to carry it out; but all who have been connected with it have, by dint of hard-work, overcome the numerous difficulties which at first beset them, and the arboretum grounds will, ere long, be the chief centre of attraction of their kind in South Staffordshire. Whilst the boundaries and lodge present a somewhat sombre appearance, the visitor is agreeably impressed on entering the interior of the grounds with their beauty. There are numerous silvery and Mossy groups of plants, cushions of bright green foliage, panicles of rosy flowers, margins of well-defined botanical species with prettily marked foliage, and spring flowers peeping out nearly everywhere, thus affording a variety that cannot fail to meet with universal admiration.

— THE production of Saffron, says the *Journal of the Society of Arts*, is considerable in France, but it is confined to three departments, of which Loiret produces the largest amount and of the best quality. It is a peculiar industry, and little known even in France. A Saffron field is not in full bearing till the end of the second year, and at the end of three years it is exhausted, and, according to the local proverb, the land is then so poisoned that it cannot be used for the same purpose for fifteen or sixteen years more. The average crop of the second and third year is various, from ten to thirty kilogrammes per hectare, or from 9 to 27 lbs. per acre, of dry pistils; each acre produces about 600,000 to 700,000 bulbs, and each bulb two or three flowers. About 30,000 flowers are required to produce 2 lbs. of fresh pistils, which, when dried, are reduced to one fifth of that weight; the pistils are the only productive portion of the flower, the rest is waste. The labour of picking such enormous quantities of flowers by hand is great, and when the crop is large, and labourers scarce, the flowers are carried into the villages and small towns round about, to be picked at home. The farmer has to pay from about 10d. to 4s. a pound for the picking, according to the abundance of the crop. When the pistils are separated they have to be dried, and this operation is effected by placing about a pound fresh pistils at a time in a horse-hair sieve, suspended over a little charcoal furnace. As soon as it is dry the Saffron is ready for sale. It requires a peculiar soil, and the land which suits it is worth £3 to £1 per acre, or double the rent of ordinary land in the same district; but the Saffron itself sells, on an average, for 30s. to £2 per lb., and, when very fine, for double those rates; in very extraordinary years, which, however, occur only once or twice in a century, Saffron is worth as much as £8 per lb.

THE INDOOR GARDEN.

ORNAMENTAL FRUITED PLANTS.

IN addition to the descriptive list of "Berry-bearing Plants," given at page 436 of last volume, we have others which, if not so generally grown, are not less interesting on that account. Some plants, of which the common Butcher's Broom (*Ruscus aculeatus*) may be cited as an example, bear inconspicuous flowers, hardly perceptible to the naked eye; but their fruits render them as ornamental as the generality of flowering plants. One of the prettiest of these (and one which is now becoming extremely popular for winter decoration) is the scarlet-berried Gladwin (*Iris foetidissima*), a plant that grows and fruits well on any warm sandy border in the South of England. Some of the *Pæonies*, again, bear great brown woolly capsules, which, after their showy flowers are past, when they burst open and reveal their shiny blackberry-like seeds, and the crimson lining of the pods, are even more ornamental than those of the Gladwin. As a miniature berry-bearing plant for the window, we have few that grow better or fruit more freely than the dwarf mossy-looking little *Nertera depressa*, which may be readily propagated either by means of seeds or by division. Seeds of it germinate freely in a pot of light sandy soil, covered with a tumbler or a small bell-glass, and set in the window of an ordinary apartment; or, little rooted patches taken off an established plant, and planted in a pot or small pan of light rich earth, soon become covered with orange-scarlet bead-like capsules or berries. The Golden-fruited Bromeliad (*Bromelia sepectrum*) is one of the most striking of all stove or warm greenhouse plants that bear ornamental fruit, not even excepting the more prolific of the *Granadillas* (*Passion-flowers*), many of which bear very ornamental egg-shaped fruits of a bright golden-yellow, or rich purple colour. Bromelias are easily grown, and, like succulents, they require but little attention beyond occasional watering and syringing during hot weather. Any compost seems to suit them; but a good sandy-loam and well-drained bottom is best. The golden-fruited species has long spinose leaves, and bears an erect spike of flowers, which are not particularly ornamental; but they are succeeded by a cluster of golden-yellow fruits, each as large as a pigeon's egg. Collectively, these are very ornamental, and, if kept dry, they will last for several months in perfection. The crimson-fruited *Carex* (*C. baccans*) is another plant which produces fruit of an interesting kind. It is a robust-growing Himalayan species, well adapted for pot culture, or for planting out in conservatories. It has gracefully recurved Grass-like leaves, from 18 inches to 2 feet in length, and about half-an-inch in width. The most ornamental part of the plant, however, is its clustered spikes of deep vermilion or crimson-tinted fruits, which contrast well with the bright green leafy bracts by which they are supported, each

little fruit shining as if varnished. When seen on the plant these clusters are very pretty, and they last for months in perfection; they are also well adapted for cutting and mixing with choice flowers and Ferns. The plant grows well in a pot in fresh sandy loam, if well drained; it requires a regular and copious supply of water when growing, taking care never to let it become thoroughly dry at the root. The accompanying illustration (which gives an excellent idea of the habit of the plant) was taken from one which fruited last winter in the Palm-house at Kew. The cluster of fruit here represented is, however, little more than half the size which it attains under good cultivation. The plant is easily propagated, either by means of division or seed, and is well deserving of general cultivation. Many other ornamental *Carices* are well worth cultivation, and among our own native species we have one or

two that are beautiful objects planted on the spongy margins of ponds, lakes, or other ornamental waters. *C. pendula* is one of the best for this purpose, and also makes a conspicuous object in drier parts of the pleasure-grounds. I remember that some fine patches of this plant grew well in the old wilderness at Chiswick some years ago, but, unfortunately, these, together with many other rare and interesting plants, no longer exist there. B. F.



Carex baccans.

THE BALSAM.

IN old-fashioned days, before the rage for bedding-plants had set in, the Balsam was occasionally used for out-door decoration, and very pretty beds it makes, especially if there be a considerable variety of colours amongst the plants so employed. But, perhaps, the Balsam is most properly classed as a pot-plant, not because it grows better or flowers more freely under glass than out of doors, but, because when elevated up to the eye-level, its beauties are much more easily discernible than they otherwise would be, and the fine double blooms that adorn its branches are seen in perfection. The Balsam deservedly ranks as one of the most effective and most easily grown of all tender annuals. It has been, moreover, elevated to the distinction of a florists' flower, and thus, as a show-plant, it possesses certain merits that render it important. Well-grown and well-flowered specimens are by no means common, simply, because few men know how to do the plant justice; yet so amenable is it to ordinary culture in the open ground, that it is comparatively easy to lift up from thence much finer and much better bloomed plants than any grown in pots under glass. Probably, the reason of the too frequent failure in the cultivation of good plants in pots lies in the fact that the Balsam is rather impatient both of great heat and a confined atmosphere. The first induces drought at the roots and a quick falling of the flowers, whilst the other forces the plant into a somewhat premature and lanky form of growth, which is not conducive to elegance, or to the formation of good specimens. I grow Balsams by the hundred for seed, and, not having in that case the fear of horticultural censors before my eyes, I should

much prefer to grow all that I need in pots, instead of out in the open garden, for the simple reason that one is then able to group all the respective colours together, and also, because seed so produced ripens earlier than in the open air, and the crop is more certain. But there are objections, not the least of which is the great amount of good holding soil required for the growth of several hundred of the Balsam in 24-sized pots; then there is the large amount of house-room needed; and, lastly, the time required to water them—an operation that needs performance twice or thrice a day in hot weather. I sow my seed in shallow drills, in a soil-bed in the greenhouse, about the middle of March, marking each colour with a label, and giving plenty of room, so that the seedling plants may not be cramped for space as they grow. If the season is favourable, they are dibbled out into rows in the second week of May, giving the plants 12 inches space in the rows, and 30 inches row from row; between these, however, I put out either Stocks or Asters, or some other moderate-growing annual, so that the Balsams get plenty of space without wasting the ground. Sorts that grow tall, or furnish a large number of side-shoots, need both pinching and thinning out, as it is best to perfect what flowers have been formed, say to the end of August, rather than look for seed from any bloom after that date. The glorious uncertainty of our climate was most unpleasantly exemplified in September, 1872, when an early white frost caught the Balsams in full growth and vigour, and inflicted considerable mischief on the plants and seed crop. However, such a misfortune seldom happens so early in the year; and if the first frost does not fall until after the middle of October, then the crop is pretty safe.

If lovers of the Balsam were to watch the plants so abundantly sent into Covent Garden Market, they would note that wonderful results in the way of both growth and flower are got out of 48-sized pots, in which all market plants are grown, and also that the sorts sold are limited in colour almost entirely to white, scarlet, and white with scarlet flakes, these being the orthodox marked tints. But the florist, ever on the look-out for novelties, knows no such limitations, and is rather anxious to obtain as much variety in the colours and markings of his flowers as possible; so that the market dealer seldom sees the beautiful sorts that private gardeners grow. After some eight years of Balsam culture for seed purposes, I have been much surprised to find how wondrously its colours and markings have increased; and, although in that time I have had the assistance of but few of the Continental kinds, yet I can now reckon amongst my collection nearly thirty diverse colours, shades, or distinctly-marked kinds; in addition to which I have a dwarf or Tom Thumb strain, that also displays some seven or eight colours and markings—so it is evident that there is now variety enough to satisfy the most exacting. The dwarf strain is most adaptable for pot culture, as they grow to just half the height of the common sorts, and are both robust and free-blooming. Of these there are in colour white, purple, scarlet, scarlet with white blotch, white with carmine flake, and white with purple flake. Of the tall kinds, I have now pure white, white shaded buff, white shaded mauve, and white shaded rose; then white striped and speckled crimson (otherwise called Solferino), white striped and speckled purple, white striped and speckled carmine, white flaked crimson, white flaked purple, white flaked carmine, crimson self, crimson scarlet, deep purple, light purple, lavender, peach, salmon, scarlet, salmon-carmine, rose, carmine, mauve flaked crimson, lavender flaked crimson, scarlet white blotch, purple white blotch, crimson white blotch, and several other shades and markings difficult of description, but still quite dissimilar in appearance. Of course, a good number of plants in a greenhouse or conservatory containing all these diverse colours would, of necessity, present many more charms than a collection of but a few colours; and to exhibitors of Balsams, this variety is not only charming, but a great help to success.

A. D.

The Wild Ipeacuanha (Aselepias curassavica).—This makes an excellent summer-flowering greenhouse plant, and well deserves an elevation on that account. It produces seeds freely, and if they are sown in the month of August, and the young plants grown in a stove temperature throughout the winter and spring months they

come in very useful either for summer-flowering plants or for furnishing cut bloom. As soon as the seedlings have made four or five buds their tops may be pinched out; and, also, those of the laterals, when they have grown about 6 inches in length; give them a liberal shift and encourage them occasionally with a little manure-water. A mixture of half loam, quarter peat, quarter leaf-mould, and a good addition of sand, seems to suit them perfectly. Established plants flower, more or less, all the year round; but, I think it better to dry them off through the winter, and to start them early in spring, thus securing a good bloom through the summer months. Pinching, when the seedlings are little, is absolutely necessary; for, if this operation is delayed too long, they become leggy and do not flower freely. As regards drying off and starting them into growth again, they may be treated the same as stage Pelargoniums.—JAMES MORRISON, *Wotton Gardens, Aylesbury.*

Indian Crocuses (Pleiones).—These rank amongst the most lovely of Orchidaceous plants. They are herbaceous, and produce blooms from October to February; at least a succession of bloom can be kept up during that time. They succeed best when grown in the Mexican or East India house, in pots or in suspended pans, in a compost of Sphagnum and peat, with a little silver-sand; some growers add, also, a small portion of loam. In every case, the plants should be near the light, and, for this purpose, suspended Orchid-pans are more suitable and convenient than pots. All the species are dwarf, and form depressed pseudo-bulbs, from which emanate pale green leaves about 6 or 8 inches in length, which usually turn yellow and die off in September. As soon as this happens, the resting season should commence, during which no more water should be given than is absolutely necessary to keep the bulbs from shrivelling. When they begin to grow, the water supply should be gradually increased. The flowers, when expanded, last in tolerably good condition for nearly three weeks, and those of *P. maculata* for a week longer; while open, they should, of course, be kept dry, otherwise their beauty becomes greatly impaired. Unseasonable resting is one of the greatest causes of failure amongst these lovely little Orchids. *P. maculata* is one of the earliest flowering kinds, and also one of the prettiest. *P. Wallichiana* is a beautiful deep rose-coloured species, that blooms a week or two later than *maculata*, under similar circumstances. *P. lagenaria*, quite a gem in its way, has mauve-coloured sepals and petals, and a white lip faintly tinged or veined with crimson. There are also two other beautiful species, viz., *P. humilis* and *P. Reichenbachiana*, the last of which has a pretty fringed lip. These little Orchids should all be potted in the beginning of November, or when the flowers fade.—W. F.

Second Year Hyacinths.—Is there any mode of treatment by which Hyacinth bulbs may be made to bloom more than once in perfection?—R. W. [We fear not; but, by treating them as follows, a tolerable degree of perfection may be arrived at:—As soon as their beauty of flower is over, we always cut off the flower-stems just below the lowest flower, and for this reason: the Hyacinth and Tulip both seed freely, particularly the latter; if the bulb is forming seed, its strength is wasted in a great measure by that process; whereas, if the flower-stem is cut off, the bulb has nothing to do but to prepare itself with vigour for blossoming in the ensuing year. We pay great attention to the protection of the leaves of both Hyacinths and Tulips, and never allow them to be interfered with until Nature indicates, by the decay of their points, that the bulb is preparing for rest. We then follow a course with both Hyacinths and Tulips which we believe many do not; that is, we take them up before the leaves are quite decayed, and for this reason—we believe that both of them, after the bulbs have attained this period of growth, are only weakened by remaining in the ground, because the offsets are living upon the parent bulb, and, consequently, weakening it for the flower of the following year. If a cultivator wishes for stock, he should let his bulbs remain until the leaves are quite decayed. If he wants his bulbs to flower in beauty again, he should follow the practice above mentioned. When taken up, the bulbs should be removed to a shed sheltered from the sun, but free to the air, and any earth adhering to the fibres or roots should remain for some little time; after two or three days they should be looked over, and the loose earth shaken from them; and, as the leaves decay, they should be occasionally removed. We have generally placed our bulbs at first on the ground, in the tool-shed, and, as they got dry, removed them to an airy shelf. When the leaves are nearly decayed, we place them in very shallow baskets, and allow as much air as practicable to be between each root to harden them, turning them every two or three days. By this treatment, and rubbing off any portion of mould attached to the bottom and sides, they are in a fit state to be placed for the summer in a dry room; and, by a little occasional attention, the rough and outside coat will, by a gentle side-pressure of the thumb, be effectually removed, and exhibit the appearance of the bulb clean, smooth, and in good condition. This latter operation is best performed in the end

of August, and at that time remove the remains of such parts of the root of the former year as may not have dropped off previously to this time. It is hardly necessary to state that any bulb in an unsound state, either from appearance of decay, or from having been injured in taking up, should not be put with those intended for future planting.]

BOUVARDIA LEIANTHA.

THE genus *Bouvardia*, named after the astronomer Bouvard, belongs to the great natural family of the Rubiaceæ, which includes the Cinchona plant, the value of whose properties, as a febrifuge, is well-known from the popular name of its product, Quinine. The plant under notice, of which we give a representation of the extremity of one of the branches, with its flowers and leaves, is a native of Guatemala, Central America. It forms a neat shrub of 2 or 3 feet high, branching very much at the top, each branch being terminated, in the flowering season (which lasts from July to November), by a hemispherical



Bouvardia leiantha.

cal corymb of pretty vermilion-red tubular flowers, which are most effectively relieved by the deep green hue of the leaves. One of the chief merits of this plant is that, in addition to its great intrinsic beauty, it lends itself most readily to cultivation as a room or window plant. A mixture of peat-soil and fibry loam is the compost in which it thrives best; and the plant is very easily propagated by means of cuttings taken from the youngest branches, and struck on a gentle hot-bed.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Bletia (verecunda) Shepherdii.—This is an old and very easily grown Orchid, well worth general culture on account of the copious supply of rich purple blossoms which it furnishes at this season of the year. Its bright purple segments contrast well with the golden-yellow plates on the lip, and, it is well adapted either for button-holes or for bouquets. It is now in bloom at Kew.—B.

Woodwardia radicans Brownii.—This fine Fern was discovered by Mr. Brown in the Island of St. Michael's. Pinne and pinnules extensively subdivided, the latter deeply cleft at the terminations, and finishing up the sides of the fronds with tufted branches or crests starting from each other almost at right angles. Terminal crests larger, frequently several inches in width, and composed of almost innumerable small excurrent points. Unlike many other abnormal forms, the peculiarities of this variety are quite apparent in plants not more than 2 inches high. Of this exceptionally distinct and handsome kind, Messrs. Stansfield, Todmorden, possess some good plants.

Oncidium cheiroporum.—This Orchid, which is now being sent out by MM. Thibaut & Keteleer, of Sceaux, is a dwarf caespitose species with small and very flat pseudo-bulbs, each surmounted by a single linear leaf, about 8 inches long and nearly an inch wide. From the base of the pseudo-bulb springs another leaf, from the axil of which issues a flower-stalk about 16 inches long, with numerous lateral branches, each bearing seven or eight flowers, of a fine light-yellow colour, and somewhat resembling a bat in shape. It continues a long time in bloom, and will probably be found capable of culture in a cool-house.—W. M.

EFFECTS OF HEAT ON PLANTS.

THE action of heat on plants has been made the subject of an elaborate series of experiments by M. Blondeau, who has contributed an account of his researches to the *Moniteur Scientifique*. The apparatus used was very simple, consisting of a sheet-iron muffle, through the cover of which passed the stem of a thermometer. The muffle, with water in it, was heated to the required temperature, which was kept constant by a Bunsen burner. To produce low temperatures, ice or a refrigerating mixture was employed. M. Blondeau first endeavoured to ascertain the effects of heat on annual plants, and the temperature necessary to destroy vitality in the various organs. He exposed to a temperature of 122° many kinds of seeds—those of garden vegetables, grain, Acorns, &c.—which were first proved to possess vitality. After remaining an hour at this degree of heat, they had all lost the power of germination. Either the embryo was killed by the heat, or the substances stored up in the seed for its nutrition had undergone changes that rendered them unfit for that purpose. Now it is well known that, when heat does not exceed certain limits, instead of being hurtful to vegetation, it favours it. If seeds are placed in tepid water at a temperature of 68° to 77°, the substances contained in the seed are softened, and become more readily absorbable by the embryo. If the embryo dies at the higher temperature of 122°, it seems probable that heat, raised to this degree, has become a poison, the effect of which has been to paralyse the organs and destroy the irritability of the tissues. It is a confirmation of this view that the vitality of certain organs, and even of the entire plant, is destroyed by the same temperature, while the tissues do not appear to have undergone any appreciable change. For example, the end of the stem of a Balsam plant was subjected to a temperature of 122°, a number of the leaves being thus exposed to the heat, while the rest of the plant was protected by a screen. On removal from the muffle after an hour, the exposed leaves presented nothing peculiar. Examined with the microscope, they showed nothing indicating the least alteration of tissue. Nevertheless, these leaves had been killed, for, after a little while, they became dry and withered. The vitality in the organs of the plant had been destroyed, without the tissues being changed. It might, perhaps, be thought that the effect was due to a rapid evaporation of water contained in the tissues. To settle this point, instead of putting the end of a plant in the muffle, it was simply immersed in water at 122°, and kept there a quarter of an hour. The part thus affected by heat did not continue to vegetate, but withered in a few days; showing that death was due to the direct action of heat, and that evaporation had nothing to do with the result. The entire plant, except the root, was then subjected to the temperature of 122°, the root being kept in earth. The effects were similar. Removed after an hour, it soon faded and the stem became black, as if it had been exposed to a very high temperature. All seemed to indicate that the plant had succumbed to a poison, which had left no trace on the organs by which vitality is manifested. It remained to decide whether the vital force, which can be easily destroyed in the leaves and the stem, presents a greater resistance in the roots. Would heat have the same effect on the organs of nutrition as on those of respiration? To determine this, the pot of earth containing the root of a Balsam was placed in a water-bath; the upper part of the plant being kept out and protected against the heat by a screen. A thermometer was inserted in the earth of the pot; and when the temperature had been raised to 122° the pot was removed and left to itself. At first nothing remarkable occurred, but in a few days the plant gave signs of diminished vigour, and gradually withered and died; proving that the toxic action was as energetic on the roots as on the other parts of plants. Another simple experiment served to determine the limit at which roots begin to lose their vitality. Having taken out of the ground several plants of Balsam, the roots were immersed in water raised to 86° and 104°, and, after a quarter of an hour, were re-planted. The only ones that recovered were those that were heated only to 69°; none of the others took root again. All plants are more or less affected by this agent when it exceeds certain limits. In our gardens, the watering, which is frequently required, serves, not merely to supply water necessary to vegetation, but also to refresh the ground and prevent its attaining a temperature which may become fatal to plants. The absence of heat appears to have the same influence on vegetation as the excess of heat. When the layer of earth in which roots of grain are situated, falls to 25° or 30°, the plant grows yellow, showing a diseased state which, commencing in the roots, gradually spreads up the stem. If a leaf of Balsam, adhering to the stem, be introduced into a glass tube, surrounded with ice (care being taken not to bruise it), and be kept there long enough to be cooled down to the temperature of the glass, it will be killed, and will present the same phenomena as leaves heated up to 122°. Examined with the microscope, it shows no organic change, and yet it is unable to perform its functions. It soon withers, and falls off.

GARDEN DESTROYERS.

GARDEN PESTS.

By THOMAS BAINES.

Cabbage Grub, or Clubbing.

THIS insect often does very great mischief, especially in old gardens, where it is far more numerous than in new soil. The damage it causes is often a serious matter for the gardener, as it destroys almost whole crops, and makes very inconvenient gaps, especially in summer Cauliflowers. When the grubs first attack a crop there is nothing to indicate their presence until the plants begin to turn an unhealthy colour; then they flag in the sun, and in a few days the crop is lost. There is no variety of the Cabbage tribe quite free from these pests, although the different kinds of Winter Kale, as well as Red Cabbage, are more seldom affected than Cauliflowers and summer Cabbages. There are several means employed to lessen their numbers, and to render the ground distasteful to them, such as winter dressing with salt or lime, or a liberal application of wood-ashes; this all assists more or less to reduce their depredations generally, but fails to prevent the most objectionable appearance a crop presents when there are gaps here and there all through it; and in ground that is much infested with the insect, I have found these dressings, which are usually palliative, altogether ineffectual. After employing every means that I could hear recommended, with partial success, it occurred to me that there was no chance but trying to make each plant unpalatable to the grubs. In the spring I procured some newly-burnt lime, which was laid under cover until it became air-slaked. I then took an equal quantity of soot and mixed it with the lime. In planting, the holes were made with the trowel in the usual way; each plant was dropped into its hole, an inch or so of soil put over the roots, a good watering given, then a moderate handful of the soot and lime mixture thrown in each hole, and the remaining soil filled in. The ground where this was tried was an old garden that swarmed with the insects to such an extent that it was impossible to get a crop of either summer Cabbages or Cauliflowers by any means I had previously tried; but in this case I did not lose a plant. When the crop was gathered I examined the old stalks, and the mixture was there in close contact with them, still in sufficient quantity to ward off the attacks of the grubs. No insect either fully matured, or in the early stages of its existence, can bear the presence of soot. From that time—a good many years ago—until the present, I never put out a single plant of any of the Cabbage tribe without their being so treated, and we rarely lose a plant through the grub, unless owing to a careless application of the mixture. In this there is some difficulty, unless there is personal supervision. For instance, even after the clearest directions, a man will sometimes put in the mixture first, and water the plants afterwards. This, as will be seen, washes the stems clean, taking the mixture down into the soil, away from where it is required, and affording no protection to the plants. If carefully applied as described, it is effectual. Where plants are put in by the acre it is some additional labour, more from the number of times the ground has to be gone over in planting than from the mere application of the mixture. I have found that it takes about a third more time than planting in the usual way; but even so it is much more satisfactory than the appearance of broken crops, to say nothing of the loss frequently caused by their total destruction.

Wasps.

The depredations of wasps are principally confined to their attacks upon ripe fruit. For some miles round the outskirts of large towns they never appear in such numbers as they do in purely country districts, where they are not so much molested. It is here that the ravages they commit are the most serious, with some fruits almost defying any means to preserve even a portion of the crop. The Greengage Plum is an especial favourite with them. I have seen them destroy the whole crop produced by numbers of trees, not allowing any to get fit for table; as each fruit began to ripen on one side, the wasps commenced their attack. Pears, Peaches, and Nectarines on the open walls, suffer in like manner. Ripe Grapes are

especially their favourites. When they attack a Vinery, they will quickly destroy the whole crop if left undisturbed. Like the majority of other pests that attack garden produce, they are best nipped in the bud. On fine mild days in early spring, the warmth of the sun brings the queens out, every wasp at this season representing a colony, and every means possible should be employed to destroy all that make their appearance thus early. A small price upon their heads at this season offered to children will prevent the progeny of these queens from ever coming into existence. If it should happen that the weather is unseasonably mild at the end of March and beginning of April, so that it brings the queens out early, the chances are that the wasps are not numerous during the after part of the season, as these early bright days are usually succeeded by sharp frosty nights, which destroy these prematurely-awakened queens. On the other hand, in late springs, they do not so soon make their appearance, and, consequently, escape the effects of the return of cold weather. It is in such seasons that they are the most formidable, in many places defying all means to cope with them, especially out-of-doors. In Vineries several methods are employed for the protection of the fruit, with more or less success. Muslin or thin paper bags, in which to enclose the bunches are often used; but there are several objections to both, especially in the autumn, for, if the bunches are not frequently examined, odd berries begin to mould, which quickly affect the whole bunch. The moving of the covering also destroys the bloom, so indispensable to the appearance of first-class fruit; and it frequently happens that, with all the care that can be given, the wasps will find their way through the bags. By far the most effectual method to adopt is to keep them out of the house altogether. This can be done by the use of the hexagon garden netting, tacked over all the openings where air is admitted: this is sufficiently open to admit all the air required, without the wasps being able to get through; even if the doors are required open, a large piece of the netting can be temporarily hung over the doorways. When they attack choice fruits, such as Peaches, Nectarines, and Apricots, on the open walls, it is necessary not only to adopt means for their destruction, but such also as will attract them from the fruit they are devouring. Every tree bearing fruit on which they are busy at their work of destruction should have three or four wide-mouthed bottles hung in it, half-filled with sweetened beer, or treacle and water; this will attract them from the fruit, and they will also perish in large quantities. Traps may be made as follows:—take a bell or hand-glass, with a small hole in its top, elevate it on half-bricks, place some damaged fruit under it to allure the wasps, then place on the top another glass, tight-fitting in every way; numbers of the insects will ascend through the hole in the top of the under glass into the upper one, from which they cannot find any exit, and soon perish. A number of these traps placed upon the wall coping, as also on the ground at the foot of the trees, will be found effectual, not only for the wasps, but also for the large blue-bottle flies, which generally first attack Peaches, making incisions which are quickly taken advantage of by the wasps. An idea may be formed of the number of wasps existing in some parts of the country, as also of the quantity that may be destroyed when a sufficient number of traps are employed, when I state that I have seen a gallon-pot full of them taken in a single day by the above means. All nests that can be discovered should be destroyed. An offer of 6d. or a 1s. apiece for the nests will be sufficient inducement to bring very great numbers of them in. The best method of taking their nests is, after dark, when the greater portion of the colony are at home, to thrust rags, dipped in gas-tar, into the nests, which set fire to, and when freely ignited close up the hole; not a wasp will escape death. The nests may then be dug out, and the young grubs destroyed. Or 1 oz. of gunpowder mixed with 2 oz. of sulphur, tied up in a paper, may be thrown into the nest, ignited, and the hole closed. Another method is to take an ordinary beer or wine bottle, containing a small quantity of spirits of turpentine, and, at nightfall, when the wasps are quiet in the nest, thrust the neck of the bottle into the entrance, and let it remain for a day or two. The fumes of the turpentine will suffocate all the wasps, and the nest may then be dug out, and the grubs destroyed.

THE FLOWER GARDEN.

FERRARIAS.

The genus *Ferraria*, named by Burmann in honour of Jean Baptiste Ferrari (an Italian botanist who flourished in the earlier part of the last century), is very nearly allied to the *Iris*s, and contains two or three species which are deserving of some notice at the hands of our cultivators—amateurs or professional. Some time ago, one might occasionally see *F. Pavonia* (better known, perhaps, as *Tigridia Pavonia*) here and there in gardens; but, of late, from our own experience, at least, it has become comparatively rare. The great defect of the *Ferrarias* is, that their flowers are most fugacious, and, although both pretty and singular, they last for so short a time (a few hours only) that we believe this to be the reason why they have, to a great extent, dropped out of cultivation. The flowers, however, notwithstanding their brief period of existence, present such a strange combination of the aspects of the *Stapelias* and the *Orchids*, that even a fleeting acquaintance with them well compensates for the slight trouble involved in the culture of the plants. Our illustration (which represents *F. undulata*)



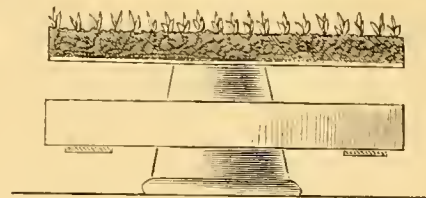
Ferraria undulata.

will give, to those who are not familiar with these plants, a good idea of their general appearance. This species grows to the height of from 2 to 2½ feet, and has imbricated sword-shaped leaves, like those of an *Iris*. The flower-stem is furnished with two or three bracts, from the axils of which, as well as from the extremity of the stalk itself, flowers are produced. They are seldom more than two or three in number, and are of a very peculiar reddish-brown colour, with violet reflections, like the shades of certain shot silks. In the centre is a whitish circle, and the margins of the petals are marked with yellow dots on the upper surface, while, underneath, the petals are entirely white. The plants are easy of cultivation in a conservatory or greenhouse, if potted in slightly peaty soil, and well watered during the flowering season. W. M.

A USEFUL BOX FOR CUTTINGS OR SEEDS.

To those who object to shallow earthenware pans for the raising of seeds or cuttings, on account of the needless amount of space they occupy, I recommend boxes made in the following manner. Procure a few slates of the Countess or Lady size; the former are 20 inches by 10 or 18 inches by 10, the latter

16 inches by 8. I use a size between the two, 16 inches by 9. Get some strips of ½ or ⅝ inch deal, 3 or 4 inches wide. Cut them in lengths to suit the size of the slates. Of these make the sides and ends of your boxes; cut off two extra lengths to go across the bottom, an inch or two from each end; let your slate rest on these to form the bottom, and your box is ready



Box with moveable bottom for Cuttings or Seeds.

for use. In the course of time the lower edge will begin to decay, together with the cross pieces. When that happens, turn the box upside down, after having nailed on two new pieces on what was the top. When you have to remove the seedlings or cuttings, push up the slate from below, and you can remove them without injury. Crocks, Cocoanut-fibre, or any other material can be used for drainage, and the superfluous water will readily escape round the edge of the slate. These boxes will, of course, look better and last longer if they are painted; but that operation had perhaps be better deferred till after they have been used one season and have become thoroughly dry after use. One season will have had no injurious effect upon them, and if, as often happens, the wood used is not thoroughly seasoned, it is better on that account to defer painting to the autumn. It would be well at that time to remove the bottom pieces, and paint with at least two coats before they are replaced. Boxes so constructed can be used directly they are made, and, if painted in the autumn, will be ready for use again the following spring. B. S.

SAXIFRAGES.

By J. C. NIVEN, Botanic Gardens, Hull.

The Crustaceous Group.

Saxifraga Aizoon.—The ever-living Saxifrage, as the literal translation of the name would imply, stands, as I stated last week, as the typical representative of several forms that we have long dignified by the title of species, and here I am disposed to agree with Engler—not exactly, however, to merge them all as synonyms, but to give them what appears to be their true position as distinct varieties. Before, however, we deal with them, I must say a few words as to the parent itself. Of compact and dense habit of growth, it presents a mass of small rosettes, whose leaves are bluntly obovate and slightly incurved; the margins, as in all its varieties, lined with small cartilaginous serratures, and dotted with a dense line of crustaceous markings. It produces its flower-stems in abundance, rising to a height of 9 inches. The flowers are whitish, and grouped in somewhat dense cymes. It enjoys, perhaps, the widest geographical range of all the Saxifrages, being found in all the Alpine districts of mid and south Europe, extending northward to Lapland, and even Spitzbergen, and westward through Greenland into North America; with such a wide range it may well claim for its progeny a marked amount of divergence from the parent form.

S. Aizoon var. intacta.—Possessing the dense habit of the old species, and differing very little, if anything, in the flowers, its claim to recognition rests on the much narrower and more erect leaves, the marginal markings being less conspicuous, and the general green of the leaf having a greyer tint during summer, and in the autumn assuming a chocolate-brown colour, which it retains during the winter.

S. Aizoon minor.—This, hitherto called *S. intacta minor*, and of which latter no doubt it is a dense and compact form, I have recognised as a variety of the more remote parental type, because I think it unwise to increase the number of names by the introduction of sub-varieties. Possessing, as it does, the narrow foliage of *intacta*, so densely are its little rosettes arranged that they quite lose their individuality, and scarcely a pin's point can be inserted in the dwarf cushion-like mass that it forms without damaging a leaf. Hence it has been appropriated by the flower gardener, as constituting an admirable ground-work of peculiar grey glaucous green, on which to exhibit some of his more tender pets; it has a further advantage to recommend it for this purpose, that it is a shy bloomer, and hence

does not assume the somewhat ragged appearance that all those which bloom freely do immediately after the flowering season is over. I have seen it used as a substitute for the *Selaginella* in those geometrical glass arrangements for the dinner-table which are now amongst the waning fashions of the day. The effect was good as a matter of variety, and, placed in such a conspicuous position, it would be sure to attract close attention, and its many, though minute, beauties would manifest themselves that otherwise might be passed over unobserved.

S. Aizoon recta.—This is, unquestionably, the same as the variety called *gracilis*, by Engler, and were it not so well known by the former, I should willingly adopt the new name, as it conveys a correct idea of the habit of the plant. It differs chiefly from the typical form in the arrangement of the rosettes being far more lax, each one having space for perfect development, and each sending out several slender surculose runners, which, from their extremities, ultimately develop fresh rosettes. Its flowers are smaller and less dense in their arrangement, and I have found it retain its character very constant from seed. It is met with abundantly in the Alps and in the Tyrol, where, from its lax habit of growth, it freely intermingles with the adjacent forms of vegetation, instead of monopolising large patches to itself, as the case with the foregoing.

S. Aizoon major.—This I take to be the best title under which to group three hitherto recognised species, namely, *S. Malyi*, *S. elatior*, and *S. robusta*, they are in truth nothing more than large forms of the old species.

S. Aizoon germanica is recognised by Engler under the title of *orientalis*. It differs from all the foregoing varieties, in the fact of having longer leaves, broadest at the base and gradually tapering to the point. It is not, with me, a free-grower, nor have I ever seen it bloom; I have a strong suspicion that it would be more at home as a variety of *S. pectinata*, it lacks, however, the bright crustaceous markings of that species, and is, very possibly a hybrid production.

S. crustata.—A well-known beautiful and constant species. Was looked upon by Sternberg as a lesser variety of *longifolia*. It forms a dense mass of hard narrow sncate leaves, short and reflexed, and margined with very distinct markings, that retain their brightness both winter and summer. It is neither a very free grower nor an abundant bloomer; its rosettes are irregular, and are clustered together on a very short axis, they are not readily divided, nor do they root very freely; its floral axis is 6 to 8 inches long and its broadly ovate petals, as well as the dense arrangement of the blooms, give it a more than usually showy character in this respect. It is found wild at high altitudes on the Tyrolean Alps, and the Carpathéan and Carniolian mountains.

S. crustata hybrida—Originated with me many years ago as a seedling from the true species, but presents, in its freer growth, broader and more upright leaves, unmistakable evidence of a close relationship to the intacta var. of *Aizoon*. Singular enough, all the seedlings produced by a series of sowings extending over some years, show the same hybrid character, nor have I ever found a single seedling represent the true reflexed character of the leaves in the original species, even when the parent plant has been completely isolated during the flowering process. It is, however, quite possible that the true plants, as raised from the seed, will be of very slow growth, and hence they become smothered amid their stronger-growing brethren, illustrating that process of natural selection whereby the weaker succumbs to the stronger. Be this as it may, it is a variety well worthy of culture, and grows freely and rapidly in any light garden soil.

S. carinthiaca.—Though I have not had it sufficiently long in cultivation to speak decidedly thereon, it appears to claim a much closer relationship to *crustata* than to *Aizoon*, of which Engler makes it a variety; so I conclude that his plant and the one we have under the above name in cultivation are quite distinct. Its appearance is exactly that of *crustata*, with shorter leaves, smoother at the margins, and very slightly reflexed. Not having seen it in bloom, the remarks I make may be obviously open to modification.

S. lantoscana, recognised by Boissier, and figured by him as a distinct species, is, as I before stated, looked upon by Engler as a variety of *lingulata*; but failing, as I do, to see the grounds of relationship, I adopt Boissier's dictum in preference. It is a somewhat nondescript plant in appearance, with the leaves irregular in shape, and "zig-zagged"—if I may coin a word—across one another. The rosette arrangement, as I have grown it, is altogether at a discount; the leaves are narrow and blunt at the points, or not unfrequently obliquely cut, the extreme end being generally recurved in a hook-like fashion. I have not seen it bloom, nor do I find any special description of its flowers. It is of equally slow growth with the true *crustata*, and derives its name from the valley of Lantosa,

in the Maritime Alps, which locality appears to be its present only known habitat.

S. cochlearis, of Reichenbach, like the foregoing species, is called by Engler a variety of *lingulata*; but, surely, it possesses such distinct character, in both growth, foliage, and bloom, that there need be no hesitation in endorsing Reichenbach's nomenclature. Here we have a dense compact-growing plant, with leaves of a dark green, beautifully margined with a crustaceous line, rather than dots, and not unfrequently suffused with white over the entire surface, as though Nature had let her paint-brush fall and smeared her delicate handiwork; each leaf is about 1 inch long, the lower portion linear, the upper part expanding into a broad blunt-pointed blade, slightly recurved at the margins; the flower-stem is covered with dark glandular hairs; the flowers themselves are white, the lower portion of each petal being dotted with crimson dots. To my mind, there is no species in the whole crustaceous group that claims its right to specific distinction more thoroughly than does this. To my floricultural friends, I may remark that it promises to be one of the most valuable for decorative purposes that we possess. I believe we are indebted to Mr. Maw for its introduction into cultivation in this country, as the result of one of his botanical rambles in the Maritime Alps.

S. Rocheliana, one of Sternberg's old species, is a dwarf compact-growing plant, with broadish little leaves, horizontally expanded, terminated by a somewhat acute point, and channelled on the upper surface, each leaf having from three to five crustaceous spots at the apex; the flower-stalks are erect, about 3 inches high, terminated by two or three flowers of a yellowish-white, the whole stalk covered with green glandular hairs. It is the very earliest bloomer of all the section, flowering, as it does, in February; but such a liking have the slugs to its early-produced petals that, unless it be closely watched for these depredators, it might readily be taken for an apetalous plant, so scientifically do they excise the white petals. This species does not appear, by any authentic records we have, to enjoy a very wide distribution, the Carpathéan and Roumelian mountains being its only present known habitats. It grows freely under rock or pot culture, and, like all the smaller forms of this group, appears to like a fair admixture of peat in the soil in which it is planted.

S. coriophylla, of Grisebach, is looked upon by Engler as only a variety of the former species. The general contour of the plant is, however, perfectly distinct, and this distinction is abundantly confirmed on a closer examination. Its rosettes are considerably elongated and less dense in their arrangement, as well as twice the size of *Rocheliana*; its leaves are long, blunt or rounded at the point, and gradually taper to the base, added to which, they are slightly incurved, smooth at the margin, and lined with a few widely separated small dots. The inflorescence in a young state is always bent downwards—not erect—the flowers themselves are large, the largest, in fact, of all the section, produced in compact heads of six or seven in number, and supported upon a leafy stalk about 6 inches high—the whole, including the calyxes, are covered with green glandular hairs; added to which, the flowers are a pure white, and are produced in the month of April. This brief description when compared with that of *Rocheliana* given above, will indicate at once how distinct the two plants are, as well in outward appearance as in botanical character. It is a native of Bosnia and Albania, and occurs at a considerable mountain elevation. With me, though I have grown it successfully for many years in large pans, as well as in the rockery last season, every plant appeared simultaneously to turn brown, with an evidently sickly appearance; some I left to their fate, some I shook out, re-potted, and divided, but the result was in every case alike; this spring, as I now write, I find they are all dead; fortunately, I raised a lot of seedlings two years ago, and, although they are yet small, they are in good health, and everyone as true to the parental character as can possibly be, thus, confirming its specific distinction.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Primula japonica.—Will this grow from seed and come to perfection in the same year? and is it quite hardy, as advertised by Mr. Bull in *THE GARDEN*?—**TWEE.** [The seeds of this plant are somewhat capricious as regards vegetating. Sometimes they come up in a short time after having been sown, at other times the seed lies dormant for many months. Plants that come up during the spring, or early summer, will make flowering plants the spring following. The plant has stood the winters we have had since its introduction. How it would fare in such a winter as 1860-61, remains to be proved.—**ED.**]

Phygellus capensis.—This really pretty plant ought to be more generally grown than it is; although a native of Southern Africa, it is perfectly hardy in most situations, and may be readily increased by means of cuttings, or seeds, which ripen freely. A plant of it put out in the open border here (Dorby) some two or three years ago, now covers about a square yard, and has been much admired during the summer and autumn months. It blooms most profusely until cut off by frost. In spring, the dead tops, like those of outdoor *Fuchsias* may be cut down before it starts into growth.—**J. W. MOSELEY.**

THE FRUIT GARDEN.

THE FIG APPLE.

THIS interesting little Apple is said to be that which was eaten by Eve, and, if so, singularity of form must have had more attraction for her than beauty. The following is a description of it, made from fruit grown at Merriott. *Figue d'Hiver* (D'Adam, Petalless, Sans Fleurir, Sans Pepins, à Trochets), third size, second quality, January to March, conical or pyriform, and drawn in or twisted at the base; skin, yellowish, dotted with russet, and tinged with carmine on the sunny side; stalk, about 1 inch long, set obliquely in a shallow cavity; eye, large and open, placed in a very wide and deep basin; flesh, whitish, firm, and crisp. This variety is always seedless, and Poiteu, in his "Pomologie Française," says the petals are so small as to escape general observation, but that is not the case here, as they are pretty large, and tinted with rose. It is probable that this is the Apple described by Pliny under the name of *Spadonium*, because it is seedless, and, as no other Apple has ever yet, as far as I know, been found uniformly sterile, it is only reasonable to suppose that this variety is the fruit to which he alludes; if so, it must have come down to us through a long series of years, and shows how tenaciously we hold on to our old fruits, even when they have been immeasurably surpassed by finer sorts. There is another Fig Apple described by



The Fig Apple.

Bauhin, which must be entirely different from this one, as he would, doubtless, have taken notice of its abnormal characteristics, such as the absence of stamens and seeds. It is very possible that his *Figue Apple* was what we now grow as *Figue d'Été* or *Letire*. To prevent mistakes, we grow an Apple here called *Adam's*, but it is an American variety, and entirely different from the *Figue d'Hiver*. J. SCOTT.

Merriott, Crewkerne, Somersetshire.

SPRING PROTECTION OF FRUIT TREES.

THIS is an important subject at this season of the year, and one which will require the attention of all horticulturists who are interested in saving their fruit crops. We have experienced an exceptionally mild winter; and this, by bringing on the fruit or blossom-buds somewhat prematurely, renders them still more liable to suffer from late spring frosts than would be the case after an early and severe winter. While the buds are safely encased in their closely-imbricated bracts, no amount of frost or sleet will hurt them; but, after a mild winter, our fruit crops almost invariably suffer. In a word, it is not a long period of frost and wintery storms that does the mischief; but the mild open sunny weather which often occurs during December, January, and February, and then the cold wet winds or sharp "catches," which are peculiar to March, April, and even May. In a variable climate like our own, we must either pay considerable attention to the protec-

tion of our fruit crops, more especially to Peaches, Pears, and Apricots on walls, or run the risk of losing a season's produce. As a rule, our climate is not a severe one; but sudden fluctuations in temperature more than counteract this advantage, and leave us actually worse off with regard to our fruit crops than those who experience far more severe, but regular, winter seasons. The French Peach-growers, many of whom depend on the sale of their produce for a livelihood, carry spring protection to its utmost limit, and understand the principles of shelter, on which success depends, far better than the majority of our horticulturists at home. The best of all spring protectors for our climate is, undoubtedly, a glass-case, wherein the trees are dry, and where a crop is almost a certainty; still, there are many who grow a few choice fruit trees who do not care to go to the expense of a glass-case, and for these there is nothing less expensive than a coping-board, 9 inches or 1 foot broad, with tiffany or Shaw's Hexagon netting hung in front during the night, and even all day when bright sunshine succeeds a severe frost. It is astonishing what a little protection in the way of a fold or two of any thin fabric will effect, not only in protecting the tender blossoms from sleet, hail, or cold rains, but, also, in preventing, to a great extent, the radiation of heat absorbed by the walls themselves during fine and sunny weather. In some of our best gardens, canvas blinds, properly fixed on rollers beneath the wall coping, are employed; and this is a good plan to adopt, as such a provision effects a saving both in time, labour, and material. Broad or projecting copings are specially valuable, and in the Peach-gardens at Montreuil, near Paris, narrow hurdles of reeds are used for this purpose; these project about 2 feet from the top of the wall, and are upheld by slanting supports fixed in the masonry at regular distances; and to prevent them from being blown off by winds, each is securely tied in its place. These are invaluable, as the trees are kept dry, and when that is the case, a sharp frost does but little harm. The spring protection of our wall-fruits has of late years met with considerable attention, and various glazed protectors have been brought into public notice, which doubtless answer their purpose admirably when expense is not an object, but, when these cannot be afforded, other less expensive contrivances must be resorted to. Where other means are not at hand, an excellent shelter for wall trees may be constructed by any intelligent labourer, by making frames of deal or pine, say 10 or 12 feet square, according to the height of the wall; diagonal spars will hold them tightly together, and transverse bars, 18 inches or two feet apart, should be tacked on, through which fir boughs may be drawn to afford protection, and at the same time allow the ingress of sufficient light, and a free circulation of air. These frames may be fixed against the coping and can be allowed to remain for weeks together in cold frost and rains. It is always advisable to close up each end of these frames where many are placed together, otherwise a cold current of air will be always rushing between the screen and the wall. Bright sunshine after a sharp black frost is more fatal than anything else to fruit buds, and even where the buds are frosted they may often be saved by syringing them with cold water and shading them early in the morning before the sun shines on them. In all cases, the protecting material should project clear from the trees, at least 9 or 10 inches, and the lighter and drier the material used, the better will it act as a protector.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

A Queensland Fig Tree.—Mr. Walter Hill, the Government botanist in Queensland, reports to the authorities there that, while cutting a given line on the banks of the River Johnstone, for the purpose of examining the land, an enormous Fig tree stood in the way, far exceeding in stoutness and grandeur the renowned forest giants of California and Victoria. Three feet from the ground it measured 150 feet in circumference; at 55 feet, where it sent forth giant branches, the stem was nearly 80 feet in circumference.

Plum Culture in Scotland.—The Damson is a fruit which used to be very much cultivated for the market in many parts of Scotland. About thirty-five or forty years ago I saw in some districts of Ayrshire, trees literally bent down with fruit. Such a sight I have not seen in Scotland, except in Ross-shire, for many years; but even there I am informed that heavy crops are only partial. The Ross-shire climate has always been considered one of the best north of the Tweed for ripening fruit, both wall and standard. Of recent years, a considerable extent of Plum orchards has been formed in many parts of the west coast district, where the climate seems well suited for their growth; but instead of Damsons, plants of the Victoria Plum are most in demand for the purpose of planting.—JAMES McNAB.

A HOLIDAY TOUR.

By THE EDITOR.

PUBLIC GARDENS AT LYONS.

ONE might here, at Lyons, far south of Paris, expect a fairer climate, but it is not so. Standing on the high banks over the Rhone, and, looking north-eastwards, what seems an angular snowy cloud is seen, clear, but far away, and one is surprised to hear it called Mont Blanc. From near its feet, and far away across the eastern sky, stretches a wall of whitened mountain-crests, pale and solemn-looking as a distant fleet of icebergs. This is an outlying line of the Alps, whence comes the icy breath which gives the fair city on the Rhone a less favourable clime than that of Paris. Hence it is by no means so interesting from a gardening point of view, but we may, nevertheless, find something worth seeing in the public garden or park. France, in the present generation, has witnessed many improvements, but in no way made more progress than in the matter of public gardens. The sunny street, with its fresh air and green trees, is not a greater advance on the narrow, malodorous and darkened alley it replaced, than the Parc de la Tête d'Or, at Lyons, on such old botanic gardens as those which exist at Angers, Geneva, Milan, and other continental cities. The old botanists too often regarded the garden as a sort of supplement to their collection of dried plants; and, as huge labels, with formidable names, straight walks, clipped shrubs, trees of many kinds and sizes, planted as thickly as Currant bushes, and all cut into the same size, to make them fit into narrow beds, suited to whatever scheme of classification was the mode at the time, were among the most graceful features of these gardens, it was, perhaps a relief to turn to the dried herbs now and then for a change. The true idea that any place, worthy the name of a garden, should show us, as much as may be in one spot, the majesty of the woods, and the thousand infinite graces of vegetation, is gradually finding expression in the Parc de la Tête d'Or, as in many other public gardens in Europe and America. Although called a "park," it is really a garden of some 250 acres, and combines in one establishment the French plan of a botanic garden in all its parts, a zoological garden, a school of sylviculture or *dendrologie*, a large nursery for the supply of the town squares, &c., a very extensive and richly-filled set of Palm and hot-houses, and goodness knows how much besides one fails to see for want of some official printed guide to its contents. In the maze of subjects, I had almost gone away without knowing that there is here a collection of all the Roses cultivated at the present day, a collection of nearly 1,500 kinds, among them being those rare Provence and other Roses of bygone days, so difficult to obtain now. Any private individual who undertook to form a similar collection would probably be laughed at for his pains, but it is, nevertheless, a capital feature in this garden, and one for which many a Rose lover will be grateful. With narrow-minded exclusiveness, botanists have hitherto virtually shut out varieties from the botanic gardens, countenancing or spreading the erroneous notion that such are not as much the production of nature as anything else, so that, in a severely orthodox botanic garden, no such collection of Roses would have a chance; on the other hand, among the cultivators, everybody advocates the culture of the very best only, and the amateur takes the hint and writes to us for the "names of the best dozen Roses!" a distressingly concise list, considering what a host of fair and variously-hued flowers own the name of Rose. Therefore, it would be well if, in every country, there were formed in a public garden such a collection. It would conserve for us the beauties of the past, and permit of our fairly judging of the value of contemporary ones by comparing them with living examples of their predecessors. Few Roses disappear from our gardens from want of merit; they are crowded out by the "swells" of the day, and if growers only strive as to who shall array these most gorgeously, there is more important work left undone. A very interesting classification of Roses, by the way, would be by the period, so to say—the Roses of Shakespeare and Parkinson, of Queen Anne, of our own day, and so on, each in a separate group. The notion may be worth the attention of some gentleman who has won every prize he cares about in the great strife of modern Rose-showing.

In various parts of the Lyons garden there are immense beds and groups of Roses (on their own roots, or grafted low on the seedling Briar), and pegged and pruned down close to the ground. Standards are in effect abolished; this is as it should be. There is no plant so vilely disfigured as the Rose; as M. Jean Sisley, the well-known horticulturist (to whom I am indebted for much friendly guidance hereabouts), remarked, "a Rose on a standard is like a bouquet on a broomstick!" Rose-growers, of tall and mighty frame, like Mr. Hole, no doubt find it convenient to have their competition blooms worked high on tall standards near the eye; but then, show Roses, as everybody knows, more frequently embellish the kitchen-garden or nursery-bed, than the lawn; whereas, the uncalled-for standard disfigures half the gardens in the land. So fully is this felt, if not expressed, even by the stiffest and most prosaic landscape-gardeners, that they speak of the Rosery as a doleful object, when not in bloom, and counsel that every effort should be made to keep it out of sight! Now, any such effect is wholly the result of our management of the plant, which, even in foliage, is superior to nine-tenths of the bushes of any clime, and which only requires to be tastefully arranged in our gardens to improve their aspect enormously. To this end much has to be done, and, previously, several widely-spread ideas have to be plucked up by the roots, viz., that the standard is in any sense necessary or desirable; that the Rose-garden should be an obscure and isolated division of the garden, with all its wealth of beauty lost to the garden-landscape generally; that Roses should be in beds to themselves, in lonely glory, with nothing but dark earth for a carpet beneath their naked stems, and neither Lily nor Gladiolus, fragrant herb nor graceful foliage, other than their own, clustering beneath or mingling in sweet association with them.

Fruit and Other Trees.

A school of sylviculture is a happy idea. If such schools were founded in each important section of every civilised country, gardens would, probably, soon assume a greatly improved aspect. Every traveller knows that, so far as cultivated regions are concerned, England is the most beautiful of countries. This is, to a very great extent, owing to her trees, long allowed to spread their branches in peace, and never, it is to be hoped, fated to boil the soldier's pot. When one considers how very little knowledge of trees there is throughout the land, a vision rises as to how much more picturesque and beautiful even England might be made, if a fair knowledge of the many trees that grow with us were common among all classes interested in gardens. This, in any real sense, can only be attained in a large garden, with plenty of room for every kind to attain full size, and to be arranged in an effective manner. Here the collection was made, regardless of expense and trouble; numbers of trees are planted by the sides of the drive, and have sufficient space for fair development, but not enough for picturesque and varied grouping. Up to the present time, no arboretum we have seen has been designed with anything like a sufficiently broad idea of the subject; in fact it is only such parks as Richmond, the Fairfield, at Philadelphia, and the Bois de Boulogne, at Paris, that offer sites on which to form arboreta worthy of national aims. No attempt has been made to plant any such large parks as tree-conservatories, specially designed to show in due time the full beauty and expression of every obtainable tree worthy of culture. Some precious specimen Conifers, such as Araucarias, were brought from England to this park when formed, but of this tree, and many others long supposed hardy here, the frosts made a clean sweep during the first week of December 1870, just in the midst of the war, and when the frozen plain formed the bed of many a dying soldier. Whole colonies of Deodar, Atlas, and Lebanon Cedars were killed outright, and, almost without exception, all the evergreen trees and shrubs in the garden, including Hollies, Aucubas, Euonymus, and even the Colchic Laurel, generally supposed to be so hardy in England, perished. So much for the influence of these picturesque neighbours the Alps. The city of Lyons, like others in France, has its promenades, well-planted as usual with the Plane, which no cold here seems to touch, and sometimes with Acacia. Some thirty-five years ago, a municipal administrator of this city



VIEW IN THE PUBLIC GARDENS AT LYONS.

distinguished himself greatly in connection with trees. He fancied they were bad for the health, and had all in the city cut down! His name—its deserves remembrance—was Terme. Notwithstanding the destructive cold above alluded to, curiously enough, the evergreen *Magnolia grandiflora* thrives as a standard here and flowers well, though not in such glossy health as it is in Touraine and Anjou. All the Vines about here were killed to the ground or outright by the frost of 1870, so that the growers did not gather a crop for three years. This, one would think worse for them than a visit from the Prussians; but, as usual among this Phoenix-like people, they always quickly rise from their misfortunes. It is a poor country for fruit trees around Lyons, nevertheless, there is a "school of fruit-culture" in the public gardens, calculated to be useful to the natives. The many modes of Vine-culture shown in it, are, of course, of little interest to us, who grow the vine in a wholly different manner and for other purposes; but, an experiment lately carried out as regards the colour of the surfaces on which to train fruit trees is of interest to all. It has long been held that a black surface is the best for ripening fruit. But, more recently, people in this country began to enquire if the colour which absorbed most heat (black) was the one which most favoured fruit-culture against walls. Experiments led to the conclusion, that the surface which reflected heat most (white) was decidedly the best. Here, M. Denis, the chief of the botanical department, tested the question, by covering a considerable portion of the ground beneath Vines with white stones, and another portion with those of a dark-bluish hue. There was a difference in sun-heat of nearly 4° in favour of the white stones at a few inches from the surface, that is to say, at about the distance at which trees are usually trained. This, surely, is a very important fact for all those who have to cultivate fruit trees in a cold climate like ours. There are some modes of training here carried out with a view of resisting high winds which may be worth noticing. Repeated disappointment has arisen in France from having lost fine crops of Pears by wind dashing the crop from the pyramidal trees. The espalier mode of training counteracts this effectively, but there are other good ways and simpler ones. One is the winged pyramid, that is to say, a pyramidal tree with all the branches trained into four, five, or six vertical lines; the branches being exactly one above the other, it is easy to support all firmly from a central point at the apex of the tree and a stake below each wing. This, however, cannot be explained to all without the aid of illustrations, though the form is as easy to make as the common pyramid. Other forms, including the Quenouille, not uncommon in our own gardens, have the branches inter-grafted, so that, growing firmly together, the fruit is not shaken off by the highest wind. It should be observed that these trained trees, on which the fruit, being well thinned and cultivated, is large, require to be more carefully looked after in the above respect than standards, and probably the winds are more destructive than with ourselves, who do not suffer so much in this way. The nurseries round Lyons are small, the market-gardens of no particular merit, and the fruit and vegetable markets of little interest.

HISTORICAL NOTES ON FRUIT TREES.

THE investigation of the origin and introduction of the vegetable productions raised for the use of man, is not only an interesting study in a critical, historical, or geographical point of view, but it may be applied to practical use by the cultivator. In showing how very few of these plants are to be met with naturally in the state in which we grow them, and how, by careful and persevering cultivation, their natural properties have been modified, so as to suit the purposes they are applied to, a stimulus is given to our exertions in the still further improvement of those already known, as well as for the introduction and conversion of new species or varieties to the use of man. At the same time, the knowledge of the readiness with which, in some instances, a worthless weed has been changed into a valuable esculent, and of the lengthened period which has, at other times, been required to effect the conversion, may often suggest to us the *modus operandi* to be attempted on future occasions. But this inquiry is often attended with no small difficulty. However readily we may trace the process by which our European Cabbages and Carrots, or Apples and Pears, have been received into our gardens

and orchards, and there made to produce the luxuriant vegetables and fruits of modern days; however authentic may be the records of the introduction of the tobacco, the potato, and other additions to our esculent, economical, or ornamental plants, since the discovery of America, and the invention of printing, it is a very different matter to trace, with any great degree of plausibility, the origin of the majority of the Cerealia and fruits of more ancient cultivation, and which still supply so important a part of our agricultural and horticultural productions. Tradition ascribes "the East" as the source from whence many of them sprung, and so much is this relied upon that in all cases where a plant, known to have been cultivated in early ages, cannot now be found growing wild, there is a natural tendency to assign as its probable native station some unknown district among the mountains of Central Asia. It is, indeed, probable, that the populous herbivorous nations which early occupied the warmer climates of that Continent, had become cultivators for ages before the wilder and more carnivorous hordes which wander over the colder regions of Europe, and that civilisation, as it spread from the former over the latter, carried with it the more useful Cerealia and fruits then known. But all were already in a state of cultivation, that is, more or less modified by human labour and skill. It seldom has occurred in modern days, still less is it likely to have happened in early ages, that a wild plant has been brought from a distant country to be grown in our own, for the use of man. The conversion must have been gradual, and generally, if not universally in the district where the species was indigenous. Wherever, therefore, the origin of a plant, cultivated in a given country, is involved in doubt, all inquiries tending to clear up that doubt, must resolve into the following queries:—1. When was it first known to have been there cultivated? 2. In what countries, if any, was it previously cultivated, and, if so, when and how could it have been from thence transported? 3. What are the plants indigenous to the region where it was first made use of, which could have been the wild origin of the cultivated varieties? The answers to the first two questions may be derived from actual record, or from collateral historical evidence. But, in early ages, agricultural and horticultural nomenclature was exceedingly vague, and the allusion to vegetable productions is often so slight in ancient works, that it requires very great critical acumen to form any plausible opinion as to the identity of the plants mentioned. The conclusions come to require, moreover, to be constantly checked by a judicious study as well of geographical botany and local floras, as of the general principles of vegetable physiology as applied to horticultural and agricultural metamorphosis; and these geographical and physiological studies can alone supply the answers to the third of our queries.

The Pear (*Pyrus communis*) and Apple (*Pyrus Malus*) are found in their wild state in the mountain woods of the greater part of Europe, and from these indigenous species have been raised the whole of our orchard and garden varieties. Their amelioration by cultivation, and the perpetuation of varieties by grafting, have been celebrated by poets from the time of Ovid, and continue to the present day. Pliny enumerates thirty-nine different Pears known to the Romans, several of them being also mentioned by Virgil, Cato, Columella, Juvenal, Macrobius, &c. Fée has endeavoured to identify some of them with modern French varieties, and Galesio with Italian ones, as in the following examples:—

PLINIAN NAMES.	SUPPOSED CORRESPONDING MODERN NAMES.
Amerina serotina	San Tommaso.
Lactea	Perle or Blanquette.
Dolabelliana	Winter Bon-Chrétien.
Falerna succosa	Bergamot.
Favoriana rubra	Large Muscat.
Superba parva	Little Muscat.
Hordearia	Common Muscat.
Mustea	A variety of Bon-Chrétien.
Picena or picentina . . .	Spina.
Pempeiana mammosa . .	Campana.
Viridis	Spadana vernina, considered by Galesio as a most ancient Italian Pear.
Myrapia	Guigueline.
Volema	Another Bon-Chrétien.

In Tuscany, under the Medici, we find, in a manuscript list by Micheli of the fruits served up in the course of the year at the table of the Grand Duke Cosmo III., an enumeration of two hundred and nine different varieties of Pears, and another manuscript of that time raises the number to two hundred and thirty two. Among them, grafts of the Dorice Pear of Portugal were introduced by the same Grand Duke, at a cost of one hundred golden doubloons, whence it received the name of Pera cento doppic, by which it is still known, as well as by that of the Ducal Pear.

The Cherry.—We fully concur with Prof. Targioni in his conviction that the wild Cherry (*Prunus Cerasus*), common in the woods of Italy and other parts of Europe and Asia, is the mother plant of all

the kinds of that fruit now in cultivation, in opposition to many modern botanists, who follow De Candolle in distinguishing four species, *Cerasus avium*, *C. duracina*, *C. Juliana*, and *C. caproniana*, or even go far beyond him in their multiplication. The species is also evidently indigenous, notwithstanding Pliny's statement that there were no Cherries in Italy, before the victory obtained over Mithridates by Lucullus, who was the first to bring Cherries to Rome in the year of Rome 680, and that, within one hundred and twenty years after that, they were spread over the empire as far as Britain. This statement gave rise to the tale that Cherries came originally from Cerasus, a town in Pontus, and were therefore called *Cerasus* by the Latins. Lucullus may, however, have first imported the cultivated varieties, which the Romans may not have recognised as identical with the wild Cherry. In Greece, Cherries were certainly known long before his time, for Diphilus Siphnius, according to Athenæus, mentions them under the government of Lysimachus, one of the dukes of Alexander the Great.

The Plum.—Our garden Plums appear, from the investigations of our Indian botanists, to be varieties produced by long cultivation of the *Prunus insititia*, a species common in the mountains of Asia, from the Caucasus to the Eastern Himalaya, but which we have no authentic evidence of being a native of Europe. In all the more accurate European floras, the *P. domestica* and *insititia* are either omitted, or inserted as doubtful natives or escaped from cultivation; or, if in some instances positive native stations are given for the *P. insititia*, it is generally some variety of the *P. spinosa* that has been mistaken for it. Several varieties of the garden Plum were introduced by the ancient Romans from the East, as we are informed by Pliny, since the days of Cato, who was born 232 years before the Christian era.

The Apricot.—Pliny, as well as Linnaeus and most modern botanists, includes amongst Plums the Apricot (*Prunus armeniaca*), a tree most extensively cultivated, and which sows itself very readily in cultivated grounds over South-eastern Europe, Western Asia, and East India, but its native country is very uncertain. The ancients called it *Armeniaca*, as having been brought from Armenia into Italy, where it is not indigenous; also *Præcoca*, *Præcoqua*, and *Præcocco*; and under one or other of these names it is mentioned by Dioscorides, by Galen, by Columella (who is the first who speaks of its cultivation), by Pliny (who, about ten years after Columella, asserts that it had been introduced into Rome about thirty years), by Martial, &c. Democritus and Diophanes give it the name of *Bericocca*, analogous to the Arabian *Berkac* and *Berikach*, the probable origin of the Italian names of *Bacocca*, *Albicocca*, and even, according to Cesalpin, *Baracocca*; and, lastly, Paolo Egineta, according to Matthioli, has spoken of these fruits under the name of *Doracia*. Although some of these names, even in modern times, have been occasionally misapplied to a variety of Peach, yet they all properly designate the Apricot, and show that that fruit was known in very remote times. Having never been much appreciated, except for its odour, there was not in former days any great propagation of varieties of it. Micheli, however, under the *Medici*, enumerates thirteen among the fruits cultivated for the table of Cosmo III.

The Peach (*Amygdalus persica*) is, according to the common opinion, of Persian origin. Diodorus Siculus says that it was carried from Persia into Egypt during the time that Cambyzes ruled over that country. It is supposed to have been transported from thence into Greece, and, after a lapse of time into Italy, where it only began to be known about twenty years before the birth of Pliny, that is, about seven years before the Christian era, and it appears that Columella was the first to treat of its cultivation there. According to Nicander it was brought to Greece by the agency of Persens from Cepheia, a locality affirmed by some to have been in Persia, by others in Æthiopia or in Chaldaea. The Peach is also spoken of by Theophrastus, Dioscorides, and other Greek writers. We must, therefore, conclude that this fruit was well-known in the East very long before its introduction into Italy. Many ancient writers, including Athenæus and Pliny, and more recent ones, as, for instance, Marcellus Virgilinus, in his "Commentaries on Dioscorides," confound the Peach with the *Persea*, a fruit the identity of which is uncertain, some supposing it to be a *Cordia*, others a *Balanites*. Macrobinus again confounds the Peach with the *Persicum* of Senevius, which is the Walnut, and with that of Cloatius, which is the Citron; all fruits resembling the Peach in nothing but in the name, a clear proof that it cannot have been in their days by any means a common fruit. How few were the varieties of Peach known to the ancients appears from Dioscorides, who only names two, from Pliny who enumerates five, and Palladius four only, giving, at the same time, accurate information on the mode of cultivating them. Although all the evidence collected by Professor Targioni tends to show that the Peach was, originally, brought from Persia, and he, therefore, does not consider it necessary to proceed further with the investigation; yet, no traveller whom we can rely

upon, has ever found it growing really wild there or anywhere else. We are left in doubt whether its native stations remain yet to be discovered, or whether its original wild type must be sought for in some species of *Amygdalus* known to be indigenous in the East. It has been more than once suggested that this original parent is no other than the common Almond, a conjecture founded, perhaps, on the similarity in the leaves, and in the perforations of the endocarp, but rejected as absurd by those who attach even generic importance to the succulence of the indehiscent pericarp. This point cannot be decided with any degree of plausibility until we shall have a better knowledge of the different forms which the fruits of wild *Amygdali* may assume under various circumstances; but we may mention, as circumstances in some degree favouring the supposition that some kind of Almond is the parent of the Peach, the ancient tradition referred to by Targioni (with the remark that it is contradicted by Pliny, and by common sense) that the Peach in Persia was poisonous, and became innocuous when transported to Egypt, and the case quoted of a supposed hybrid raised in 1831 in Sig. Giuseppe Bartolucci's garden, at Colle di Val d' Elze, from a Peach-stone which produced fruits at first exactly like Almonds, but which, as they ripened, assumed the appearance and succulence of Peaches, whilst the kernel remained sweet and oily, like those of Almonds. We might, also, refer to some bad varieties of Peach with very little juice to their pericarps, although we do not know of any which assume the flattened form of our Almond, a distinctive character which appears to us to be of considerable importance. The foliage and flowers of the two trees show little or no specific difference.

The Walnut (*Juglans regia*) is a native of the mountains of Asia, from the Caucasus almost to China. It is supposed to be the *Enoz* of the Bible. The Greeks had it from Asia; and Nicander, Theophrastus, and others mention it under the names of *Carya*, *Carya persica*, and *Carya basilike* (or Royal nut). Pliny informs us that it was introduced into Italy from Persia, an introduction which must have been of early date, for, although it is doubtful whether it is alluded to by Cato, it certainly is mentioned by Varro, who was born in the year 116 B.C. The Romans called it *Nux persica*, *Nux regia*, *Nux emica*, *Jovis glans*, *Dinglans*, *Juglans*, &c. They recognised several varieties, and amongst them the soft-shelled Walnut still cultivated, which several of the commentators have confounded with the Peach. In modern days, the cultivation has much extended, and the number of varieties considerably increased. Jean Bauhin noticed six only. Micheli, under Cosmo III. of Medici, describes thirty-seven, of which the original specimens are still preserved; some of these, however, are scarcely sufficiently distinct from each other.

The Nut (*Corylus Avellana*) is said by Pliny to derive the name of *Avellana* from Abellina in Asia, supposed to be the valley of Damascus, its native country. He adds, that it had been brought into Asia and Greece from Pontus, whence it was also called *Nux pontica*. Theophrastus calls these nuts by the name of *Heraclotic nuts*, a name derived from *Heraclaea*, now *Ponderachi*, on the Asiatic shores of the Black Sea. Hippocrates gives them the name of *Carya thusia*. Dioscorides says they were also known by the name of *Leptocarya*, or small nuts. Other ancient writers confound the Nut with the Chestnut and the Walnut. But all the above indications of importation from the East relate only to particular varieties, for the species, as is well known, is common enough in Europe and a great part of Asia in a really wild indigenous state.

The Chestnut (*Castanea vesca*), celebrated amongst European trees for the enormous size it will attain, is already mentioned in the Bible. Theophrastus and Athenæus give it the name of *Eubœan Nut*, from the island of Eubœa, now *Negropont*, where it was peculiarly abundant. Pliny says that Chestnuts first came from Sardis, the ancient capital of Lydia, and not far from the modern Smyrna. Galen, who was a Lydian, confirms that origin, and says that they were also called *Balani leuceni*, from *Leucene*, situated on Mount Ida. Other writers, ancient and modern, give various Eastern countries as the native stations of the Chestnut, and even Giovanni Targioni-Tozzetti, our author's grandfather, believed them to be introduced only into Italy; but not only have the extensive Chestnut woods in the Apennine Alps and other parts of the Apennines, mentioned by Bertoloni, every appearance of being really indigenous, but further evidence that woods of this tree existed in Tuscany from very remote times, may be found in the number of places which have derived their names from them, such as *Castagna*, *Castagnaia*, *Castagneta*, &c. We may, indeed, safely give as the native country of the wild Chestnut, the south of Europe from Spain to the Caucasus. It does not extend to East India. The larger-fruited varieties which we import for eating, and which are generally distinguished in France and Italy under the name of

Marrons or Marrone, were probably those which were first introduced from the East by the Romans. Pliny enumerates eight different varieties. Micheli has forty-nine, most of which, however, from his own specimens, are, as in the case of the other fruits mentioned in his manuscript, founded upon distinctions too slight to be really available for their separation.

The Fig (*Ficus Carica*) is a native of the south of Europe, including Greece and Italy, of Northern Africa and of Western Asia. The wild type, known in Italy by the name of *Caprifico*, has indeed been distinguished by Gasparini not only as a species but as a separate genus, but we cannot but concur with Professor Targioni in the opinion, confirmed by positive assertion on the part of practical pomologists both ancient and modern, that our garden Figs are of the same species, and have repeatedly been raised from seeds of the wild *Caprifico*. We find mention of the cultivation of Figs, and of the high estimation in which these fruits were held, in the very earliest writings, in the Holy Scriptures, and in Homer's *Iliad*. Those of Athens were celebrated for their exquisite flavour. Xerxes was tempted by them to undertake the conquest of Attica, in the same way that Cato urged the Romans to that of Carthage, a Fig in his hand. The number of varieties, however, produced in ancient Italy were not numerous. Six only were known in the time of Cato. Others were afterwards introduced from Negropont and Scio, according to Pliny, who gives a catalogue of thirty sorts. Their names are mostly taken from the countries whence they had been brought, such as the African, the Rhodiote, the Alexandrine, the Saguntine, &c., or from some great personage who had introduced or patronised them, such as the Pompeian from the great Pompey, the Livian from Livia, the wife of Augustus, &c. Macrobius, two centuries after Pliny, enumerates twenty-five, but generally under names different from those of Pliny.

Oranges, Lemons, Citrons, &c.—These are all of Eastern origin, and mostly introduced into Europe in comparatively modern days, but of very ancient and general cultivation in Asia. The varieties known are very numerous and difficult to reduce accurately to their species, on the limits of which botanists are much divided in opinion. Those who have bestowed the most pains in the investigation of Indian botany, and in whose judgment we should place the most confidence, have come to the conclusion that the Citron, the Orange, the Lemon, the Lime, and their numerous varieties now in circulation, are all derived from one botanical species, *Citrus medica*, indigenous to, and still found wild in, the mountains of East India. Others, it is true, tell us that the Citron, the Orange, and the Lime are to be found as distinct types in different valleys, even in the wild state; but these observations do not appear to have been made with that accuracy and critical caution which would be necessary in the case of trees so long and so generally cultivated. With regard to the Shaddock (*Citrus decumana*), it is almost universally admitted as a distinct species, although, at present, only known in the state of cultivation. It must be admitted also that it appears to present more constant characters than most of the others in the pubescence of its young shoots, and in the size of its flowers, besides the differences in the fruit; but Dr. Buchanan Hamilton, who is of great authority on such matters, and some others, are inclined to believe that this also may have originated in the *Citrus medica*. This point requires much farther investigation, and a better knowledge of the floras of South-eastern Asia, before we can come to any plausible conclusion. Professor Targioni gives copious details of the introduction into Tuscany and other parts of Italy, of many of the varieties there cultivated. It may suffice, for our present purpose, to extract a few notes on some of the more important races or species according as they may be considered. Among them all the earliest known was the Citron. It is not, however, that fruit nor any other Citrus, according to Professor Targioni, that we read of in the Bible under the name of Hadar as is asserted by some, nor yet is it anywhere alluded to by Homer. The first mention we have of it is in a comedy of Antiphanes quoted by Athenæus, in which it is said that the seeds of the Citron had then recently been sent by the King of Persia as a present to the Greeks. Theophrastus is the first who describes it; he tells us that the fruit was not eaten, but solely prized for its odour, and as a means of keeping the moths off woollen clothing. Among the Romans, we find an allusion to the Citron in Virgil's *Georgics*, but it does not appear to have been then yet introduced into Italy, for Columella, long after Virgil's death, made no mention of it, and Pliny, in his paraphrase as it were of the passage of Theophrastus, adds that it had been endeavoured to transport plants of the Citron which he calls *Malus medica* or *Malus assyria* into Italy; but without effect, as it would only grow in Media and Persia. Palladius, however, in the fifth century, gives many details of the modes of propagating and cultivating this tree, which he says he had carried on with success on his Sardinian and Neapolitan possessions. It was, therefore, in all probability, in the course of the third or fourth

century that the Citron was introduced and established in Italy. The mass of evidence collected by Professor Targioni seems to show that Oranges were first brought from India into Arabia in the ninth century, that they were unknown in Europe—or, at any rate, in Italy—in the eleventh; but were shortly afterwards carried westwards by the Moors. They were in cultivation at Seville towards the end of the twelfth century, and at Palermo in the thirteenth, and probably also in Italy; for it is said that St. Dominic planted an Orange for the convent of St. Sabina, in Rome, in the year 1200. In the course of the same thirteenth century, the crusaders found Citrons, Oranges, and Lemons very abundant in Palestine; and, in the following fourteenth, both Oranges and Lemons became common in several parts of Italy. It appears, however, that the original importation of Lemons from India into Arabia and Syria occurred about a century later than that of Oranges. The Shaddock is believed to have followed a different route in its migration into Europe. Most abundantly cultivated in, and possibly indigenous to, the south-eastern extremity of the Asiatic continent, it is said to have been carried from thence to the West Indies, and from Jamaica and Barbadoes to England, early in the eighteenth century. It was, however, certainly previously known in Italy, for it is described and figured by Ferrari, in 1646, as having been sent from Genoa to the garden of Carlo Cadenas, near Naples. There is no record of its first introduction to Genoa, whether from the east or the west. Innumerable varieties of Citrons are cultivated at Florence, where they have ever been great favourites as objects of curiosity, as much as for their flowers and fruits. Among them is a very singular one called Bizzarria, raised by hybridising and cross-grafting, in which the same tree produces Oranges, Lemons, and Citrons, often on the same branch, and sometimes combined into one fruit—a curious case, analogous to that of the well-known hybrid produced by grafting between the *Cytisus Laburnum* and *C. purpureus*.

The Grape Vine (*Vitis vinifera*) must, as already observed by Pliny, be ranked amongst trees on account of the prodigious size it will attain. Among the instances given of enormous Vines, we may quote the following: Pliny records a Vine in the Porticos of Livia, which overshadowed the whole area used as a promenade, and yielded annually twenty-two amphoras (154 gallons) of wine; the same writer states that he had seen at Populonia a statue of Jupiter, made of the trunk of a Vine, and that the columns of the temple of Juno at Metapontus, and the steps of that of Diana of Ephesus, were also of Vine wood. In more modern days, Soderini mentions a Vine in Portico di Romagna, which extended over 1,000 braccia (2,000 feet); in the *Mém. de l'Académie de Paris* 1737, a Muscat Vine at Balançon, is described, which, at twenty years old, produced 4,206 bunches of Grapes. Giovanni Targioni-Tozzetti, in his travels in Tuscany, quotes one in the woods near Montebamboli, the trunk of which two men could not embrace. Santi found a Vine at Castellottieri in the Maremma, torn up by a storm in 1787, whose trunk is preserved in the botanic garden at Pisa, with a stem $5\frac{1}{2}$ feet in circumference; and Professor Targioni has himself recorded in the article "Botanical Chronology" in the "Dictionary of Natural History," printed at Florence by Batelli, two Vines near Figline, in the Upper Val d'Arno, with trunks 5 feet in circumference. The doors of the Cathedral of Ravenna are made of Vine wood. This may be more especially observed in the Maremma, where it grows wild in the greatest abundance. It appears to be there, as in other parts of Southern Europe, truly indigenous, extending from thence over the greater part of South-central Asia; for the *Vitis indica*, on the testimony of the more recent Indian botanists, is by no means specifically distinct. From these wild Vines have evidently been raised the innumerable varieties cultivated over the greater part of Europe, Asia, and North Africa, and now carried out to all parts of the globe where the climate will admit of it. But the period when it was first taken into cultivation, is lost in the obscure ages of antiquity. We read in Genesis that after the flood Noah began to plant the Vine; the heathens ascribed its first introduction to their fabulous heroes or divinities, Diodorus Siculus to Osiris, Servius to Saturn, and in the most ancient times Italy was called *Enotria* from the wine that it produced. We have already observed that the varieties of the Grape are most numerous; they are also often so strongly marked as to cause many writers to deny the possibility of their having all sprung from the wild Vine, but their apparent permanence is in most instances only due to their universal propagation, by cuttings or layers, not by seed. Pliny records eighty kinds, and many others are mentioned by Virgil, Columella, Varro, Macrobius, and other writers, which it is now impossible to recognise with certainty amongst the modern varieties, amounting in some collections to above three hundred.

[The preceding is a summary of a work entitled "Cenni storici sulla introduzione di varie piante nell'agricoltura ed orticoltura Toscana," by Dr. Antonio Targioni-Tozzetti; and is from the *Journal of the Royal Horticultural Society*.—Ed.]

GARDEN STRUCTURES.

RICHARDSON'S PATENT GLASS-HOUSES.

OF the many novel designs of horticultural buildings seen at our flower-shows of late years, these houses are among the most interesting. They are, as will be seen by the accompanying illustration, light and elegant in appearance; and a distinguishing feature belonging to them is the perfect way in which the ventilation is managed. This is effected by narrow openings in the roof (9 inches wide) the full length of the lights from top to bottom, and from 4 to 5 feet apart, covered with glazed frames made perfectly weather-tight, with grooves up the sides, fitting down into galvanised iron tongues. These frames are 4 inches wider than the openings they cover, and, when lifted, are clear above the fixed lights, leaving an open

over the hot-water pipes, by which it is slightly tempered on entering the house.

These houses, which are manufactured by Messrs. Richardson, of Darlington, are easily erected according to directions sent with them, and though generally used as permanent structures, they are always made portable, so that they can at any time be removed at the expiration of a tenancy, and refixed without a pane of glass being disturbed. The roofs are constructed without rafters, which in other houses obscure so much light, and are cumbrous in appearance. Buildings of this kind can be heated in the same manner as any others, and are adapted for the growth of either plants or fruit. They are all glazed, painted, and fitted up complete before leaving the manufactory, every bolt-hole being made and each part numbered, so that there cannot be the least difficulty in refixing them by any ordinary carpenter. The special advantages claimed for them



Richardson's Patent Glass-house, showing their mode of ventilating.

space at both sides as large or as small as may be desired, thus allowing a free and even circulation of air throughout the house, and, at the same time, protecting the interior effectually from rain, wind, or a direct down-draught upon the plants. These ventilating roof-lights are made in either one or two parts, each separate set or range, from one end of the house to the other, being simultaneously opened and regulated by a single handle, placed in the most convenient position, and balanced in such a way as to be easily worked. Any ventilating light can, if desired, be thrown out of gear, so as not to open with the rest; or it may be lifted entirely off for glazing without the removal of screws. In the houses with front lights, bottom ventilation is obtained by wood-panelled doors, or flaps, along the full length, these also being opened and regulated by a single handle to each range, thus affording complete protection from the weather; the air is thus admitted below the level of any foliage, and immediately

by the patentees are the following:—1. The amount of roof ventilation is exactly in proportion to the area of the house, instead of being by the ordinary-sized opening along the top made regardless of the width of the roof.—2. The ventilation is not affected by rain or wind, the position of the ventilating lights completely protecting the interior of the house, and, when closed, forming a perfectly water-tight joint.—3. The opening and regulating of the ventilators is performed more quickly and easily than by any other system, being done instantaneously.—4. The method of bottom-ventilation underneath the plant staging, and immediately over the hot-water pipes, prevents cold draughts upon the plants.—5. The houses are portable, and legally removable by a tenant; can be easily taken down and refixed without disturbing the glass.—6. The training wires being fixed up the centre of the lights, have no obstruction from the sun's rays by the usual heavy rafters, and a free circulation of air is obtained between the plants and

glass over the whole roof.—7. If blinds are used, they are lifted simultaneously with the ventilators, thus allowing a circulation of air underneath, instead of obstructing the ventilation just when most needed. This principle of ventilation can also be applied to buildings of iron if preferred.

There is one important contrivance in these houses, when the roof ventilators are made in two lengths, as in the figure of a lean-to house on p. 293. This arrangement connects or disconnects the top parts from the bottom parts over the whole roof simultaneously, by means of a small lever handle; and another lever handle, close to it, opens and closes the whole length of the house simultaneously—either the upper parts, or both upper and lower parts, as may be required. The power employed in effecting this is merely nominal, the ventilating lights being nearly balanced. The section on p. 293 shows the positions of the ventilator when open and shut. It will be seen that, in the latter case it is most effectually closed, and entirely excludes both air and rain.

THE ROYAL GARDENS AT LISBON.

[For the following interesting communication we are indebted to Dr. E. Goetze, Curator of the Botanic Gardens at Coimbra, who is at present engaged in superintending the foundation of a botanic garden for the Polytechnic School at Lisbon, and who sends us this account of the Royal Gardens in compliance with the express desire of His Majesty King Don Fernando.]

It is a good while since the writer of the following lines came to reside in Portugal, where he has had many opportunities of admiring all the richness and abundance which vegetation displays in the sunny south. Coming from a more northern clime, this country appeared to him, at his first arrival, like a vast garden, for, wherever he met with plants, they were represented by forms either quite new, or at least often only known to him by scanty specimens cultivated under glass. Well does he remember the day when he landed at the Lisbon Custom House, and when mighty Date Palms, tall Musas, slender Sugar-canes, flowering Agaves, luxuriantly-growing Bougainvilleas with thousands of brightly-coloured bracts, gave him his first and best welcome. Since then, some seven or eight years have passed by, and he, sharing the general disposition of mankind—that of not feeling satisfied with the present, but always wishing for something better—has long since ceased to entertain an unqualified admiration for the plants just named, and has been looking out for forms still finer, still more perfect; and, to a great extent, he has been successful in his researches. He had been living, till last year, chiefly in the north of Portugal, where nature, though beautiful, does not exhibit all her splendour; but, since then, he has been enabled to remove to Lisbon.

What beauties doth Lisbon first unfold!
Her image floating in that noble tide
Which poets vainly pave with sands of gold.

These “sands of gold” he discovered in all the treasures which mother Nature has bestowed upon the vegetable kingdom, and, of which, some private gardens in the capital and its neighbourhood may especially boast. He, therefore, at once asks the reader to accompany him on a walk through the Gardens of Necessidades, the royal winter residence of the King of Portugal, reserving for another occasion an excursion through the Gardens of the Penna, at Cintra, a summer residence, where His Majesty King Don Fernando and his Queen have of late introduced such remarkable features of exotic vegetation as to render both Penna and Necessidades the first establishments of acclimatisation in Portugal.

Situated in very close proximity to the river, or, as one might almost say, to the sea, the plants of Necessidades Gardens would have encountered, in the briny sea winds, which often occur here, the greatest obstacle to a vigorous growth if His Majesty had not, first of all provided, towards the water-side, high shelters, consisting of thick shrubberies of more hardy species. But, not satisfied with this, Don Fernando created in the large garden a small reserved one, especially destined to receive the finest specimens of his collections. This beautiful little place is not only sheltered by shrubberies, but also by high walls and one side of the Palace, so that cold and

destructive winds cannot come near it. But there was another difficulty to overcome. The soil about Lisbon, in general, is very heavy and compact, and to render it fit for more tender kinds of plants, thousands of cart-loads of rich vegetable mould had to be mixed up with the native soil. Water here is in abundance, and of very good quality; so, with exterior conditions such as have been described, and the interest which His Majesty takes in horticulture, one cannot feel surprised at the result being most satisfactory. The Palms, the kings of the vegetable world, and the allied family, the Cycads, claim our attention in the first instance. The famous Coquita Palm, of Chili, *Jubæa spectabilis*, is represented here by an enormous and most splendid specimen, in fact, very probably the finest plant of it grown in Europe. Some twenty years ago His Majesty bought a small plant of it from M. Van Houtte, and had it immediately planted out in the open air. Palms, as we well know, are very slow in starting, but when once they begin to grow, they do so rapidly, provided they find all the conditions necessary to growth, such as rich soil, abundance of water during the dry season, and a well sheltered situation. So the young *Jubæa* at Necessidades has become already quite a large specimen, measuring, at its base, 13 feet 8 inches in circumference, with a height of, perhaps, over 32 feet. It is of a more compact growth, than one expects to find in a lofty Palm, but, all things considered, it is a striking specimen, and well worth attention. The *Livistona chinensis*, Mart. (*Latania borbonica*, Lam.), of more recent introduction in this garden, at least, so far as the open air is concerned, is making every effort to overtake the older *Jubæa*; and there are several plants of it, which show such a vigour and luxuriance that there is no knowing what size they may attain. This beautiful Chinese species is certainly one of the best acquisitions for the gardens of Southern Europe, and it is very much to be regretted that it is still a rare plant in Portugal. Next to it, a very tall and healthy specimen of *Sabal Adansonii* claims attention, and it is difficult to say whether to this, or to one of the previously-mentioned Palms, the crown of beauty should be awarded. This species of *Sabal* has already fruited in this garden; the seeds have proved to be good, and there are now a great many fine healthy plants of it in large pots. The Cabbage-Tree of New South Wales, *Livistona australis* (*Corypha australis*), and *Seaforthia elegans* (also from Australia), are not less attractive, and there are certainly but very few specimens in some of the larger Palm-houses of Europe, which can be compared in size and beauty with those grown at Necessidades.

In continuing our walk, a vast group of *Chamærops* attracts the eye; and these plants, in their artistical arrangements, their different shades of colour, and their luxuriant growth, are really the *ne plus ultra* of perfection which one may expect in such a plantation. This group is composed of four species, and consists of about thirty plants, viz., *Chamærops humilis*, *C. excelsa*, *C. Fortunei*, and *C. Palmetto*, several of them laden with fruit, others just beginning to flower. To heighten the contrast, some tall plants of the red and yellow-striped *Yucca* have been mixed with them. The Phoenix *dactylifera* is the most common Palm in Portuguese gardens, and very often the traveller meets with some very tall specimens of it. There are at least a hundred strong plants in this garden, some of which, with very tall stems, were originally planted out as single plants, but they more frequently occur in groups of from between twenty to thirty specimens planted together. This species fruits here almost every year, but it seldom happens, except we get a very dry and hot summer, that the Dates ripen, and, even then, they are inferior to those imported from Africa. Phoenix *reclinata*, from the Cape of Good Hope, is well represented here by fine plants, and its characteristic port. The recurved leaves recall to our memory the late Dr. Seemann's words—

Ye bending Palms, that seem to look
Pleased o'er your image in the brook.

Japanese plants, in general, do not seem to like the Lisbon climate; and that is the case, too, with *Rhapis flabelliformis*, which, planted out here in different places, does not seem to appreciate the privilege of growing in a royal garden. Though the Cycads are much less numerous here than the Palms (numbering, perhaps, only half-a-dozen species), they

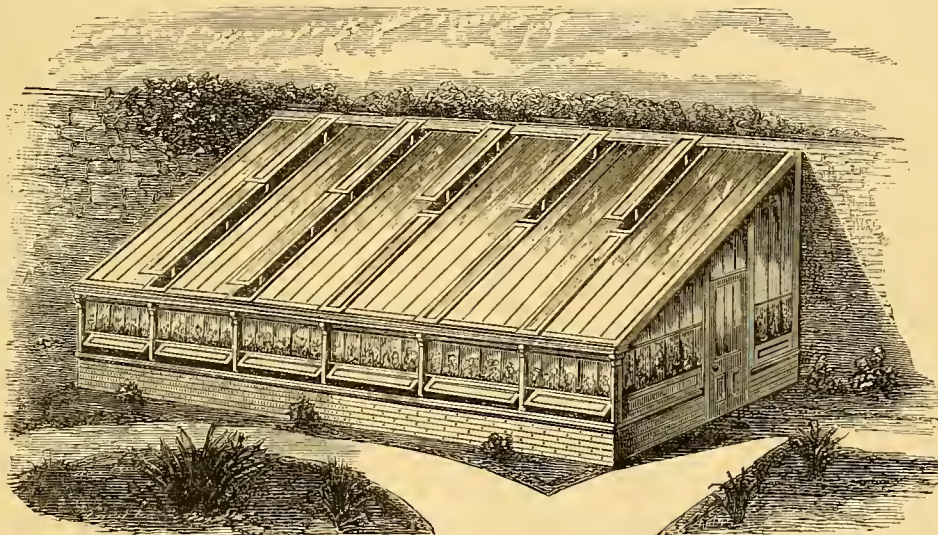
excite just as much interest, and claim our admiration in no less a degree. First of all there is a most beautiful *Dion edule*, to be noticed, showing far better health than any plants we have ever seen cultivated under glass. Only a few years ago, His Majesty had this *Dion* planted out in the open air, and the rapidity with which it has grown since then is somewhat prodigious. Quite in its neighbourhood we meet with an enormous trunk of *Cycas revoluta* with seven heads or crowns, of which two show the peculiar inflorescence, with a great many ripe seeds. There are at least a dozen veterans of this species at *Necessidades*, all imported trunks, not to speak of the many young plants obtained here from seed. Pushing on, we make the acquaintance of more striking subjects; first a splendid specimen plant of *Cycas circinalis*, from Malabar, then a stout *Encephalartos horridus* with a good many dark-coloured fronds, and at last a nice-looking species of *Zamia*. So we have here, growing in the open air, Cycads from Japan, Mexico, the East Indies, and the Cape of Good Hope. They are soon to be associated, let us venture to hope, with a few Australian species. What an interesting picture of the geographical distribution of this family, which seem to be well fitted for acclimatisation in southern Europe! A few other Monocotyledons cannot be passed over in silence. The *Bambusas* are growing here just as luxuriantly and rapidly as

in their native countries; one species in particular is of enormous height, and forms large tufts. But, perhaps, some of our readers would prefer to stop a little longer at a thick undergrowth of *Bambusa nigra*, in order to select one of the straight black and shining shoots for a walking-stick. These *Bambusas* are growing on the borders of small artificial lakes, and are here and

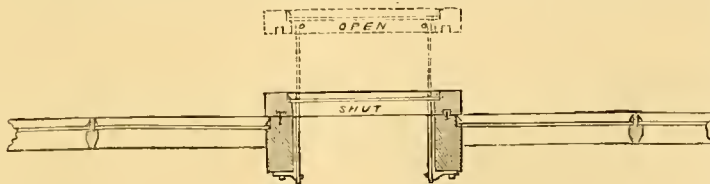
there mixed up with *Cyperus*, *Papyrus*, and several kinds of *Hedychiums*. These latter are not in flower at this time of the year, but they are covered with fruit, and the fleshy, red, shining seed-vessels offer a nice contrast to the different shades of green. *Strelitzia angusta* is of great strength, and attains the height of a tall *Musa*; the other species, *Strelitzia Reginae* flourishes equally well here, and both flower abundantly every year. *Dracaena Draco* is a somewhat common plant in Lisbon, but in attaining such dimensions as in this garden, it always presents a most interesting and picturesque sight. *Cor-dyline australis*, *Dracaena heliconiæfolia*, and some more of the *Dracaena* tribe, seem to be equally at home here, and one might suppose the same of a very old *Testudinaria elephantipes*. The tree, *par excellence*, in this garden is, perhaps, the *Araucaria excelsa*, to be found here by hundreds, one might almost say, a great many of them showing stems of considerable height. But when this tree has attained a certain age, or, as it is, perhaps, more correct to say, has come to a certain height, it very often decreases in beauty and increases in stiffness. Very interesting it is to compare these species,

which form large groups here, with the much less common *Araucaria columnaris*, of which we met with three really perfect specimens. There cannot be the slightest doubt that the latter, in showing a very compact and still very regular growth, is the finer of the two species. More than one good opportunity for comparison between allied species was presented to us in this garden, and, certainly, if we examine the plantations in this way, they increase in variety and become still more instructive. Of *Araucaria brasiliensis*, there are here, as in other gardens of Portugal, very tall and fine trees; this is, indeed, the most common species in the kingdom, and a good many cones, with perfect seed, are gathered from it every year. *Araucaria Cookii* and *A. Cunninghamii* are not forgotten, and are contending with the other species in rapid growth. Several kinds of *Podocarpus* and some plants of *Thuja pendula* may also claim special mention amongst the *Coniferae*. As Oranges, Citrons, and others of the Citron tribe, are so very common in this country, it is, perhaps, just as well not to mention them here, but another genus belonging to *Aurantiaceae*, viz., *Sclerostylis*, of Blume, if we are not very much mistaken, is to be found in this garden, and certainly we shall watch it closely to see if it produces flowers and fruit. Another interesting tropical fruit-tree is the *Mangifera indica*, which promises to do well out-of-doors. The species of *Aralias* and

Ficus are so numerous in *Necessidades*, that a mere enumeration would be a difficult task; indeed, their number is legion. Both *Aralias* and *Ficus* thrive exceedingly well, and here, where they seem to have acquired their full size, one is well enabled to form an exact idea of the beauty and variety of their foliage. Other thick shrub-beries are made up of different kinds of *Pitto-*



House with ventilators in divisions (see p. 292).



Section of ventilator.

sporum and *Myoporum*, and, to avoid monotony, rich flowering plants of *Salvia involucrata*, a few varieties of *Lantanas*, *Plumbago capensis*, *Sparmannia africana*, *Adhatoda vasica*, and a great many *Roses* relieve the dark-coloured green foliage of the above-mentioned shrubs. Beautiful creepers cover the walls and, sometimes, the trunks of some dead trees, left here on purpose. Long-flowered *Solan-dras*, with their almost leathery leaves, *Rosa Banksiæ*, with very thick stems and white and yellow flowers, richly-coloured *Passion-flowers*, *Tacsonias*, and *Bougainvilleas*, in three or

four varieties, are the most prominent among them. *Begonias*, as they are employed here, to border small walks, produce a very good effect, and *Fuchsias*, as well as *Geraniums* and *Pelargoniums*, cultivated for similar purposes, are very conspicuous. Though glass-houses are not exactly required under the Lisbon climate, they are, nevertheless, wanted where plant-growing is extended over so many families from tropical countries as are found in *Necessidades Gardens*. A very long and, apparently, quite new glass-house is destined for the cultivation of Pine-apples, of which there are a great many

young and healthy plants, which promise to fruit next year. Some fine plants of *Cocos nucifera*, which germinated here, seem to live in suitable companionship with the Pines. But the most striking vegetation in this house is represented by a very strong plant of *Vanilla aromatica*, covering one of its long walls. This *Vanilla* produces abundance of flowers every year, and we are in hopes, that it may, with a little artificial assistance, produce ripe fruits next year, an occurrence the more interesting, because it has not yet taken place in this country. The large conservatory, with cupola and gallery, contains some very choice plants, especially of Palms and Ferns. Among the former we noticed a very tall plant of *Caryota urens*, then fine specimens of *Thrinax parviflora*, *Chamaedorea*s, and several *Areca*s and *Cocos*. A very valuable collection of plants arrived a short while ago from the Brazils, a present from His Majesty the Emperor of the Brazils to his royal cousin, King Don Fernando. Most of these plants had not suffered at all from the sea voyage, and some five or six big trunks of *Lomaria imperialis*, which have already pushed many young fronds, seemed to us the most valuable amongst them.

A mere collection of rare and beautiful plants would not suffice to make this garden so attractive to the visitor if His Majesty had neglected or ignored the principal requirements of landscape-gardening, but here everything is in its right place, and so we find a good exemplification of the union of science with a refined taste for scenery. From different points one may enjoy the loveliest views on the river and its opposite banks, and there are some vistas cut through groups of trees and shrubs, which really resemble fine paintings. The walks are laid down with elegance, kept in capital order, and very often bordered with thousands of *Aloe latifolia*, just now in full flower, and exhibiting, with their brilliant red spikes, a beautiful aspect. Some very nice artificial lakes, with undulating banks, and good pieces of rockery, produce still more variety, and, to give to the whole scene still more life, crowds of beautifully-coloured water-fowl add interest to the lake itself. We have almost finished our walk, let us cast one more glance over this beautiful garden before leaving it. On our left there are the royal groups of Palms, straight before us our eyes meet with splendid *Aracarias* and not less splendid *Magnolias*, the branches of which are reaching to the ground, while on our right we have the magnificent Palace of *Necessidades*, the royal dwelling, so intimately connected with glorious and also sad events in the history of Portugal.

Lisbon.

EDMUND GOEZE.

AN ORDINARY COTTAGE MADE BEAUTIFUL.

Those who have not tried the experiment can scarcely imagine how the most prosaic forms of bricks and mortar may be made picturesque and tasteful at very small cost. The repulsive dreariness of the usual bare front of a modern labourer's cottage, with nothing to vary the aspect of its naked walls but the ugly square openings of the windows and doors, may, with very little cost, a scintillation of taste, and a small modicum of outlay (scarcely more than a few shillings) be, in a single season, transformed into a picturesque rustic façade, positively attractive, instead of all but actually ugly. A porch should be the first addition, and a little bit of carpentering forming the roof, as shown in the annexed light, but spirited, little sketch, is the only matter requiring a trifling outlay. It should be supported on unbarked uprights, of any readily available wood; four sticks of young Larch, from the thinning of an overcrowded plantation, being as good for the purpose as anything that can be suggested. A few ladder-like cross-barrings should be added, and the foundation for an exquisitely pretty porch has been successfully laid. Climbing plants are the next requisites. A pink China Rose, as flowering nearly all the year round, and its foliage being nearly evergreen, may be the first planted, for it possesses a never-failing charm. It is so elegantly and daintily delicate both in flower and leaf, and yet defies our most cruel frosts. It is one of those "things of beauty" which, as Keats has so poetically said, are "a joy for ever." There may be at its base the crimson dwarf of its own kith and kin, for the sake of contrast of colour. Two kinds of *Clematis* may next occupy posts of honour. On one side should be *C. montana*, with its shower

of snow-flake blossoms, and on the other the brilliant-flowered *C. Jackmanni*, the huge and abundant drooping blossoms of which will serve in their season to surround our cottage-porch with a glory of purple flower-drapery, which no palace entrance could surpass in splendour. Then there may be dropped into the soil, in early April (but not too profusely) a few seeds of *Convolvulus major*, common climbing *Tropæolum*, and *T. canariense*. This combination will, in June, July, and August form a gorgeous mass of varied colour, which neither the plants of glowing tropical valleys nor the rarest of the exotic flowers luxuriating in the artificial heat of our palatial stoves can surpass.

The crowning of our porch-roof with gracefully fantastic wreathings will arrange itself without aid, and with a wild grace and beauty that might have driven the designer of the Corinthian capital to despair; but care will be required to make the lower portion of our structure equal to its crowning cornice. The Grecian carver threw all his energy of device into the capital; but our chief aim, if only for the charm of change, must be the base. Neither the *Clematis* nor the *Rose* give out either flowers or beautiful foliage near the lower portions of their stems. We have, therefore, to provide another and distinct source of ornamentation, and it shall be one even more beautiful than that formed by the *Acanthus*, which furnished the beauty-loving Greek with his charming device for the capitals of his elegantly-fluted columns. It shall be, on either side, a group of Ferns, the most graceful



An ornamental cottage porch.

of all the green carpetings with which Nature has clothed the earth. The few expressive touches of our sketch may serve to convey some idea of the graceful living base from which our rustic columns are made to spring. What a model for an architect of genius, who could combine such a hint with other æsthetic requirements!

At the back of the porch, close to the cottage wall, and so as not to encroach upon the domain of the *Rose* and *Clematis*, a slow-growing *Ivy* may be added for the sake of its shining evergreen leaves; and it should be one of the variegated kinds, perhaps, as they are none of them so profuse in growth, or so ambitious of taking the lead and smothering up their rival climbers as are their more rampant green congeners. About the windows the common green *Ivy* may be planted, if kept within bounds by occasional shearing. But such cropping should not extend to the top, in order that too much formality may be avoided, and also to afford an opportunity for the introduction of a *China Rose* or two, whose flowers, peeping out among the dark *Ivy*, which should be left clustering about the eaves, will produce the most charming effect. I have often noticed examples of such a display of the delicate sea-shell pink of *China Rose* blossoms among the deep glossy green of the *Ivy*, and the combination never failed to be pleasing and highly picturesque. There might also be a plant or two of the *November* and *December*-flowering yellow *Jasmine*, whose starlike flowers—brilliant as "patines of bright gold"—would sparkle among the sombre green of the *Ivy* at a time when the *Rose*-flowers are few

and far between; and this effect, followed by the early scarlet flowers of a *Cydonia japonica*, which are produced in such profusion late in February and early in March, would carry on a display of floral colour till the season for the earliest China Rose-blooms to come round again.

There should always be a narrow flower-border; even if there is no room for a small patch of flower garden in front, for there is always room for a narrow strip close to the wall, which should be so planted as always to present something fair to look upon. This is a very easy matter in the summer months, when numberless kinds of hardy annuals and perennials are available; but for late autumn, and the depth of winter, a little care and thought must be bestowed. The *Anemone japonica*, autumnal Crocuses, and late Michaelmas Daisies, will carry on to December, when a large tuft of Christmas Rose on each side of the entrance will afford a gleam of brightness over a dreary period. There should also be groups of winter Aconites to follow, whose yellow flowers will warm up the pallor of the graceful Snowdrops, which must on no account be forgotten. These should be followed by red, blue, and white Hepaticas and clumps of one of Shakespeare's favourite flowers, the yellow Daffodil, "that take the winds of March with beauty;" mauve and orange Crocuses will then begin to bloom, mingling their purple and gold with the rich tawney-browns of the Polyanthus, and the fresh pale yellow of the wild wood Primrose. After that, whole tribes of the good old-fashioned flowers of cottage-gardens begin to bloom in profusion; and the gay colouring of the little strip of flower-border will then take care of itself. In this way the depressing bareness of the most formal and naked-looking cottage may be made absolutely attractive, however humble its scale, or however unpromising its character; the dressing up of the bare door-way with a picturesque porch, similar to the one shown in the annexed sketch, being, of course, the most essential of the improvements suggested.

H. N. H.

ROFFEA FOR TYING PURPOSES.

I HAVE used this, Grass I suppose I may call it, for tying both indoors and in the open air for some time; and, for tying Peaches, Vines, plants, &c., I like it much; but, if used under circumstances where it is constantly damp, it rots and drops to pieces, almost like tinder, in about three weeks. I may mention a case in point. About a month ago, I grafted a number of *Maréchal Niel* Roses on *Manetti* stocks in the way I have just described. When the grafts began to grow and they were lifted for potting, the *Roffea* with which the grafts had been bound was completely decayed and dropped to pieces. Of course, I do not object to its use for this purpose on that account, as the plants were immediately potted in warm soil, and, the junction being covered, they felt no check; but, I mention it now, because I was surprised to see how thoroughly it had decayed in so short a time, whilst, in a dry place, it retains its strength for a long period. Twelve months' ago, I tied up a lot of heavy creepers with it on a lofty wall from 30 to 40 feet high, and, therefore, the ties had to sustain a considerable weight; not one gave way, and they are now to all appearance sound. I have used it also in the Vineries, where, including the combined weight of fruit and wood, a strong material is necessary, and when the Vines were taken down for cleaning, &c., the ties seemed perfectly sound.

E. HOBDAV.

Practical Uses of the Poet's Asphodel (*A. ramosus*).—Everyone is familiar with the pretty white-flowered Asphodel of our gardens. In the south of Europe, and apparently on both sides of the basin of the Mediterranean, it is extremely abundant; in times of scarcity its acrid fasciculated roots, after much boiling, have been eaten by the poor. In the Paris Exhibition of 1855, there were shown bottles of alcohol extracted from the Asphodel; specimens of the residuum of the roots after being twice distilled; paper-stuff from the stalks and leaves—card-paper and writing-papers of various qualities, manufactured from the same, and mixed in various proportions with rags and common paper-stuff. The stalks and leaves contain a remarkably tenacious fibre, fine, strong, and flexible. The distillation of Asphodel root has been already pursued, and with considerable success, in Algeria; but the immense abundance of the plant in Tuscany, where it has hitherto been considered only a pernicious and most ineradicable weed, points to the advantage of endeavouring to turn it to account.—P. L. SIMMONDS.

THE KITCHEN GARDEN.

PREPARING AND SOWING ASPARAGUS BEDS.

Now is the time to attend to this work; fresh plantations may be formed, seeds sown, and winter coverings removed. Many sow the seeds where the plants are intended to remain, and, when up, thin them to the required distances apart; but I think it better to sow them in lines, from 8 to 12 inches apart, in a well-manured bed, made on a warm south border, watering them in dry weather, keeping down weeds, and stirring the ground amongst them occasionally with a hoe. Towards the end of autumn, when the tops have ripened, they should be removed, and a few inches of dung spread on the surface to protect the young crowns from frost. About the middle of the following March, the covering may be taken off, and by the 1st of April the young plants will be in good order for transplanting. In preparing a plot for this purpose, choose an open situation, free from trees or roots, and damp ground seems better suited for Asparagus than that which is too dry. About the 1st of November, the ground to be planted should be heavily manured and trenched two spades in depth; the bottom of each trench should be forked up, and the dung carefully mixed with the soil in the operation of trenching. A piece of ground, thus prepared, may now be manured with, at least, 6 inches of rotten dung, and trenched over again two spades deep as before; but, this time, all the manure should be spread equally in the bottom of each trench. The width of the beds may be made a matter of convenience. Some grow their Asparagus in beds 2 feet wide, some in 4 feet, and others in 6-foot beds. Beds 7 feet wide, planted with three rows, with 2-foot alleys between the beds, answer every purpose. After the beds are marked out, a line should be stretched from end to end, 10 inches from the outer edge; the soil should then be cut down straight from the line with a spade, and thrown out towards the centre. The plants should then be carefully lifted with a fork, exposing the roots as little as possible, either to sun or air, and re-planted about a foot apart, spreading the roots regularly in the trench, and allowing the crowns to be about an inch below the surface. The first line being thus planted, the second should then be made in the centre of the bed, 14 inches from the first, each plant alternating with those in the first row, while in the third row they should stand opposite the first, thus alternating with those in the centre row. After the planting has been finished, the beds should be carefully raked over and straightened up, when no further attention will be needed, except hoeing and weeding during the summer. As a winter-dressing, about 6 inches of rotten dung should be spread on the surface, and the loose soil from the alleys should be spread over it. The latter can be raked back again previous to the plants starting into growth. The roughest of the covering should be removed about the beginning of March, but as much as possible of it should be carefully forked into the beds. No cutting should be done until at least the second year after planting; as a rule, three years, indeed, should elapse before cutting commences, and, if very large heads are wanted, four years.

JAMES MORRISON.

Wotton Gardens, Aylesbury.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Clubbing in Cabbages.—What can I do to prevent clubbing? Our garden, which has been in cultivation about twenty years, is frequently trenched and kept in a good state of cultivation. I have had gas-lime dug in in winter; I have dipped the roots of my Cabbages in a mixture of soot, lime, and clay before transplanting them; I have covered the roots with a mixture of burnt ashes and fresh soil; but nothing which I have done prevents clubbing.—R. GALLIER, *Edgubaston*. [See Mr. Baines's remarks on this subject in another column (p. 282).—ED.]

Depth to Plant Peas.—Mr. F. R. Elliott gives an account, in the *Gardeners' Monthly*, of some experiments performed fifteen years ago to determine the best depth to plant Peas. Buried 1 and 2 inches deep, they came up soon, bore early; but did not last long. At 3 and 4 inches in depth, they came up three or four days later, did not bear quite so early; but gave a heavier crop, and continued for a longer time. At 5 and 6 inches depth, they appeared two or three days later, grew about as vigorously as the others, and continued still later. At 8 and 10 inches, they were long in coming up, and did not produce so well. A few straggling feeble plants came up from 12 inch planting. Mr. Elliott thinks about 4 inches the most profitable depth in strong soils, and a little more in light soils.

THE ARBORETUM.

VIRGINIAN CREEPERS.

Of the species in cultivation the following are worthy of special mention:—

Ampelopsis hederacea (Virginian Creeper).—This, which is found wild over a large portion of Canada and the United States, is a vigorous deciduous climber—reaching, sometimes, heights of from 40 to 50 feet—with large digitate leaves of a warm green colour in early summer, but changing on the approach of autumn to a bright red, giving the plant at that season a peculiarly grand appearance, amply compensating for its small inconspicuous flowers, which, being of a greenish-white, are not of themselves attractive. This shrub is one of the most ornamental of hardy climbers, unrivalled for covering walls and houses, to which it clings closely and firmly with no other aid than that of its tendrils; and that few plants withstand the smoke and dust of towns so well, is proved by the frequency with which it is to be seen growing, and even thriving, on windows and balconies in the most crowded thoroughfares, with no other soil than that afforded by a shallow box, or moderate-sized flower-pot. In order to keep it tidy, it should be trimmed or pruned annually, the best time for the operation being in spring, before it begins to grow.

A. bipinnata (Two-winged Virginian Creeper).—This is another American deciduous species, found growing in similar situations to the preceding. It has a much dwarfer habit of growth, rarely rising to greater heights than from 10 to 20 feet. The leaves are bipinnate, elegantly lobed, and assume that beautiful crimson tint in autumn so characteristic of the genus. For low walls and trellis screens, it is a most useful and handsome climber, and, like all the other species, not particular as to soil.

A. Veitchii (Mr. Veitch's Ampelopsis).—This, the *A. tricuspidata* of some writers, is a Japan deciduous species, first sent home to this country in 1864. Its habit of growth is much more slender than the American species, the leaves very small, varying in form from trifoliate to three-lobed, of a bright reddish-green in summer, and changing in autumn to a rich shiny brown. It is a singularly elegant and distinct little plant, quite hardy and well-worthy of a prominent place on low garden-walls, screens, or, indeed, wherever a neat moderate-growing climber is to be desired. A dry light soil with a good proportion of well decomposed leaf-mould, or other vegetable matter, seems to suit it best, and the beautiful tints of its foliage are brought out to the greatest perfection when fully exposed to the sun.—*The Gardener*.

Holly from Seeds.—Will you kindly tell me when to sow seeds of Holly, and what soil to sow them in? if in a box or in an open border? I gathered the seeds in January, and have kept them in silver-sand.—SUBSCRIBER. [As the seeds of the common Holly do not come up the first year, the berries are best mixed with dry earth in a large flower pot, and buried in the ground for a year; but if the seeds are to be sown as soon as gathered, then the berries should be thrown into a tub of water and rubbed between the hands until the seeds are divested of the thick glutinous covering which surrounds them. The seeds should be sown either in the autumn or spring, in finely-prepared soil in beds in the open ground and covered about $\frac{1}{2}$ of an inch deep; and, if the beds are covered with the fronds of Fern, they will protect the soil from heat and drought and greatly facilitate the progress of germination. The young plants will come up in June, and should not be disturbed for two years.—ED.]

The Monterey Cypress (*Cupressus macrocarpa*).—I am glad you have directed attention to this Cypress, though I do not think the question is yet definitely settled as to the difference between it and *C. Lambertiana*. Some fifteen or twenty years ago, among the Conifers which were planted on Belvedere, near Mullingar, in Ireland, were some Cypresses sent as *macrocarpa*, and since called by this name. They are now very handsome trees, of considerable size, spreading like a Cedar, and rather dark in foliage. They have been, hitherto, quite hardy, transplant well, and are singularly fine and picturesque in character. At Keir, near Stirling, remarkable for the number of its Coniferous trees, are some Cypresses of the same age as mine. They are tall, columnar, handsome, and somewhat lighter in foliage than mine. They are known there as *Lambertiana*. I have had several Cypresses, described as *macrocarpa*, sent me from different nurseries. Some were spreading, some columnar, but none equal to my own in vigour, colour, or constitution; indeed, I lost a dozen of them in one winter. If there are two trees so dissimilar in appearance as those called *C. macrocarpa* and *Lambertiana*, springing from one species, and produced by seed, sometimes horizontal, sometimes upright, it is a very remarkable fact. But I cannot help suspecting that, whether my tree be *Lambertiana* or *macrocarpa*, it is not now a common tree; that the true variety of the Monterey

Cypress is scarce, and that some other weaker and less hardy sort has been substituted for it. I do not think that the fact of the *C. Lawsoniana* growing sometimes upright, sometimes spreading, is quite a case in point, as the character of the tree remains unaltered, and there is not the same dissimilarity of appearance which I have observed in the two forms of the Monterey Cypress—at least, there is quite sufficient ground for further inquiry on this subject.—BRINSLEY MARLAY.

WORK FOR THE WEEK.

Flower Garden.

SPRING flowers are now daily becoming so plentiful that herbaceous and shrubby borders are getting quite attractive; on lawns, too, are tufts of Crocuses, Snowdrops, Dog's-tooth Violets, and other favourite bulbous plants that annually spring up and unfold their beauties when once planted in such positions. They get cut down prematurely by the first turn of the scythe or lawn-mower, but the following year they spring up again, numerically increased, and with greater vigour than before. Under the wide-spreading canopy of large deciduous trees a spring carpet of white, yellow, and blue, furnished by early-blooming bulbs, is most desirable and pleasing, and in such a situation they thrive where not a vestige of Grass will grow. Only the commoner kinds, however, should be used in that manner, for the finer ones, if so treated, are apt to degenerate; hence the necessity of a good position for them, where they can retain their foliage until the bulbs are properly matured, when the foliage may be cut over, and the surface of the ground carpeted with annuals or other shallow-rooting plants. Lawns should be swept, rolled, and, if necessary, mowed. Where they are covered with Moss it should be raked off, a top-dressing of finely-sifted soil applied, and some Grass and white Clover seeds sown at the same time. The top-dressing should be equally spread, raked smoothly and level, and then well rolled. Should the lawn be thinly covered with Grass, although free from Moss, a top-dressing of good soil with some guano mixed with it, and also a sprinkling of Grass and Clover seed will greatly renovate the turf; before applying it, however, go over the surface with an iron-toothed rake, so that the old and new soils may the more readily unite; soot, salt, or guano, applied alone in rainy weather, is also productive of excellent results. If the edges of lawns or Grass walks are well rolled before trimming them, that operation can be more neatly and accurately done. Turfing of lawns may still be performed, but the sooner such work is finished now the better will the Grass stand the summer's drought. In the absence of turf, seeds may be used, but in that case a long time elapses before a thick close carpet can be formed, and continuous attention in the way of mowing is requisite. Alterations in the flower-garden or pleasure-grounds may still be proceeded with. The planting of deciduous trees cannot, however, be too speedily finished now for a season; evergreens may be transplanted later. Coniferous trees, as a rule, transplant very well in the spring time. In planting, preserve the roots as entire as possible, and do not bury them more deeply than is necessary; stake such as require support. Instead of roughly filling in the soil, it should be well and carefully worked in amongst the roots with the hand, and a good soaking of water at planting time has also an excellent effect in settling the soil about the roots. Rose-planting should now be proceeded with; indeed, where the trees are grown on their own roots, this is a good season for transplanting them. Roses in general may now be pruned. A thinning of the shoots is sufficient for strong-growing kinds, whilst some of the dwarfer and more compact sorts bear a severe shortening of the shoots with impunity. A good dressing of manure should now be forked into Rose beds or borders. Transplant spring-flowering plants as occasion requires, and dust some fresh air-slaked lime amongst them to keep off slugs. Transplant seedling Pansies, and pinch the tops out of old plants, to encourage the production of laterals and continuity of flowering. Transplant autumn-sown Mimuluses and annuals, such as Candytufts, Nemophila, and Eschscholtzia, where they are in bloom. Biennials, such as Rockets, Sweet Williams, Wallflowers, Hollyhocks, Canterbury Bells, Foxgloves, Anemones, &c., may also be similarly treated. Annuals for early flowering may be sown in light soils and in warm situations; sow thinly, and thin out a little immediately after the seeds germinate. Remove last year's shoots, if any, from herbaceous plants, and give the borders in which they grow a good dressing of well-decayed manure. Overgrown specimens should be lifted, divided, and transplanted either permanently or in nursery lines, as may be most convenient. Where mulchings of leaves, straw, or litter were placed around the necks of plants of Pampas Grass, Tritomas, &c., remove them gradually. The protection given to Myrtles, Loquats, Clematises, and all but hardy plants on walls, may now be partially, and, in many cases, wholly removed. Finish

planting Box, *Eaonymus*, *Santolina*, Japanese Honeysuckle, and Ivy edgings. If any of these are turned out of pots, shake the soil from their roots, and spread the latter well out; after such treatment they may remain stationary, or nearly so, for a few weeks, but when they begin to grow they will proceed with a vigour unknown to plants committed to the soil with matted roots. The golden-variegated Thyme is now popular as an edging plant, and deservedly so, for it is quite hardy; old plants of it may now be lifted, divided, and transplanted permanently; any in pots subjected to an increased temperature will afford cuttings freely, and they will root as readily as *Verbenas*. An edging, formed by dividing old plants last autumn, has now scarcely a plant in it alive, whereas one formed in the same way alongside of it last spring has withstood the winter unscathed. *Campanula carpatica*, *Stachys lanata*, *Cheiranthus Marshalli*, *Cerastium*, &c., make excellent edgings, and this is the right time for forming them.

Bedding Plants.

From greenhouse and other plant and fruit houses it may now be necessary to remove *Pelargoniums* into frames, in which they will keep perfectly well until bedding-out time. By keeping them in warm quarters, however, better supplies of cuttings are obtained. Proceed with the propagation of different subjects from seeds, cuttings, or division, as speedily as possible; for, the stronger the plants are before they are planted out the better will they flower. Prick off, from the seed-pans into other pans or boxes, *Lobelias*, *Wigandias*, *Petunias*, Golden Feverfew, French and African Marigolds, *Amarantuses*, *Brachycome*, &c. Sow some crimson-leaved Beet, for flower-garden purposes, in a very gentle heat or close pit. Pot off cuttings of all sorts as they become rooted; and after they have yielded up their tops for cuttings they may be placed in a position a little cooler than the propagating pit, unless a farther supply is required. Re-pot autumn-propagated *Pelargoniums*, and place them in a close pit or frame for a time. Give them plenty of water, but do not allow them to be saturated so much as to generate damp. Prick into boxes of light soil, seedlings and leaf-cuttings or succulents, and keep them in a position near the glass. Put into frames 6 or 8 inches in depth of light soil; pack it firmly and into it transplant the autumn cuttings of *Verbenas*, *Ageratum*, *Lobelias*, *Calceolarias*, *Salvias*, &c.; from such a position they transplant with excellent roots. Similar frames are also extremely useful for *Dahlias*, for the roots, after being divided, may be planted in them, 6 inches apart, or the roots may be started in a propagating pit or frame, and transplanted to these cold frames. Sweet Peas sown in pots and boxes should be removed to cold frames after they have germinated. Stocks, Asters, Marigolds, &c., may be sown in very gentle hot-beds, that are ventilated a little day and night, and shaded from sun, for after the plants have appeared they are extremely susceptible of damp. When large enough for being pricked out singly, prepare another frame in the same way for them, prick them thereon, shade well for a few days, and eventually completely expose them, but replace the sashes in showery weather or at night, when they may be tilted up. Instead of transplanting the Stocks and Asters in frames, a wall border with a south aspect will do equally well if a few sprigs of Broom or evergreen branches are stuck in front of them; indeed, seed of these plants may be sown out-of-doors in April with satisfactory results.

Orchids.

See that the plants are kept as free from insects as possible. White scale and a minute yellow thrips are their greatest enemies. The scale will thrive alike on those from the eastern or western hemisphere, on thick fleshy-leaved plants like *Vandas*, *Saccolabiums*, or *Aërides*, as well as on the thin leaves of *Miltonias*, *Lycastes*, and *Dendrobies*; the thrips attack most frequently the thin-leaved plants, yet if allowed to get the upper hand they will do much mischief to the young leaves of *Phalænopsis*, *Saccolabiums*, or *Aërides*. They usually secrete themselves down in the heart of the plants, where no amount of fumigation that can be used with safety appears to affect them. Continual syringing will keep them in check. Some growers object to syringing overhead; but, if it is done sufficiently early in the morning to allow the plants to get dry before night, with a reduction of atmospheric moisture, no bad results will follow. For the eradication of scale nothing is more effectual than the sponge and a camel's hair brush carefully applied. Increase the temperature 6° or 8° by night, with 8° or 10° by day, according to the state of the weather. Shade with thin material during bright weather, yet never allow it to remain down when not required.

Conservatories.

These are now quite gay with early-blooming bulbous and other plants. Pots containing three or four Tulips, bordered with Club Moss, and set off in the centre with such Ferns as *Pteris serrulata*, have a beautiful effect, and the same arrangement may with advan-

tage be carried out in the case of Hyacinths. Forced shrubs are now particularly attractive, and should be mixed harmoniously with such plants as are not in flower: amongst them are Lilacs white and purple, Weigelas, Roses, *Prunuses*, Thorns white and scarlet, *Spiræas*, *Dentzas*, *Acacias*, &c. *Cinerarias*, *Cyclamens*, Zonal *Pelargoniums*, Chinese *Primulas*, *Epacris*, Heaths, and *Fuchsias*, are also now in great beauty. Plants in general are making fresh growth, and, consequently, require more water. Prune and tie all that require such attention. Any that are in a backward condition in borders should be moved and have others put in their places. In planting from pots, loosen the ball of soil and spread out the roots, for, although this may occasion a little check for a time, the plants thrive better afterwards. All hard-wooded plants requiring re-potting should be attended to at once, and afterwards kept for a time in the closest part of the conservatory. They should not be watered for some days after being potted, but the atmosphere should, if possible, be somewhat damp. Climbers of various sorts should be thinned and tied, taking care in thinning to provide for a free display of flowers rather than a gross production of wood.

Pines.

Pay great attention to fruit swelling in all stages; continue to allow an increase of heat by day and night, as the light increases. Maintain a kindly humidity, taking care to ventilate, but so as to avoid a draught. Give tepid clear manure-water to the roots, and syringe round the stems and over the plunging materials with the same. Some charcoal, laid about the surface of the plunging material, is also beneficial in absorbing and giving off gases and humidity. Take care that such fruits as have nearly finished swelling get neither bottom watering nor syringing about the stems; and if they can be moved to a light dry situation, let it be done, in order to improve colour and flavour, and make room for others that may be starting. From those now in bloom withhold syringing for a short time till they set, and apply but moderate humidity. Give such Pines as are now starting into fruit every encouragement, in order that they may make a bold and strong appearance; taking care, at the same time, not to stint them for water at the roots. Select for another batch the finest, fittest, ripe, well-grown plants, and place them together on a well-prepared moderate bottom-heat, to come into fruit in succession, and shift on other successions to replace them. In the case of succession plants, there must be no stand-still; shift them on, as they require it, into good-sized well-drained pots, in which they are intended to fruit, using good, healthy, sweet, well-pulverised soil, charcoal, and soot. Place them on a moderate bottom-heat, increasing the atmospheric heat as light increases, which will also naturally raise the bottom-heat a little. Syringe freely now on fine afternoons, shutting up early. Maintain a kindly, humid, growing heat, and allow the plants to make fall speed while there is light and heat. No check must be allowed, or splendid well-swelled fruit will not follow in succession at all seasons of the year. Starve or stagnate a young Pine plant, and it will never produce perfect fruit. Suckers, take off in succession as you clear away the fruit, and pot and start them immediately. Thus fine plants and noble well-swelled fruit will be the result. Push them along at full speed on a genial healthy bottom-heat in a humid atmosphere, well charged with ammonia, giving methodical syringings early on fine afternoons, airing freely in order to fully maintain robustness and vigour throughout their progress, and never allowing a plant to get dry at the root, or pot-bound for lack of timely re-potting. Attention to little items like these cannot fail to end in complete success.

Outdoor Fruit Department.

April, the most uncertain month in the year, makes it necessary to devote more attention than most gardeners can give to preserve their fruit blossoms from its scathing power. Apricots, Peaches, and Nectarines, will want protection as soon as the blossoms show colour. Glass coverings are certainly cheapest and best where they can be had, and strong canvas the next where it can be rolled up and down, according to the weather. All nailing and pruning should be completed as early in the month as possible, for the blossom-buds of hardy fruit trees on the walls are swelling fast. Pears on the Quince stock are usually more advanced in their buds than those on the Pear stock. The time for grafting is earlier this year than usual, and grafts intended for using must be placed in the ground behind a north wall till wanted. There are often many worthless kinds of Apples and Pears in collections, and the best way is to cut their heads off and graft them with good sorts. Gooseberry and Currant bushes will soon have their foliage expanded, unless a check comes on, and protection of some kind may save a crop should there be severe spring frosts. Fern leaves, dry hay, or Fir branches, will, if put on the top of the bushes on the appearance

of a severe night's frost often afford sufficient protection. Strawberry plantations will now want dressing, and, if a slight covering of littersy manure is spread over the beds, the foliage will grow through it, as well as the flower-stalks, and the straw will keep the fruit clean. The mild season has naturally brought all kinds of orchard-house trees grown in pots into bloom sooner than usual. If the pots have not been top-dressed in the autumn they should now be done so by making a rim of fresh cut turf round the edges of the pots with the grassy side down and filling the centre with some well-rotted cow or sheep dung. This will give fresh vigour to pot-trees which have not been re-potted for years. Before the flowering process commences, syringe with Gishurst Compound of the strength of three ounces in a gallon of water, and this will help to keep the trees free from mildew and aphids; soft-soap dissolved in water of the same strength is likewise an excellent corrective of mildew on Peach, Nectarine, and Cherry trees. As soon as the stoning process in the earliest Vinery commences, a steady night and day temperature must be maintained. The thinning and stopping the shoots in the succession-houses will want frequent attention; and Muscats, when in flower, require a high temperature, 70° not being too high. To have this fine variety of Grape in the greatest perfection as regards colour and flavour, the forcing of it should be commenced in January or February if possible. The thinning the fruit in Peach-houses where too thick, and tying the shoots down as they advance in growth, must be attended to. In the earliest Peach-house it is better to leave the fruit rather thick on the trees till the stoning is over, as some may drop off then. The temperature must be kept lower till the stoning is over, the inside borders being well watered. Pigs, whether grown in the borders, tubs, or pots, will require liberal waterings and syringings overhead on fine clear days. Some liquid manure may likewise be given them occasionally until they begin to ripen. Cherries require to be kept in rather a low temperature when stoning; from 50° to 55° will suit them. Air must be given freely in favourable weather. Sow now good batches of Cucumber and Melon seeds for succession-crops, and keep the young plants in the seed-beds till strong enough to harden off. The Strawberry plants placed earliest in heat will now begin to be showing colour, and watering must be more sparingly given to improve the flavour. Keens' Seedling is, if from selected plants, perhaps, the best early-forcing Strawberry yet grown, and President is also very good for a second kind for succession.

Kitchen Garden.

A golden rule to be kept in mind in reference to the kitchen garden is, to sow little, often, and thin. Thin out and otherwise attend to all growing crops. Trench every bit of ground as soon as it becomes vacant, casting it up rough and in ridges with a strong steel fork. Where necessary, give it a good dressing with manure or other compost, thoroughly incorporating it with the soil, as the trenching progresses. Care must, however, be taken, not to bring up too large a quantity of the sub-soil to the surface; but it is of great importance to loosen it well every time at the bottom of the trenches. This allows water to run through it freely, and renders it pervious to air, which is so essential to the maintenance of a healthy tilth. During mild showery weather slugs are sure to be troublesome, devouring, as they do, young vegetables, especially those in seed-beds. To prevent their ravages, sprinkle with fresh air-slaked lime. At this season saw-flies deposit their eggs on the young leaves of Gooseberries and Currants, and by-and-bye the caterpillars from these prove destructive to the crop. These may be effectually got rid of by immediately applying a thick dusting of air-slaked lime, dry soot, and dry wood-ashes, on a mild morning when the bushes are moist with dew, or after rain; or, failing the occurrence of moisture naturally, they may be damped with the garden engine or syringe. In this way, not only insects' eggs, but also Moss and Lichen, may be got rid of, and a healthy, robust, dark green appearance given to the bushes and clean stems. The weather, during the last three weeks or so, has been favourable for cropping and seed-sowing; and now, that "bright days have come again" these operations may be proceeded with. Should gaps appear amongst vegetable crops, they should be filled up from parts that are thickest, carefully preserving the roots and lifting with good balls, with a trowel in each hand. Every kind of crop may be successfully transplanted when in a young state by using hand trowels; even tap-rooted plants, such as Carrots, Parsnips, Beet, Parsley, &c., will withstand moving in this way whilst young, whilst pulling or taking up young plants, and dibbling them in with naked roots, will be found to be attended with little success. As soon as young crops appear above ground, run a light hand scarifier or an open-toothed rake across the drills, to loosen and break the surface; and, as soon as the rows can be distinguished, run a narrow Dutch hoe between them, so as to keep down weeds.

SOCIETIES, EXHIBITIONS, &c.

ROYAL HORTICULTURAL SOCIETY.

APRIL 1.

THIS was a fair average meeting, the chief exhibitors being Messrs. George Paul, whose pot Roses were in fine condition, healthy and well-bloomed; Mr. B. S. Williams, who staged a miscellaneous collection of stove plants and Orchids; Messrs. Barr & Sugden, whose collection of cut Narcissi was a distinct feature; Mr. Smith, of Worcester, who showed a dozen variegated Acers, supposed to be new, their elegantly cut leaves being of a fine golden tint blotched with green, others red and crimson. Messrs. Veitch also had a nice collection of Orchids, Clematis, and other decorative plants. Messrs. Veitch likewise staged Clematis Duchess of Edinburgh, a fine delicate lilac variety; and John Gould Veitch, a semi-double form of a soft bluish-lilac tint; in their miscellaneous collection we may note a new species of Masdevallia, somewhat resembling *M. civilis*, and, like that species, it has a disagreeable Stapelia-like odour; also a very distinct form of *Oncidium fuscum*, with white and rosy-purple flowers; and a fine basket of the new Red Rose Duchess of Edinburgh; the new *Anthurium floribundum* was staged in this collection, it has velvety-green leaves and inconspicuous white spathes. Mr. Williams had a very interesting collection, including the new white variety of *Anthurium Scherzerianum*, here named Williamsii; *Ataccia cristata*, with its sombre-looking bearded inflorescence; *Ornithidium coccineum*, *Oncidium longipes*, a pretty golden-lipped variety, with dark brown sepals and petals. In addition to these were several showy Palms, Arads, and Amaryllis, the latter being very showy. A fine collection of Roses, in pots, came from Mr. George Paul. These were perfect in leaf and flower, and formed a brilliant show of themselves. Among others we may mention Annie Laxton, a fine purplish-rose; Camille de Bernardin, a well-known old favourite, most profusely flowered; Duke of Edinburgh, a fine crimson-purple variety, with stout waxy foliage; La France, fine silvery-rose; Dupuy Jamain, Princess Beatrice, and Cheshunt Hybrid, a most beautiful magenta-tinted rose; and Etienne Levet, a large rosy-lilac of fine form, with round smooth petals. In addition to the pot Roses, Messrs. George Paul and Mr. H. Bennet both staged stands of cut Roses. Mr. Goddard again staged his seedling Cyclamens, Royal Purple, Crimson Gem, and Rose Queen—for this collection Mr. Goddard was deservedly awarded a cultural certificate; and Messrs. J. Standish, Ascot, exhibited Cinerarias and early-flowering Pinks in good condition. Mr. R. Dean, of Ealing, had a group of spring-blooming Pansies and Polyanthus, very nicely bloomed. Messrs. Barr & Sugden staged a fine collection of spring-blooming Narcissi, correctly named, including forty-eight species and varieties. The Rev. W. Kendall, of East Sulworth, also staged a nice collection, which would have been still more interesting if staged singly instead of being massed in groups. Mr. Woodbridge brought cut-specimens of *Sterculia nobilis*, and the deciduous sheaths of the Bamboo Cane from Syon House. Dr. J. Denny, Stoke Newington, staged a blooming plant of his new seedling *Zonal Pelargonium*, *Imogene*; it was scarcely sufficiently advanced to judge of its truss, but the flowers are fine in form, with well-rounded petals, of a deep purplish-scarlet. Mr. J. Perkins, gardener to Lord Henniker, Thornton Hall, Suffolk, sent a fine stand of *Maréchal Niel* Rose, of fine form, and most beautifully coloured. J. S. Law, Esq., South Lodge, Enfield, sent two plants of *Primula verticillata* var. *sinensis*, a free-growing plant, with jagged powdery leaves, and a verticillate inflorescence of long-tubed pale-yellow flowers. Mr. E. Bennett brought pollen-bearing branches of *Cupressus Lawsoniana*, which were very beautiful.

First-class Certificates were awarded to the following:—

Boronia megastigma (Veitch).—A slender-growing plant bearing clusters of blossoms most deliciously perfumed.

Cyclamen Rose Queen (Goddard).—A fine rosy-violet form of this popular decorative plant.

Cyclamen Royal Purple (Goddard).—A fine large purple-flowered form.

Rose Duchess of Edinburgh (Bennet).—A finely formed flower of a delicate rosy-lilac tint.

Polyanthus purpureus (Dean), a deep purple form belonging to the fancy class, and a fine addition to a now popular group of hardy spring flowers.

Amaryllis Oriiflora (Williams), a fine fully-expanded flower of a deep velvety-crimson colour; very effective.

Horticultural Swindlers.—Perhaps the most audacious horticultural swindlers ever known were those who for some time did a good business in France, having at one period a handsome shop in the Boulevard des Capucines at Paris. Here they had the satisfaction of swindling a large number of the aristocracy, including the Princess Mathilde, and various Marshals and Generals. In 1859 they were at Cadix, where one acted as master, and the other took the part of servant. After doing a good business they decamped, leaving their bills unpaid, and turned up next year at Seville. When finally turned out of France, they went through Germany and the North of Europe; so lately as 1869 they were represented at Berlin, and one of them held a shop at St. Petersburg. We read of their selling a common Gentian as the Victoria regia; of *Magnolia grandiflora* with blue flowers; of Cherries, three of which went to the pound; of Pinks, with fourteen colours; and Pears with four distinct flavours. Best of all, however, was the "arc-en-ciel," or rainbow, which they managed to sell to an innocent shoemaker, who did not discover until it was too late that he had only received a common Fern in exchange for his money. This wonderful plant was to produce a blue flower, from which was to issue so brilliant a light that one could see to read and write by its rays at night without the aid of any further illumination.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

ROSES ALL THE YEAR ROUND.

It is comparatively easy to adorn each month of the year with some form of floral beauty, and, in this way to girdle the season round with flowers enough and to spare. Still, Roses all the year round continue an exception rather than the rule. Only in gardens here and there is this feat of cultural skill attempted, and in comparatively few is it actually accomplished. Many succeed in making Roses almost as common, and even more lovely, by contrast, at least, in March than they are in June. But there is a dreary blank from November to February in most gardens, hardly lighted up by one solitary Rose-bud; and how few can say, even in the highest ranks, "My room has not been Roseless for a dozen or more years." Is it possible to have an unbroken succession of Roses? No doubt it is; for what one has done, others may accomplish. But what of the expense and appliances, number and character of houses, plants, &c., needed? Nothing to be alarmed at. Of course space, plants, and certain conveniences are requisite; and, if one could command a Rosary under glass, properly warmed, the supply of Roses all the year round would be made easy. But, without that, and with a moderate supply of, say 50, or 100, or 200 plants in pots, the year may be wreathed round with Roses. For the purpose of an uninterrupted supply, no varieties are so useful as Tea Roses; and a few of the superior varieties of Noisettes on a back wall of a greenhouse, conservatory, glass corridor, or case, are invaluable for producing fine flowers when they are most wanted. For such purposes, Adam, Gloire de Dijon, Safrano, Souvenir d'un Ami, and Madame Falcot, among the Teas; Céline Forestier, Lamarque, Maréchal Niel, and Solferino among Noisettes; and Souvenir de la Malmaison among Bourbons, are among the best. By so pruning and treating these, sacrificing any amount of summer and early autumnal beauty, so as to have them showing blossom freely towards the end of September (the Maréchal Niel much later, to throw flowers in January), Roses may be had in the dead season, even in as low a temperature as from 40° to 45°; if more can be given, up to 50° or 55°, there will be no difficulty. But the chief use of these Roses in cool houses is to fill up the gap between stray flowers which come late in the open air, and those which may be tempted to open their buds by a hot-bath, or the genial air of a stove or forcing-house at work. The first batch of forced Roses—perhaps the word forced should hardly be used in regard to these—for, rightly managed, they will be late rather than early Roses, the produce of plants cut sharp in about the middle or end of September, placed in a warm sunny spot, till frost threatens, and then set under glass, with a forest of buds formed or forming. A very slight heat will suffice to develop these, and many of them can hardly have too cool a treatment. A greenhouse, or conservatory shelf, will suffice to unfold their late or early beauty from November to January. A few plants of the common or dark China Rose, and the beautiful flesh-coloured Mrs. Bosanquet, the flaming scarlet Cramoie Supérieure, and the old Bourbon Queen, as well as some of the hardiest of the Teas, are the most useful for this season. About the same time as these are placed in cool houses, towards the end of October or beginning of November, a batch of Tea Roses, with plump dormant buds ready to break, and a full stream of sap prepared to bound through them, on the slightest application of more heat, should be introduced to the forcing-pit or an early Vinery or Peach-house about to start; or, lacking these, a cool stove or temperate house. These will progress rapidly in a temperature ranging from 45° to 55°, and will be in full beauty before the others have unfolded all their autumnal or winter buds. Beyond January the supply becomes easier. Towards the end of December, the first batch of hybrid perpetuals should be introduced. It may seem like a libel on our new varieties, many of which force remarkably well, but let those who are bound to have plenty of Roses, and of colours that cannot fail to please, not

neglect to provide a good stock of plants, for forcing, of those two fine old-fashioned Roses, at once brilliant, sweet, and profuse bloomers, Duchess of Sutherland and Baronne Prévost. It may almost seem like presumption to pick and choose out of this magnificent class of hybrid perpetuals, but I venture to do so for the sake of beginners, whom the following varieties will not disappoint in forcing, viz., Alfred Colomb, Antoine Ducher, Auguste Mie, Beauty of Waltham, Charles Lefebvre, Dr. Andry, Duc de Rohan, Dupuy Jamain, Eugène Appert, Exposition de Brie, General Jacqueminot, John Hopper, Jules Margottin, Le Rhone, Louise Peyronny, Madame Crapelet, Madame Julie Duran, Madame Vidot, Marie Baumann, Marie Rady, Pierre Notting, Senateur Vaisse, Victor Verdier, and Xavier Olibo. It will be observed that most of these are dark, bright coloured pink, or red varieties. The majority of Tea Roses are yellow, orange, light, or fawn coloured; and, as a considerable collection of these is an indispensable requisite to a continuous supply of Roses, the brighter varieties of hybrid perpetuals are the more useful. Apart from this, the more delicate hybrid perpetual Roses, such as Baroness Rothschild, La France, Madame Rivers, &c., never look so pure and charming as when forced or grown under glass. Among Teas, Devoniensis is a host in itself, and Madame Willermoz, Madame Margottin, Madame Bravy, Niphetos, Rubens, Souvenir d'Elise, and Belle Lyonnaise, are all very good. Among summer Roses, the common crested and white Bath Moss, the white and red Provence, Charles Lawson, Paul Ricaut, and Coupe d'Hebe are the best for forcing. None of these should be started till January or February, the later the better; and the Moss and Provence especially prove welcome additions to the other classes of Roses. After the Rose harvest comes the critical period for the plants. If every year is to have its Roses the plants must never be neglected. There must be no placing the early sorts out into the ruthless March winds as soon as the flowers are cut, no parching or starving during the summer through want of food and water; no preying of insects upon their leaves, but each class of plants must have its special course of culture to fit them to fill their own niches in the Rose season of the next year. To this end all summer labour should be sacrificed, and all summer strength and force treasured up. A warm sheltered place out of doors during summer, with proper attention to potting, staking, training, pruning, feeding with top-dressings or liquid-manure, watering, and keeping scrupulously clean is all that the Rose will require throughout the summer months. From the end of May to the end of October the outside Roses may be trusted to keep up the supply of flowers, and those in pots or planted out under glass must furnish the other seven months of the year. Of course, with a house or two filled with Tea, Noisette, Bourbon, and China Roses, a Rose harvest all the year would become a mere matter of skill in pruning or the application of heat and culture; but, in pots, more forethought and higher skill are needed to accomplish the same end. A house for Tea Roses, Mr. Rivers says, to be enjoyable should be span-roofed, glazed with large squares of glass, the rafters light, and the roof fixed. Its dimensions should be as follows:—width, 14 feet; height of sides, from 5 to 6 feet; height to ridge, from 9 to 10 feet; it should be ventilated at each side by shutters on hinges; or sashes 18 inches wide; no roof ventilation is necessary. A nicely-gravelled path, 4 feet wide, should occupy the centre, and a border made on each side 5 feet wide. Each border will hold three rows of Rose trees, which should be planted so as to form two banks of Roses in this manner—the back row should be of low standards, 3 feet in height; the middle row, standards, 2 feet 6 inches high; and the row next the path, dwarf standards, 2 feet high. When the trees are in full foliage and flower, a perfect bank of beauty is formed; for, owing to the favourable climate, the trees grow with a vigour scarcely conceivable. Previous to planting, the borders should have a dressing of manure 6 inches thick, which should be well mixed with the soil to a depth of 2 feet. In a house of this description, Tea-scented Roses will bloom beautifully from May to November; but in spring and autumn—say in May and part of June, and again in September and October—they will be in the greatest perfection. In June, July, and August, the ventilators should be closed only to exclude violent winds.

NOTES OF THE WEEK.

— ONE of the best specimens of the beautiful *Dendrobium fimbriatum oculatum*, perhaps, ever seen in this country is now in flower at Enville Hall. It is 6 feet in height, 4 feet in diameter, and is bearing sixty-four flower spikes, each averaging thirteen flowers. The latter are of a deep orange-yellow colour, the lip being much fringed, and having a deep crimson blotch in the centre.

— SIR JAMES MATHESON, of Lewis, has just intimated to the Town Council of Dingwall, his intention of presenting that burgh with a field on his property to be used as a public park, on condition that the council suitably enclose and embellish it. Sir James was, at one time, Mayor of Dingwall.

— THERE is now a very large flowered form of *Phalenopsis grandiflora* blooming in the Orchid-house at Kew. Its individual flowers are fully five inches across, and of pearly whiteness, with the exception of the yellow-blotched lip. This variety is the longest-petalled form of this beautiful plant that we remember to have seen, and, as it will be in bloom for some weeks, it is worth the inspection of cultivators.

— HYACINTHS and other spring-flowering bulbs are now blooming freely on the Thames Embankment, and also in Hyde Park. These last few warm and bright days have served to brighten up the flowers of such plants a good deal, so much so, indeed, as to make one wish they were more plentiful. Not the least attractive feature in connection with the Hyacinths is the grateful perfume diffused by them, especially in the evening.

— A PUBLIC meeting was held at Weston-super-Mare the other day, for the purpose of considering the formation of a public park and recreation grounds. The chairman, in explaining the object of the meeting, remarked that the glebe land near the church was about to be let by auction, and as no other site was so available for a pleasure park, it would be desirable to secure it. The rector had expressed his willingness to let the land to a responsible person for such a purpose as that now proposed. He concluded by proposing, "That in the opinion of this meeting it is desirable that a pleasure park be formed for the benefit of the inhabitants and visitors of this town." This was seconded and carried. A scheme for laying out the land and providing the necessary ornamental buildings, fences, and entrances, will have to be procured.

— M. FAIVRE has recently performed a series of experiments on the Mulberry, Hazel-nut, and Cherry Laurel, which he considers goes far to prove the fact that the substances which supply the food of plants have an ascending motion in the bark. For this purpose he made perfect or imperfect annular incisions through the bark, or detached pieces of the bark, to which buds were attached, or removed entire cylinders of bark from the trunk. The result of the experiments was, that the buds always continued to develop when the communication remained uninterrupted with the lower portion of the trunk; while, when this communication was completely destroyed, the buds invariably withered away. If the bud was separated by a perfect annular incision, it withered the more slowly the greater its distance from the incision; and in these cases the starch disappeared entirely from the portions of the wood above the incision between it and the bud. When entire cylinders of bark, with buds on them, were removed, the buds continued to develop, and even produced branches bearing leaves.

— In the *Botanical Magazine*, for April, we find figures of the following plants, viz.:—*Colchicum Parkinsoni*, a native of the Greek Archipelago, and known in gardens as *C. variegatum*, *C. tessellatum*, and *C. agrippium*; but it appears to differ from the true *C. variegatum* of Linnaeus in its smaller size and more distinctly chequered or tessellated markings. This plant was originally figured and described by Parkinson, in his "Paradisus Terrestris," as long ago as 1629, where an excellent description of it will be found at page 156. The flowers are white, shaded with lilac and chequered with deep rose. Leaves about 6 inches long, 1½ inches broad, with revolute sinuous margins.—*Beschorneria Touelii*, a Mexican plant, nearly related to the Agaves, having smooth unarmed bright green recurved leaves, and a nodding spike of crimson-green tipped flowers; the ovaries are of a bright purple colour.—*Aconitum heterophyllum*, a native of the Himalayas, having coarsely-lobed foliage and erect spikes or close panicles of greenish-yellow purple-tipped flowers. Although belonging to a well-known poisonous class, a preparation from this plant is extensively used as a tonic medicine throughout N. India. It is nearly allied to *A. Napellus*, a plant cultivated in cottage gardens in this country.—*Panax sambucifolius*, a warm greenhouse plant from New South Wales and Victoria, having smooth green pinnate leaves, glaucous beneath, and terminal clusters of white berries the size of large Peas.—*Epidendrum criniferum*, a native of Costa Rica. This is a slender caulescent species, with stems 12 to

15 inches high, terminated by a cluster of yellow crimson-spotted flowers, having a curious tri-lobed lip, the lateral lobes of which are lacinate or fringed, the central lobe being subulate or awl-shaped. *Rhopala Pohlil*; this plant belongs to a well-known group of free-growing Proteaceous plants, and is a native of Brazil. It is of erect habit, and has gracefully recurved pinnate foliage, like its congeners, and axillary clusters of yellow flowers.

— THE Council of the Society of Arts has decided to offer a prize, consisting of a gold medal or twenty guineas, for the best essay "On the Cultivation and Manufacture of Indian Teas."

— THE *Belgique Horticole*, for February, publishes a complete list of botanical gardens throughout the world, with the names of their curators and of the professors of botany at the different towns.

— IN Switzerland there is a law, it is said, which compels every married couple to plant six trees immediately after the ceremony, and two on the birth of every child. They are planted on commons and near the roads, and being mostly fruit trees are both useful and ornamental. The number planted amounts to 10,000 annually.

— THE Peruvian Commission have found, in Pabellon de Pica, over 6,000,000 tons of pure guano, containing a large proportion of ammonia; in the Pant de Lobos, 2,000,000 tons; in Thaniholas, 900,000 tons; in Chanabaya, 150,000 tons, all of excellent quality; at Patache, 125,000 tons; and at Patillos, 15,000 tons of inferior guano.

— THE rare and beautiful *Oncidium concolor* is now in flower in the Royal Exotic Nursery at Chelsea. Its flowers are of a clear golden-yellow colour, and are borne on a long drooping spike. This is one of the best *Oncids* in cultivation. In the same collection is also a fine mass of *Utricularia montana* in a hanging basket bearing forty fine spikes of from three to seven flower buds each. This is, we believe, the finest specimen of this plant hitherto grown in this country.

— THE large American Aloe (*Agave americana*) in the succulent house at Kew, is now throwing up a flower-spike as thick as one's arm. The plant is a very fine specimen of its kind, measuring, as it does, fully 15 feet in diameter, and the rapid-growing spike has already reached the roof. When its large candelabriform arms shall have become fully-developed it will form a conspicuous object outside the house, for room will have to be made in the roof to allow them to escape.

— THE third number of the *Illustration Horticole* contains coloured plates of *Epidendrum Catillas* (*E. Imperator* of gardens), a caulescent species having leafy stems 3 to 4 feet high, terminated by a cluster of reddish-crimson flowers. Like many other species of the same section, it continues to develop flowers for several months in succession.—*Dracaena Bellula* is a slender-looking species, which if of free growth will be valuable for decorative purposes. It has recurved green foliage shaded with purple beneath and margined with crimson. *Apelandra Facinator*—This is a stove plant of erect habit, having bright green leaves veined with broad silver bands above, and of a deep purple colour beneath. The flowers are of the most dazzling vermilion scarlet, and, contrast well with the leaves. It is one of the best plants in the whole group and comes from New Granada.

— DURING the past week we have noticed small specimens of the Cherimoyer of Peru (*Anona Cherimolia*), in Covent Garden Market. Several species of this genus are cultivated in tropical countries for the sake of their fruits. The Sour-sop of the West Indies is the fruit of *A. muricata*. It is of considerable size, often weighing upwards of 2 lbs.; it is greenish and covered with prickles, the pulp is white, and has an agreeable slightly acid flavour. The Sweet-sop is the fruit of a tree, *A. squamosa*, native of the Malay Islands, but extensively cultivated in the East and West Indies. The common Custard Apple, or Bullock's Heart, is an eatable fruit produced by *A. reticulata*, a native of the West Indies, but cultivated in the East Indies also. Its yellowish pulp is not so much relished as that of the other kinds.

— IT was announced at a recent meeting of the Académie des Sciences, that the methods adopted in the department of the Hérault for flooding the Vineyards with water strongly infiltrated with guano, has proved perfectly successful in destroying the Phylloxera, and arresting all traces of disease produced by its presence. It is reported that by the use of these guano floodings the most severely attacked plants have been restored to a healthy condition in a very short period, and have exhibited their normal vigour and productiveness. Various experiments are at present being tried in the department to ascertain the simplest and most efficacious method of employing the guano; and also to test the practicability of the schemes that have been proposed for destroying the insect by the abstraction of the oxygen from the surrounding medium; but this process, although it may be feasible in theory, is beset with almost insurmountable practical difficulties when it has to be applied to widely extended areas.

THE INDOOR GARDEN.

DICKSONIA SQUARROSA.

THIS is one of the most distinct of all the New Zealand Tree-Ferns, and one that on account of its moderate size, is well adapted for a small greenhouse or conservatory where head-room is limited. The plant is of rather slow growth, but does well in a moderately cool house. Like its congeners, it grows best in a fresh, open, peaty compost, on a thoroughly well-drained bottom, but it must be liberally supplied with moisture, and does all the better if the trunks are syringed every day during the hottest of the summer weather. As shown in the accompanying illustration, the plant is singular in habit, its fronds diverging nearly horizontally with the trunk. One of the finest examples of this choice Fern is in the collection of O. O. Wrigley, Esq., of Bridge House, Bury, Lancashire. This plant is 12 or 14 feet in height, and has a dense head of fine deep green fronds about 6 feet across. The fronds of this plant are very harsh to the touch, and, as the trunks are of a deep brown



Dicksonia squarrosa.

or black colour, they contrast well with the green colour of the fronds. It should be grown in every cool Fernery, and does best if planted out in a cool moist bed of fibrous peat and brick-rubbish. It is so distinct in habit from its congener, *D. antarctica*, that one would scarcely believe them related, except for the unmistakable characters of near resemblance afforded by the fructification.

B.

FUCHSIAS ANNUALLY FROM CUTTINGS.

FUCHSIAS are such invaluable plants for conservatory decoration during the summer months that it is no wonder they are so much cultivated for that purpose. The graceful habit of growth of the plants, the profusion of bloom they yield, and their elegant blossoms, combine to render the Fuchsia one of the most popular plants cultivated in pots, and the immense quantities grown for market indicate a demand equal to the supply. It is a mistake to suppose that a high temperature is absolutely necessary to produce good specimens of Fuchsias. It is, however, of use in pushing on into rapid growth plants, which it is necessary to make into large specimens at an early

date, but it is not essential. Anyone having some bottom-heat at command in early spring, especially if it be in the form of a small stove-house, can grow fine specimen Fuchsias; and even those who have a cold house simply, can form fine plants by August if they will give them the requisite attention. If I wanted fine specimen Fuchsias, say in July and August, I should prefer to have cuttings struck last August, and grown on during the winter. It is, however, possible to have fine well-formed specimens by selecting cuttings from the earliest shoots in winter and spring put forth from the plants kept over from the previous season. The cuttings may be planted in a gentle hot-bed or in pans of sand over some bottom-heat, and they will be nicely rooted in the course of a week, and may then be potted into thumb-pots, using one half well decomposed leaf-mould and the other half a good virgin loam. Shift the plants as the pots become filled with roots, and grow them on with all speed. The Fuchsia is a rapid-growing plant, and its quick development is quite in keeping with a rude vigorous health. By the time the plants are 6 or 8 inches in length they may be removed to a warm part of a greenhouse, and kept watered and well syringed overhead in sunny warm weather. At this stage the leading shoots should be pinched out so as to induce a branching habit of growth, and in the course of three weeks or so all the other shoots should be pinched out except the leading one, which should be allowed to grow up for 6 or 8 inches, and then be again stopped, so as to keep the plant bushy at the bottom, and to induce it to form that handsome pyramidal shape, which is the most natural and fitting habit of growth for the Fuchsia. Let it be a pyramidal form, not a squat bush shape, which will sometimes happen when the main shoot is pinched back too frequently. Supposing the season to be, at this stage of the growth of the plants, about the middle or end of April, they must be syringed morning and evening, and the process of re-potting must be continued as the plants advance in growth; the points of any shoots which may be growing so strong as to endanger a symmetrical habit of growth must be kept pinched in. Do not allow the sun to shine directly on the plants; and, if the position of the house does not afford a shady spot in it, some shading should be extemporised. A dry atmosphere will beget green fly, therefore, syringe occasionally, according to the state of the weather. Should the plants show any bloom, it is well to pick it off at this stage, to throw all the strength into the growth of the plant. Supposing the cultural process has been so far followed, it may be presumed the plants will be about 2 feet in height, and of a nice regular pyramidal shape. If they are wanted for exhibition about the middle of June, the plants should not be shifted after the first week in May; the shoots should be allowed to grow, and the flowers to develop themselves freely; but stopping only sufficiently to maintain a symmetrical shape. If, on the other hand, the plants are required not for show purposes, but simply for the decoration of the conservatory during summer, the period of bloom may be retarded, so as to grow plants of a good size. If the plants are not too large to re-pot, another shift may be given at the end of May. The house in which the plants are growing should have air given it night and day, and the plants should be syringed four or five times a day, to keep the house cool and moist, and prevent the gathering of blight. It is a good plan at this stage to cover the surface of the pots with well decayed cow-manure to the depth of about 2 inches, forming it into a kind of circular trough round the rim of the pots; and, on no account, must the plants be allowed to suffer for want of water. By attending to these directions, the Fuchsias will carry good heads of bloom, and be invaluable for decorative effect.

Is it worth while holding over the plants for a second year's bloom? This is a question frequently asked by cultivators. My reply is, no, unless some very large plants are needed. The fact is, fine young vigorous plants can be grown in one season from cuttings, and, when this can be done, it is hardly worth while to be troubled with wintering old plants. Not, however, that it is difficult to winter them, but simply because cuttings make the best plants when properly grown. The old plants can be preserved through the winter by placing them under a greenhouse stage, or in any place where they can be preserved from frost. The following fine varieties

would form a good collection; they are all thoroughly approved sorts, which have been repeatedly tested:—Alpha, Avalanche (Henderson's), Arabella, Alexandrina, Delight, La Favorite, Noblesse, Starlight, Killiecrankie, Wave of Life, Weeping Beauty, and White Perfection. R. D.

LIBONIA FLORIBUNDA.

This plant is a native of Brazil, and was first introduced into cultivation about ten or twelve years since, by its discoverer Libon, after whom it was named. It belongs to the natural family of the Acanthaceae, and forms a neat bush about 1½ or 2 feet high, with downy stems and branches, which are somewhat swollen at the joints. The leaves are small, oval-lance-shaped, opposite, of a fine glistening green on the upper surface, and whitish underneath. The flowers, which are very numerous, are tubular in shape, and of a scarlet colour, tipped with yellow at the mouth. They usually begin to appear in January, and the plant continues to bloom until March or April. It requires the heat of a moderately warm plant-house, and thrives in a compost of sandy loam, leaf-mould, and heath-soil. It has been objected against this plant, that it is very prone to shed its leaves unseasonably, and so becomes unsightly. This, however, may be avoided by keeping it in a steady equable temperature. If placed abruptly in a high temperature, the leaves are sure to fall. The plant is easily multiplied by cuttings struck in heat. The following mode of culture, communicated by M. Bisson to the *Revue Horticole*, is stated by him to be perfectly successful in preventing the plants from losing their leaves:—"I strike my cuttings in spring; when they are well-rooted, I plant them out, at distances of 7 or 8 inches in a well-drained bed, composed of half sand and half spent hot-bed material, and keep them covered with a frame until all danger from frost is over. I admit air by degrees, finally removing the frame altogether, and leaving the plants in the open air until the end of September, when I transplant them again into a bed of the same material, and cover them with a frame, under which I leave them for a month or six weeks, when I remove them to their permanent quarters in the plant-house, and find that they turn out equally well whether I place them in a warm house or a temperate one. Plants a year old, treated in the same way, succeed quite as well. I cut them back and prune them in before planting.

Begonia octopetala.—Of this a coloured plate has been issued, representing the flower to be white inside and red outside; but, on referring to a figure of this plant published many years ago in the *Botanical Magazine*, I found that the flower was wholly white. The re-introducers, however, assert that their figure is correctly coloured, as described to them by their collector, who saw the plant in flower and sent them the tubers, and that the reason why the flower, as figured in the *Botanical Magazine*, is altogether white, like the white variety of *Anemone japonica*, is, that having been grown, by mistake, in a stove (which this plant in nowise required and which ultimately had the effect of losing it altogether), the blossoms became bleached, and lost altogether the fine deep red under colour of petal, which they should normally have, as shown in Messrs. Fröbel's plate. This, to my mind, seems a satisfactory explanation of the discrepancy.—W. E. G., *Junior Carlton Club*.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Prunus triloba.—This is one of the best of spring-flowering wall-shrubs, bearing, as it does, perfect wreaths of double pink flowers. It is even more beautiful than the double-flowered variety of *P. sinensis*, and, like that variety, is invaluable for pot-culture, either for cut flowers or for conservatory decoration, during the winter and spring months. It is sometimes called, in gardens, *Prunus Lindleyana*.—J. N. L.

Melianthus major.—This is one of the most distinct of all half-hardy foliage-plants, and one well worth growing, planted in a warm sandy border, where it forms a noble object. If planted under a south wall, and protected by a mulching of litter or dung, it stands a moderately severe winter without injury, and comes up strongly in spring. As a sub-tropical plant, in sheltered positions, it is very effective. It is easily propagated by division. Grown as a climber or pillar-plant in a cool greenhouse or winter-garden, it makes a fine plant, from 10 to 20 or more feet in height, clothed from bottom to top with large and handsome leaves.—J. H., *Sydenham*.

Dendrobium Cambridgeanum.—This lovely Orchid is just now blooming in perfection at the nurseries of Mr. James Backhouse, York. Though introduced from Assam more than twenty years ago, it has always been considered a difficult matter to bloom it well. The present Dendrobe has formed its leaves and flowers since the new year. It has been treated by Mr. Marshall in a house, the temperature of which has varied from 40° to 60°, and herein, probably, as Mr. Marshall thinks, is the secret of its throwing up its beautiful spike of bloom. The flowers are golden-orange, expanding above 3 inches in diameter. The lip, which is fringed and densely downy, has a large maroon blotch at its base, with paler pencillings below. The flowers rise in pairs from the nodes. The leaves of the plant are deep green, with a delicate purplish edging.—PETER INCEBALD, *Hovingham Lodge, York*.

THE FLOWER GARDEN.

SAXIFRAGES.

By J. C. NIVEN, Botanic Gardens, Hull.

The Crustaceous Group.

Saxifraga calyciflora, of Lapeyrouse, an old Saxifrage monographist, is, for reasons that I shall explain, so far preferable to that of Genan, which Engler adopts under the title of *S. media*, that I do not hesitate to retain the elder name. Not only does it claim priority on this score, but it has a more important speciality in the fact, that in the very name *calyciflora* we have embodied one of the most marked peculiarities of the species, and one in which, so far as my knowledge extends, it stands unique. Those who have seen this plant in bloom, or, rather, in the early stages of blooming development, will recognise at once what I mean; but, as a large majority of my readers may not have had such an opportunity, seeing that the plant is somewhat rare, I must endeavour to explain more clearly what I mean. I do not think that any two adjectives will more perfectly describe the general appearance of the plant than to say that it is both hard and horny, in fact, a plant that a blind man could readily detect with his finger ends. Its rosettes are few in number, about an inch in diameter, each composed of a number of blunt-pointed spatulate leaves, of a grey colour, densely arranged in an imbricated or spiral fashion with perfect regularity, each leaf being reflexed at the point, and margined with a stiff smooth cartilaginous line. The first indication of bloom is presented by a rosy tint in the centre of one or more of these clusters of leaves, the rose gradually deepening into the most intense and lovely crimson. On close examination, it will be found that this development of colour originates in the glandular hairs that clothe the early floral leaves and the flower-stems, and cover the calyx also; its beauty may be said to culminate just as the development of the inflorescence above the rosette commences. The petals are small, more erect than expanded, and of a dirty yellowish-rose colour; in fact, of so little importance are they to the beauty of the flower, that they might be absent altogether. Hence, I think, my readers will see that as the real beauty of this plant lies in the developing inflorescence and the calyx, the specific name is essentially appropriate. It is a somewhat shy-growing plant, and not readily increased except by seeds. If grown in the rockery, it should be firmly wedged in its place by means of pieces of porous stone, as its root-hold appears to be rather slender; the same remark will equally apply to it under pot culture. The seeds, which are produced tolerably freely, do not vegetate until the second season, and grow very slowly; hence, it is advisable to remove the seedlings from the seed-pan, when very small, into a pot of fresh soil, else the Moss, which is almost sure to be developed, is apt to rot them off just at the neck. This charming Saxifrage is a native of the Pyrenees and the Italian Alps, and occurs also in Greece, in a more slender form, known as *S. calyciflora olympica*.

S. luteo-viridis.—In close relationship with the former species, but lacking the peculiar beauty of those crimson glandular hairs that I have described, this species so named, and most appropriately so, by Schott and Kotschy, possesses much smaller rosettes and so far elongated that its leaf development extends along the densely-arranged branches; small and hard in texture, the whole forming a dense compact mass, from which the flower-stems, clothed with numerous linear leaves and furnished with green glandular hairs, rise some 2 or 3 inches, each stem being terminated by a few flowers of a yellowish-green colour; hence its specific name. The cultural remarks apply equally to this as to the last, except that *luteo-viridis* is rather a freer grower, and more readily increased by division, but still it is by no means a common plant in cultivation. It is a native of the Caucasus and Armenian Mountains.

S. cæsia of Linnaeus is a gem of the first water; its height, as regards foliage, can only be measured by fractional parts of an inch; its rosettes are about a quarter of an inch in diameter, beautifully arranged, like a microscopic bit of tessellated pavement, each so perfectly and evenly developed as to be an exact counterpart of its neighbour. The leaves are somewhat sharply pointed and recurved one on the other; the beauty of their regular arrangement being enhanced by the minute specks of white crustaceous matter with which they are dotted; the flower-stems are erect, slender, covered with a dense dark glandular pubescence, and terminated by three to six pure white flowers, of a development that must be looked upon as large, when compared with the rosettes from whence they spring; they are produced in the month of July, thus extending the period of blooming in the Saxifrages even beyond Midsummer; so beautiful, however, is the plant, independent of the flowers, that it would be no harm even if they were omitted altogether. In cultivation, I find that a mixture of peat soil and silver-sand, in a proportion of two-thirds of the former to one-third of the latter, with a few nodules of limestone

intermixed, suits it admirably; and, if planted in a rockery, this special provision, as regards soil, should be made, if success is to be attained; in ordinary soil it turns sickly and yellow, and ultimately collapses. It has a wide geographical range, extending from the Pyrenees through the whole of the lower spurs of the central European Alps, where it is found growing in dense patches, firmly embedded in the crevices of limestone rocks. No collection of Saxifrages should be considered complete till this desirable species is added to it.

S. squarrosa.—If I have ascribed a beauty of a minute character, all the more beautiful on account of its minuteness, to the last-named species, I must characterise the present as microscopic. Harder and more woody in texture, its tiny rosettes consist of six or eight leaves, broad at the base, and somewhat deltoid in form, not recurved, as in the preceding, but more rigid and erect, each leaf towards the apex being margined with a few crustaceous markings; so dwarf and dense, in fact, is this plant, that it might readily be taken for some form of Lichen that, growing out of the stone, had become, in its structural character, assimilated to the stone itself. The first acquaintance I made with this plant was at Mr. Maw's last autumn, where nice patches were being established, and, indeed, appeared to have suffered nothing from a fortnight's confinement in the interior of a vasculum while being conveyed from the Maritime Alps to the Severn valley. From its extreme minuteness, it is one of those plants that require the sharp eagle eye of a thorough botanical collector to detect; hence, no doubt, the reason why it has not made its appearance in general cultivation before. Both *squarrosa* and *caesia* should have full and complete exposure, and thorough drainage, whether grown in the rockery or in pots; if in the former, they ought to be placed at a height sufficient to bring them close under the eye, else their minute beauties are apt to be overlooked.

S. valdensis of De Candolle derives its specific name from the Valley of the Valdini, in the Savoy Alps, where the plants from which it was first described were found. This, along with the two following species, must be looked upon as connected with their more truly crustaceous brethren, by their hardness of texture rather than by any special markings, and also by the character of the flowers. The growth of our present species is as distinctly marked by irregularity in outline as that of the two previous species was by regularity. Its little fleshy grey leaves are arranged in tufted irregularly-branched rosettes; their blunt points, crowned with a white tip, are erect and slightly expanding, the whole forming a compact dense mass, from the more prominent of whose rosettes arise the flower-stalks, to a height of about 2 inches, clothed with short glandular hairs, and crowned with three or four white flowers of great purity. It is a tolerably free grower, as compared with others of the hard horny type, and should always be provided with some mechanical means to give it a firm root-hold, such as small fragments of stone incorporated with the soil will always afford.

S. diapsioides.—As its specific title indicates, bears a striking similitude to the charming little *Diapsia* of northern latitudes. It is a species that has been in cultivation in this country for a good many years, but, owing to its remarkably slow growth and hard texture, it does not increase freely, in fact, the attempt at division is attended with great risk, so long as the tuft retains its compactness, but occasionally it becomes naturally broken up. When it assumes this character, the process of division may be readily and safely accomplished. It has many characteristics in general appearance with *valdensis*, but its leaves are narrower, almost triquetrous, sharp-pointed, and its little rosettes appear to indulge in a lateral, rather than an erect, growth. Its flower-stems are about 2 inches in height, usually supporting three flowers each. The bracts are large, membranous, tipped with rose, and the stem and calyxes are suffused with the same tint, rendered beautifully soft in appearance by the glandular pubescence that accompanies it. The individual flowers are above a quarter of an inch in diameter; they expand quite flat, and have an even and circular outline, the colour being pure white. The size of the flowers are in striking contrast to the diminutive growth of the plant. It is a native of the Maritime and Swiss and Tyrolean Alps.

S. aretioides derives its specific title from its resemblance to the Primulaceous genus *Aretia*, to which, both in the matter of foliage and the colour of the flowers it has a great similarity. In size about the same, and in hardness of texture also, it claims a close affinity to *valdensis*, but its leaves are narrower, more sharply pointed, and of a dark green, thus showing off to advantage the white crustaceous mark that occurs at the extremity of each tiny leaf. It is, however, in the flowers that the most important distinction rests; these are yellow with the slightest tinge of green therein, and are usually produced solitary or in pairs, on a foot-stalk not more than an inch high. Like all the others, it is of but slow growth, a good-sized patch representing the growth of years; it seeds pretty freely,

but requires great attention to get the delicate little plantlets through the early stages of their development. Geographically speaking, it appears to be almost confined to the western and central Pyrenees, where it grows in considerable abundance. For many years *S. sedoides* was cultivated under this title, and, I believe, to Messrs. Backhouse belongs the credit for having first introduced us to the true plant.

S. mutata of Linnaeus, and *S. florulenta* of Moretti, ought perhaps to have taken a position earlier on in the present group, but had I done so they would have made a break in the gradually diminishing series that I have enumerated from *Cotyledon* on the one hand to *squarrosa* on the other, so I thought it better to reserve them as the concluding species of the crustaceous section; correctly speaking, they form a brace by themselves, possessing as they do a largely-developed cartilaginous margin, smooth in the former, and serrated in the latter, devoid of those white markings which constitute the all-important character of this group. Another peculiarity they have in common is, that however long it may take to acquire the necessary development of rosette, the process of flowering and ripening the seed is immediately followed by the death of the parent; neither species appears to have any power of developing off-shoots from the base, thus giving them a somewhat biennial character; albeit I have a strong suspicion that in the case of *florulenta*, the preparatory stages before blooming may extend over ten or twelve, or even more, years, judging by the quantity of old decayed leaves that subtend the vitally active portion of the rosette. In the foregoing remarks, I think I have established sufficient grounds to justify myself in considering them as accessories rather than as actually belonging to this group. *S. mutata* has a great resemblance, in outward appearance, to *lingulata*; the radical leaves are broader, and blunt, or, in fact, rounded at the point; the rosette is more perfect in its form, and, prior to flowering, assumes a cup-shaped character; the inflorescence rises to a height of 15 inches or more, is densely covered with glandular hairs through its whole extent; the cauline leaves are abundant, gradually becoming narrower, and ultimately forming linear bracts through the entire inflorescence; the petals are somewhat narrow, of a yellowish-buff colour, scarcely as long as the calycine segments; the flowers are, however, dense and pyramidal in their arrangement, which adds much to the generally effective appearance of the plant. Seeing that the immortal Linnaeus has stood sponsor for the name, it will at once be patent that this species of Saxifrage is no modern introduction; and yet, between the years 1850 and 1872, I have endeavoured in vain to get a plant of it. In the former year, I flowered a number of plants raised from Swiss seed; in the latter, I flowered a plant that had come by chance—a seedling, whence I know not; but, after some three years' growth, it bloomed, and proved itself, as I suspected, the true *mutata*. It is not a little singular that a plant possessing, if not real beauty—at least all those elements of interest that will at once arrest the attention of even the casual observer—should, for such a long period, be almost unknown in this country, the more so, considering that it is by no means confined to a limited area in its natural locations, but is found abundantly on the Pyrenees, the Alps, and, in fact, all the mountains of central Europe. Within the last five months, I have been called upon to name collections of plants brought home from Switzerland by amateur tourists, and in every case this identical Saxifrage has been the most abundant form; looking at it from a cultural point of view, it is a plant that requires, when in bloom, a free and abundant supply of moisture, without which the death of the plant occurs before the blooming process is complete, and, as a result, the seeds, though partially developed, are imperfect. Such was my case in the year 1850.

S. florulenta.—Though found, named, and described by Moretti as collected by him in the Col de Madonna many years ago, has, till within the last two years, never got into cultivation, nor, indeed, is it to be met with even in herbaria. This is all the more astonishing, seeing that, in point of beauty, it is a far more desirable species than the former. The radical leaves of this plant are narrow and lanceolate, forming a dense rosette of considerable size, and, if I may judge by the number of old and decayed leaves that I have had to remove previous to potting some plants that came into my hands some two years ago, I think I cannot be far wrong in estimating their age at not much less than ten years, if not more; the leaves have a smooth cartilaginous margin towards the point, the base being lined with fine ciliary serratures. The inflorescence, like the former species, is dense, and covered in all its parts with glandular hairs. The petals are of a rose colour, somewhat narrow, but, in the mass, presenting a very effective appearance, sufficient, at least, to dignify it, according to Moretti, as "a splendid plant." Knowing, as I have done, this species by description, I have often wondered how a plant, so markedly distinct, and, at the same time, effective should in these days of Alpine clubs and Alpine travellers, continue

to be known only by name. The mystery, however, was solved last autumn, when on a visit to Mr. Maw, of Benthall Hall—he had then just returned from a tour to the Maritime Alps laden with botanical spoils, and amongst these were numbers of plants of *S. florulenta*, varying in size from 2 to almost 6 inches in diameter of the rosettes; these were from a new locality, or, I ought to say, new localities, having been collected in the Col du Fenestrelle and the Col du Cerise, to quote Mr. Maw's own words, "both near the watershed of the Maritime Alps, between the valleys of Lantosca and Valdini," whence then, it may be asked, arises the rarity of a plant that grows in abundance in a region tolerably well frequented by our tourists? Mr. Maw's explanation at once solves this enigma. He informed me, that his attention was first attracted to masses of decayed leaves that lay scattered about on the loose snow that subtends the line of perpetual snow; on examining them, he found that they were the dead flower-stems of the plant he was in quest of—and, as the fact of their occurrence here, at once indicated that the plants must be looked for higher up—a scramble over the uninviting snow debris soon revealed the true habitat of *florulenta*; there it was, growing in abundance in the fissures that occur in the face of the perpendicular rocks, just below the permanent snow-line, and, of this fact, let the Saxifrage-grower make a special note, for if he wishes to succeed, he must take a lesson from the book of nature. This species will, I understand, be figured in an early number of the *Botanical Magazine*, where, no doubt, it will be supplemented by some remarks from the pen of its discoverer, Mr. Maw.

In thus completing the enumeration of the species that form the crustaceous group, I may state, that I have confined my remarks to those only in cultivation; there are many other species of equal beauty, which, at present, we know only by description; but, with which, we trust, our Alpine tourist friends will, ere long, give us an opportunity of forming a personal acquaintance.

IRISES.

THAN the different species of Iris few plants are more beautiful. "Iris of all hues," says Milton, and other writers have compared their colours to those of the rainbow. With the exception of the Rose, no flower has been more celebrated both by historians and poets than this genus of plants. It is also a great recommendation to the different species of Iris that, whilst some of them blossom early, others succeed them all through the earlier summer months, and onwards until July. Old writers dwell with delight on the rich and varied colours of the Iris, which they were anxious, like ourselves, to see flourishing in every garden, not only in borders but even in water; for, says Scott—

Where waves the Bulrush as the waters glide,
The yellow flag-flowers deck the sunny side.

and it is difficult to imagine an effect more agreeable to the eye than to see clumps of these yellow flowers reflected on the clear waters of our streams and ornamental lakes. Even in situations in which it might be desirable to keep the waters themselves free from aquatics, there can be no objection to having the banks beautified by yellow and purple Irises, provided they are planted in a natural and tasteful way, all appearance of art being concealed as much as possible. While the yellow Iris may be set in the water, the purple sort should be placed on the bank by way of contrast—not in any regular way, however, but here and there in masses. In borders, the dwarf kinds of Iris cannot fail to be attractive. The Persian Iris flowers as early as February and March, but it likes a sheltered border and a warm soil. Then there is the dwarf Iris (*I. pumila*), also a kind which flowers in spring, and coming, as it does, from the open hills of Austria and Hungary, it endures the inclemency of our winters without injury. For the decoration of rock-work, or for the margins of borders, this is a useful kind. It might be planted among Primroses, Narcissi, or other early-flowering plants, among which it might be desirable to get a purple contrast. Of the singular and really beautiful Chalcidonian Iris (*I. susiana*), I have seen fine plants in flower in Covent Garden. Its flowers are very large, densely spotted, and striped with dark purple on a grey ground. This is a kind which has been cultivated in gardens ever since the fifteenth century. Gerard tells us that it flourished well in his garden, being planted in ground that was not over wet. He also says that "the whole flower is the colour of a ginnie hen—a rare and beautiful flower to behold." The Florentine Iris is another desirable kind, which blooms early in May. Its flowers are white slightly tinged with blue, and it has a bright yellow beard. Its roots when dried give out an agreeable perfume, somewhat similar to that of Violets; it is, in fact, the Orris root of the shops. Iris pallida is a tall fine species, which produces pale blue flowers early in the summer. Iris ochroleuca is also a tall distinct-looking sort, and of the larger

violet German Iris too many can scarcely be about any place. Of this there are innumerable varieties, all of which are likewise well worth growing. Iris graminea is a pretty kind, intermediate in stature between the dwarf and tall varieties; its flowers are violet-lilac veined with blue, with a yellow band in the middle. Iris sibirica is a distinct kind, which thrives in marshy soil; and, lastly, there is the lovely Iris reticulata, a perfect gem in its way, and well worth growing wherever there is a warm nook in which to put it. Its colours are extremely beautiful, and its flowers are produced in sufficient abundance to render them effective and striking. It blooms in the greatest perfection all through the months of March and April, the golden-yellow blotched lip setting off the brilliant purplish-blue flowers to excellent advantage. For spring border decoration it must be regarded as a great acquisition; it is very dwarf, scarcely rising more than 6 inches in height, and it is perfectly hardy. A light peaty soil suits it best. The Mount Lebanon Iris (*I. histrio*) is a very beautiful early-flowering species, opening its rich blue-speckled flowers in January, on a warm south border. It belongs to the bulbous section, and deserves to be grown on account of its early-blooming habit and showy flowers. It is a native of the Holy Land, being found in tolerable abundance in several parts of Palestine, more especially on Mount Lebanon, where its lovely purplish-blue blossoms peep through the herbage in company with long slender green leaves.

TWEEDSIDE.

Seed Ripening on Cut Flowers.—An exceedingly curious and interesting botanical specimen was submitted to the inspection of the floral committee of the Royal Horticultural Society at its meeting on the 1st inst. It consisted of a branch of *Berberis japonica*, which had been cut from that shrub at the commencement of the month of February when in full bloom, and placed in a bottle of water, in which it had continued to produce and expand its deliciously sweet-scented blossoms of a pale green colour, up to the tops of the flower-spikes, for a period of over a month after having been cut, and had then produced and perfected a number of berries amounting to three or four at the base of each flower-stem and when cut open they showed perfectly formed seeds. This is the more singular as this shrub, though very free-flowering, seldom produces any seed berries when left to itself. In connection with this fact, Mr. A. Salter informed the committee that nearly all the *Chrysanthemum* seed from which he and his father, Mr. J. Salter, of the Versailles Nursery, Hammersmith, raised the many fine varieties of this valuable winter-blooming flower, for which they became so justly celebrated, was ripened by them on carefully crossed and hybridised flower-heads cut from the plant, and placed in jars of water, where they often took three months to ripen their seed, but in almost every instance did ripen it, perfectly and thoroughly; a circumstance which could not be depended on, if the stems were left on the plants, where they usually damped off without ripening any seed.—W. E. G.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Clay Edgings at Battersea.—How are those clay edgings, if I may so call them, that surround the carpet beds in Battersea Park and elsewhere, made, and of what do they consist? I mean those in which the *Echeverias* and *Semprevivums* are planted.—J. S. S., *Newmarket*. [These clay rims are very ugly. They are made of cow-dung and loam, worked with water into a paste, and put into form by means of a trowel.]

Keteleer's Larkspur (*Delphinium Keteleerii*).—Can you give me any information about this Larkspur?—J. MORRISON. [A coloured illustration of it is given in the *Floralist* for this month. It is a hardy perennial, the blossoms of which are borne in dense spikes nearly a foot long; they are double, about 1½ inches across, and bright blue, with a white eye in a pink setting. Grown well it cannot fail to be effective.—En.]

Veratrum nigrum.—This old and well-known plant is now a conspicuous object on one of the herbaceous borders at Kew. Its foliage is broad, and of a bright green colour, each leaf being folded or plaited, like the foliage of some Palms. These leaves are quite a foot long, and about 6 inches wide, and the plant is now far more ornamental than later in the season when in bloom. Its fine fresh green leaves entitle it to a place in every herbaceous border.—B. J.

The Bromelia-leaved Sea Holly (*Eryngium bromeliifolium*).—This has stood several winters with me, fully exposed, without shelter of any kind, the foliage remaining green the whole winter, and this neighbourhood is not favourable to plants of a tender character. In the same border, and near it, is another plant generally regarded as tender, which also proves quite hardy here, viz., *Leucocarpus alatus*, but it does not fruit so freely as when the roots are cramped in pots. It is, of course, cut down in the autumn, but breaks out vigorously again in the spring.—J. M., *Waukechurch, near Exminster, Devon*.

High-coloured Hybrid Primroses.—In the spring of 1872 I crossed the mauve-coloured *Primula altaica* with *P. vulgaris auriculiflora*, and succeeded in raising some seedlings, which have bloomed this spring for the first time. My object was to get more colour into the *P. altaica*, and also infuse into the progeny the fine thrum-eyed centre characteristic of the pollen parent. The result has proved most satisfactory. In all the seedlings the flowers are very large and stout, and of varying hues of rosy-violet, and in most cases thrum-eyed. These seedlings having been much admired, I have made other crosses this season, and hope to realise the best results from them.—R. D.

THE GARDEN IN THE HOUSE.

ORNAMENTAL PLANT STANDS.

WHEREVER plants are used for the decoration of the drawing-room or front hall, stands of some kind must be employed, and, when well designed, they do much towards showing off the plants effectively. Wire stands show the pots very plainly through their sides, and, unless a pan is set inside them, the water runs through on to the carpet. The accompanying is an illustration of a stand, which, when made of varnished Pine, harmonises well with the furniture of a drawing-room, library, or front hall, and sets off the plants to advantage. The sides are neatly moulded, and made high enough to hide the pots in which the plants are grown; and these sides, as well as the bottom, instead of being painted, are well coated with Japan varnish, which protects the wood and carpet quite as well as if a tray of lead or zinc were set inside. When plants are nicely arranged on stands such as this, the latter are far more ornamental than those made of wire. In the arrangement, select a bold and effective plant for the centre, as, for instance, a *Dracena* or a *Ficus*, which always look well surrounded by Ferns, small Palms, *Begonias*, and trailing or gracefully drooping plants, as *Tradescantia*, *Panicum variegatum*, *Creeping Jenny* (*Lysimachia*), or *Selaginellas*. For edging these stands, either *Festuca glauca* or *Isolepis* (*pygmaea*) *gracilis* may be employed, and always look well; or a few succulents may be added for the sake of variety. The Royal Horticultural Society last year offered prizes for the best arranged plant stands of this description, and some nice arrangements were the result, but this year we hope to see still greater variety. It must be remembered that nearly as much depends on the shape of the stands as on the plants used, and it is easier to satisfy oneself when the stand is a pretty one, and shows off the plants well, than when we have to hide its unsightliness as much as possible by means of the graceful forms of plants. In filling stands like the above, all crowding must be avoided, and as much variety obtained as possible, always remembering to vary form as well as colour. During the early months of the year, they may be filled with spring flowers and bulbs in pots, and, by the use of these, as they bloom in succession, a pleasing variety may be maintained for several weeks, and, with the addition of a few distinct Palms or graceful Ferns, will make very effective arrangements.

SMALL VASES OF FLOWERS.

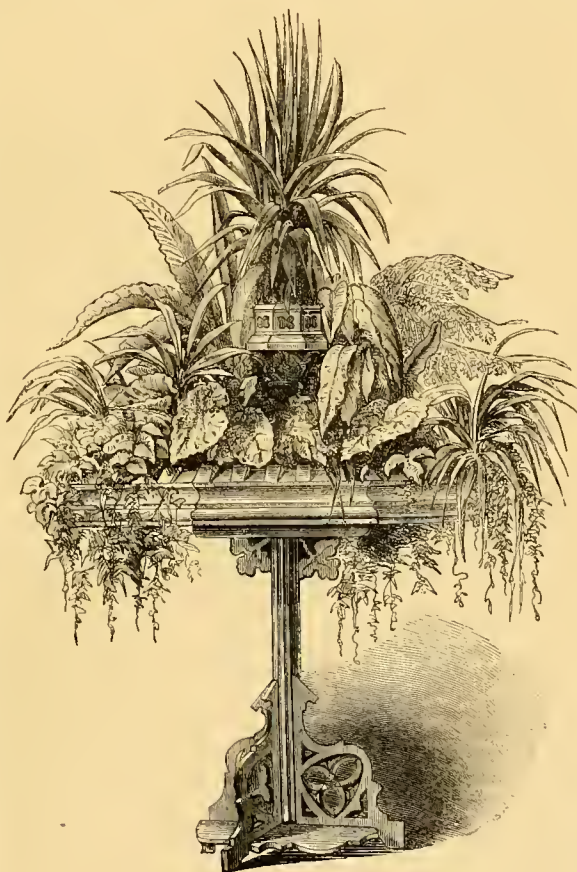
A SHORT time ago, when paying a visit to a friend, I was struck with the arrangement of two small vases of flowers, which stood on a side table, and, being particularly effective, I shall endeavour to describe them. The shape of the vases, if I may so term them, was that of the low-sized Hyacinth glasses, gold pattern on an opaque ground. Their contents consisted of *Deutzias*, *Azaleas*, sweet-scented *Geranium* leaves, pink *Cape Heaths*, and several bunches of blue *Forget-me-nots*, arranged in

the following manner. The foundation, if I may so call it, of the bouquets consisted of large bunches of *Deutzias*, not full blown, only in bud, and, through these were interspersed the other flowers just mentioned, the pink and blue coming out well against the white and green. On my return home, having several large plants of *Deutzia* in flower, I thought I would arrange a little stand myself. Not having a stand of the shape just referred to I selected a china hand holding a vase. Like my friend, I made the foundation of *Deutzias*, but not having any of the other flowers named, I used in their places, *Lily of the Valley*, a few sprays of a rich purple-coloured *Cineraria* with a white centre, some leaves of *Lady Plymouth Geranium*, and three fronds of *Maiden-hair Fern*. This arrangement looked very effective by daylight, but I quite expected to see its beauty vanish when subjected to artificial light, as it is generally supposed that violet and mauve shades are ineffective, when placed under gas light. In this instance, I was however, agreeably surprised to find that the purple of the *Cineraria* looked, if any-

thing, richer than when seen by daylight. I have seen a mauve-coloured *Cyclamen* look well by gas light, but I never for a moment supposed that the dark shade of the *Cineraria* would show up so well. As a rule, it is much better, when arranging flowers to select those that look well both by day and gas light, as one cannot have two sets of vases, and sometimes flowers that look well when being arranged have a sadly different appearance under artificial light; now, when summer is at hand, however, this matter becomes of less importance, as, of course, they will be seen nearly altogether by daylight. A small specimen glass which I saw the other day filled with *Lily of the Valley*, *Pinks*, *Hepaticas*, and a few fronds of *Maiden-hair Fern*, had a fine effect. The *Lily of the Valley* was first placed in the glass, and arranged so as to droop round gracefully, dotted through it the *Hepaticas* and the *Maiden-hair* were so placed as to form a kind of fan of foliage at the back.

A. HASSARD.

Upper Norwood.



A useful Plant Stand.

B.

IMANTOPHYLLUM MINIATUM.

ONE of your correspondents speaks of this as an excellent subject for greenhouse or conservatory decoration, an observation

with which I quite agree, and I may add that I have found it to be the best plant that has yet come under my notice for dwelling-room ornamentation. There are many plants which thrive moderately well in such positions during part of the season, and then require others to be substituted for them, while they are removed to more genial quarters, in order to re-establish themselves; and there are others which succeed in such positions continuously, if well cared for; but the *Imantophyllum miniatum* grows and flowers beautifully indoors; in fact, thrives with me under positive neglect. I have now a plant of it in a 32-sized pot, bearing eleven perfectly-formed flowers, as fine as any I ever saw produced by this plant, even in a greenhouse, and it has been in my house, in the same pot, eighteen months; sometimes it has been without water two and three months together, and with dust enough on the foliage to kill most plants; sometimes it has been on the floor between my desk and the window, the window being 3 feet above it; at other

times it has stood in a corner behind a door, where it got water only when some one took pity on it. Yet, in spite of all this, its foliage is in perfect condition, and I now look upon the plant in my window as a real gem. Last season, at this time, I had a large plant of this *Imantophyllum* which, though similarly treated, threw up six strong well-developed flower scapes, and opened its blossoms most satisfactorily. J. CROUCHER.

Mounting Ferns.—By taking a little trouble, pretty pictures may often be made out of many Fern fronds, considered useless in the greenhouse, or, at all events, by the use of a few which may be cut off, and never missed. After the Ferns have been removed, they should be dried between sheets of botanical drying paper; even old newspapers or blotting paper will answer the purpose. Presuming that a collection of dried Ferns is at hand, a sheet of nice cardboard should be procured; some like white cardboard; I prefer it slightly tinted, but that is quite a matter of taste. The Ferns should then be laid lightly on it, and arranged in the form of a bouquet, or in whatever shape desired. The position of each Fern should be indicated before it is glued down, as, after that, it could not be well removed without marking the cardboard. Supposing the fronds to have been arranged according to taste, they should be lifted up again, and their backs should be glued with a fine brush, so as to make them stick to the paper. Should any gold or silver varieties be amongst those selected, they should be placed so as to show the colour of the under sides of the fronds. The light-coloured Moss, which is to be found growing on old trunks of trees, if interspersed through the Ferns, tends to give the arrangement a light and elegant appearance. A wreath of Ferns, mounted in this way, has an effective appearance, if placed round or under a handsomely illuminated text. The fronds selected for mounting in this way should be those of small and light-looking varieties, as large and heavy-growing fronds would make a small arrangement of this description look heavy. In this way a capital book of reference on Ferns might be made up, each variety being mounted on a sheet of drawing-paper or cardboard, and the name of the variety, height of growth, native country, &c., written under the frond. It will be found astonishing how very quickly a collection of this kind can be got up, as single fronds are easily obtained.—A. HASSARD, *Upper Norwood*.

House Plants.—Perhaps every one is not aware that the coldest place in a room, on a cloudy day or at night, is within a foot or so of the window, just where the plant-stand is stationed. All dwellings cannot be new, and new ones are not always proof against the insidious attacks of cold. In the old ones the windows become loose with the wear and tear of years; there are cracks and crevices where a small current of cold air penetrates, and where the frost creeps in stealthily and seizes on the green leaves. To guard against this, I paste a narrow strip of paper (of a colour corresponding with the paint in the room) over every aperture that admits a passage for the air from without. The unsoiled margin of newspapers is very good for this purpose, as the texture is light and thin, and adheres readily to the wood. Every one, I presume, does not know what an amount of cold a thin piece of paper is capable of keeping out. Give it a trial and prove the fact, only do not select a cold freezing day for the business. It saves the trouble of moving the plants at night, and ensures their safety when the mercury drops low in the thermometer. Our climate is subject to sudden and unlooked-for changes, and often one night will destroy a whole winter's care, and ruin hopeful prospects, even as late as March, when we deem our security good. It is well to be prepared for these emergencies or caprices of our latitude. Some complain of their plants growing spindling and weak, and yielding no bloom. One fault is too high a temperature, with too much water, a portion of the time, during the day, and too low a one at night. When this is the case they grow sickly, and we hear the often-repeated complaint, "I can't keep plants, they don't do well; what do you do to yours?" You want strong yet growthy plants to secure bloom and beauty. Every day, when I water, I turn my plants, and thus keep them even and shapely, by allowing every side the advantage of the sun. A slip will grow during the winter and become a large flowering plant in a 4-inch pot, if judiciously watered and cared for. Earthen pots, without glaze, are best, as they are porous, and absorb superfluous moisture.

Flowers in Sand.—Many pretty little blossoms of bulbs of Violets, Primroses, and other spring flowers having short stalks, will keep fresh for a long time, if each flower be pricked into a saucer or plate of wet sand. The great advantage of the sand over water used in the usual way is that each bloom remains in its place just where fixed. I always keep a flat glass dish, filled as stated above, on my side-board, and as the flowers decay, I remove them, and stick in a few more in their places.—N. T. O.

THE ARBORETUM.

SPRING-FLOWERING SHRUBS.

DURING the first warm days of spring, few objects are more effective than flowering trees and shrubs for brightening up our gardens and pleasure-grounds. No matter what natural advantages a garden may possess, it generally looks bare during the earlier portion of the year, unless well stocked with early-flowering trees, shrubs, and flowers. These are permanent in their character, and, if judiciously grouped with evergreens, they play an important part in making our gardens enjoyable during the first months of the year. We are acquainted with many large gardens which never look so well as in spring, when early-flowering shrubs are in bloom. Among those at present in flower we may allude more particularly to the common Furze or Whin (*Ulex europæus*), which is, at present, an object of great beauty on many of the commons and open places around London. It does best on a warm dry soil, fully exposed to the sun, and, when grown in such positions, it blooms all through the winter months, lighting up the margins of shrubberies or sloping banks with bright golden blossoms. In out-of-the-way places and on dry rocky banks few plants do better than this and its double-flowered variety. The single form is easily raised from seeds, which may be sown as soon as ripe in the places where the plants are to remain. Another yellow-blossomed plant, blooming at the same time as the Furze, is the Golden Jessamine (*J. nudiflorum*), one of the prettiest of all wall plants, especially when associated with Ivy or other evergreen climbers, the foliage of which sets its flowers off to excellent advantage. Following the Jessamine we have *Forsythia viridissima* and *F. suspensa*, both of which are now blooming freely, either in the form of bush-plants in the shrubberies or in the shape of trellis-plants. Some years ago I planted *Forsythia suspensa* and the red-flowering Currant (*Ribes sanguineum*) alternately along a trellis in my garden, and just now (April 5th) they form a perfect wall of bright rosy and yellow flowers, which contrast well with the fresh green leaf-buds that are now just bursting from their wintery coverings. The common purple Mezereon and its white-flowered form are also nice additions to spring-blooming shrubs, and even the common Spurge Laurel (*Daphne Laureola*) is a pretty object when thickly studded with light green sweet-scented flowers. Of all the hardy shrubs, however, worth a place in our gardens the foremost rank must be assigned to *Magnolia Soulangeana*, which is one of the finest of all of them. It blooms in March on a warm sunny wall, and generally a fortnight later, if planted out on the open lawn. My plants are this year covered with fine flowers, and, on passing the Wandsworth Road Station the other day I saw three specimens of this *Magnolia* covered with an abundant crop of purple-tinted sweetly-scented flowers. The latter are nearly as large as those of the white-flowered *M. grandiflora*, but this *Magnolia* differs from *M. grandiflora* in being deciduous, and its purple-tinted flowers are borne before the leaves appear. For walls, one of the prettiest of all shrubs is *Cydonia japonica*, which is just now one mass of crimson blossoms. Its pale-coloured variety is well worth growing by way of change, and as wall-plants both kinds have few equals. One of the most distinct and beautiful of spring-flowering shrubs, however, is *Berberis Darwinii*, which should occupy a place in every garden, however small. Just now, we have bushes of this *Berberis* literally laden with brilliant rich orange flowers, and its leaves, although small, are numerous, and of the deepest and most glossy green imaginable. Either as isolated specimens, or, as a hedge-plant, this *Berberis* deserves general cultivation. One of the best white-flowering shrubs we have, and one which forms a charming companion to the *Berberis* just named is the *Lanrusinus*, which is just now one mass of snowy blossoms in many gardens around London. Apart from its dwarf habit and profuse-flowering qualities when grown out of doors, it deserves to be largely grown for forcing purposes. Plants taken up from shrubbery borders, and potted in any good garden soil, form nice specimens for the conservatory during February and March, and its dense clusters of snow-white flowers come in usefully as cut bloom. Some of the early-

blooming Rhododendrons are now brightening up our gardens in warm sheltered localities, and the Almond trees are in most cases covered with flowers. *Prunus triloba* is a showy wall-plant, its branches being so thickly covered with little rosette-like pink flowers, that they may almost be likened to wreaths, beset with miniature pure white Roses. Its double-blossomed congener, too, *P. sinensis*, is, if possible, still more beautiful. Both may easily be grown in pots, and then form nice plants for conservatory decoration; especially the last, the snowy flowers of which are very beautiful, either in button-holes or bouquets. Others might be enumerated; but these include the best and most generally useful of early-flowering hardy shrubs. B.

SEA-SIDE PLANTING.

IN reply to "Salmoniceps's" observations in reference to this subject (see p. 274), I beg to say that the three Conifers which he recommends have been tried in a stormy locality, and have been found wanting; the whole of the plants died, as did most of those of *Pinus insignis*, but it was not the stormy place that killed them so much as the clay soil in which they were planted, and which was too much for them. Conifers, in general, are not partial to strong blue clays, and, although they will thrive close down to the water's edge where the soil is light and sandy, they cut a sorry figure when the clay is such as it is at Greenhill, Weymouth. So much for the Conifers. Now, as to the Camellia. I only planted two of these as trial plants, and, when I last examined them, just after a storm, every leaf was intact, and they looked as hardy as *Backthorn* close by them; they were not in the least protected, and were purposely planted as near to the water, and as much exposed as possible. As to *Escallonia* and *Mahonia*, I found them all right, as well as *Picea pectinata* and *Nordmanniana*, only this last had its leaves browned on the seaward side. I ought, perhaps, to have been more particular about Rhododendrons, as I only tried *R. hirsutum*, which did well; but, when I mentioned the above plants, I had in my mind's eye a splendid group of them close by the sea at Bournemouth, where the soil is congenial to them; and, whilst speaking of Bournemouth, I may mention a very large and handsome Camellia there, at least 10 feet high and nearly as much through, which seems quite at home in that quarter, and has been so for several years, within 100 yards of the sea. I, also, may mention some splendid *Araucarias* at Branksome Dale, where they are planted in large numbers within short distances of a stormy coast. Here, however, the soil suits them, and the blue clay may not continue to do so at Weymouth. As regards the Horse Chestnut, it was not planted at Greenhill; but there are fine young trees of it, situated on high and stormy ground, at Rodwell, and exposed to the south-westers across Chissel Beach. Beech, Sycamores, and Willows are, as your correspondent says, good sea-side trees; and to these I may add Hornbeam and Elder, and one of the most persistent sea-side plants is the common Bramble; for light soils, too, I may mention Broom of various kinds, also Furze, the dwarf, the common, single, and its double variety. I think I have now answered all "Salmoniceps's" objections, and I hope he will add to my list considerably, as he seems to have experience in regard to sea-coast planting. Perhaps Mr. Munro, at Cleveclauds, Lyme Regis, would tell us how the Camellias do there. I know there used to be some good plants of them on that coast. JOHN SCOTT.

FIR TIMBER.

VARIETIES of the Scotch Fir are to be found all over the Continent of Europe, and its great use in building has led to the development of a trade in it which was far from being anticipated a century ago. The high rate of duty charged thirty or forty years ago was against the true interests of commerce, and the vexatious hindrance to business inflicted by customs' regulations did much to discourage building. Wood was then bonded, and the duty paid as occasion arose. The result was a very great loss of time, and the speculations as to the lessening or increasing the tax consequent on the approach of every budget were a source of great disturbance and injury to the market. Entirely free from such disadvantages, the trade in wood, especially of Fir, has assumed colossal proportions, and is increasing every year. Onega is the best description, being fine-grained, generally free from sap, durable, and easily worked, but its price is so high that it is not at all in general use. Archangel, though coarser in grain, is more used, but not to such an extent as formerly, although it has not advanced in price to the same extent as the other wood. It is of a soft silky nature, and is also easily worked. The Maymax saw-mills send some very good samples to the market, and those

requiring good quality and long lengths can be accommodated in this description of goods. St. Petersburg wood is more largely used than Onega or Archangel, but the quality is not so good as it used to be twenty years ago, when Gronoff's shipments were in such great demand. The whitewood is much used in this market, and works very well. Wyburg is a very useful quality. The wood is close-grained, and, although cheaper, is often very difficult to distinguish from St. Petersburg, but, like all Russian goods, it has an often successful competitor in Swedish wood. It is more liable to sap and shakes than other Russian deals, but when free from these defects no wood can be more useful for flooring, and most kinds of indoor work. Fredricksham is of similar description, and with the same may be classed Uleaborg, Tornea, Abo, and Bjorneborg. Riga white is extensively used. The grain is generally coarse, but the wood sound, and well spoken of for its utility. There are other timber ports in the Gulf of Finland, but the differences in quality are not so striking as to call for special notice. Swedish wood has been attracting much attention of late years, and it is sent here from about forty ports. Gefle has been known in this country for many years, and it is a very durable and valuable wood. There is a family likeness amongst the products of all the other ports, which send us the same species of timber from all, the only variation in quality being due to the difference in soil, and the generally favourable or unfavourable surroundings of the trees. Messrs. Dickson Brothers & Co. have a great repute as good shippers, and their shipments from Gothenburg, Holmsund, Husum, Swartwick, and Sundswall command very high prices. The latter deals are very good and easy to work, and are generally very free from knots and sap. The very high rates do not appear to affect the importations; and the question is, whether they are not much too high to last. We get but few Prussian deals into the market; but they are useful for carpenters or rough work, the large knots and coarse grain rendering them unfit for anything else. Norway deals run of small scantling; but much is of very good quality, such as Namsos, Laurvig, Vefsen, Dram, &c. The latter are principally 2½ by 6½, and lately have turned out very well, and brought good prices; but, when they are bad, no wood can be worse. Sap, knots, wane, and shakes are then in abundance, so that even a firewood manufacturer would not be anxious to buy them. In square or balk timber Riga, Memel, and Dantzig are the staple, but the first is scantily imported. Its great strength and durability make it very valuable for building purposes. Nothing can exceed the best qualities of Memel and Dantzig for cleanness, straightness of grain, and freedom from knots, but the great price restricts their use to a very great extent. The inferior qualities, especially of Dantzig, are, as might be expected, coarse and knotty, the knots in Dantzig especially being very large. There is much more demand for Swedish, as it is much cheaper, although it does not run to such a great scantling. It is more like red Pine than is any other timber, and is frequently used as a substitute. It will be seen from the foregoing remarks that we are largely dependent on Fir for building purposes, and that the state of the market, however unfavourable, causes no decrease in the imports. But year by year the expense is increased, as the wood has to be brought further, thus increasing the free-on-board cost, although by no means to the extent that prices have advanced.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Flowering Currants as Standards.—*Ribes sanguineum*, new in full bloom, is grown effectively in this way in Mr. Rumsey's nursery, at Waltham Cross. The stems are 4½ feet high, and the heads from 2 to 8 feet in circumference. Mixed with evergreens in shrubberies, such plants have a fine appearance.

Ornamental Hedging.—We learn, from the *New York Tribune*, that in America the Hemlock Spruce is the evergreen, *par excellence*, for ornamental hedging. Combining, as it does, all the excellencies of other species, it will, in addition, thrive beneath the shade of trees, where most Conifers, except, perhaps, Yew, would fail.

Berberis Darwinii.—This is now flowering freely in the Royal Gardens at Kew, where it forms neat little bushes a yard high, and nearly as much through. At this time of the year it is most attractive when covered with its bright glossy leaves and clusters of deep orange-yellow flowers. This I consider to be one of the very best of all the *Berberises*, and in Devonshire I have seen it flowering freely all through the winter.—N. P.

Berberis atropurpurea.—Is this *Berberis* evergreen or is it deciduous?—J. M. [It is merely a variety of the common *Berberis*, with dark purple leaves. It bears a profusion of flowers, which are succeeded by berries of a dark colour, and of no great beauty; yet it should be in every collection, on account of its hardness, retaining, as it does, its foliage for a considerable length of time during winter.—En.]

Abies polita.—I have had a young Fir sent me under this name; can you give me any information respecting it?—J. S. [Among Conifers introduced from Japan, this is one of the handsomest. Its leaves, when full grown, are long, curved, and four-sided, broad at the base, gradually narrowing to a stiff point, and of a pale green colour, with which the large, globose, reddish-brown buds form a striking contrast. It is said to be quite hardy in this country.—En.]

A HOLIDAY IN THE SOUTH.

By THE EDITOR.

ITALY.

He who would see nature as well as art in Italy should go there in summer or in autumn. Summer is as great an improvement on winter on the slopes of the Apennines as on those of the Alps. The trees are now bare, or carry dead leaves only; the Grass, or what answers for it, is brown; the mountain slopes, not snowed over, seem arid as the desert; and, in much of the country, the only verdure noticeable is that of the Pines, dimly seen spotting the snow of the high ranges. Southwards, the grey Olive and the deep-green pointed Cypress soften the effect a little; but, as a rule, there is little to be seen to give an idea of the great natural beauty of the country. An acre of mountain pasture over Lake Como or Maggiore, with Gentians, and mountain Primroses, and Cyclamens sparkling in the tender young Grass in June, is worth, to the eye, a hundred miles of Italy in March. It is the same with the fields and gardens—they are as bare as our own in January. The country is in many parts a vast Vine-trellis; but the Vines are still asleep. The Fig and Mulberry plantations are bare as our own orchards. It is true you here and there, going southwards, see the “golden apples” of the Orange in gardens; but the tree looks a little delicate and pale, as if it ought to be sent to Florida, or Sicily, or Madeira for the good of its health. How different must all seem when the hill pastures are Iris-dyed with flowers, or when Grapes, Figs, and Melons abound in the gardens, and when the woods are dressed once more in green! The first impression of the country, then, is not a favourable one, from the absence of a sufficiency of trees, even in the most populous and wealthy districts. The hill-sides are literally sown with villas in many parts; but large, and often attractive, as these are, they add but little beauty to the country from being, for the most part, ungraced by trees. Here and there, the feathery shafts of a grove of Cypresses, and, perhaps, a few other trees, are grouped round a country house; but, for the most part, the houses on the hills, even round Florence, look in winter like band-boxes scattered over a knoll of brown turf. Assuredly here men learned to “build stately” before they did to “garden finely!” Plant round these houses, in imagination, such tree ornaments as grace nearly every country house or villa in England, and we may picture a paradise indeed. The tree which first impresses the traveller in Italy, and mitigates the severity of his journey from the Alps to the south, is the Evergreen Cypress (*Cupressus sempervirens*). It is planted so frequently, and, no doubt, sows itself so often, that the country here and there reminds one of the mountains on the banks of the Hudson River, and other parts of North America, that are freely dotted over with the tapering columns of the Virginian Cedar. But, of all trees with a conical or tapering form, from the Irish Yew to the Lombardy Poplar, this Cypress has the most graceful port, the head often tapering as elegantly and as gradually as the young stem of a Bamboo. The tree thrives freely in the southern and milder districts of England and Ireland, and should be more frequently planted and artistically used.

Naples.

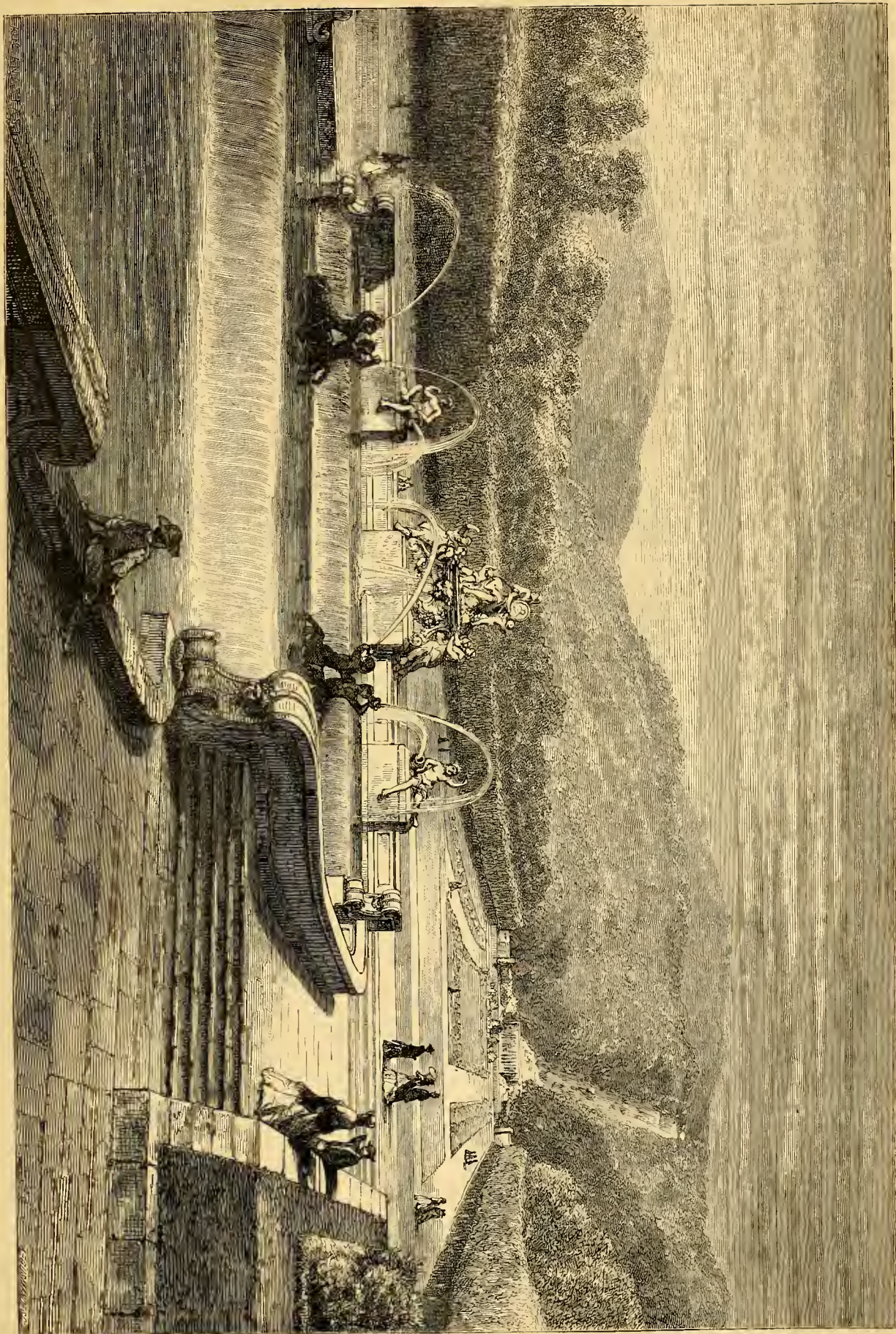
It is sweet to one coming from the harsh north to this sunny city by the sea, to find Acacias in all the glory of their golden hair, free and in the open air with Camellias, Oleanders, the Loquat, the Norfolk Island Pine, and, best of all, with the Palm. Various Palms live out of doors here, but the Prince of all is the Date. I had no idea it was so beautiful, familiar as it is in every Palm-house or winter-garden. The crowding in these houses, and perhaps the houses themselves, prevent the beauty of the plants from being seen. I have been fortunate enough to see numbers of plants which we cherish in our hothouses thriving freely in the open air, and though the difference frequently caused me to form quite a fresh estimate of the plants, no old friend removed from the imprisonment of the conservatory to the freedom of the open air ever seemed so greatly improved thereby. But here I behold a stately shaft (often with little creepers and other plants rooted in the interstices where the old leaves have been removed), 15 to 30 feet high, and from its crest a fountain of superb leaves sweeping out into the sky—a thousand lines of beauty in one stately

bouquet! Let us imagine such a tree laden with its huge drooping chains of golden fruit, of which the desert-dweller makes his food, and we have an object which the highest cultivation in hot-houses can never present to us. Another well-known conservatory tree, the Norfolk Island Pine, and also Cook's Pine, are very beautiful when planted out-of-doors in a favourable climate, the peculiarly graceful habit of each being essentially distinct from anything among the Pines of the northern hemisphere. The cliffs that face the sea here, and the rock-cuttings through many of the suburban gardens, are garnished by an ice-plant (*Mesembryanthemum*), which is quite a treasure in a sunny land. It falls down in curtains from 6 to 15 feet long, forming wreaths and veils as graceful as ever woven by Ivy or Vine leaves, verdant at all seasons, and in early summer crowded with bright rosy stars. If the *Mesembryanthemums* grown in houses were allowed to hang down in like manner, they would prove valuable ornaments for gardens generally. The rocks are also covered in many parts with Prickly Pear and the American Aloe, with here and there sweet-smelling tufts of the common Stock; but, chief of all the beauties of this kind, are large isolated plants of the variegated American Aloe, forming colossal rosettes of green and gold. Where the Agaves crowd each other, as in hedges or wide ledges, they lose nearly all that marked character which they show when grown large and seen in small numbers.

The Royal Gardens at Caserta.

ABOUT an hour by rail from Naples—twenty miles of vineyards, by the way, are passed—there is a vast palace and a vast garden. It may be called the Versailles of Naples, though it differs in detail considerably. But the spirit is the same, a huge garden, not only without life, variety, or nature in it, but, with full precautions taken to shut these out. You enter through a huge royal palace, which seems admirably suited for accommodating several regiments of Life-Guards, when the scene depicted in the illustration meets the eye—the huge cascade facing a distant hill covered with Evergreen Oak. Good as the cut is, it can give little idea of the enormous length of these garden water-works, long and well-constructed stone reaches of deep clear water, broken here and there by falls, which are embellished by a rich display of sculpture and statuary. But, before reaching the water-works, we have to traverse a very large space, by habit called a garden, but which is simply a huge expanse of turf, on which stand clumps and squares, and avenues of trees. We have to approach these closely to see what they are composed of, for all are either clipped or mown, or in some way mutilated, till they lose all individual character, and merely form irregular walls of vegetation. Well, perhaps, we ought to be grateful for so much, but, at the very least, we may ask that such work may not be called gardening! And, still less, does that term belong to the gigantic exhibition of the sculptor's and the builder's art, which succeeds this dreary expanse as one mounts the hill. Under one of the falls, there is a vast covered way, with well-constructed rocky walks and walls, and here the Maiden-hair Fern grows everywhere as freely as Meadow-Grass; it even ventures out from the moist and shaded grottoes, and creeps into the eyes and ears of the spouting sea-monsters outside in the sun—the only trace of life or Nature near. The distressing effect of all this gradually passes away, for one of relief, as the base of the great irregular (but also artificial) cascade is reached, till the eye dwells happily on the hills around, densely garlanded with Evergreen Oak. All this kind of “art” comes from allowing the space intended for a garden to be converted into an open-air gallery for the exhibition of architecture, sculpture, &c., mostly of a mediocre, and often of a feeble or ridiculous, character. The clipped trees and shorn woods mainly serve to prevent the scene from having too startling a resemblance to a sculptor's show-yard. Such scenes may, perhaps, have some obscure justification in the history of art, wholly, it is to be hoped, in showing us what to avoid in future. Let us not, however, delude ourselves into the belief, that, in creating such scenes, on either a large or small scale, we are making a garden. There is at Caserta, however, an example of one phase of real gardening, which, if the visitor is not

VIEW IN THE ROYAL GARDENS OF CASERTA, NEAR NAPLES.



exhausted by the display just alluded to, will repay the visit. It is what is called the English garden, a large piece of diversified pleasure ground, with many trees allowed to assume their natural development. Towards the end of the last century this garden was planted, and with a very happy result. The great geometrical district, so to say, gives one an idea that the region is not a fertile one; this is at once dispelled on entering the English garden. The Cedars, Cyresses, and deciduous trees have attained great size and beauty, and grow in stately groups, with open spaces between, so that their forms may be seen. Here is the first *Camellia* ever introduced into Italy, where the plant is now so abundantly grown, and whence we get most of our new varieties. It is a specimen of the single red, now in full bloom, and about 20 feet high and 15 feet through. The Camphor tree is seen in fine health here, in specimens nearly 50 feet. By the way, as the Gum-tree is now being planted as a health-giver, why do not some of the countrymen of Raspail—the great apostle of the virtues of camphor—try this tree in southern France? The garden is enriched by some noble Cork trees which may give many visitors a fair idea of what a noble tree this Oak is when fully developed. The trees are huge in stem, picturesque in their branching, and about 80 feet high. Some of the scarcer Pines attain much perfection here, as, for example, the Mexican (*P. Montezuma*) which is 60 feet high. But, to English eyes, the most striking plant of the Pine tribe, is *Podocarpus elongatus*, one of a family which has found a place in our gardens of late years; it is about 25 feet high, and, in form, like a very slender Irish Yew, somewhat too open and thin, perhaps, but this may be accounted for by the position in which it grew being a shaded one. It is likely some of this family, from their form, will prove very valuable in our gardens. Here are some remarkably fine specimens of the Stone Pine—the table-headed tree, which, after the Cypress, gives such a marked character to the landscape in many parts of Italy. In the field, where the tree is cultivated both for its fruit and wood, it is seldom very large, in consequence of the lower branches being continually cut for firewood. What is this seen through openings between the stems of dark Pines and Cyresses that fringe a glade—a large mound of light golden colour, startling in contrast to the vegetation around? It is a large tree, the silvery-leaved *Acacia* (*A. dealbata*), more than 40 feet through, about the same in height, and so full of blossom, that all its delicate silvery and exquisitely graceful leaves are buried in the foam of colour that has burst out all over the tree—a tree of gold; but of gold wrought into aerial fineness of silken floss by the Weaver of the humming-bird's wing, and of the purple curtains of the sky. It seems odd to feel very chilly under a great-coat in a garden where such a tree flowers in a cold March; but no doubt the great summer heat develops and ripens the tree so as to enable it to endure the subsequent cold of winter and spring.

A Neapolitan Villa Garden.

The hills round Naples have quite a deciduous look in winter, and it is only in some of the villa gardens near the sea that one sees what the garden may be made here. Imagine a house on the rocks, directly over the margin of a little bay, with a zigzag drive down to it, between walls of rock on each side. These walls are curtained with *Mesembryanthemum*, the plant falling in wreaths and sheets to a length of 18 feet; while, on the top of the rock, the American *Aloe* masses itself in groups. The precipitous nature of the site has caused the greatest difficulty in the making of the walks, &c., while the ground has to be terraced like steps of stairs, so as to keep soil and plants in a level position, and also to give an opportunity of watering them. High behind the house the cliffs rise, sheltering the garden from the north-east, and enclosing, as with a high wall, a much broken and diversified nook of rocky ground, where the banks are very steep, the *Mesembryanthemum* is pricked over their surface, and soon forms a fresh sheet of green over the whole, and one unfading at all seasons. We have no plant that will cover dry banks so well, and it is a pity it is not hardy enough for colder countries. Here and there a superb plant of the variegated American *Aloe* is seen—a colossal rosette of gold and green, from 8 to 10 feet in diameter. It is a pity such a strik-

ing and easily-grown plant is not more frequently seen with us in a large state. Not less striking, when fully developed on a sunny ledge, is the Prickly Pear, which holds up its shield-like leaves to a height of 10 or 12 feet. Here and there a bright coral-red head of flowers enlivens the scene; it is one of the common small *Agaves*, which we never think of growing for the beauty of their flowers; though here, throughout the winter and spring months, they are as valuable as the *Tritomas* in England in the autumn. The ground is carpeted with two *Wood Sorrels*, a yellow and a crimson (*O. cernua* and *O. spectabilis*); the *Tazetta Daffodil* is wild in the Grass, and so is the *Cyclamen* on the bank. There has been frost here, but the dry soil and air saved the plants, and our graceful friend, the Ivy-leaved *Geranium*, falls—Ivy-like—6 feet over the edges of the stone walls and rocks. Against a warm wall the giant Peruvian Cactus (*Cereus peruvianus*) attains a height of 30 feet, and the well-known *Bonaparteia* (or *Litsea*) of our hot-houses bears a flower-spike 14 feet high. This stout and dark evergreen tree, with handsome leaves, is the Locust tree, and this graceful Reed in the fountain-basin the *Papyrus* plant of the Egyptians, on the pith of which books were written in the old times. On the small lawn there is a healthy plantation of *Camellias* of many kinds in flower; near it a grove of *Oleanders* and a plantation of the *Loquat*, while, of course, the many bright fruits on the Orange trees tell boldly in the garden landscape. Here, too, is the Date, with its large tassels of orange fruit-stems, and the Fan Palm and the *Cycas* all lend their aid. Here, too, are the Evergreen Cyresses, and various trees of our own gardens, and superb specimens of the Stone Pine, with its great spreading or tabular head. With all this variety from many climes it may be thought that the scene is of a higher beauty than an equally well-arranged one in our own gardens. This is not so. These *Plumbago* and *Passion-flowers* that curtain the rocks, do not do so more gracefully than climbing *Roses* or *Virginian Creeper* would, and the garden-products of a much cooler country tastefully combined, yield as good, or a better result. While the villa or royal palace here has its garden more or less attractive, there seems a total absence of the smaller kind of gardens which abound in England. Here, the lower-middle and working classes live in huge barracks that stretch for miles around the bay, and are as dreary in aspect as so many factory walls. Two gardens, that of the *Villa Matilda* and *La Floridiana*, are of the above description and are among the most beautiful near Naples. The garden of the *Prince Colonna-Stigliano* is in the city itself, closed in by high walls, and very beautifully arranged in the recent French style, that is to say, with open spaces of Grass and no formal set of flower-beds anywhere. Here, admirable and rare specimens of such Palms as the *Latantias*, are isolated on the turf and relieved by a *Tree-Fern* (*Alsophila australis*), a tall plant with a few young ones of the same kind grouped round its base, grand trees of *Eucalyptus*, and many choice trees and shrubs. Here, a small structure built in the Orangery fashion is laid out as a very effective little winter-garden. Healthy and effective plants only are used instead of the miscellaneous rubbish which usually occurs in such structures on the Continent. By throwing the plants into tastefully arranged groups and masses, sprinkling a few spring-flowers, like *Hyacinths*, &c., towards the edge of each group, a very graceful effect is obtained, quite as good as that of a conservatory. There is, also, a long greenhouse arranged in the natural style, with winding walks and many fine-foliage plants, and the effect of this is also very charming. In fact, the whole garden is most tastefully disposed, and very suggestive of the best way to treat a city garden. Here it may be stated that the *Aloe*, which is such a conspicuous flower in Naples gardens, is *A. vulgaris*, and the Ice plant, which covers the dry slopes and hangs from the high rocks, is *Mesembryanthemum rubrocinctum*.

The Royal Botanic Gardens at Naples.

An old-fashioned botanic garden, and certainly uglier than the Garden of Plants, at Paris, to which we have long given the palm in that way. A great central road-like walk, a few squares, the surrounding houses staring into the garden—that is all, except the plants. The whole place is about large and ornamental enough to afford a site for a burial ground for

some small village or hamlet. This is, of course, speaking in relation to the importance of the city, and to the good that a national garden, worthy of the name, would do for a country like this. Imagine what might be done in a suitable and sufficiently large site in a climate where the Date Palm and the Weeping Willow, the Orange and the Plum, the Oleander and the Cherry Laurel, the Acacia and the Hawthorn, the Camellia and the Rose, all flourish together in the same garden! But it is the old story: a generous climate does not of itself make a good garden or gardener. Very often under a northern sky, and with much fewer kinds of plants, prettier garden pictures are produced than in the finest climates. But, suppose we bring the northern gardener to the southern climate, and give him *carte blanche*. This is what might be done with great advantage in many southern gardens, where one of the most instructive arrangements in the botanic gardens is a collection of all the Orange tribe—from the delicate little Mandarin to the huge Shaddock. Though the trees fruit freely here, they do not possess that glossy health which one likes to see in an ever-

curious pretty object occurs here, an accidental effect, in a house built like an Orangery, with glass and pillars in front, with a roof and back like an ordinary chamber. A plant of the creeping Fig is placed inside against one of the pillars. It runs up 20 feet or so, densely covering the pillar, then spreads over the white ceiling and down the back wall, of course, without any training whatever. The part of the roof nearest the front is covered most densely, but beyond this, where the long thread-like shoots run over the roof and cross each other here, affixing leaves to the roof as they go along, the effect is marvellously pretty, as if some cunning artist had inlaid the roof with exquisite filigree work of enamel. One of the best of the yellow Wood-Sorrels (*Oxalis cernua*), seems naturalised here, and is very pretty—a mass of soft-golden flowers on a turf of trifoliate leaves. Two weeping trees are seen here that seem valuable for all cool temperate climes, the so-called Pepper-tree (*Schinus Molle*) and the Australian Beef-Wood (*Casuarina*), all the cord-like branchlets of which are gracefully pendulous. Some of the *Casuarinas* deserve, from their peculiar grace, a place in our conservatories. The *Dasyliirions*, as yet

somewhat uncommon in our gardens, are here planted out, and spread into superb rosettes of foliage. They seem as hardy as the Aloe-leaved Yucca (*Y. Aloifolia*), which here breaks into many stems, assumes a tree-like form and reaches 15 feet high or so; it is never so graceful, however, as when confined to a single stem. The Gum-trees, so much talked of, thrive here (but not so well as in California, where they grow beautifully), and the Loquat and the Oleander are at home. If the "fever-destroying tree" is wanted anywhere, it is in many of the malaria-haunted valleys of Italy. Here, too, occur good specimens of that singularly graceful Palm (*Phoenix leonensis*). It is valuable in consequence of being of a much dwarfer and more graceful character than the common Date, and better suited for winter-gardens and conservatories. The true Date, however, is the more stately in port.



Phoenix leonensis.

Pompeii.

A well-cultivated plain; the peasants busy trimming

the Vines; the air delicately scented with the odour of Bean-fields, in full bloom in March, a few big orchards and Stone Pines breaking the somewhat monotonous level of the field-culture; southwards, and not distant, a broken range (the Mountains of St. Angelo); northwards, and near at hand, one stately mountain, with a cloud of steam at its apex, differing, apparently, in no respect from an ordinary white cloud! A little way off there is a long ridge of what looks like broken whitish stone, to the further end of which a stream of boys, bearing baskets on their shoulders, are continually adding. We approach the spot, and are standing about 30 feet over the floors of the, as yet, unexcavated houses of Pompeii. Looking seawards, we see what appears to be the remains of the basement story of a city, the walls erect, the pavement of the long lonely streets smooth and bright. We descend, passing the boys hurrying up the slope, carrying pumice-rubble from a house in course of excavation. On the wall of the upper storey there is a fresco painting, exposed to view a day or two since, after being buried for eighteen hundred years, yet now fresh and distinct as

green display; and a climate a little warmer would seem to be desirable—if not for the trees, at least for those who plant them. Sitting in the sun in a Neapolitan Orange-grove in winter is very pleasant, provided one is enveloped in several great-coats or blankets. The cold icy air that searches one through on ascending any eminence is quite a lesson to the Britisher who innocently supposes himself to have escaped, for a time, disagreeable weather. A noble looking tree, the Mexican *Taxodium* (*T. mucronatum*), has attained a large size here. Like the well-known deciduous Cypress, which attains such great size at Syon, and in other gardens, it is graceful in foliage and stately in port; but it is moreover, peculiarly graceful from the shoots being bent down by graceful tassels, composed of the small whip-like racemes of male flowers. This must be a most valuable tree for many countries. In March, at Naples, it retains its leaves; but they are quite brown. The single *Kerria* (*K. japonica*), that is, the original form of the double *Kerria* seen on many cottage walls in England, is here in fine condition—a graceful shrub, with slender shoots, bearing many deep rich yellow flowers, like small single yellow Roses. It has merit enough to deserve a place in every garden. There is a fine specimen here of the horizontal, or spreading, form of the Evergreen Cypress, by no means so valuable as the common form, though a valuable tree in its way. The finest tree in the garden is *C. glauca* var. *pendula*—a weeping tree, and a most picturesque one. It is finer than the Chinese Funeral Cypress, which does well hereabouts. The Plane tree thrives grandly here, as it seems to do in every cold or temperate country. As another contribution to the already wearisome controversy as to the names of the Planes, it may be stated that a noble avenue of trees here is labelled "*Platanus acerifolia*." It is the same as the London Plane; but from the freer growth and the clearer air, the whole of the branches as well as the branchlets are nearly white, so that the effect when the trees are naked, as now, is very striking. A

foliage on new wall-paper. At the base of the wall of the ground-floor, where only a small portion is as yet uncovered, there is a fresco painting of a plant like a wavy-leaved Aloe, and beside it one resembling the Chinese Iris. As we pass through many of the houses excavated in the present century, whose best treasures are now in the museum at Naples, it is interesting to observe that paintings of plants occur all round the base of the walls, not only of what were the sitting-rooms, but, also, in some cases, of the narrow passages and entrances. Invariably the upper portion of the wall is embellished with pictures of human life, or of human interest; while below, on the space within 18 inches of the ground, portraits of plants may be distinctly traced, painted as if growing from the ground. Conventional drawings of plants also occur, but are much rarer than these. Since their exposure to the weather they appear to be fading too rapidly, but, doubtless, numerous paintings and engravings will perpetuate for all time, these, as well as all other details of discoveries so precious to humanity. Among the numbers of interesting objects found buried in Pompeii, none are of greater interest than the various kinds of seeds and fruits used as food. All have a black or charred look, and some have been pressed into a firm mass, but all are as perfectly recognisable, by those who know the same kinds in a living state, as the perfectly-preserved Walnuts. Among the seeds, are those of the Stone Pine, then, as now, used as food. It is now everywhere grown in the fields and gardens here both for the sake of its fruit and its wood. So it, doubtless, was on the same ground two thousand years ago. There is pretty good evidence that the pointed Cypress also occupied, in those old days, the same place in Italian gardens as it does at present. In one of the landscape frescoes, on the walls here, there are good representations of two specimens of this tree, which, no doubt, was employed here in the "street of tombs," that most interesting of all burial-places. This, being wholly devoid of the horrors of the modern cemetery, containing, as it did, only the cinerary urns of the dead and their varied memorials, formed what was certainly the most beautiful street of the city. To this street of tombs the Goddess of the Woods returned once more with the sun, and planted a few Cypress seeds, which soon sent up their graceful forms, now, in their perennial verdure, mourning for the great of old beside what remains of their exquisitely-sculptured monuments. Even here, in this closely-built and strongly-walled city, there seems, so far as the excavations have yet been carried out, no space for out-of-door gardens; but many of the houses had a spacious court, open to the sky in the middle, with a colonnade all round, and a fountain and little garden in the centre. In one case (in the house of Melceger and Atalanta), the remains of many of the shrubs with which the garden was planted were found. In various instances, provision seems to have been made for the planting of flowers in the marble-work of the fountains, marble water-basins, and in the hollows of the wall which fills the inter-columniations in the elegant peristyle of the house of Narcissus. Most interesting of all, however, are the admirable arrangements for a supply of water in the gardens. Here, in the garden, or *viridarium*, of Marcus Lucretius, are many excellent strongly-constructed leaden water-pipes, now in perfect preservation! In addition to the large pipe or main supply, and minor ones conveying water to the fountain, &c., the ends of pipes project from many of the pillars of the colonnade which surrounded the garden. Marcus Lucretius had certainly conquered the difficulty of supplying his garden with water, and in a manner that many a nineteenth century gardener would envy. Those accustomed to complacently admire the "latest modern improvements" in the way of water-supply, may well open their eyes here, as these strong snake-like conduits show here and there beneath their feet in the street, and their bronze taps stand up as perfect as if placed in position last summer. Thus it is clear that these old "pagans" who conquered and civilised, and ruled and built, and fought like gods, had also gentle fancies for refinements, sometimes supposed to be the growth of a later time. But we must leave this silent city for the busy fields and gardens without touching on many of its unequalled sources of general interest, which show clearly enough that, so far as the social life of man is concerned, the two thousand years that have passed since Pompeii flourished, have effected little real

improvement. Let us hope the next two thousand will prove a more fertile era for human progress. This towering Vesuvius almost deserves our gratitude for preserving so much from time and the barbarians. It is no friend to vegetation, however, as those trees could tell which are overtaken by a stream of lava. An English friend, who has lived here for years, tells me that he watched the progress of the last great eruption with much interest. As the high glowing stream of red-hot molten minerals slowly approached the trees, the branches of some kinds took fire, and blazed away a considerable time before the bole was touched by the slowly-moving mass; the bole itself only blazed upon being broken and overthrown by the advancing wall of fire. As the lava takes three years to cool, it need hardly be remarked that the surface is still barren, yet the softer kinds of volcanic ejection, such as those which covered Pompeii, for example, soon crumble into deep and excellent earth. The low grounds round Vesuvius are fertile and well cultivated, as is nearly all the level country near Naples. We sometimes read of ground in the colonies being worn out and abandoned, and this in places only occupied by man for a few generations. Yet, here the same kind of culture has been carried on for, probably, not less than three thousand years, and the land seems capable of any amount of further cultivation or improvement. So much for "wearing out."

THE FRUIT GARDEN.

GOOSEBERRY TREES TRAINED AS PYRAMIDS.

By P. GRIEVE, Culford Gardens, Bury St. Edmunds.

The Gooseberry in both its rough and its smooth form is indigenous to Britain, where it has been cultivated from time immemorial, and regarded as the most useful and wholesome of bush fruit. So much is this the case, that it may even be doubted, if it has yet received the amount of attention, to which its merits, as a wholesome and really delicious fruit entitle it. It is true that considerable interest is taken in its cultivation in some parts of the country, more particularly, perhaps, in the northern counties of England. Still this attention would appear to have been directed more towards the increase of the weight and dimensions of certain favourite sorts, than in attempting to obtain varieties of superior quality or flavour, or in the adoption of improved methods of culture. It is quite possible that this useful and esteemed fruit may attain to a greater degree of excellence in the more moist and cool atmosphere of the north or north-western portions of our island, than it does in the keen breezes of the eastern counties, or even in the more favoured climate of the sunny south. It will, nevertheless, accommodate itself to, and succeed in, almost all varieties of soils and situations, and its culture is, consequently, universally adopted. The celebrated Lancashire show varieties of this fruit, are admitted to be more remarkable for their great size and weight than for their fine flavour; but, at the same time, there exists an almost infinite variety of sorts, many of which are of such excellent quality, that to improve upon them would be exceedingly difficult. As a really wholesome fruit, the Gooseberry must be admitted to stand pre-eminent; for, while it is frequently considered necessary to partake of other fruits, with something like caution, the Gooseberry, on the contrary, may generally be indulged in, to any reasonable extent, without apprehension of injury. And to those who have never eaten of this delicious fruit, direct from the bushes, in the comparatively cool atmosphere of an early August morning, there yet remains a treat in store, the enjoyment of which might form an incentive to the salubrious habit of early rising. The Gooseberry in all its varieties is generally cultivated in the form of dwarf, flat, or squat bushes, and its motto may be said to be *Nemo me impune lacessit*, and these circumstances render the operation of gathering the fruit, sometimes less agreeable than could be desired. But the method of culture which I am about to describe, will, if adopted, to a very considerable extent ameliorate this evil. The system has been practised here, during many years; and this, or something similar to it, may also have been followed in other garden establishments, so that it is by no means recommended as a novelty. But as it still con-

tinues to attract the attention, as well as to meet the approval of the generality of visitors, I will endeavour, in as few words as possible, to describe it, and may, in the first place, say that in forming a plantation of pyramidal Gooseberry trees, such as I am about to recommend, it is necessary, in the first instance, that the piece of ground selected for it should receive every necessary attention, such as draining (if required), deep trenching, liberal manuring, &c.; and, if the soil is of a light or sandy nature, a good dressing of clay would be found to have a very beneficial effect. For, although, as

has already been said, the Gooseberry will succeed well in almost all sorts of soils, still it must be borne in mind that this crop differs considerably from the ordinary annual and biennial crops of the garden. Inasmuch as these trees or bushes will, in all probability, occupy their position for many years, and although fertilising materials can, from time to time, be supplied to the soil, as may seem necessary, it is, nevertheless, advisable to have the soil in good condition when the plantation is formed. This preparation of the soil should be attended to at as early a period of the autumn as possible, in order that it may have time to settle, before the trees are planted, which should be done not later than the middle of December; and, if earlier, so much the better. Supposing the site for this plantation to be in readiness, let lines be drawn upon it, north and south, at a distance of $6\frac{1}{2}$ feet from each other, and intersect these lines by others, running east and west, and at the same distance apart, viz., $6\frac{1}{2}$ feet. Proceed to get ready the necessary number of strong straight Larch poles or stakes, which should be some 12 or 14 inches in circumference at the larger end, and about $8\frac{1}{2}$ feet in length; they should be sharpened at the larger ends, which are intended to be driven into the soil. But, before this is done, about 2 feet of the end intended to be so used should be well charred by being held over a fire; or the ends of the stakes may, to that depth,

be dipped in boiling pitch. The object, in either case, being to render the portion of the stakes driven into the soil, as far as possible, impervious to moisture, and to be thereby rendered more durable; and this charring or coating with hot pitch should extend to at least 6 inches above the surface of the soil, where decay is most likely to take place. The sharpened ends of the stakes should now be driven into the soil, at the points where the lines intersect each other, taking care to keep them in an upright position, and rendered steady by having the soil firmly rammed around them. Each

pole or stake should stand exactly 7 feet above the level of the soil. This height is necessary in order to give sufficient head-room, as will be forthwith explained. It is not unlikely that the difficulty of obtaining Larch or other stakes for this purpose may, in some instances, be considered an insuperable objection to this pyramidal system of training the Gooseberry. But, in almost all woodland districts, little, if any, difficulty need be experienced in procuring the thinnings of Larch plantations; and, in all localities they may, no doubt, be obtained at a moderate cost, say from 3d. to 6d. each, according to size, &c. It should be remembered that, with proper care in charring or coating the lower ends with pitch, or some similar material, they will last, without further trouble or expense, for at least ten or fifteen years. When they have been all properly fixed in the soil, they will be found



Trees destroyed by lava (see p. 312).

to stand at a distance of 6 feet 6 inches from each other, and should also be 7 feet in height. A moderately strong galvanised wire should now be made to extend from the top of one stake to that of another, and should be secured to the central part of the same by a strong iron staple, which should be made to secure both wires—that is, that which extends from north to south, as well as that which stretches from east to west. When this has been done, the top of the stake should be thickly coated with pitch, which, by excluding air and moisture, will for a long period prevent decay, and also prevent the staples which

hold the wires in their position from becoming loose. But the fixing of these wires may, if desired, be deferred for at least two seasons after the plantation has been formed, as that time, at least, will elapse before the plants can reach to the top of the stakes. It is, however, advisable to fix the wires as soon as the stakes are inserted in the soil, as they tend to keep them in their proper form, and prevent the possibility of their being loosened by high winds, or other causes. Should wire be considered as too expensive to be used for this purpose, strong tarred cord or line may be substituted for it, which could be renewed when worn out. But it is obvious that wire is the most satisfactory material to use for the purpose, although more expensive in the first instance. The plants used to form this plantation should have been struck from cuttings in the usual way, and should each have four leading shoots or branches. They should be planted as carefully as possible on either the south or the north side of the stakes, and within about 2 inches of the same; and the four leading shoots should be tied or nailed to it, keeping them as nearly as possible at equal distances from each other. Or two plants may be placed to each stake, one on the south and the other on the north side, and, in this case, only two shoots will be required to be taken from each plant. By adopting this plan, the stakes will be clothed somewhat sooner. When the plants begin to grow freely, the lateral branches on the lower part of the tree or bush may be allowed to extend themselves, in order to form the foundation of the pyramidal form which they are ultimately intended to assume; while the progress of the four leading shoots must be encouraged by every possible means, and, when they reach the top of the stake, each shoot must be trained along its proper wire until it meets and unites with that of the next tree, and so on. As soon as the stakes and wires have been properly fixed, and the Gooseberry trees are planted, &c., the soil (upon which considerable treading has been necessary) should again be lightly dug or forked over, and a line or row of Strawberry plants may be turned out between each line of staked Gooseberry trees, and intersecting each other in like manner. These may be allowed to remain during the first two seasons; after which, the entire space will be required by the Gooseberries, and the Strawberry plants may be dug into the soil. Annually, after this, as soon as the Gooseberry trees have been pruned, the surface of the soil, to the depth of 2 or 3 inches under the branches and around the stems, should be drawn into the centre of the space between the lines of plants, while that portion of the soil from which the surface has been removed should at once be thickly dusted with gas or quick lime, and some 18 inches of the centre of the space between the lines should be deeply dug, and fresh soil, in proportion to that taken off, must cover the lime under the branches and around the stakes and stems of the plants. By annually pursuing this system, caterpillars will not be likely to be very troublesome, as the larvæ, which are generally hid slightly under the surface of the soil and near to the stems of the trees, are by this practice deeply buried in the centre of the space between the lines of plants, where they probably perish. But, should the caterpillar at any time make its appearance upon the plants, recourse should at once be had to black Hellebore powder, the best and most effectual remedy. In addition to the usual annual pruning which these pyramidal trees should always receive during the winter or early in spring, it is also advisable to go amongst them about the end of June or early in July, and, with a knife or pair of garden-shears, shorten the stronger-growing lateral shoots, with a view to throw additional vigour into the weaker ones, and also to afford greater facility for gathering the fruit by increasing the space between the lines of plants. One of the great and much-appreciated advantages of this system of culture is the facility which it affords to ladies and others to walk among the trees, and to select their favourite sorts, &c., and to be able to gather them without being compelled to stoop, or to raise the branches before the fruit can be gathered. It may be almost unnecessary to say that the Red and the White Currants, with their various varieties, may be equally successfully grown as the Gooseberry when treated in this manner. A square plantation of pyramidal Gooseberry and Currant trees, consisting of some 12 lines or rows, with

twelve plants in each, or 144 plants in all, will, when fairly established, and during favourable seasons, afford a supply of fruit which will be found sufficient for an ordinary establishment. But the plantation can, of course, be of any desired extent, as well as of any form or outline. It will be found to present a striking, and even an ornamental, feature in any garden, and on that account it should always be kept scrupulously clean and free from weeds, &c. Appended to this is a short list of sorts which have been proved to succeed well when treated in the manner described; as, indeed, all known varieties will do. But, at the same time, there are some sorts which, on account of their habit of growth, &c., are better adapted to the purpose than others:—

Red Varieties.—I may commence the list with the Red Champagne, as a variety of medium size, but unequalled in quality and richness of flavour. Crown Bob: A fine, large, and excellent variety. Glorions: Also a large and first-rate sort. Glory of Oldport: An excellent variety. Highlander: A fine rich-coloured and handsome variety. Independent: A fine large late sort, and an excellent bearer. Ironmonger: Fruit, small, but of excellent flavour, and considered good for the purpose of preserving. Jackson's Red: Also a good sort, for the purpose of preserving. Lancashire Hero: A large and excellent variety. Rideman: Smooth fruit, of medium size, excellent flavour, and an abundant bearer. Rough Red: Fruit, small, but an abundant bearer, and considered as the best sort for preserving. Warrington: This is probably the best and most useful variety of all, hangs long upon the trees, is of first-rate quality, and suitable for preserving, &c.

Green-fruited Varieties.—The best are Greengage: Medium size, with remarkably fine flavour. Greenwood: Fruit large and very good. Green Walnut: A fine variety. Guido: Also a very fine sort. Large late Green: This is a very fine, large, and late sort, of excellent flavour. Wonderful: Also a fine variety.

Yellow-fruited Varieties.—Conquering Hero: A fine, large, handsome variety. Early Sulphur: Very early, with fine flavour, and an abundant bearer. Golden Drop: A fine-flavoured excellent variety. Goldfinder: A first-rate sort. Ploughboy: Fruit small, but good. Waterloo: Small, but very handsome.

White-fruited Varieties.—British Queen: An excellent variety. Large Early White: Fruit, large, early, and of excellent quality. Washington: Of good flavour, and a very fine variety. William the Fourth: A large and fine-flavoured variety. White Eagle: Also a fine large sort. Whitesmith: A very early and large variety, of excellent quality.

While, of suitable varieties of the Currant, there may be mentioned the Cerise, Knight's Long Bunch, La Versailles, Large Red Grape, Ruby Castle, Transparent, White Grape, and White Dutch.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Golden Champion Grape.—Can any of your readers say whether, in their experience, this Vine is a shy bearer? I have it grafted on Raisin de Calabre, a strong cane; it had a moderate crop in 1872, about five bunches last year, and this season every spur is blind, although, in the same house, all other Vines are showing abundance of fruit. Will any of your readers explain the cause of failure in my instance?—N.

Gooseberries on Walls.—We rarely see Gooseberries growing on walls, but in some cases this may be done with advantage, especially where the wall space is low. Trees thus trained bear abundant crops of fine richly-flavoured fruit, which is much more easily gathered than when grown in the ordinary way. The finest dessert sorts only should be planted. At Woolaton Gardens, near Nottingham, there are some fine old specimens grown in this way, and we never tasted fruit more richly-flavoured than that so grown.—Q.

Sir Philip Crampton's Pear Tree.—This Pear tree, of which we have given an illustration (see p. 417, vol. iv.), presents, it is said, this spring a noteworthy contrast to its appearance last and preceding seasons at this period of the year. Hitherto it was wont to be a marvel of floral beauty, literally one sheet of snowy blossom. At present, the few trusses of bloom with which its surface is irregularly and sparsely dotted, scarcely count two dozen. This, doubtless, arises from its having been over-cropped last year. If fruit-growers generally only allowed their trees—even in the most prolific fruit season—to bear moderately, our fruit crops would be regular, instead of being, as they are, somewhat uncertain.

Origin of the Duchesse d'Angoulême Pear.—A French nobleman observing his tenant about to destroy a fine thrifty Pear tree, inquired the cause. He was told that it was a chance seedling, and had borne no fruit in twenty-five years. He had already cut its roots preparatory to the first stroke, but was ordered to let it remain. He did so, and in the following year it was loaded with superb fruit of a new variety, which at once became celebrated. The root-pruning the gardener had given it worked like a charm. Not many years afterwards the Duchesse d'Angoulême was passing through Lyons, and its inhabitants sent to her their hospitalities. Nine fair maidens presented the Duchesse with golden silvers, on which lay heaped this precious fruit, and begged her to bestow on it her name; and the Pear now recognised as one of the best of fruits, was thenceforward known as the Duchesse d'Angoulême.—Cultivator.

GARDEN DESTROYERS.

GARDEN PESTS.

Weevils.

THESE are principally leaf-eating insects, and are sometimes very troublesome both in the grub state as well as when fully matured. They are, like many other unwanted company with which we have to contend, much more numerous in some localities than in others. In one place I found that every year the common brown weevil attacked the Vines just about the time the berries were set. They not only perforated the leaves in all directions, but also attacked the young berries, usually disfiguring the shoulders of a considerable number of the bunches. The mature insect is a night-feeder, and it may then be caught by placing a cloth under the plant it is feeding upon and giving the plant a smart shaking, by which means they will fall off on to the cloth spread out to catch them, when they may be caught and destroyed. Something white, such as a large tablecloth or sheet, should be used, as, from its colour, it enables the weevil to be seen the best.

Earwigs.

Although there are several flowers that earwigs will eat, there is nothing they do so much harm to as the Dahlia, as any grower of this favourite florists' flower can testify. Where they exist in considerable numbers, it is almost an impossibility to get a stand of perfect flowers for the exhibition stage, through their depredations in eating the points of the petals in the young unexpanded flowers. With these, as with most other garden pests, there is no alternative except diligent and timely perseverance in their destruction. The grower that neglects to employ any means for the destruction of this insect until the short time that elapses betwixt his flowers being in bud and their full expansion, will, in all probability, find it a difficult matter to make up the number of perfect flowers he requires for his exhibition stands. For weeks before the plants get so far advanced as this, means to keep them under should be taken. They feed in the night, and any substance in which they can conceal themselves in the day may be employed. The usual practice of placing a small inverted flower-pot with a bit of Moss in the bottom, on the top of the stake to which the plant is tied, is not a bad means catching them, provided they are regularly examined. Another trap commonly used is, small bundles of Bean stalks tied up, cut 6 or 8 inches long, placed in each plant, and looked over daily by shaking the end of the bundle on a board or other substance, by which they can be destroyed. The most simple and effective traps I ever tried were pieces of newspaper, crumpled roughly up in the hand, and stuck anywhere in the plants, unfolding them two or three times a week, when numbers of the insects will be found concealed in them. If there happens to have been bred a nest of young robins near the Dahlia ground, the numbers of earwigs they will eat, when they have taken flight and got old enough to find their own food will astonish anyone taking the trouble to watch their movements. The use of thin muslin bags, in which the buds are placed before they expand, drawn up close round the stalk of the flower so as to prevent the insects getting to them, is also a method followed by some growers. A piece of cotton-wool, twisted round the flower-stem just behind the bud, will prevent them getting to the flowers. By resorting to some or all of these methods, their numbers can be so far kept under as to prevent the disappointment of finding all the best buds rendered useless.

Beetles.

The depredations of beetles do not extend over so wide a field in gardening as some of the pests already treated of. They are the most destructive to Orchids. If allowed to get to any considerable head amongst these plants, the damage done in absolute value becomes a serious matter. They attack the flower-spikes whilst young and tender, and the young growths; still worse, so far as weakening the plants, is the destruction of the roots. When we consider the value of many of the rarest of these plants, the necessity of unremitting attention in the destruction of these pests will be apparent. Nature's instinctive law of self-preservation is more fully exemplified in the species that infest the Orchid-house than in anything else that stands

correspondingly low in the scale of animated nature with which I am acquainted. The moment they are disturbed, the astonishingly rapid powers of motion possessed by these beetles is brought into play. Their movements, especially in the night, when a light is brought to bear upon them, are almost equal to those of a bird. They secrete themselves amongst the drainage of the pots, in the material in which the plants are growing, when it is dry whilst the plants are at rest, in cracks in the walls where the mortar has become displaced, near the pipes, or in any out-of-the-way place. They are very destructive to soft-wooded cuttings and seedlings in the propagating-house. They increase fast, and when once they gain access to a plant-house, are very difficult to completely destroy. The thick fleshy roots of *Vandas*, *Aërides*, and *Saccolabiums* in particular become a prey to them. They never feed in the daytime, and are rarely seen during the daylight unless disturbed from their haunts; consequently they may exist in much larger numbers in any place than is supposed. By diligent hunting with a lamp after dark, some may be caught, but more will make their escape. Small pots, containing treacle and water mixed in equal proportions, placed about their haunts, are sometimes used. By such means some may be caught, as also by the different forms of traps that are sold for catching them; but with any means of this description in plant houses I was never able to catch them in sufficient numbers to keep them down so low as desirable. I have tried all the different kinds of poison sold for their destruction, including the phosphorus preparation usually employed. Any of these they will take for a time, and many may be destroyed by any of these preparations; but amongst them all, Roth and Ringiesen's Beetle Poison (obtainable through any druggist) I have found much more effectual than all the others. We lay it in bits, about the size of a small French Bean, on the smooth side of oyster shells, pieces of glass, or broken glazed crockery; it is necessary to use something that has a hard smooth surface that will not absorb the moisture from it, or it will be so dry, after the first night, as to render it useless. By using any of the above-named articles it will be fit for use for three nights, although the phosphorus it contains renders it of a drying nature. But this preparation must be used with caution, as domestic animals will eat it and be destroyed thereby. On the nights we lay it down we are careful to exclude the garden cats from the houses, or these most useful animals would come to an untimely end. When we lay the poison down in each house on an evening we count the bits, and chalk the number on a board or anything we employ for collecting them in the morning, which is always done the first thing, and put them away where they will not be exposed to the air. After using three nights the poison gets too dry for the beetles to take it freely. By using it once in three months, I am not troubled with the insects so as to do any serious harm; but where they have been allowed to get to such a head as we see them sometimes, it is necessary to keep laying down the poison every night for a fortnight or so, to bring them well under. I have seen a dwelling-house, in which the common black beetle literally swarmed by thousands, cleared by a few weeks' perseverance with this poison.

T. BAINES.

Rose Galls on Willows.—The accompanying twigs are cut from a Red Willow; and I should be glad to know what are the flower-like growths that have been formed at the extremities. Hundreds of similar examples are to be found on the Willows around my house.—J. O. D. [These curious galls or roses are produced by the larvæ of a minute but most elegant little fly or gnat, which is described by Mr. F. Walker at p. 77 of the third volume of his "*Diptera Britannica*," under the name of *Cecidomyia rosaria*. It causes these rosettes to be formed on five different species of the Willow—*Salix alba*, *S. caprea*, *S. aurita*, *S. cinerea*, and *S. depressa*, as we learn from Mr. Walker. With *S. aurita* we are imperfectly acquainted, and *S. depressa* we have never seen; but the three other species are common, and their rose-like galls at the termination of the shoots are very familiar to us, more particularly those on *S. caprea*, commonly called the Goat Willow—or, when the galls are abundant and conspicuous, the Rose Willow or Rosette Willow. De Geer was, probably, the first scientific naturalist who describes these galls. His observations occur at p. 155 of the sixth volume of his "*Memoirs*," published at Stockholm in 1752.—Ed.]—*Field*.

THE LIBRARY.

THE ART OF BOTANICAL DRAWING.*

AMONGST a number of books connected with art, published by Messrs. Winsor & Newton, intended chiefly for the instruction of beginners, we are induced to notice one which comes so naturally within our province that it would be an omission on our part to overlook so useful a contribution to our book-shelves. After a few remarks, in an introductory chapter, on the necessity for scientific knowledge, and the names of such books as will best help a learner, we arrive at the chief matter of which the work consists. Leaves, being the most obvious objects in connection with vegetation, form the first subject, and, respecting them, we have the sound advice to draw the mid-rib and lateral veins first, which method ensures far greater accuracy than commencing with some outlying part; the foreshortening of them then follows naturally and easily. The placing of

them on branches is next described, with the help of one of the illustrations with which the book is interspersed. Then we come to flowers, and a few good rules for their delineation, such as marking out a circle, and then its division into petals, whether foreshortened or not. After the regular flowers come the irregular ones, such as those of Orchids, of which some

nice drawings are introduced. We then pass on to fruits and seeds, and these terminate the instructions on simple outline. There are, however, other points touched upon, such as "enlarged details or analysis of flowers," and "arrangement," the latter subject being particularly well treated and illustrated. "Shading and colouring" next receive attention, and here the advice concerning the lighting up an object artificially, so as to get a good example of form developed by light and shade, is very much needed by many who are by no means beginners in their own estimation. Colouring

receives some brief attention, and then follows a short chapter on the highest point to be attained, namely, "the grouping of plants," represented by the Ivy, the Vine, the Rose, the Clematis, &c. From first to last, it is a most sensible and readable book. The accompanying illustrations afford an example of the manner in which a beginner

is instructed in the employment of geometrical figures so as to secure accuracy of outline in sketching fruits and cones.

BOTANIQUE POPULAIRE.†

THIS, although not a very new book, is one of the best elementary treatises on botany which have issued from the continental press. It forms a handy volume of over 400 pages, illustrated with 215 wood-cuts. The chapters are well arranged, and the various subjects are concisely but clearly treated, so that we have no hesitation in saying that it is, of all the elementary works which we have seen on the subject of botany, at once the most succinct and comprehensive. Everything relating to the primary tissues and compositions of plants is well explained with diagrams, and, in the succeeding chapters, the nature of the epidermis or outward bark is well discussed. As regards the functions and powers of the roots to sustain or originate the life of a plant, the author has very well

disposed of his subject. We have not, at present, space to quote him at length, but the following extract, which relates to the flowering of various sorts of plants, may be worth noticing as an example of the style and matter of the work:—

In the case of most plants, and with all those whose flowers are disposed in a spike or cluster, the lower or outer flowers invariably open first, and the flowering proceeds upwards, as may be seen in the Wheat, Parsley, and Plantain. In other plants the central or terminal flower opens first; when it terminates the stem, there are generally two or more floral leaves at its base, from the axils of which other blossoms spring, so that the inflorescence is formed of a series of dichotomous ramifications, which are so dispersed that the central flower is the first to open. This arrangement may be observed in several of the Euphorbias, the common Sunflower, &c., but the order first mentioned, viz., that in which the outer or marginal flowers are the first to bloom, prevails in by far the greater number of plants.

The numerous wood-cuts which occur through the volume are remarkable for their exquisite finish and clearness of outline. They comprise not only explanatory figures of the structure and various parts of the inflorescence, fructification, &c., but also many well-executed portraits of the plants themselves, and enhance, in no small degree, the value of the work.

* "The Art of Botanical Drawing." By F. W. Burbridge. London: Winsor & Newton, 1873.

† "Botanique Populaire," par Henri Lecoq. Paris: Librairie Agricole de la Maison Rustique, 26, Rue Jacob.

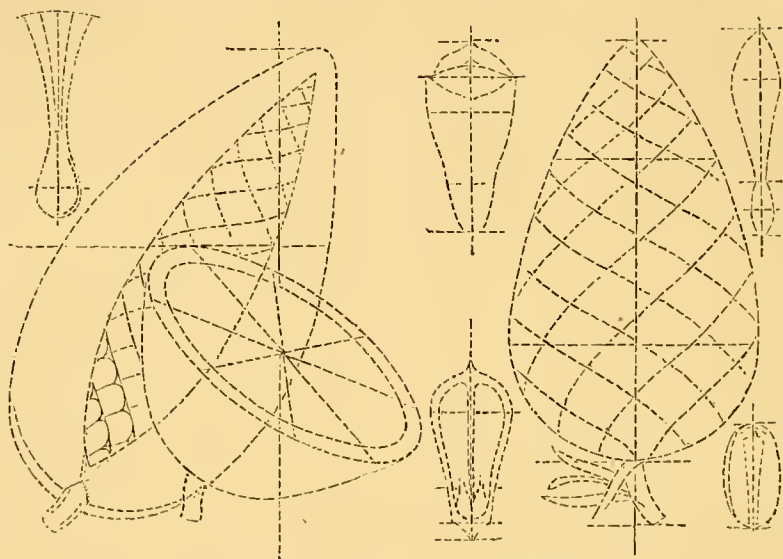
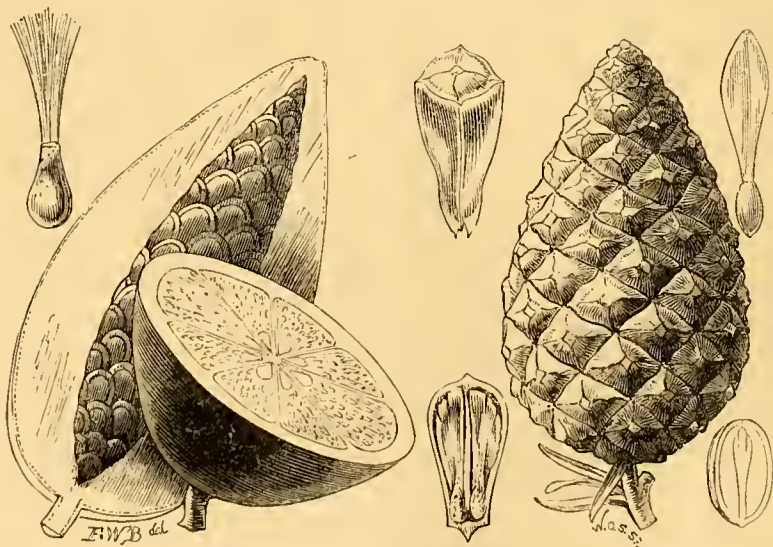


Diagram showing how Fruits, &c., may be sketched correctly.



Fruits and Seeds.

THE KITCHEN GARDEN.

NEW BROCCOLIES.

By WILLIAM TILLERY, Welbeck.

HAVING grown in quantity two varieties of Broccoli lately sent out, I can highly recommend them as being great acquisitions to all growers of this invaluable vegetable. One variety was sent out by Messrs. Watts, of Northampton, under the name of Excelsior; and the other by Mr. Cooling, of Bath, under the name of Matchless. They are both early, or, rather, mid-season sorts, having commenced this year with me to supply good heads by the beginning of March; but, owing to the mildness of the winter, all sorts of Broccolies are coming earlier into use than usual. Both Excelsior and Matchless are thoroughly protected by their leaves, and may be cut snow-white before the heads are exposed to the air; while their flavour, when cooked, is everything that can be desired in a Broccoli. When the heads come in too fast, the leaves can be tied over them to preserve their colour; and, either for growing for market purposes or for private use, these two sorts, in my opinion, will be found the very best in their season. Another new variety, sold under the name of the Leamington Broccoli, I am sowing this year for the first time; and, as it has been certificated by the Royal Horticultural Society, it ought to be of good quality. Some of the varieties of Broccoli, now so abundant in seedsmen's lists, require a thorough weeding out, for they differ only one from another in name. The following kinds are, I find, quite sufficient to keep up a regular supply and succession, when the winters are not too severe. With good management, the supply of Walcheren can be maintained well into January, when Snow's Winter White Broccoli (which is a good "strain" of Grange's Autumn) will come in, followed by Backhouse's and the Early Penzance. Osborne's Winter White has too much of the Cauliflower breed in it, and will not stand severe winter frosts in the midland districts. Dilcock's Bride and Frogmore Early Protecting are two good early varieties, to be followed by the Excelsior and Matchless. Knight's Protecting and Williams' Alexandra are also good sorts to fill up the gap until the latest Broccolies come in, such as Carter's Champion, Cattell's Eclipse, and Sander's White Goshen, which is the very latest variety that is grown.

MUSHROOM CULTURE.

By R. GILBERT, Burghley.

THE many letters that have appeared in our horticultural journals touching the growth of this valuable esculent makes it difficult to state anything new on the subject. Therefore, at the onset, I may remark I have little that is novel or sensational to offer. My object is to give some plain instructions, which, if carried out, cannot fail to ensure success. The three principal points of Mushroom culture consist, firstly, in working and turning the dung; secondly, in the fermenting of the bed; and, thirdly, in spawning, seiling, &c. These three points I shall try to describe in the order in which they are written, and finish by giving a few general remarks. Many Mushroom-growers are very particular in using clear droppings from the horses. If the market had to be supplied from such a source, the demand would be greatly above the supply. Experience has taught me that the dung brought fresh from the stable, with the straw mixed with it, makes the most lasting and best material. To make a moderate-sized bed, for a nobleman's or gentleman's establishment, four cart-loads will be required, which should be well shaken together in a round heap. If dry, pour on water as the turning proceeds, and, when finished, beat it down with the back of the fork, and put on a cart-load of any sort of soil, except rank clay; the best soil is turfy loam, but that cannot be got at all places. However, use the best you have, spreading it all over the heap to conceal the dung. In three or four days you will see the steam coming through the soil. It should then be turned over again, turning the outside into the middle, mixing the soil with the dung as the work proceeds. It will require turning twice more, at intervals of two or three days, when it will be in a fit state to form the bed, either for outside or ridge beds or for the Mushroom-house proper. And let me

here remark that outside beds grow Mushrooms of far better flavour than those grown in inside beds, from which the Mushrooms are white in colour, insipid in flavour, and lack, in an eminent degree, the thickness of flesh and the wholesome partridge colour of the former. In fact, to use a market phrase, they are parasols in miniature. Therefore, I will suppose that outside beds are intended. After looking out the site (the best is a snug warm corner facing the south), begin by forming an equilateral triangle, 3 feet each side, putting in one stake at each corner of the bed, and it will be found that the quantity of dung prepared will make a bed from 12 to 14 feet long. One man should stand on the bed, while another puts on the dung, treading, beating, &c., until the required height of 3 feet is obtained. Place at each side of the bed, but not opposite, four trial sticks, covering all up with a mat. Be particular to feel the heat daily, and, when it is new milk warm, under rather than over, the time of spawning has arrived. If a bottom-heat thermometer is at hand, from seventy to seventy-five will be a safe guide. Buy the spawn from a first-rate firm, and you will not be deceived. Break it up into pieces the size of a pullet's egg, and insert the pieces 2 inches deep in the dung, and 12 inches apart on both sides of the bed. Beat the surface down smoothly with the back of a spade, and cover up with matting to keep out the wet. The soil should not be put on for two or three days. By using this precaution, you have the heat well in hand; occasionally, a second heat gets up, and burns the spawn, if this is not attended to. In earthing up the bed, common garden soil is used, which may be dug from the ground on each side of the bed. Lay it on at least two inches thick, and beat it firmly. If the soil is wet, and you cannot get a smooth surface, put on a sprinkling of sand before beating. Cover up with a layer of 3 or 4 inches of long dung, and put a mat over all, and, in about eight weeks, you will be rewarded with a sight worth seeing, and a dish of Mushrooms worth eating.

The best time to make the beds is from September to January, which will keep you supplied until May. After that time, Mushrooms are always attacked by a small insect, which makes them unwholesome. Water should be used with great caution; in fact, if kept covered, they seldom require any; exceptionally high and dry winds, however, render watering necessary. It should be given with a very fine-rosed syringe, and should have the chill taken from it before it is applied. When the beds begin to want a second crop may be had by watering with dung water, mixed with common salt, at the rate of 1lb. to a gallon of water.

FRENCH MODE OF CULTIVATING WATERCRESS.

THE water from springs has been utilised in the cultivation of this plant, which was first commenced in the neighbourhood of Senlis, on the banks of the Nonnette, in the beginning of the present century. The ground in which the Watercress is cultivated is situated below the spring which feeds it. Across the slope a series of trenches is dug which communicate with each other, and the flow of water is regulated by little sluice-boards placed at the point of communication. The trenches having been completed, and communication with the spring cut off by the first sluice-board, the Watercress is sown in spring at the bottom of each trench, which has been previously cleaned out, and from which every aquatic plant that might prove injurious to the crop has been removed. Instead of sowing, some cuttings might be planted in August in the bottoms of the trenches, after the ground has been moistened by admitting a gentle stream of water. These cuttings are placed 5 or 6 inches from each other. In a short time they take root and the plants soon cover the surface; the sluice-boards are then raised, and water is admitted to the depth of 5 or 6 inches, which will be found sufficient. If the plants have been well taken care of, well selected, and well cleaned from every parasitical incumbrance, the Cress-bed, once established, requires no other care than to be guarded from the frost. In order to do this, the water is allowed to rise and cover the Cress while the frost lasts; but, as soon as the weather becomes mild, it must be let off to its former level, as continued submersion injures the plants. There should be an outlet from the spring not communicating with the Cress-bed,

which should be opened in times of thaw or heavy rains in order to prevent the trenches being overflowed to the detriment of the plants. It is a good plan to protect the trenches from cold and heat by means of hedges planted in the intervals between them, but the leaves from these hedges should not be allowed to get into the trenches, otherwise the Cress will be smothered and cannot grow. This evil may be prevented by fixing a trellis or mats on each side the hedges. The Cress is gathered by placing a strong plank across the trench; the Cress may be cut with a pruning-knife, but it is better to nip the shoots off with the thumb-nail one after another, as by this method the plants are not disturbed at the roots.

During summer, as long as the season is favourable, a trench may be visited, and the plants cut or gathered every three weeks; but, if the season is cold, we must wait two months before making a second cutting. When the gathering for the year is over, the trench is left dry, and a light layer of well-decomposed cow-dung is spread over the entire surface, after which the plants are pressed down with a plank, which has a long handle at each of its extremities. Two workmen take this implement, and, as they go from the end of the trench, press down the plants which have been raised at the times of gathering. A Cress-bed will last a long time if carefully managed; but, as it is seen to be running out, it should be renewed. In doing this, the plants are pulled up by the roots, and laid on the spaces between the trenches; the trenches are then dug over, and manured with well-decomposed cow-dung; after which the Cress is replanted as at first. Some growers take up the plants every year, remove the mud from the trench, dig the bottom over and manure it, after which they replace the old plants. For supplying water to, and emptying, the Cress-beds, stoneware pipes 3 inches in diameter are used. The water must be allowed to run freely, if it is desired to have Cress of a good quality. The sluice-boards are only used to stop the water in frost, and to let it off during a thaw or heavy rains. The seed is gathered from the finest plants in each trench in August. It keeps good for four years.

Yellow Cucumbers.—Could you inform me what makes my Cucumbers turn yellow? They grow well to about 5 or 6 inches long and then drop off. The foliage is very healthy, and the plants make growth freely. I have "set" the flower? Do you think the evil is due to the situation of the house, which is east south-east, shaded from the south by another house?—VIOLET. [Cucumbers turning yellow at this season of the year may arise from various causes. If the plants are as strong and healthy as described, it cannot be through want of vigour; yet, even if they are apparently healthy, if too much water is given at the roots, it would have the effect of stopping the fruit from swelling freely. A dark unsuitable situation, with the house shaded by another, as described in the present case, would produce the effects complained of. The finest of some of the varieties of the Cucumber, especially the large-growing kinds, are very subject, if used for winter-work, to turn yellow. Small, or medium-sized varieties, such as Rellisson's Telegraph, are the best. I have never found any difficulty with this sort in getting it to do well in the winter season, provided a night temperature of 65° can be maintained, with a rise of 10° by day, and a bottom-heat of 75°, using good loam with a small quantity of rotten dung added. Deficiency of water at the root will prevent the fruit from swelling freely; but, in this case, it generally curls and thickens prematurely at the end. In the case of your correspondent's Cucumbers, from the description given, I should be inclined to attribute their unsatisfactory condition to the house being, from its position, deficient in light (for winter Cucumbers the house should be as light as possible, and placed so as to catch every ray of sunshine we get), or that the sort is not suitable for growing in winter.—T. BAINES.]

Leaky Watering-pots.—Gardeners are not unfrequently incommoded by leaky watering-pots, and it often happens that there is no tinman near at hand to mend them. M. Alégatière, the well-known nurseryman of Montplaisir-Lyon, states, in the *Revue Horticole*, that such leaks may be effectually stopped by covering them with a small piece of linen which has been previously dipped in copal varnish. The inside of the watering-can should be thoroughly dried, before the varnish-saturated linen is applied to the leak, when it is allowed to dry in the open air. The can will then be found perfectly water-tight.

SOILS AND FERTILISERS.

LIQUID-MANURE FOR POT PLANTS.

THE beneficial results obtained from manure-water, when judiciously applied to fruiting and flowering plants, have long been recognised by cultivators, and its use is now becoming more general. It is well known that the roots of plants are usually more healthy when growing in pure soil free from rank manure, and these roots will draw up more healthy nourishment to the plants from manure given in a liquid state, than when they are encased in rank material which they cannot consume. We know that our most successful Grape-growers use very little solid manure in the soil, only a few bones or bone-meal, or similar material, which cannot give off more stimulant than the plants can consume, and also remains much longer in the soil as a fertiliser than manure, which dissolves rapidly. Pine-apples are not grown by successful cultivators in that rich stuff so much prized by some of our forefathers. The successful florist has more faith in giving stimulants when the plant really needs them than in keeping the roots buried in soil made rich and almost offensive by strong manure. When roots are few, and the plants almost at rest, the poorer the soil and the less stimulant the plants receive, the better will they thrive when their roots come to draw up larger supplies of nourishment. Moisture is needed to soften the soil, and to allow the roots to extract nourishment from it; but when all the virtue is out of the earth, and the plant begins to show signs of distress, all the watering in the world will not give vigour to the exhausted functions; but let a portion of guano or any well-prepared manure be mixed with the water sufficient to colour it, and let this be repeated at every watering instead of giving a much stronger dose at longer intervals, and the result will be most satisfactory. I have tried a number of experiments this season with liquid-manure, and all lead me to have faith in the application of it, at every watering, in a weakly state.—A number of fruit trees in pots (chiefly Plums) which had not been shifted for years, have produced heavy crops of fine fruit, and, though there was little in the pots but roots, frequent doses gave them all they required.—A number of old Fuchsias were stunted and pot-bound, but pressure of more important matters prevented our potting them into fresh earth; but to each watering a colouring of guano was allowed, and the plants, with their pot-bound roots, have not only made vigorous growth, but flowered freely from June onwards till November.—Some Pelargoniums, which were cut down last season and allowed to break in the usual way, were shaken out of the pots, and placed in smaller ones, but, when they should have been shifted, they were allowed to remain in the small pots, which were crammed with roots; guano-water was given at all times when they required moisture; the plants grew and made fine foliage, and flowered better than others which were favoured with larger pots and fresh soil. Many other examples I could give to prove that giving liquid-manure frequently, and not till roots are in abundance to consume it, is the proper way to deal with this important assistant to cultivation.—Florist.

Preparing Bones for Fertilisers.—It frequently happens in country places, where bones are plentiful, that there are no mills to grind them, and, if applied to the land as they are, they decompose so slowly as to be of comparatively little use. In such cases, chemical means, which are always at hand, are to be brought into requisition. Of all the various means that can be employed for decomposing and dissolving bones, the best and most practicable is weed-ashes. They are generally plentiful in country places—they prevent any unpleasant odour from being given off, and, above all, cause a rapid and complete decomposition. The bones are converted into a fine powder, which, mixed with the ashes, furnishes an excellent fertiliser, rich in potash and phosphoric acid. The method of using them is as follows:—A trench 3 or 4 feet deep, and of any desired length, is dug in the earth, and filled with alternate layers of ashes and whole bones, each layer being about 6 inches thick. The lowest as well as the top layers are of ashes, and each layer of ashes is thoroughly saturated with water. At distances of 3 feet poles are rammed down to the bottom of the ditch, and every eight or ten days they are taken out, and enough water poured in the holes to saturate the ashes. At the end of two months, the whole heap is thoroughly stirred up with a fork so as to mix the ashes and soften the bones, which are then left to ferment again, water being added as often as necessary. In about three months more, the heap being worked over twice or three times, the decomposition of the bones will be so complete that only a few of the largest remain, and these are taken out and put in another heap. This method of using bones comes to us from Russia, and is very highly recommended. The action of this fertiliser upon crops is said to be something extraordinary. It seems as if the salts in the

bones and those in the ashes unite to form very soluble salts which can be at once assimilated by the roots of plants. Where weed-ashes are scarce, recourse must be had to horse manure. The bones are soaked a few days in water, and then placed in rectangular pits with alternate layers of horse manure, each layer being drenched with the water in which the bones were soaked. The strata of bones are three inches thick, and those of manure a foot thick. The pit is covered with earth so as to be tightly closed. The decomposition of the bones will require, in this case, about ten months, when the mixture is ready for use as a fertiliser. They may, also, be more speedily prepared by boiling in the following manner:—Mix them in a large vessel with wood-ashes; and, to make the ashes caustic, add about a peck of fresh lime to each barrel of bones. Saturate and cover the ashes well with water, and then apply heat, for, say, twenty-four hours, or, during the day for two successive days. All the bones, by this time, except the very hardest parts, will be so reduced as to be easily pulverised, being in a pasty condition, suitable for placing in layers in making the compost heap. Another day's boiling will reduce the remainder of the hard bones. It is useless to recommend converting them into home-made superphosphate by using sulphuric acid; the difficulty and trouble in procuring the acid away from cities, and the care and experience required to use it, are sufficient objections.

THE JUTE PLANT.

(CORCHORUS.)

PERHAPS no vegetable product has been more rapidly introduced into general cultivation and has acquired greater importance during the past thirty years than the Jute-plant. The material for the account of it which we here present has been mostly obtained from *Science Gossip*. Jute is a fibre obtained from the inner bark of two species of plants belonging to the natural order Tiliaceæ, an order which is represented in our country by the Linden tree, from which most of the covering and tying material, well known to horticulturists as "bast matting" is obtained. The two common Jute-plants are *Corchorus capsularis* and *C. olitorius*, the former being generally considered the more valuable. The plants are annuals, growing from 4 to 12 feet high, according to the quality of the soil and the location, the stems at the base becoming an inch or more in diameter. The leaves are alternate, lanceolate in outline, toothed on the margin, with the lower pair of teeth prolonged into a slender thread. The flowers are small, half to three-quarters of an inch in diameter, yellow in colour, having five petals and a large number of small stamens. The fruit consists of a capsule, which in *C. capsularis* is nearly round, and in *C. olitorius* cylindrical and narrow. These capsules contain many small seeds. It is sown at different periods, according to the climate and variety, usually in April or May, and it flowers in July or August, when it is ready to be cut for the fibre. In Louisiana two crops have been obtained in one season. If cut at the first commencement of blossoming, the plants are more easily cut, and furnish a finer fibre than if left to mature. It is said that in India the stems or stalks of the Jute are of almost equal value with the fibrous portion. They are beautiful white and straight stems, of a light brittle wood, somewhat like Willow switches, and have a multitude of uses among the natives, such as for the manufacture of gunpowder and fireworks, for the making of fences and inclosures, for Pea-brush, and for the construction of those acres of basket-work which the traveller remarks near every native village. The thick and coarse butts of the older plants are cut off for about 9 inches. These butts are sold to paper-makers, and wrought up into coarse thick fabrics. The Jute fibre as prepared for the market, has much resemblance to that of Hemp, but is softer and more glossy, and under the microscope, more transparent and slender, and apparently with thinner cell-walls. The principal employment of Jute in India is for the manufacture of gunny-bags. These are the common coarse bags in which Indian produce is sent to market. They are also extensively used in the shipment of agricultural products in this country. The manufacture of these bags is an industry which pervades all classes in Lower Bengal, and penetrates into every household. Men, women, and children find occupation therein. Boatmen in their spare moments, husbandmen, and domestic servants, everybody, in fact, pass their leisure moments, distaff in hand, spinning gunny-twist. All the finer and long-stapled Jute is reserved for the export trade, while the short-staple serves for the local manufacture of gunny-bags. The export of Jute from India has rapidly increased during the past twenty years, and now reaches nearly 3,000,000 bales.

The use of Jute as a paper material will greatly increase the commercial value of this valuable fibre. The *Dundee Advertiser*, on its appearance printed on Jute paper, after apologising for its transparency and thinness, says:—A remarkable fact is that it is the

product of Mr. Watson's second experiment, and if we can attain to such a result on only a second trial there need be no fear with respect to further experiments. The thinness and transparency will easily be remedied, as there is nothing to prevent paper made from Jute being of any degree of thickness and opaqueness. It may be explained that this sample is made almost entirely from old Jute-bagging. We propose to have samples made entirely from Jute-fibre. To some extent Jute-bagging and waste have been used by paper-makers for several years, mixed with other materials; and when we mention that nearly 50,000,000 Jute bags were exported last year—the demand for home requirements being also very large—it will be seen how large a quantity of manufactured Jute there is to work upon, especially as bagging is only one class of the goods made from this material.

WORK FOR THE WEEK.

Flower Garden.

STIR the soil occasionally amongst spring-blooming plants, and if slugs are troublesome scatter some air-slaked lime around the outside of the beds in which they are growing. Edgings of *Stachys lanata*, *Cerastium*, variegated Thyme, *Gnaphalium lanatum*, variegated Arabis, variegated Queen of the Meadow, Aucuba-leaved Daisies, crimson-leaved Ajuga, the dwarf Campanulas, Santolinas, and a few other compact-growing plants may now be lifted, divided, and transplanted. Two-year-old edgings are generally better than one, so that unless they exceed that age, they are better left undisturbed. The variegated *Polemonium caeruleum* makes one of our finest hardy edgings; the best way of treating it is to lift the roots and pot them in October or November, to keep them during the winter in a frame or cool Peach-house, and transplant them in spring when they begin to grow. Transplant from frames, green-houses, or pits, into beds in the flower garden, Pinks and Carnations wintered in pots, or autumn layers potted in light soil in frames in winter. Bulbs of Lilies, yet in store should be planted as speedily as possible. Pansies, and other spring-blooming plants, may yet be transplanted as occasion requires; indeed, few plants are more useful at any season than Pansies. Gladioli, for blooming in beds or shrubbery borders, may be planted at once 3 or 4 inches deep, and a sprinkling of sand should be strewed under and over the bulbs. It is a prevalent idea that Gladioli should not be transplanted till May, for fear of spring frosts; but that is too late, unless the plants are required for late flowering. Sow Mignonette where it is required to bloom, and hardy annuals not sown last September here and there in beds or borders for transplanting. Sow also a good stock of Sweet Peas, Nasturtiums, and Scarlet Tom Thumb Tropæolums, either where they are to bloom or in sheltered beds or corners for transplanting hereafter to their permanent quarters. Autumn-saved roots of Scarlet Runners throw up shoots freely, and bloom earlier than seedlings; the roots require treatment similar to that usually given to Dahlias. Divide and transplant roots of herbaceous plants of various sorts. If worm-casts are prevalent on lawns, prepare some lime-water, mixing therein some soot and salt, and water the lawn with the mixture through a rough rose; this not only gets rid of the worms but invigorates the Grass. Pieces of ground about to be converted into lawns should be turfed at once, or, if turf cannot be obtained, they should be thickly sown down with Grass seeds. Hollows or other irregularities should be made level at once. In such operations the turf should be carefully skinned off and used again, for in no case should patches of new Grass be visible on permanent lawns; the more prominent portions of lawns will have been already mown this season, but now the whole of the Grass-surface should be cut. It should first be gone over with a wooden-toothed rake, and Beech nuts, small stones, and other things detrimental to the scythe or mowing-machine should be removed by means of a Daisy rake or a birch-broom. After that well roll the Grass previous to mowing. Plantains, Dandelions, Daisies, and similar plants the riddance of which from lawns is a desideratum, may now be eradicated. If Moss prevails amongst the Grass, rake the roughest of it off, and apply a dressing of sifted soil over the whole surface, which will so stimulate the Grass so as to make it choke the Moss.

Indoor Fruit Department.

Peaches, Nectarines, Plums, and Cherries will now be in full bloom, and plenty of air must be given them on all favourable occasions. See that the soil in the pots is kept moist, but not soddened, for the trees often drop their fruit when young under any excess of moisture or dryness. It is a good plan to retard a few dozens of these kinds of fruit-trees in pots, as they will flower later, and furnish a succession of fruit. As soon as the Grapes in the early house begin to show colour, a drier atmosphere may be maintained, and air given

liberally. Water freely the inside borders of the succession-houses, and see that the protecting materials on outside borders still maintain their efficiency. Owing to the winter being mild and open, the buds of the Vines in the latest houses will be swelling; and fire-heat, where available, should be applied, so as to get the Grapes ripe in September: they will then keep far better than when ripened in October or November. This is one of the great advantages belonging to the plan of bottling late Grapes; for the Vines can then be properly dressed, and forced earlier than they otherwise would be. The earliest house of Peaches and Nectarines will now be nearly past the stoning process, when a rapid change takes place in the swelling of the fruit; but, before this takes place, it must be thinned if too thickly set, as no more will drop off. If the trees are in good health, the fruit on them may be regulated from 6 to 8 inches apart at this last thinning. When it begins to colour, air may be given freely, and the temperature may rise to 75° or 80° by sun-heat. Succession-houses will want syringing daily, and attention must be paid to watering the inside border; for, although the surface may look moist, underneath they may be as dry as dust. Tying down the shoots as they progress, and thinning them gradually where not wanted, keeping aphides and red spider in check, will be routine work now for some time in the late houses. Keep Figs well watered and syringed daily, as red spider is a great pest to them. When the fruit begins to ripen, watering must be gradually discontinued. Stop all shoots when 6 or 8 inches long, in order to encourage a second crop. The earliest forced Cherries will now bear a higher temperature; but plenty of air must be given in the daytime, to colour and give flavour to the fruit. The supply of water at the roots must likewise be lessened for that purpose. Plenty of heat, together with light, air, and moisture, will now be required for Cucumber and Melon plants, and the shoots must be regulated frequently, by stopping and pruning them, so as not to get too crowded. A steady bottom-heat must be maintained to Melons till they flower; and, after plenty of fruit is set, liberal supplies of tepid water may be given to the roots. Sow good batches of seed of both Cucumbers and Melons for a late supply of plants, and some of the Ridge variety of Cucumber for planting out in the open air. Where plenty of room can be had in frames or in low pits, the remaining batches of Strawberries in pots may now be put in them to flower, and then be taken into the forcing-houses, as required, for succession.

Kitchen Garden.

From the crowns of Globe Artichokes remove all weakly suckers; strong grown ones, intended for new plantations, may also be carefully taken off with a root or piece of the crown and planted in lines, two or three plants, a few inches apart, being put in together, so as to enable them to have a Seakale pot put over them for a while, until they have become a little established or sheltered with boughs. As regards Asparagus, those who practice the blanching system should finish the covering of their beds. Plants grown on the level-ground plan in single rows, the alleys between which were manured and forked in the autumn, and stirred up with a strong hand scarifier, should be kept frequently surface-hoed and freed from weeds. The time has now arrived, if the ground has been brought into proper condition by means of previous deep trenching, heavy manuring, and additions of good surface-soil, decomposed vegetable matter, Seaweed, &c., for new plantations to be made. For these, choose the strongest plants that can be got from the seed-bed when they have made a few inches of growth, and having the ground levelled and in readiness to receive them, mark it off into distances of 2 feet apart. This may be considered by some to be too close; but the plan is to lift, when two years old, every alternate row for forcing, thus leaving the permanent lines 4 feet apart. In planting, stretch the line, and draw deep on drills each side of it, thus leaving a ridge just under the line. Across this ridge place the roots systematically astride, and cover them over from both sides. This is a more natural mode of planting than taking out a notch on one side of the line only, and laying in the roots fan-shaped, as it prevents any undue huddling together of the fibres. Asparagus seed may also now be sown thinly in drills, and, as soon as up, thinned by hoe or hand; using the hoe frequently among the young plants, to stir the surface and keep it open. Of Broccoli, Brussels Sprouts, Borecoles, Savoys, &c., make other sowings, to succeed those made last month, the produce of which, if big enough, should be pricked out a few inches apart. Make small sowings of Coleworts once a fortnight, in order to keep up a succession. Little Pixie, Matchless, dwarf York, and the London green Coleworts are best for this purpose. Earth up Cauliflowers, and cover the surface about the roots with a mulching of short dung or litter; leave, also, a basin round those that have had over them hand-lights, in order to supply them with soakings of manure-water. Prick off spring-sown plants, and, when fit, plant them out in succession in cool shady places. Sow Veitch's Giant in succession for late summer and autumn use; these

should be planted in partially-shaded places, such as between rows of tall Peas. Sow Carrots once a fortnight till the middle of July, in order to have nice young roots throughout the season. Of Celery sow a main crop on a slight hot-bed, and prick off the plants as soon as they are fit to handle, into a well-pulverised rich soil, such as a compost of equal parts decayed mulchings, leaf-mould, and half-decayed tarfy loam, chopping the whole rather finely, and mixing all well together. Towards the end of the month the plants, which by that time will have become strong, may be pricked out on an open border, using the same compost, or a layer of it laid down to the depth of 6 or 8 inches, on a hard bottom. The latter prevents the roots from penetrating too deeply; they, therefore, can be lifted the more easily, with good balls for transplanting permanently. Protect, if necessary, and supply water plentifully. Sow Chervil in small quantities once every two or three weeks throughout the summer, on cold north aspects. Sow Lettuces in drills; thin, and, if necessary, and the weather favourable, transplant the thinnings. Thin Onions in beds or lines, and fill up any vacancies by timely transplanting; hoe and surface-stir frequently, in order to maintain a healthy and vigorous growth. Of Peas, sow tall kinds in succession, and run a wide-toothed rake across the drills of those just coming up; draw little ridges of soil about 6 or 8 inches from the sides of the lines, in order to admit of a mulching of litter being administered, and to retain soakings of water that may be given in dry weather. Sow Round Spinach in succession in cool situations throughout the summer; plant out New Zealand Spinach, and encourage the strong winter kinds by frequent stirrings. Sow Turnips in succession, in drills, in cold moist soil for the next two months. Harden Tomatoes off, and prepare for planting them out by the beginning of May. Preserve a few plants in small pots, and expose them all summer, in order to obtain from them some short, stubby cuttings, for early fruiting next season. The older Tomatoes are the shorter jointed and more fruitful they become. This treatment is also applicable to the Cape Gooseberry. Sow Sweet Basil and Marjoram in succession; prick off those already up, and grow them on in gentle heat. Sow Angelica for next year's crop, in rows 2 feet apart. The first lot of stalks should now be ready, and should be looked to before they become too hard and strong. We too often find the herb-ground in a comparatively dilapidated condition. It should, however, now be neatly trimmed, and any blanks that exist in it should be made up. Sow Borage and Borecole, and transplant last year's plants of Fennel. Lift the roots of Horseradish, and divide and transplant them. Lift young plants of Hyssop, Lavender, Rue, Savoury, &c., and re-plant them in beds, and put in another lot of cuttings. Sow seed of the common Thyme, and plant out that previously sown. Layer and plant out singly Lemon Thyme and Sage. Make new plantations of Tarragon; removing with a knife the young shoots a little under ground, and preserving to each some rootlets; plant out in rows a foot apart. Mint of various kinds treat as Tarragon, and top-dress the beds an inch or two in depth with rich earth or leaf-mould. Camomile, divide the roots, and transplant in rather moist and shady places. Make new plantations of Tansy, Pennyroyal, Balm, &c. As regards Mushrooms, obtain good manure, fresh from the stables, and incorporate it thoroughly with sound adhesive loam, in sufficient quantity to prevent its heating violently, and thus becoming over dry. It is by imprudent over-heating that so many growers fail in producing Mushrooms of firm and useful substance, good flavour, and lasting as regards crop. The most successful place for growing Mushrooms during these next six months is in cold cellars, and other places with north and shady aspects. In such situations they are not so apt to become infested with maggots, as they otherwise would be if occupying a sunnier position; but precautions against these marauders are always necessary. To the surface of the beds now in bearing, and those just showing, if dry and crusty, give a little tepid manure-water, manufactured only from the dung of cattle, sheep, or deer. It is seldom Mushrooms are required to be grown artificially in the late summer months, when they can be procured from the fields.

A New Fibre.—A short time ago my attention was called to a sale of fibre of a novel description which was brought to this city from the South Sea Islands. This fibre was at least 7 feet in length, very strong, and apparently suitable for any purpose. I was, at first, puzzled to know what plant could yield so valuable a material, which was described as having been obtained from the stem of a tree growing in great abundance near the sea-shore. Fortunately, there was on board the vessel which brought the fibre, a portion of the so-called stem, which proved to be the adventitious root of a species of Pandanus, and constructed almost wholly of fibre. It is expected that large quantities of this new material will soon be imported here.—CHARLES MOORE, *Botanic Garden, Sidney.*

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

ROSES.

By S. REYNOLDS HOLE.

ALTHOUGH the winter seems to have been unusually propitious, the late frosts have so effectually checked the precocious growth, which was seen in the Rosarium before their influence was felt, that, here in the Midlands, we are much more backward than in an ordinary season. The Briars, planted last October, are only just breaking, and some, as yet, have made no sign. The seedling Briars are more demonstrative, and this will, I think, always be the case, because their abundance of roots will render them far more powerful to resist the vicissitudes of weather. People who have recently had a few of their toes amputated do not stand quite so securely as those do whose feet are intact, and the wonder is how those stocks, "yarked" out of the hedge-rows, thrive so robustly, and produce such glorious Roses, as they generally do. The Manetti Stocks are more forward, and so are last year's buds upon the Manetti, coming through the soil like Asparagus heads, and making the buds on the Briar look "quite emancipated" (as a talkative hair-cutter once described to me a poor boy who had been starved by his parents), when compared with their obese proportions. It does not follow, however, that the Manetti Roses will surpass in 1874, as they did in 1873, the Roses on the British Briar. Happiest is that Rosarian, who has his favourites in all forms, on the Briar (standard or seedling), on the Manetti, and on roots of their own. This year's list of new Roses is before me, and I infer from it that the French growers have hardly yet recovered from the interruptions and destructions of the war. Their number is not so large as it should be, but the well-known names are there—Lacharme, Eugène Verdier, Ducher, Levet, Damaizin, Guillot, Liabaud, Levêque, Jamain, Vigneron, Tournais, Schwartz; and these inspire pleasant hopes. And it is gratifying to observe that the spirits and confidence of "our lively neighbour, the Gaul," are not broken by his reverses, and that he is quite capable, as in the olden time, of doing full justice to his Roses in speaking of their merits to his friends. These seem, as usual, to be all that eye or nose could wish—very large, very full, very lovely in colour, and perfect in form. They are "incomparable," "most effective," "dazzling," and "superb." Somehow, we old fogies do not find ourselves quite convinced, having reached that stern epoch of existence in which it becomes necessary, before our eyes are "dazzled," to have a peep at the sun. In the meantime, I have only to say that I hear, from trustworthy brethren, very favourable reports of Lacharme's Captain Christy, and that I shall shortly have reliable descriptions of other novelties, which shall be communicated to THE GARDEN. Blooms of two new Roses have been sent to me for inspection, both bearing the same name, Duchess of Edinburgh; but as different from each other as Roses well could be. The first which reached me is a hybrid perpetual from Mr. Bennett, of the Manor Farm Nursery, Stapleford, Salisbury, and is a beautiful large blush Rose of the Marguerite de St. Amand type, very full of petal, symmetrical in form, making healthy vigorous wood, with fine fresh foliage and delicious fragrance. The second is from Messrs. Veitch, of the Royal Exotic Nurseries, at Chelsea, a bright cherry-red Tea Rose, quite distinct and new, evidently of free growth, and sure to yield abundant Roses of great value for decorative purposes. We shall see it a favourite in Covent Garden Market by-and-bye, in button-holes and bouquets, in the Rose-house and the conservatory. Mr. Bennett also sent me flowers of a charming Tea Rose, Madame François Tanin, in colour a bright orange—a real *bouton d'or* for the coat. Roses under glass are blooming excellently. My best are the Maréchal, Marquise de Castellane, La France, Mdlle. Eugénie Verdier (these two *belles* of the Rosarium seem always to be meeting in rivalry, but I most admire the first), François Michelon, Paul Neron, &c. Souvenir de Poiteau and Charles Turner are very good Roses to force.

OUR FRUIT PROSPECTS.

ANOTHER mild winter and spring, with a few sharp frosts in March, have resulted in the general wreck of the Apricot crops, and the injury of many of the forward blossoms of Peaches and Pears. As to Peaches, they have, upon the whole, escaped better than might have been expected. They were later, and they are also harder, than Apricots. Structurally, the blossoms seem very much the same; but their distinct and differing powers of endurance have long been noted. It would be interesting to discover how much of the Peach-blossoms' extra power of withstanding cold is owing to their bright colour. Paleness and tenderness often go together. Two lessons all fruit-growers should study. One is the importance of getting trees to flower late in the open air, and the other the necessity of providing more efficient shelter in the spring. Something may be done towards the first by a partial change of aspect. May we not be wholly wrong in invariably giving Peaches, Nectarines, and Apricots, a south or west wall? The result is a maximum amount of heat, often at the wrong season. The trees live, in March, between fire and ice. Now the sun beats upon them, and their sap flows forth with a rush, impelled by a mid-summer heat of from 70° to 90°; within a few hours a mid-winter frost chills and freezes their juices—15° of frost—a difference of, it may be, over 70°. Under such extremes as these, is it any wonder that the tender blossoms succumb? On an east or north-west wall, the trees would be colder, it is true, but they would, also, be later; and this lateness would prove their safety. The idea seems to have prevailed that our trees cannot be active too early. This is wholly a mistake. They gain nothing by being excited so early in spring. Our summers are long enough and warm enough to ripen Peaches and Apricots, did they not flower till the middle or end of April. It is not by a series of starts and checks that good fruit is perfected; but by a process of constant and cumulative growth. The latter would be the result of a late start. Some of the finest Apricots I ever gathered were the produce of an east wall. They bloomed late, and never missed a crop; and the flavour was superior to the half-baked produce of walls facing due south. Further, we want strains of late-blooming Peaches, Plums, Nectarines, Apricots, and Pears; not later sorts, but later bloomers, as distinguished from late varieties. Here is a new field for hybridisers, in which each week abstracted from the season of flowering would be a clear gain to practical horticulture. Mr. Rivers has done much to extend our season of superior fruits at both ends, by giving us earlier and later, as well as superior, varieties. I hope he may at some time turn his attention to the procreation of late-flowering varieties, as I know of no one so likely to succeed in the matter. Already we have considerable difference in the time of flowering; and, by working with the latest kinds, later and yet later might still be produced. Another point of importance would be any additions to the substance of the flowers themselves. There are great differences in the self-protecting forces of the flowers of fruit-trees, and the slightest addition to these is of more service than almost any amount of external or extraneous protection. But, so long as later-flowering varieties of fruit-trees, stronger, better guarded, and, therefore, harder flowers, are desiderated, there cannot be a doubt but that we must have more efficient shelter if we are to carry our fruit safely through our springs. We need, at least, glass-copings, or glass-cases, or glass-houses to ensure outdoor crops. Of most of these I have written in former seasons, and need not enlarge on them now. Glass copings I found the best protection against 15° of frost during the month of March last. They are 18 inches wide, and slip under the copings of the walls. Under them, Apricots, in full flower, have preserved a fair crop; while other trees, not so sheltered, have failed. Peaches seem, also, quite safe. Still, in addition to these modes of protection, and also as a substitute for them, I would recommend flued walls in all cases of erecting new garden walls. They need add but little to the expense, and, of course, the fires would not be lighted unless needed. But, during exceptionally cold weather in the spring, or wet, comparatively sunless, autumns, the application of a little fire-heat behind the trees would prove the means of safety to the blossoms and of perfect maturation to the fruits.

D. T. FISH.

NOTES OF THE WEEK.

— WE have received *Primula denticulata pulcherrima*, beautifully in flower, from Messrs. Backhouse, of York. Its flower-heads are as round as balls, fully 2 inches in diameter and as compact as those of a Guelder Rose. Individually the blooms are much larger and more richly-coloured than those of *P. denticulata*. Altogether it is a fine addition to our outdoor Primroses.

— THERE is now a fine display of hardy spring-flowering Alpine and herbaceous plants in the Royal Exotic Nursery, Tooting, both in pots and in the open borders. Scarcely any other classes of plants better repay careful cultivation than these, or cost less to grow them in perfection, and we are glad to see them rising once more in popular favour.

— THE transformation works in Leicester Square are now in a very advanced state, and are still being pushed rapidly forward. Already has the whole of the turfing been laid down, and the walks have been marked out, while, among various other operations in progress, a number of stone-cutters may be seen busy chiselling the stone-work of the great central fountain.

— THERE are no fewer than 160 varieties of Plums growing in pots in the Royal Horticultural Society's Garden at Chiswick, and most of the trees are now profusely in bloom. This collection is a valuable one, and if, as may reasonably be expected the trees bear well, a comparison of their habits and fruits will, doubtless, furnish some valuable information concerning our different varieties of Plums; due allowance, of course, being made for the restricted conditions under which they are grown.

— A BRISK trade in dried Potatoes has lately sprung up in America. They are sliced up and dried in much the same manner as dried Apples. One firm in Rochester has an order on hand now for 50,000 pounds of these dried Potatoes, as well as for 1,500 bushels of Onions, which are dried in much the same manner. They are intended for the navy. A bushel of Potatoes dries away to about ten pounds, and a bushel of Onions to about six pounds. When ready, they are put into large tin cans, holding about forty pounds each, and sealed up the same as oysters.

— ON Tuesday next, the 21st inst., a special meeting of the Fellows of the Royal Horticultural Society will be held at South Kensington for the purpose of taking into consideration the expediency of conferring (as has been proposed) upon male Fellows the power of voting by proxy. The question is one of high importance to the interests of the Society, and, as very great diversity of opinion is known to exist amongst the Fellows respecting it, there can be little doubt that it will form the subject of a very lively discussion, the result of which will be anxiously looked forward to by both sides.

— THE New Chelsea Embankment is to be opened on the 1st of May. The indispensable portions of the work are now completed, and the ornamental portions are being rapidly pushed forward; the entire length, extending from Battersea Bridge to Chelsea Old Bridge, has been planted on both sides with rows of Linden trees. The mud-banks fronting Cheyne Walk, and extending from Queen's Road to the Albert Bridge, and thence to Chelsea Bridge, 700 yards in length, are laid out in Grass plots and flower-beds, planted with bulbs, roots, and flowering shrubs.

— AT the meeting of the Royal Horticultural Society on Wednesday last, Mr. Denning exhibited three very large-flowered *Masdevallias*, viz., *M. Harryana*, with enormous blood-coloured sepals, tinged with purple, the lateral sepals being nearly 3 inches long, and about as much across. Another variety, slightly smaller, seemed to form a connecting-link between this beautiful but variable plant and *M. Lindenii*, a plant of which was also shown for comparison. This intermediate form convinced us that the two supposed species (*M. Harryana* and *M. Lindenii*) are identical. Cultivators may distinguish them by the basis of the connate sepals generally being white in *M. Lindenii* and yellow in *M. Harryana*, although this is not invariably a reliable distinction.

— IN a correspondence which lately took place between Mr. Gladstone and Mr. Algernon Clark, the secretary of the Chamber of Agriculture, on the subject of the Colorado beetle, Mr. Clark expressed his fears that this beetle, which has made such terrible havoc amongst the Potato crop in America, would be brought over to this country. The views expressed by Mr. Clark are confirmed by Mr. Riley, the American entomologist, who, in a communication to the *New York Tribune*, expresses his belief that, if once this pest reaches the Atlantic seaboard, there will be great danger of its finding its way to Europe; for the impregnated females will live for weeks, and even months, without food, and might, in their flight, cling to the rigging of outward-bound vessels, and so be transported to these shores. As a means of preventing the evil, Mr. Riley suggests that the various agricultural and horticultural societies should disseminate, as much as possible, correct information concerning the

insect; and recommends that a small card, giving coloured figures of the beetle in its different stages, should be posted in the cabins of vessels, and other places, with a note calling upon the reader to do all in his power to exterminate the terrible scourge.

— MR. MARNOCK has sent in a plan for the new park at Sheffield. Its adoption has not, we believe, yet been actually decided upon, but in all probability it will be. It is intended to commence operations in the way of laying out the park early in May.

— WE have received from Northampton some splendid heads of Watts's Excelsior Broccoli—close, firm, and of milky whiteness. Fine as these are, however, they were surpassed in excellence by heads of this Broccoli grown at Barghley and exhibited by Mr. Gilbert at South Kensington, on Wednesday last. These were in unusually good condition.

— SOME prettily ornamented flower-pot screens were exhibited by Mr. W. H. Honey, of Regent Street, at the Royal Horticultural Society's Meeting on Wednesday last. They are made of stiff cardboard and can be readily folded up into a small compass when not in use. Attractive as this ingenious contrivance undoubtedly is, it would be still more so if it were either six or eight-sided instead of square.

— AMONG the most showy of herbaceous perennials now in flower is *Doronicum austriacum*, a fine tuft of which is flowering freely at the Exotic Nursery, Tooting. This plant, though not rare, is by no means so often met with in gardens, as, owing to its free and early blooming qualities, it deserves to be. Its large golden-yellow flowers are particularly striking, either in borders or margins of shrubberies.

— IT may be recollected that the floral decorations at Buckingham Palace, during the Shah's temporary residence there, consisted almost wholly of Roses, selected with a view to recall to his mind his own Persian "gardens of Gul in their bloom;" and so struck was his Majesty by the splendid display of these flowers which daily met his eyes, that he has, we are informed, sent an order to Mr. Wills for an extensive assortment of the same kinds to be despatched immediately to Persia.

— IN the current number of the *Revue Horticole* is a beautifully coloured plate of *Lagerstræmia indica*, a plant long since introduced to our gardens, although now very rarely seen in cultivation. It grows freely in a warm greenhouse, bearing conical clusters of deep rosy flowers, their divisions being very crisp or wavy, and borne on slender stalks, nearly half-an-inch in length. A plant of it at Kew, 8 or 10 feet in height, flowers every season in the Palm-house, in the greatest profusion. In the neighbourhood of Paris it succeeds perfectly out of doors in summer.

— FROM the American "Monthly Report of the Department of Agriculture," we learn that in several of the States, market-gardening is very much on the increase, and that in the neighbourhood of Hudson, New Jersey, the "farmers are selling or leasing their farms to market-gardeners, who are doing a large and lucrative business." One cultivator is mentioned as having 15 acres under Strawberries alone! Another, in Monmouth county, "who has 6 acres in Wilson Blackberries, sold, last season, fruit to the value of 3,000 dollars (£600)."

— LAST autumn, a deputation of labourers on the estate of Lord Spencer waited upon his lordship at Althorp House, Northamptonshire, and requested him to allow them acre allotments for their own cultivation. Lord Spencer promised to give the application due consideration; and he has since informed the men that he has determined to try the experiment, and will commence with half-a-dozen acres next spring, to be divided among as many men, the number to be increased should the experiment prove successful. His lordship also fixed the mode of selection. At present, the labourers on his estate have Potato ground, for which they pay a low rental. An inspector is to go over these in the ensuing summer and autumn, and the occupiers of the best cultivated patches will receive the first acre allotments.

— NARCISSUS TRIANDRUS, a rare and distinct species of Daffodil, is now in flower at Mr. Parker's nursery at Tooting. The flowers of this kind are of a lemon-yellow colour, and the divisions of the perianth are turned back, in somewhat the same manner as the petals of a Cyclamen. Besides this Daffodil, there are several other showy bulbous plants at present in flower in this nursery, notably the fine *Fritillaria uniflora lilacina*, which is a much more attractive plant than the common form, its flowers being of a fine blue colour throughout; *Puschkinia scilloides*, to which we directed attention a week or two ago; *Fritillaria latifolia*, a large form of the common Snake's Head; *Muscari Heldreichii*, and a goodly number of the commoner kinds of Grape Hyacinths, such as *botryoides* and its varieties, and *racemosa*, are also all just now in good condition in the same establishment.

THE FLOWER GARDEN.

HOW TO MAKE THE MOST OF SPRING FLOWERS.

In a garden at Weybridge, one of the most beautiful spots within half-an-hour's rail of London, is a picturesque mass of root-work of considerable extent, which has this spring exhibited a display of floral beauty rarely seen. The proprietor, one of our most enthusiastic lovers of horticulture has built up a root-work, so bold in its general outline, and so picturesque in its details, that the effect is quite Alpine; and, on approaching it, one expects the odours of the wild mountain Thyme to arise from beneath every footstep and fill the air with perfume. Where large masses of stone, in their natural forms, are not available, "root-work," as it is termed, may be substituted; but the wretched attempts to create a simulation of a rocky mountain-side that one often sees in suburban London, and also farther a-field, are truly distressing exhibitions to all of cultivated taste in horticultural decoration. The construction of simple

it takes nothing away from the rugged picturesqueness which is naturally sought in rock or root-gardening, as shown in the fragment selected for illustration. This kind of pseudo-Alpine gardening has many advantages; it protects small and delicate plants from the reckless spading and forking which they meet with when confided to the tender mercies of an unskilful workman in open borders. Their slender roots remain as undisturbed as in their original mountain homes, and they strew their seeds freely into the adjoining nooks and crannies, where their offspring arise around them unmolested by rash rakings and other kinds of interference. This last-named advantage is one productive of many kinds of interest; such as watching the growth of seedling plants, which have, possibly, never been seen in their earliest stages of existence by the ordinary amateur; and, also, by arousing a natural expectation that new and unusual varieties may appear among the seedlings, which is a never-failing source of pleasant speculation to true plant lovers. Another advantage of growing Alpine and other plants in this way, is the facility with which the specially favour-



Root-work embellished with Spring Flowers.

root-work is a much safer proceeding than forming a mass of miscellaneous matter in the shape of rock-work, even where not guided by taste of the best description, because, in the first place, the whole of the material employed is homogeneous in character; because, in the second place, old roots have a tendency to clothe themselves very rapidly in a raiment of Moss and Lichen of many tones of rich olive and tender grey; and because, in the third place, big root-stumps, left untrimmed, will, when piled together, however clumsily, persist in assuming more or less picturesque forms, in spite of the most inartistic arrangement.

The masses of root-work, in the Weybridge Garden, have been put together with consummate taste; they have been so arranged that the parasitic accretions of Moss and Lichen had every opportunity of developing themselves in the most favourable manner, so as to unite the different masses of root, and blend them, with beautiful tintings, into a broad general effect, which entirely conceals the fact of the mass being composed of a number of detached pieces, while

able aspect and exquisite degree of shelter may be afforded to each class of plants. The recesses or plant-niches, naturally formed by the ramifications of the greater roots, inevitably face nearly every point of the compass, affording a northward nook for tufts of shade-loving Maiden-hair Fern, an eastward-looking home for tufts of Primroses, and such plants as love the morning light but droop before the mid-day glare; and southern or western aspects for plants which delight in them. In the noble piece of root-work alluded to in this description, the plants have been grouped and classified in a most effective and interesting manner; not always as to mere colour, but invariably as to general form and character. Thus, the group represented in the annexed illustration consists entirely of Hepaticas. The pretty niche-like recess in the centre is occupied by a fine root of *H. alba*, with white stamens; and to the left, in front, is a tuft of the smaller white kind, with reddish stamens; a double variety to complete the group of whites would be desirable, but no double white is at present known. Its place might be supplied, perhaps, by a mass of

double Wood-Anemone, which flowers about the same time. To the right, in front, is a small mass of the large mauve kind, *H. Barlowii*, a very handsome plant; and to the left, in a crevice between two pieces of root, *H. angulosa* has been established. This species is very distinct; the narrow petals, of bright carmine blue, resemble those of the Blue Mountain Anemone, and the foliage, as will be noticed, is also materially different from that of other kinds. On the extreme right, the old *H. cærulea* is seen peeping above a mossy projection, while the double-blue variety has not been added to this family group in consequence of its time of flowering occurring at a later period of the spring. On the top of the large mass of root that forms the niche below, is a fine tuft of the pale single Pink; and beyond, though not visible in the illustration, are two varieties of deeper red, one of them nearly crimson. On the extreme left, a glimpse is obtained of the beautiful double red, with its profusion of exquisitely perfect flowers, that look like a crowd of pigmy Roses—a kind which forms the glory of many a cottage border, defying the snow and hail, and bitter winds of March, from which the delicate beauty of its blossoms does not appear to receive the slightest injury. Such is the charming family group of Hepaticas, which has been established in such picturesque fashion among the artistically composed mass of root-work at Weybridge. There are many other floral beauties of the early spring displayed in a similar manner—masses of *Scilla verna*, for instance, with its pretty blooms of intense metallic blue—and, in another section of the root-work, a rich representative galaxy of the Primrose tribe. Above all, there is an exquisitely delicate group, most gracefully niched, of three distinct kinds of early Snowdrops, of which a drawing has been made expressly for THE GARDEN, and which will appear soon. These hints and descriptions regarding the formation and planting of root-work will enable those, whose tastes lead their horticultural industry in that direction, to make timely preparations for the production, next spring, of interesting groups of spring flowers as charming as those at Weybridge, which were so well worth a pilgrimage to see and admire, at the time when the drawings for these illustrations were made. H. N. H.

DOUBLE DAISIES FOR SPRING BEDDING.

REFERRING to the notice of the arrangement of a choice spring border, consisting of eleven varieties of double Daisy, double Van Thell Tulips, with bands of *Myosotis dissitiflora*, and mixed *Crocus* at back and front, described by me at page 459 in your last volume, I shall now proceed to give you my opinion as to the relative merits of the different varieties of Daisy used with a view to effectiveness in the decoration of spring borders, which I hope may be of some interest to those of your readers who take delight in pattern bedding.—1. Dickson's crimson-quilled Daisy (supplied to me by Mr. R. Dickson, of Erdington, near Birmingham), which was used for composing the whole of the ten circles, has proved itself most effective, and of first-rate quality for general bedding purposes, the colour being bright and clear, and an abundance of bloom being continuously produced on tall foot-stalks, well raised above the foliage.—2. Pink, Little Dandy, an exceedingly free-growing and pretty Daisy, making a pleasing contrast with the larger-flowering varieties, and evenly quilled.—3. Hen and Chickens Daisy. This variety, I think, unfit for this kind of work, as it is one of the latest-blooming of all the Daisies, and does not produce its flowers with any freedom till the middle of April or beginning of May; it is also too pale and undecided a colour to be effective.—4. White Queen. A variety which was strongly recommended to me by the nurseryman from whom I bought it, but which has proved utterly worthless, showing a large yellow centre.—5. Crimson King. A very good double red Daisy, free-blooming, and producing flowers of good size and substance, of a lighter shade than, and quite distinct from, the variety described as No. 1 in this list. This variety can be purchased in any quantity outside Covent Garden Market, at the moderate price of 1s. per dozen plants, and should be in every collection of Daisies.—6. Henderson's Snowball, certainly one of the best and most fully and evenly double, if not the best white, Daisy in culti-

vation, as well as by far the earliest to come into bloom. Its flowers are of a medium size, but are produced in great abundance and in regular succession, and are well raised above the foliage, which is not by any means of so vigorous or robust a habit of growth as that of most Daisies; in fact, I should say that, unless in soils and aspects that specially suited it, this fine variety might prove of a delicate and unsatisfactory constitution; but, where it thrives, it would be, indeed, hard to beat it.—7. Double red-flowered *Aucubafolia*, an exceedingly effective and ornamental Daisy, but, unfortunately, one for which the voracious and night-crawling slug has a peculiar partiality, it being the only variety touched by these animals, who, during the early part of the winter, nearly ate away four out of the six plants composing this central clump, while, strange to say, they did not touch the equally conspicuously-variegated white-flowered variety growing alongside of it in the very next circle.—8. White-flowered *Aucubafolia* (Flower of Spring). This fine novelty, raised by an amateur florist near Reading, and sent out for him by Messrs. Henderson, of St. John's Wood, is a great and decided acquisition to this class of plants, being of exceedingly free and vigorous habit of growth, and producing its pure white-quilled flowers in great profusion, which form a very pleasing contrast to the brilliant golden variegation of the foliage.—9. *Bellis roseo-tincta*, sometimes known as Pink Beauty. A most delicate and lovely variety, resembling, when the flowers are not quite fully developed, a beautiful Persian *Ranunculus*, the ground colour being blush-pink, and all the petals clearly and distinctly tipped with deep rose. Unfortunately, the flower is not quite as fully double as could be wished, many of the flowers, when fully expanded, showing a more or less hollow centre and deficiency of petals. This, I should think, might be remedied by judicious culture, selection, and hybridisation, by which means the flower might be made to come more evenly and fully double, while preserving its exquisite delicacy of tint. Still, even though unimproved, it will always commend itself to amateurs, who are not over particular, for its unique and delicate beauty.—10. *Bellis grandiflora bicolor*. A handsome parti-coloured Daisy with alternate petals, white and crimson, and of immense size and substance when it comes out really well; but, unfortunately, it is not to be relied on for early or regular blooming, for which reason I do not think I should include it in a choice border another year, but should substitute for it an exceedingly pretty deep crimson form of little Dandy, recently received from a lady friend, and apparently quite distinct from its type.—11. *Bellis Ranunculiflora*. The latest-blooming of all the Daisies known to me, and so unfit for use in an early spring border, such as the one now under consideration; in colour, this variety is almost exactly similar to the last-named variety, but the flowers are rather smaller in size, and the habit of growth is, by no means, so vigorous. It may be useful for later work, either as an edging, or in clumps, with some of the bedding Pansies or Polyanthus. I have, also, recently received a single plant of an apparently perfectly distinct and fully double white Daisy, obtained by the friend (who sent it to me for trial), I think, from Mr. George Poulton, of Edmonton; if this turns out as good as it at present promises to be, I shall, in all probability, substitute it in my next pattern border for the worthless semi-double White Queen. I have, also, received from Mr. R. Dean, of Ealing, a pretty light pink-flowered form of *Bellis aucubafolia*. Some of the new Victoria Daisies raised by Mr. B. W. Knight, of Battle, Sussex, are very fine indeed, though many of them, necessarily, closely resemble one another; but, as only a few of them are yet in flower, I must reserve further notice of them for the present.

Junior Carlton Club.

W. E. G.

ARRANGEMENT OF PLANTS IN VASES AND BASINS.

IN formal or architectural gardens, where ornamental stonework, in the shape of basins and vases, abounds, it is often possible to render them very attractive during the summer months by means of plants in pots, especially where the masonry is artistic in design. The accompanying woodcut, showing such stonework draped with elegant forms of sub-tropical vegetation, will serve to illustrate our meaning. We have many plants at command peculiarly well suited for this

kind of ornamentation; indeed, many of our common foliage-plants, grown in pots in the conservatory or greenhouse are greatly improved, both in health and appearance, by being grouped outside during the summer months. This is especially the case with plants that do not receive the benefit of fire-heat during winter, as the growth made outside, while they are fully exposed to shower and sunshine, is better able to withstand a low winter temperature than that made in a comparatively close and hot temperature. The best plants to use in this way are the more hardy Palms, Ferns, Solanums, Cannas, and the larger succulents, as Agaves, Aloes, Sem-pervivums, and Echeverias. Some of our greenhouse Yuccas, as *Y. aloifolia variegata*, and *Y. quadricolor*, are, also, all the better for being fully exposed during summer; indeed, we have seen the foliage of the latter stained with the deepest crimson after having made its growth outside, and in that condition it is one of the most effective of all hard-leaved decorative plants. In some large gardens, Agaves, Pomegranates, Oranges, Myrtles, and Portugal Laurels, are grown in pots or tubs, specially for the above-mentioned purpose, and grouped inside an ornamental stone kerb; in this way they are set off to much better advantage than when formally placed at regular distances apart along a terrace, or margin of a walk or drive. A few striking foliage plants tastefully grouped, as shown in our illustration, is far more pleasing and effective than large specimens arranged with no higher aim than that of formal symmetry. Plants about to be placed out-of-doors,



Vase and Basin furnished with Plants.

from under glass, must, however, be gradually inured to the external temperature before they are finally grouped outside in beds or vases. B.

SAXIFRAGES.

By J. C. NIVEN, Botanic Gardens, Hull.

The Mossy Group.

IF, in the foregoing series of articles, which embraced the more important crustaceous Saxifrages at present in cultivation, I found some little difficulty in identifying to my satisfaction, the various species and varieties, I fear in dealing with the mossy section a far more difficult task awaits me. There is such confusion in the names, such similarity in the growth and habit of the plants, and such divergence in general appearance induced by the varying circumstances under which they may be cultivated, that I plainly foresee my task is not a light one. Engler, in dealing with this section in his "Monograph," evidently has studied the plants in their dry state as they occur in herbaria, more than in the living state; and, as a result, I must in some cases differ from him, more especially in the sequence under which I propose arranging the species. Both my grouping, as I before stated, and the order in which I arrange the species in those groups, are based on external appearances, rather than on technical distinctions, and I am not a little pleased to find that general affinities, even though these

be to a great extent purely botanical, are not unfavourable to my arrangement.

S. Burseriana of Linnæus, is a species that appears to form, as it were, the keystone of the arch connecting the crustaceous and the mossy sections together; it is a dense compact-growing plant, with tapering, almost triquetrous leaves, each terminated with a stiff mucro, the whole forming a compact mass of glaucous green, that reminds one a good deal of some of our dwarfest forms of Junipers. In verification of the statement I have made, that this forms the connecting link between the two sections, I may say that this glaucous tint, is owing to the whole surface being suffused with a crustaceous exudation not exactly uniform, it is true, but giving a thoroughly marked character to the plant. Not only in this have we a character that links it with our last section, but a still more marked one in the flowers; these are produced sparsely, each supported on an almost naked foot-stalk about 2 inches high. The flowers are large as compared with the size of the plant, of a creamy white, the pedicels being covered with a short glandular pubescence. Though this plant must be looked upon as comparatively rare in cultivation, it appears to enjoy a tolerably wide geographical range, including the Pyrenees, the Maritime and Swiss Alps, the Apennines, and extending eastwards even as far as the Mountains in Tauria.

S. juniperifolia of Adams—more generally cultivated under Haworth's name of *juniperina*—is a species that will be familiar to all Saxifrage growers. It is of rigid and compact growth, its leaves, entire, subulate, and mucronate, are arranged in dense rosettes of the brightest shining green, the whole forming a conical mass, whose beauty will arrest the attention of even a casual observer. It rarely flowers; never, indeed, have I seen, even from a large tuft, more than one or two of its dense leafy spikes developed; these rise about 1 inch above the general surface, and are surrounded with incurved glandular bracts to such an extent that the flowers individually are scarcely visible; this is of the less importance, as their beauty depends a great deal more on the large golden protruding anthers than on the petals, which are small, and, in some instances, absent altogether. This species may be readily increased by careful division and a little judicious management afterwards. It is confined to Asia Minor, where it is met with in the Caucasus, and Armenia.

S. tenella, originally described by Wulfen, is, as its name implies, a slender grower, and especially when compared with the last. Here we have creeping stems covered with linear, slenderly-mucronate, golden-green leaves, not adpressed—there we find a rigidly and densely caespitose habit of growth, dark shining green being its universal characteristic. This slender Saxifrage flowers freely on erect branching stems, and is remarkable for the well-defined ovate capsule that remains after blooming; rarely, however, does it mature perfect seeds in this country. Its flowers are pure white; this, along with its neat habit, renders it a desirable plant for the rockery, where it should have a well-drained warm sunny corner, as it is most impatient of damp, not unfrequently rotting off in a mass, if kept during winter in a frame on a cold sub-soil. It affects limestone districts in Croatia and Slavonia, and is also met with on the Alps.

S. aspera of De Candolle, is well named the rough Saxifrage; to its procumbent stems, the very appropriate title of caudiculi, meaning "little tails," is given by descriptive botanists. These stems are covered with loosely arranged linear leaves, provided with stout ciliae along their margins, and terminated with a stiffish bristle, giving a general rough feel to the plant; added to this, its growth is irregular, and it has an habit of hibernating, if I may use the anomalous term, during the hottest part of the summer, when it presents a greyish-brown uncomfortable appearance. Rarely does it bloom, at least in cultivation, and its flowers are by no means conspicuous. Seeing, then, that its chief value consists in its being a well-defined distinct species, I need enter into no further details, beyond saying, that it enjoys a wide distribution through the whole of the South European Alps.

S. bryoides, though looked upon by Engler merely as a variety of the preceding species, is so thoroughly distinct, that I prefer retaining the old Linnean specific name, than which nothing can be more appropriate, so exactly does the appearance of the plant represent the growth of some of the Bryums. In aspect it forms a carpet of light-coloured green, consisting of innumerable little tails, varying in length, not one-fourth the size of those in *aspera*; each tail is covered with a dense arrangement of adpressed linear leaves, terminated with soft hairs, but totally devoid of the rough bristly character of the last. Its flowers are small, generally two on a peduncle, elevated an inch or two above the general surface, somewhat yellowish in colour; not, however, produced in any abundance. It is to its general appearance, irrespective of bloom, altogether, that this plant owes its beauty. It is by no means a strong rooter, and where a few worms take possession of the pan in which it is culti-

vated, they soon give it a ragged appearance; and will, if not removed, completely loosen it from its root-hold. It has not the peculiar hibernating property of the last species, and, consequently, retains its fresh greenness through the entire summer. In its geographical distribution, bryoides is to be met with pretty generally through the whole of the central and south European Alps.

S. sedoides of Linnaeus, as I stated in a previous article, was long cultivated under the name of *arctioides*. It appears to claim a very close relationship to the preceding species, differing chiefly in the tiny leaves being rather more rosulate than caudiculate, and in not being adpressed, but rather the reverse; its petals, also, are narrower. Lacking, therefore, as it does, the more attractive features of the former, merely chronicling it as a species will suffice.

S. Seguieri of Sprengel and *S. Androsacea* of Linnaeus are so closely related, that I may consider them under one heading. As to the characters they possess in common, we have a dwarf dense growth, the tuft of radical leaves scarcely rising half-an-inch above the surface of the soil; the tail-like character, which we found in several of the foregoing species is totally absent here; the flowers are small, elevated on foot-stalks about 2 to 3 inches high, pure white, those of the latter species bearing a very marked resemblance to the genus *Androsacea*, from which it derives its name, owing to a greater rotundity of corolla, and also to its petals being emarginate, or slightly notched inwards at the points. The most important distinctive character consists in the leaves of the former being lanceolate and entire; those of the latter have generally three, or even sometimes five, teeth towards the apex; usually speaking, however, the central one is so large, as compared with the side ones, that they are apt to be lost sight of; it, however, indicates the first change into the notched or divided-leaved section of the mossy group. It is very seldom one sees either species happy and thriving in cultivation. My success in either case has not been satisfactory. Drought they cannot bear, and to shade they appear to have an equal objection. I fancy those double-walled pots I alluded to when describing the garden at Benthall Hall, and which are now to be purchased in the trade, will be admirably suited for such plants as these. Possibly some of the want of success may be attributable to a too great greed for division when the plants are first introduced, sacrificing health and vigour in the whole for the gain of a few plants. Geographically speaking, both plants have a pretty wide distribution. *Androsacea* extends through the mountain districts of Europe as far as Lake Baikal, in Asia; *Seguieri* is generally met with at very great altitudes, and, no doubt, has a tender affection for the pure cool draught at the snow-fountain.

S. Stelleriana of Merck, is looked upon by Engler as a variety of *S. bronchialis* of Linnaeus, to which he applies the name *cherlerioides*; and, unquestionably, the plant that we have long cultivated under the above specific title is identical, so far as I can make out, with this variety, albeit, Engler's name is not a very happy one; but, seeing that I have never met with the true specific type in cultivation, I am disposed to retain it as a species, at least till such time as we get the true *bronchialis*; it is a creeping plant, its procumbent caudices being well furnished with somewhat fleshy, small, concave leaves, beautifully ciliated along their margins, and broadly lanceolate and spatulate in shape; its flowers are supported on short glandular pedicels, are of a greenish-white, and are produced in very limited numbers. Its home is in Siberia, where it has an extensive range as far as Behring's Straits, occurring also on the American Continent at Unalashka, and along the range of the Rocky Mountains for a considerable distance.

S. tricuspidata of Retzins, has long been in cultivation, and is one of the species belonging to this section that carries not only its specific character, but its very name, on the face of every leaf; it is much closer allied to the last species than would at first sight appear—larger in growth and foliage, with the leaves less densely arranged on the procumbent branches; during the summer, the leaf margins are tinted with a beautiful chocolate-brown, which colour covers the entire plant during winter. Its specific character is derived from the leaves; these are fleshy, distinctly divided into three pointed mucronate lobes at the apex, the centre or terminal one being much the longest, each margined with a hard cartilaginous mass. Its period of blooming has varied much with me—sometimes in April, but more generally in August or September. The flowers are four or five in number, supported on a slender pedicel, and of a pale yellow or straw colour, which contrasts very prettily with the small chocolate lobes of the calyx. It is a native of North America, where it extends from Kotzebue Sound to Greenland, and far into the Arctic regions. Sometimes a slight variation occurs whenever the two side teeth are suppressed, or merely represented by two stiff bristling hairs; and to this form I have seen the name *cuspidata* applied; but, as I find this variation occurring frequently on the *S.*

tricuspidata plant, and possessing no constancy of character, it would clearly be wrong to give it the status even of a variety. Added to this, there is a perfectly distinct species not at present, I believe, in cultivation, to which the name *cuspidata* is given.

S. spathulata of Desfontaines, as a species ought properly to take its position between the foregoing, possessing, as it does, entire leaves devoid of any lobes or notches whatever. The plant consists of a number of procumbent stems, well covered with foliage, sometimes arranged in rather dense small rosettes. The leaves are entire, lanceolate, concave on the upper surface, and edged with delicate spider web-like ciliae. Its flowers, which are produced more freely than in either of the foregoing species, are whitish, growing in threes or fours upon naked peduncles some 4 inches long. It is a north African species, and is met with as far inland as Mount Atlas, where it grows at a considerable altitude. In spite of its southern origin, it is found to be perfectly hardy in cultivation, if planted in a well-drained and thoroughly exposed corner of the rockery.

A Twofold Chord of Spring Beauty.—The highest beauty is mostly composed of the simplest elements. By patting too many colours into our pictures we spoil them; we produce distraction where we ought to find repose. We want embroidery aglow with beauty for the early spring, or a double shading of two colours that shall produce a striking contrast and yet yield repose. You have only to dip your brush—trowel, I mean—into two large beds of golden Thyme and the early Forget-me-not (*Myosotis dissitiflora*), plant them everynow, anyhow, near each other in masses, patterns, beds, lines, straight or curved, and they are beautiful; the eye never wearies of them. In bright colours and style of growth so different, yet so in unison, they form one of the most effective of all combinations. Another twofold chord of beauty is formed of the white *Arabis* and the same Forget-me-not; the one seems so much whiter, and the other so much bluer by contrast. Primroses, again, are fine against the Forget-me-not; in fact, I know no yellow, orange, or white, that is not improved by close proximity to this lovely Forget-me-not. It should not, however, be put near to *Aubrietias*, nor blue-violet, nor violet, nor purple flowers of any kind. For carpeting for golden Daffodils it is superb; the latter, ruffled by the wind, seem, indeed, dangling in an azure sea. But, enough; else my friends will declare that I have Forget-me-not on the brain. It is, certainly, the pet of all the flowers of the spring, and in beauty far exceeds them all.—D. T. F.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The Pasque Flower (*Anemone Pulsatilla*).—This beautiful old plant ought to have a place in every garden, however small, as it requires no care and but little room. I have a fine plant of it, which has not been disturbed for years, and which is a most beautiful object every Easter. This season it has produced from fifty to sixty of its beautiful silky blossoms.—J. WHITTAKER, *Mortley, Derby*.

Varieties of Primroses now in Flower in the York Nurseries.—The following, many of which are very beautiful, are now in flower here, viz.:—*P. amœna* (one of the earliest, commencing early in March), *purpurea*, *denticulata*, *pulcherrima* (Bach.), *integrifolia*, *Candolleana*, *Dinyana*, *villosa*, *vera*, *viscosa*, *navalis*, *marginata*, *glaucescens*, *Wulfeniana*, *tyrolensis*, *ciliata*, *minima*, *auriculata*, *farinosa*, *farinosa v. canalis*, *commutata*, *Ginsiana*, *canensis*.—RICHARD POTTER.

The Dwarf Flag (*Iris pumila*).—This pretty little *Iris* is now being brought to Covent Garden Market in quantities, and it well deserves attention. We have grown it in a warm peaty soil, with a good sprinkling of sand, and, when so treated, it thrives well and flowers profusely. Its leaves are like those of the common German *Iris*, but they seldom exceed 2 or 3 inches in length, and the flowers, which are violet-purple, are borne on short stems not above 3 inches in height. It is a native of the south of Europe, and should find a place in every warm sandy border where it will bloom freely about this time.—J. W. T.

Wallflowers.—Nothing is better than the single yellow Wallflower for naturalising on warm sandy borders, rock-work, or natural rocks, or old walls. Once established it reproduces itself freely from seed, and never fails to make a brilliant show in early spring. Many old mims of historical interest throughout the country are covered with it, but nowhere is it seen to more advantage than on the Sandstone bluff, just below Nottingham Castle, where its golden flowers show to great advantage while the purple Vernal Crocus is freely dotted over the fresh grassy meadows at the foot of the "Castle" rock. Nice little plants of this Wallflower are now being sold in Covent Garden Market at 1d. or 2d. apiece.—Q.

Daffodils.—We have no fewer than eight single and double forms of the incomparable Daffodil now before us from Mr. Barr's grounds at Tooting; and they are all of such a clear and beautiful yellow or creamy white, with the orange segment of the cup scattered among their perianth divisions, that we are surprised that these fine hardy bulbous plants have been so much neglected by modern cultivators, especially after what has been done by Parkinson, Haworth, Ellcombe, and others. Mr. Barr's collection is perhaps the richest in species and forms of any in Europe, the plants being well-grown and robust, instead of poor starved examples, such as are too often found at the present time in gardens in which they happen to be grown.—B. H.

THE INDOOR GARDEN.

ORNAMENTAL CYCADS.

SINCE the rage for Ferns has, to some extent, subsided in favour of Dracenas, Crotons, and Palms, the more ornamental Cycads have been brought to the front, and, as evergreen decorative plants, they well deserve such prominence, many of them being particularly interesting. It has been said that they combine the fresh green aspect of our finest Ferns with the graceful habit and permanence of the Palm, and possessing distinct and striking characteristics peculiarly their own, and this, in some cases, is correct, but in others their colouring and general contour is wholly different from both. Although, for the most part, natives of tropical countries, they nearly all grow freely in this country, in a warm greenhouse or conservatory, under precisely the same treatment as is desirable for our more hardy Palms. Their propagation is, for the most part, difficult, but this is the less to be regretted, as old specimens are as easily imported as Tree-Fern trunks, and some few produce offsets, or root-suckers, by which the plant can be readily reproduced. They will be found to grow best in a well-drained compost of fibrous-loam broken up into lumps about the size of a pigeon's egg, and they all require a copious supply of moisture during the warmest portion of the year. The plant, of which the accompanying is an illustration, is one of the best in its class for conservatory decoration, or even for sub-tropical gardening during the summer months. It is not a quick grower, but very permanent in its character, as are all the other species; hence it is advisable to be careful not to injure any of their foliage; inasmuch, as any bruises or broken parts remain blemishes for years. Other species in this group are also very effective when well grown, and none more so than the blue-foliaged *E. horridus*, a stout dense-growing form, with spinose foliage, and one of the most striking of all foliage-plants for conservatory decoration. *E.*

Caffer—or, as it is popularly called, *Hottentot Bread*—is another noble plant, forming, as it does, a fine trunk, surmounted by deep green leathery foliage, which droops or arches gracefully on all sides. There are some good specimens of this in the Palm-house at Kew, and it deserves a place in every collection of warm conservatory plants. Some of the Australian *Macrozamia*s are likewise striking in habit, and well worth more general cultivation than they at present receive. *M. corallipes* has a short rounded trunk, and a gracefully-curved diverging plume of deep glossy foliage. Of this plant there are one or two forms, the most distinct being *M. corallipes gyrata*, which has its leaflets spreading out from the glossy rachis in all directions instead of lying flat, as in the normal type. *M. elegantissima*, *M. spiralis*, and others, are all well worth a place where variety is desired in plant-houses, inasmuch as the whole group of Cycads are as invaluable and as deserving of general culture as are the Palms themselves, although they are more limited in number. Many come from the Cape district and Natal, or southern Africa, where they form distinctive features of vegetation. They should be carefully watered during winter, as any injury from excess of moisture will not be evident for weeks after the mischief is done.

B.

PLANTS FOR BASKETS.

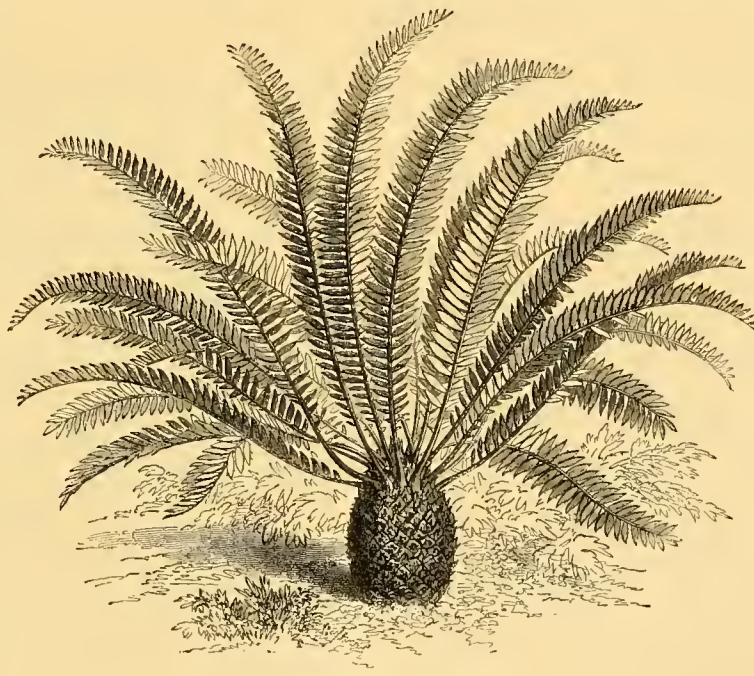
By GEORGE WESTLAND, Wiley Court.

THERE are many of our most beautiful plants that are seen to best advantage when grown in hanging-baskets; naturally, such as are of a pendent habit of growth are most effective when so suspended that their gracefulness and beauty of inflorescence are fully discernible. Largely as these basket plants are now employed, there is still ample room for extension, and by breaking up many of the stiff, lumpish, uninteresting combinations which we not unfrequently meet with in plant houses, with judiciously disposed groups of tastefully-filled baskets, we would render them much more effective and enjoyable than they now are. There is scarcely a class of plants which does not present suitable material for this purpose, both as regards foliage and flowers; we have Orchids in abundance, and the quaint and singular *Nepenthes*, which have long been extensively cultivated in baskets; but, however interesting and desirable these may be, with few exceptions, they are too tender to bear exposure in a show-house. For the embellishment of the conservatory during the summer months, the *Achimenes* recommends itself, from its free-blooming properties and admirable adaptability for basket-work, as one of

the most effective plants we can employ. The hardiest sorts should be chosen for this purpose, as many of the delicate kinds stand exposure badly; when the plants are well-established in the baskets, they should be hung up in the position in which they are to bloom, so that they may become inured to it previously to flowering. This is important to ensure perfect success, if the position is at all exposed; next to the *Achimenes*, I would recommend *Petunias*; they are most gorgeous subjects when freely-cultivated in good-sized baskets, which will contain from ten to twelve plants around the rim, with a *Geranium* or a *Begonia* in the centre. They may be propagated from named sorts, or (what I prefer) from seed of the best hybrids, which produce a charming variety of colours with

a large proportion of striped sorts. These will bloom for several months in the greatest profusion, and are not excelled, for effectiveness, by any other class of plants I have seen tried. I have grown them so as to hang down 8 feet or more below the baskets, and they stand exposure well. Again, there are the varieties of the Ivy-leaved *Pelargonium*, all most appropriate subjects for a cold house, and forming charming baskets when thoroughly established. A single plant of some striking *Geranium* as a centre, and a mixed or simple coloured fringe of the Ivy-leaved round it, will last for months in good condition; I have grown these so as to hang down 10 feet from the baskets. The old plants trained and re-planted bloom best.

Tropæolums are likewise most desirable subjects for basket-work, as is also the charming *Convolvulus mauritanicus*, and the dazzling hues of the *Clematis* are most vividly displayed when drooping in this manner. Amongst evergreen drooping plants, nothing surpasses the variegated *Vinca major elegantissima*, its gracefully streaming spray and reflexed leaves being specially beautiful in such a position. We plant the centres with *Scarlet Geraniums*, and re-plant the *Vinca* annually during the early spring months, cutting away the previous



Encephalartos Altensteinii.

year's growth; and so rapid is their growth that, in three months' time, the new plants will have reached the ground, which is 18 feet from the baskets. For suspending in dark corridors and situations where it is difficult to get tender subjects to succeed, this is the most satisfactory plant I know. There are many charmingly pretty plants requiring a stove temperature, such as *Æschynanthus*, *Hoya Bella*, *Coccocypselum discolor*, *Torenia*, *Panicum*, *Pothos*, *Argyreia*, and *Gymnostachyums*, which are specially valuable as basket-plants, and which display their natural developments of character to the best possible advantage when so grown, besides presenting very graceful and pleasing features.

We have still another very large and popular class of plants in the Ferns, which are most adaptable to basket-culture from their habit of growth, and the graceful elegance of their fronds. Most of the *Davallias*, with creeping rhizomes, *Drynaria*, *Nipholobolus*, *Lygodium*, *Nephrolepis*, *Adiantums*, *Asplenium flabellifolium*, the bold and graceful *Goniophlebium sub-auriculatum*, and the quaint and picturesque aspect of the *Platycerium*, which adapts itself most admirably to this form of culture, and contrasts so forcibly with the fragile elegance of the other kinds, are all suitable for baskets. These may be grown singly, covering the Moss with *Lycopods*, or they may be grouped. When the baskets are small, care should be taken that they are not over-crowded, as they grow so freely.

A great point in the cultivation of plants in baskets during the summer months is, to give them an abundant supply of water. If the foliage is allowed to become sickly through any lack of moisture, the thorough effectiveness of the plants is very much marred. The above are but mere indications of the many subjects that are suited for baskets—a mode of culture which has much to recommend it.

POINSETTIA PULCHERRIMA.

As a winter decorative plant this is one of the most valuable plants in cultivation, and in every garden, where winter-flowering plants are used, its cultivation should be made a speciality. True, the habit of the plant is not of the most attractive character, but that can be considerably modified with proper management; and the brilliancy of the colouring of its rich crimson bracts, together with their great size and lasting power, quite counterbalance every defect. Generally, the culture of this excellent plant is but imperfectly understood, and, considering the torture it sometimes has to undergo, the great wonder is that it has stood its ground so well as it has done. How often do we see it crowded in among miscellaneous stove-plants in positions where only the few leaves at the top of the stem can see the light or feel the fresh air playing about them, instead of their being kept cool and airy during the summer months, so that the wood may be ripened and consolidated. In describing the form of culture now generally adopted by good cultivators, and which has proved most successful in its results, we will suppose a beginning being made with young plants from cuttings. These may be taken about the month of March, when the wood has been well rested after flowering. In cutting down the old plants, the best of the wood should be saved for propagating purposes. When we say the best, it must by no means follow that the strongest is meant, as that is sometimes sadly deficient in some of the most important points; but that which is moderately strong is generally to be preferred, as it will be found firmest and most thoroughly ripened. It should then be cut up into short pieces in a similar manner to that in which *Vino* eyes are prepared, that is, by cutting off the wood within $\frac{3}{4}$ inch of the eye on each side of it; or, they may be cut off under another joint, as some prefer; but this is not essential, as they will be found to root easily either way. The pieces may then be planted upright in pots or pans, keeping the growing eyes level with the surface, and, if plunged in a bottom-heat of 70° or 75° they will soon root freely. A mixture of rich fibry loam, with a little sand, leaf-mould, and well-rotted manure, may then be prepared for potting them off; and if this be done carefully, using 3-inch pots, and returning them to the bottom-heat, they will start away at once, and will soon be well-established. As soon as the pots are well filled with roots, they may be removed to a cooler situation; and, after being hardened off a little, the plants may be again shifted into 6 or 7-inch pots this time, which will be large enough for the first season; they may then be placed in a cold frame, as close to the glass as possible, and will require nothing more till the end of summer, when they may be returned to a moderately warm house, and may be brought in quickly, or gradually, as may be wished. Abundance of moisture must be supplied during all

the growing season, and the foliage should be frequently syringed, to keep down red spider and promote healthy growth. Liquid-manure may be applied freely as the blooming season draws near, which will assist in increasing the size of the bracts, rendering them more persistent. As soon as the coloured leaves are well-developed, they may be removed to a cool conservatory or greenhouse, where they will stand for a long time, and will be very effectual in enlivening the dull foliage of the plants around them. When done flowering, they may be gradually hardened off, and water may be partly withheld as they sink to rest, and in due time the process may be begun over again. The treatment of old plants is similar to that already described for cuttings. When they have been cut back, they may be placed in slight bottom-heat until they break into growth, when they may be shaken out of the pots, and as much of the old soil removed as can be detached without injury to the roots. They may then be re-potted into the same, or rather less-sized pots, and be returned to their places until they get well started again, when they may be grown along with the young plants as here recommended. The usual way is to grow only one plant in a pot, and by this means the finest heads are obtained; but, where a mass is wanted, larger pots may be used, and two or more plants grown together to suit the circumstances. In the case of old plants which have become too leggy and bare to be presentable, they may be economised by taking the tops off in August and striking them as cuttings. They may be cut about 6 or 8 inches long, and inserted in the centre of small pots singly, and if plunged in brisk bottom-heat and kept shaded and moist for a few days, they will quickly root, and may be transferred to 6-inch pots, and will make nice dwarf plants for room or table decoration, as they will flower nearly as well as if they had been allowed to remain on the parent plant. In addition to the crimson variety, which is the one usually cultivated, there is a white variety, which is seldom met with, probably on account of the white not being decided enough to render it a desirable addition.—J. L.

Do Leaves Absorb Moisture?—At the opening of the Gardeners' Institute, at Darlington, the Rev. C. Peach addressed the meeting, and alluded to leaves absorbing moisture. He said, "This is a great question now with some of our French horticulturalists, who are of opinion that leaves do not absorb moisture." He further stated, "A very common occurrence after a very bright day in spring, on entering a propagating-house, say a house of young *Roses* or *Verbenas*, is to find them flagging. We at once start to syringe them, and thus are actually doing harm instead of good." Have leaves, therefore, the power of absorbing moisture or not?—Y. B., *Darlington*. [We have no definite proof that leaves do absorb moisture, although, as is well known, a humid atmosphere is essential to the welfare of growing plants. No doubt syringing does harm under the circumstances just related, unless shading is applied at the same time. When we shade growing plants or cuttings, and keep them constantly moist, it is not so much with the idea that they will absorb moisture as that humidity and shade combined lessen, to a very great extent, the transpiration which would otherwise take place from the leaves, thus causing them to droop or "flag." Every propagator is aware that moisture alone will not prevent cuttings from flagging; they are, therefore, very careful to keep their cases well shaded from bright sunshine.—Ed.]

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Clematis indivisa lobata.—In addition to what your correspondent says (see p. 260), in reference to this plant, I would recommend it on account of its producing its flowers for about two months in succession. In cutting the blooms, those should be taken which are not fully developed, as they keep much longer than such as are wholly open. Plants only a few feet high bloom quite profusely.—F.

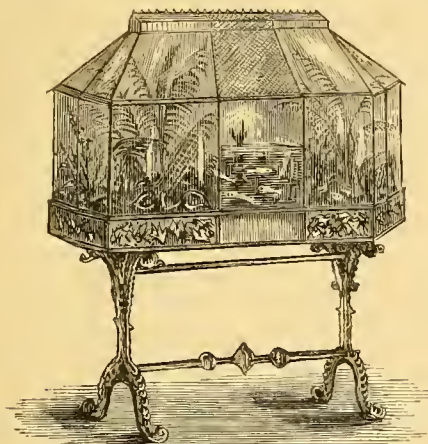
Phalenopsis Parishii.—This pretty little plant is now flowering in Messrs. Veitch's Orchid-houses, at Chelsea. It is one of the smallest of all Orchids, having glaucous leaves only about an inch in length, and bearing two to seven pearly-white flowers on a spike about the same length. The lip is heart-shaped and deep purple, with a few white hairs at the base. Although very small it deserves cultivation, its flowers being pretty when closely inspected, and quite unlike those of any other member of this well-known group.—B.

Fuchsias.—What varieties of *Fuchsia* are best adapted for standards and pillars in a cool conservatory?—T. BARNES, *Kew*. [The old *Fuchsia corallina* does remarkably well in the gardens at Chiswick House, trained up the rafters like Vines. *Souvenir de Chiswick* and *Venus de Medici*, are also two other old favourites that are well suited for the purposes you name. Plant them out in rich well-manured compost, and train them up in the form of a single stem, removing all laterals until they are as high as required. After they have finished blooming in autumn, prune the laterals close in, just as is done in the case of *Grape Vines*, and start the plants afresh in the spring, by applying a little heat and syringing them with tepid water; so treated, they will bloom profusely, and are among the most beautiful of all cool conservatory plants. We saw some at Hatfield last autumn, and magnificent they were, having been in bloom for three or four months. When so grown, cut-branches of some of them are very useful for drawing-room vases.—Ed.]

THE GARDEN IN THE HOUSE.

PLANT-CASES AND AQUARIA COMBINED.

THERE are several drawbacks to the more general culture of tender Ferns and ornamental-foliaged plants in ordinary apartments. In the first place the temperature is very unequal, and the plants, if fully exposed, suffer from the aridity caused by open fires and gas. In order to regulate the temperature as much as possible, and, at the same time, protect the plants from dryness and other injurious influences, we have recourse to Wardian cases, and these, to a great extent, enable us to make the most of tender plants as embellishments for the sitting-room or boudoir. A plant-case, when of graceful form and well made, is a most excellent invention, and one that ought to be introduced into every home of taste, where fresh plants and delicately-tinted flowers are admired, and where there are no means of cultivating them except in windows. A badly constructed case is a great nuisance, and only proves a source of annoyance to its possessor. One of the best plant-cases we have ever seen was made by an industrious artisan for the amusement of a sickly daughter. This was of wood, with a flat zinc pan inside to contain the soil in which the plants were grown, while a large bell-glass in the centre contained leeches, water beetles, lizards, gold fish, and other aquatic animals, a handful of coarse sand at the bottom serving



Plant-case and Aquarium combined.

for the growth of a few pieces of *Anacharis*, *Vallisneria*, and other small water plants. It was glazed with 21-oz. glass, and neatly painted both inside and out. The vegetation around the bell-glass consisted, for the most part, of small-growing Ferns, as *Asplenium flabellifolium*, *A. Trichomanes*, and *Scolopendrium vulgare*, all of which grew vigorously, while the whole surface of the soil, being carpeted with fresh green *Selaginella*, had a most pleasing and refreshing appearance. We have recently seen some very pretty designs for aquaria and Fern-cases combined, one of the best being that of which the accompanying is an illustration. It is novel in point of construction, varying from most others which we have seen in having the aquarium between, instead of below, the compartment for ordinary vegetation. It is one of the many elegant introductions of Messrs. Bromwich, of South Belgravia. We recently saw one of these cases tastefully planted with Ferns, Palms, and other foliage plants, Mosses, and *Selaginella*, and the whole had a bright and cheerful effect, being enlivened by the sparkling water and gold fish, the warm hues of which contrast so well with fresh vegetation.

STANDS OF HARDY FERNS.

FOR the decoration of sitting-rooms in large towns, these are particularly well-suited, and yet it is seldom they are employed for that purpose, because I suppose those who have not tried their effect, or seen them, do not care to experimentalise in the matter; those, however, who will try their effect will not be disappointed. Hardy Ferns stand every change in the atmosphere, and look quite as effective as

the more tender varieties. I first saw an arrangement of this kind in an apartment in a large town in which it continued in good condition for two years. The stand had been formerly a hanging-basket, but, in order to convert it into a stand, the chains by which it had been went to hang had been taken off, and a wire-worker supplied it with four feet, or supports, which raised it about eight or ten inches from the table on which it stood. The basket was lined with Moss in a growing state, at least it had a bright and fresh appearance; inside of this was a layer of broken crocks. The rest of the basket was then filled with a mixture of peat, loam, and silver-sand, in which the Fern roots were planted. The basket was about a foot across; planted in the centre was a nice specimen of the Hart's-tongue Fern (*Scolopendrium vulgare*), and round it were mixed varieties, such as *Asplenium Trichomanes*, *Asplenium marinum*, *Polypodium vulgare*, and several other small plants of *Lastrea Filix-mas*, and similar Ferns. The surface of the soil was covered over with fresh-looking wood Moss. Another stand of this kind, only on a much larger scale, was as follows:—The stand was at least 2 feet across, and each plant in it was growing in a separate pot; but this was concealed by the Moss with which the pots were packed. In addition to the Ferns, this stand was furnished with several plants of plain and variegated Ivy, which were so placed that they drooped round the edge, and had a very charming effect. In the centre was a large sized plant of *Lastrea Filix-mas*, and round it were grouped several other good-sized specimens of British Ferns. In winter, the plants were watered about twice a week, the pots being lifted out of the stand and watered in another room. The Moss, also, was damped, which tended to keep the plants fresh.

A. HASSARD.

Upper Norwood.

AUCUBAS FOR INDOOR DECORATION.

AMONG hardy shrubs, there are but few that rival Aucubas in their brightness or aspect, or in adaptability for town planting. Even as pot plants for windows or balconies they are invaluable, more especially during the winter, when any scrap of fresh vegetation is welcome. Aucubas will grow in any ordinary garden soil, and are easily propagated, either by means of seeds, cuttings, or layers; or, if no facilities for their reproduction exist, nice bushy little plants may be bought for a trifling sum either at the nurseries or in Covent Garden. Just at this season they commence their growth, and will shortly flower, so that if to the other ornamental properties are to be added rich scarlet berries, male plants or flowers must be procured at once. No one who has seen a nice bushy Aucuba, bearing berries, would ever care to see it without them at the proper season; and, as the mechanical part of fertilisation consists in merely conveying the powdery pollen from the male plants to the little green stigmas of the female flowers, fruit is easily obtained. Fertilisation is best effected with a moist camel's-hair pencil during bright sunny weather. If the pencil or brush is first moistened in honey so much the better. One male plant, grown in a pot, will produce pollen sufficient for a great many female plants. It is best to assist the process of fertilisation in the way just described, but, if several female plants are set in a cool airy house, and a male plant placed among them, they often produce heavy crops of fruit without any extraneous aid. If only a few plants are grown, pollen or male blooms may be obtained from some nurserymen for a trifle. If neatly wrapped in tinfoil it will preserve its fecundating powers for several weeks, if kept free from damp. Aucubas will last for several consecutive months, and will require no attention beyond periodical waterings and occasional syringings with clean water. R.

NOTES AND QUESTIONS ON THE GARDEN IN THE HOUSE.

Aaron's Beard Saxifrage.—What is the name of the enclosed plant? It grows well in my window. It never blooms, but the leaves are pretty.—J. S. [What you have sent is a piece of what is commonly called "the Sailor plant," or "Aaron's Beard" (*Saxifraga sarmentosa*). It is a first-rate plant for a hanging-basket or bracket-pot. It is viviparous, and is very readily propagated by layering the runners in the same way as Strawberries are layered. When well-grown it forms a pretty object in a room window. You are wrong, however, in supposing that it never blooms. It bears white flowers on a spike about a foot high, but it is well worth growing on account of its silvery bloched leaves alone, even if no flowers made their appearance.—F. W. B.]

The Common Myrtle.—This, as most of us know, makes a capital window plant grown in a small pot, and kept fresh and clean by means of frequent sprinklings. One of the best restorers for all pot-plants is to set them outside when it rains. This is far better, and does them much more good than sprinkling or sponging them indoors. My plants of Myrtle have grown in a north window for these last ten years, and have repeatedly been frosted, but they suffered no harm on that account, and they are now a fine pair, 2 feet high, and nearly as much through, notwithstanding their being repeatedly robbed of cuttings and branches for friends who admire them. I have a plant in front of the house planted out in the border, but this is generally cut down every winter, and makes but little progress. This season, however, it has escaped, and I hope that it will get strength enough now to resist a severe frost.—A. H.

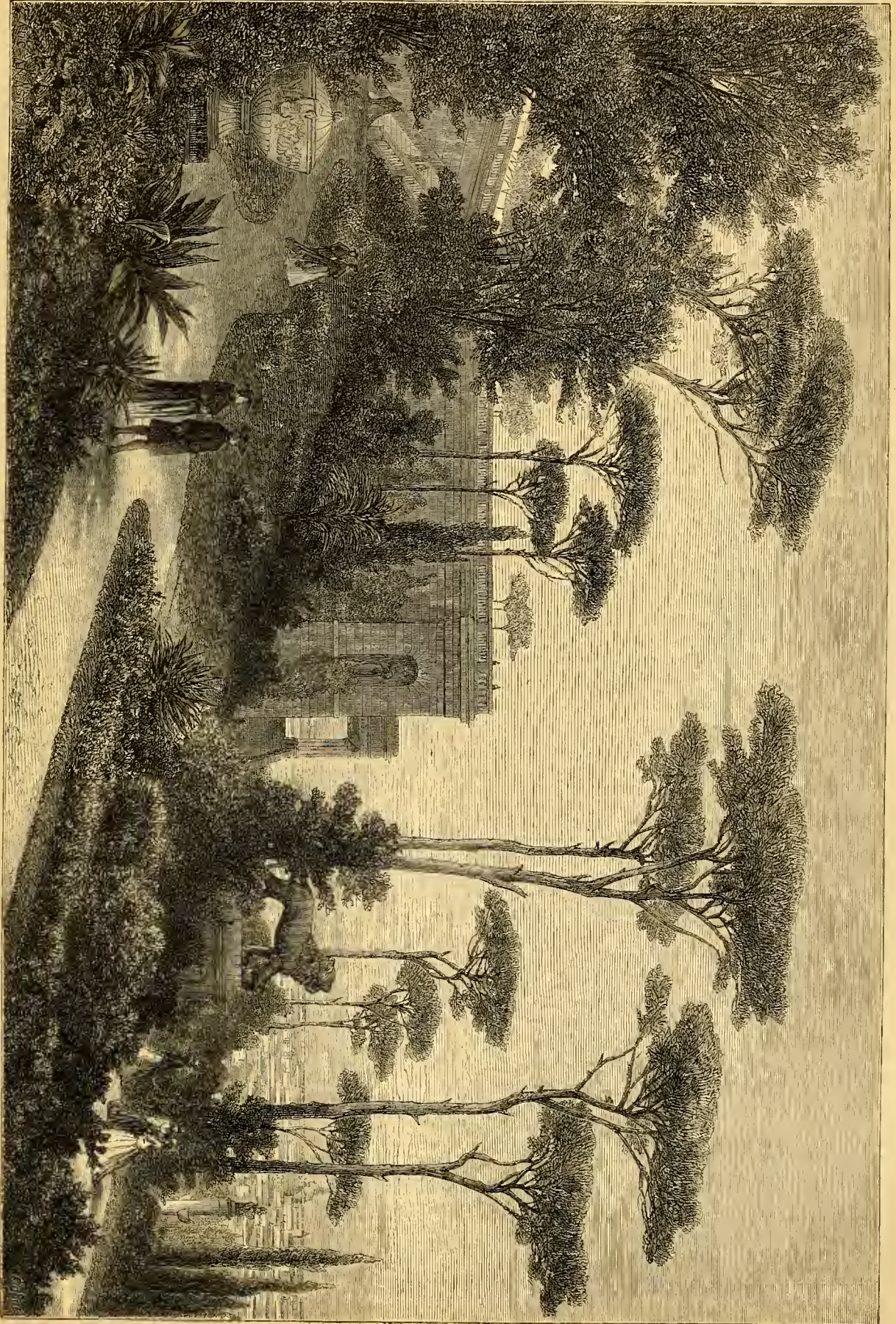
A HOLIDAY TOUR.

By THE EDITOR.

ROME.

SPEAKING of gardens to a French amateur, long resident in Rome, I was not encouraged to hear that there was "nothing to be seen. Horticulture exists not at Rome." Well, it is not quite so bad as that; but there was some ground for the opinion. In Rome, the home of art, Nature is almost a stranger; for ages the world was drained of much of its wealth for her art and glory; but a very small mite has been devoted to cultivate the study of natural history. If the city of the New Methusaleh, in the western wilds of America (an important and rising capital, consisting of some sixty-three houses, and several spacious and airy streets without any) makes up its mind to have a park, it will begin by making one far better than anything of the kind here. Dublin, Nantes, and Brussels have each sent their Peter's pence to Rome, and have never been much enriched by creed or conqueror; but the least of these cities has a botanic garden, to which that of Rome is insignificant; yet the climate is a glorious one for vegetation—the Palm and the Rock-Rose, the Prickly Pear and the Violet, the Olive and the Ivy all thriving together. Ah! if they had only been satisfied with, say a quarter of an acre of pictures less, and given the difference to showing what the soil and climate were capable of producing, it might easily have been made a fairer land than it now is. For, in Italy, it has been proved again and again that, when men are driven from their fields by war, or when cultivation is, from any cause, put a stop to in a given district, malaria begins to spread its fatal breath over the land, which soon becomes uninhabitable. But such things mattered little to those whose great aim was to carve quarries of marble into god-like shapes, or cover miles of wall with wearying repetitions of the same subjects, or raise pile after pile into the sky, spinning away the souls of all the greatest at unproductive work. Yes, and worse; for what is the good of it all, if it does not make men better and happier? Means that would suffice to improve a whole district, are devoted to paintings in a single church. Frequently may be seen a fine stretch of level land without a habitation on it. However, the people, or what remains of them, can all crowd up to the closely-built town on the top of the hill, where there are innumerable works of art, and where the streets are very narrow, and by no means sweet. Sometimes, as in Naples, the dwellers in these close streets, are the meanest-looking wretches one could find in Europe. Although in one of the fairest lands under the sun, they benefit nothing by it, between these close rows of six-storied houses. But what did it matter about the real men and women, when there were whole skyfuls of painted angels? And it is not only on the town dwellers the result may be judged of. Look at these bent figures in the fields; for ages the hand of the taxgatherer has left them nothing but black bread and sour wine, and long days of unbroken labour; and this poor fare and thankless toil, not always for any noble or necessary work, but too frequently for the mere gratification of vanity, in building uninhabitable palaces, and costly gardens of stone. Art has its place, and a most important one, but it is on all counts a mistake to act invariably as if the imitation were better than the life. Let us leave these exhaustible galleries and domes for the open air. Look at this picture of the Pincio Gardens, the most important public garden in Rome. It is a varied and pleasing composition; but that is mainly owing to the predominance of trees that occur everywhere here, the Stone Pine and the Cypress—the two most picturesque Italian trees. They almost seem made to contrast with each other—the Cypress tapering to a point like a Willow-wand—the Pine spreading out its head like an umbrella. Till recently, little more had been done to assist the effect of these trees; but now a portion of the ground is tastefully planted, and shows Palms and Araucarias and Conifers, all in good condition. This portion, however, is a mere patch in a somewhat formal garden, occupying a fine site, and disagreeably spotted with new white busts. These busts (which surely would be better in some of the public buildings) will by-and-bye assume a more sober hue; a random Lichen will spread

over them, and cover them with a mouse-coloured tint, so that the merely spotty will become the spotty-grotesque. A single statue, well placed in a green garden, is sometimes a pleasing feature, as in Professor Owen's garden at Sheen; but, dot statues at regular intervals along the front of a shrubbery, as is frequently done here, and a most objectionable and inartistic effect is at once produced; whether the statues are good or bad, the distant effect is the same. The plants give what character they possess to the small public gardens. Here are, in addition to the Date Palms and the Fir Palms, the American Aloe, the Prickly Pear, the Aloe-leaved Yucca (both green and striped forms), the Great Peruvian Cactus, which grows finely in warm spots, and particularly the Acanthuses and Ferulas, with their fine fresh foliage. A beautiful object on the Pincio is a tall Date, with its stem clad with a glossy mantle of Irish Ivy. This union shows well the peculiarly favourable conditions which exist here for every kind of planting, and are suggestive of how much may be done when the country is awakened to the importance of such matters. It is in the gardens of the wealthy Romans that one finds most interest, but even that is of a limited kind. Of a good many famous gardens seen in Rome, that of the Villa Pamphili is the most remarkable. This is mainly distinguished from English gardens of the geometrical order by an abundance of plants in huge pots and vases, and by vegetation, to some extent, subduing the formal lines, where it descends to box and coloured gravel patterns; it is very poor indeed, as all such gardens must ever be. The scroll-work, however, is not so offensive here as in other gardens, and the French plan of clipping or mowing the trees into walls is not resorted to as it is at the Medici, and not a few other Italian gardens. On the walls, and by the steps, and everywhere one turns, there are very large earthenware pots, of bold and not ungraceful designs, filled with Orange trees, Agaves, Yuccas, Prickly Pears (*Opuntia*), and many other plants. The most strikingly effective of these is, decidedly, the Prickly Pear, which, with its great arms bearing broad shield-like leaves, is utterly distinct, in aspect, from any other vase plant. The only improvement suggested by this garden is in the matter of these vases and pots. Imagine pots of common earthenware, 5 feet in diameter, and with a rim 3 inches thick, the surface embellished with a wreath or other design; pots of this kind, small and large, are very often seen here, and those of good design are quite cheap; they are simply our common red pots cast in graceful forms, and deserve to be used largely in England. The custom, seen occasionally here, of wreathing the *Wistaria* and other plants round the stems of large trees is a tasteful one. In the Pamphili Gardens there are tall pillars formed by *Wistaria* alone, and which must be effective; *Camellias* are grown very extensively, and, being now in full bloom are very attractive; although thriving in the open air it is found desirable to protect them with screens formed of the Canes of the great Reed (*Arundo Donax*) which prevent the flowers suffering by violent changes of weather. The screen is easily fixed when the border of *Camellias* is against a wall. It is interesting to notice that the Neapolitan Violet, which is very much grown here, is cultivated in frames, just as in England. It is used so largely that in one garden I saw over a hundred feet long of frames devoted to it alone. The sweet Violet abounds everywhere, and is one of the many plants that may be noticed growing on the stems of the Date Palm—rooted among the decaying fibre and on the stumps of the old leaf-stalks. At Rome the fruit is not sufficiently developed to become edible, but the seeds, notwithstanding, vegetate and produce good plants. The most strikingly graceful tree in Roman gardens is a Sumach (*Rhus viminalis*), which reminds one slightly of a Weeping Willow, and attains a height of nearly 20 feet. Even admirers of the well-known Japan Privet would be surprised to see it used as a street tree, with a clean bole, 6 inches in diameter—a handsome round evergreen head, and leaves somewhat like an Orange, but more leathery. It does not, like tall trees, require continual cutting-in when used in small streets, and is the best evergreen I have ever seen used for street planting, the head assuming the very shape and size that is required, and the flowers having much beauty. The Creeping Fig, everywhere seen in our hot-



THE PINCIO GARDENS, ROME.

houses, grows against a wall in the Botanic Garden here, with leaves 4 inches long, and fruit bigger than the common Fig; while beside it, on the same wall, and growing from the same root, are small shoots with delicate little leaves and wiry stems. It seems curiously influenced by conditions. I once saw a plant of it, in the open air, on a wall at Woodstock, intermediate in size between the small growth in our houses and the Tree-Ivy-like growth here, all the leaves being of a fine bronzy colour.

The garland-forest, which the gray walls wear,
Like Laurels on the bald first Cæsar's head.

If Popes and Emperors were so busy carving and painting that they had no time for planting trees, Nature was as busy, as usual, with her handiwork. As soon as the mighty aqueduct or colossal wall was reared, she sent certain emissaries—some from the Apennines and some from the fields and hills around—in the shape of tiny seeds, which soon planted her flags on those hanghty walls; and when the Colosseum had lost its glory, and both arena and mountains of stairs were desolate of men, the Anemones, and other flowers of spring, came and touched the ruins with hues of life, till the place almost looked like a patch of flowery mountain. And Sylvanus sent his children, too, who planted—

A grove which springs through levelled battlements;
And twines its roots with the imperial hearths.

And on the colossal walls of Caracalla's baths, and many other ruins, the Arbutus and the Rock Rose, the Laburnum and the tree Heath, the Fig and the Honeysuckle, the Olive and the Bird Cherry, the Laurustinus and the Ivy, found a home. The Acanthus, favourite of the column-rearer, carved its own fine leaves far above his capitals, the Maiden-hair Fern came and graced every moist and shady nook; the Giant Fennel was there, in spring, with its large graceful plume; the Clematis and Convolvulus, the Cyclamen (two or three kinds), the Pink, the Everlasting Pea, the Poet's Narcissus, the Crocus, the Mignonette, the Rosemary, the Violet, the Bee Orchis, and a host of others, all grow there too. On the ruins of the Colosseum alone, Dr. Heakin found more than four hundred species of plants sown thereon by passing breeze or bird. With this fact in mind, it is easy to imagine that the number that could be grown on similar positions is almost illimitable. It is not without a useful lesson, apart from that of suggesting how old walls, &c., may be embellished. The plants grow on these ruins much better than on the rock-gardens so commonly made for their accommodation. And the reason is, that the rock-garden, as generally made, is so loose and open in texture that, though the soil may be very suitable, plants perish from drought. On the ruin, such moisture as occurs between the stones is prevented from rapidly escaping by the stones of the surface and the firm texture of the whole. Thus, on the ruin we find a garden, and on the so-called rock-garden too often nothing but clinkers and dust. Recently, with a view of preserving the ruins from decay, the plants have, unfortunately, all been removed from the walls of the Colosseum, but they abound on many other ruins. It was a mistake to remove them, for the walls are avowedly less picturesque, and that the roots of the plants would do harm on such a structure is not proven.

THE BANYAN TREE.

In the Royal Botanic Gardens at Calcutta, there is now a splendid specimen of this famous tree (*Ficus indica*), of which the following account has been recently given by the Director:—"The circumference of the area occupied by the tree, measuring round the outermost stems (with a tape line), is 700 feet, and the diameter between the extreme stems, from east to west, is 200 feet, and from north to south, 189 feet. Many of the branches extend 40 feet beyond these limits. I roughly estimate the area shaded by the tree at about 1½ acre. The main stem is a conglomeration of large trunks, which have united, the whole measuring 48 feet in circumference at 8 feet from the ground. A few of the largest of the secondary stems measure as follows, the circumference being taken 4 feet from the ground: 13 feet, 10 feet 7 inches, 9 feet, 8 feet 3 inches, 7 feet 9 inches, 7 feet 8 inches, 7 feet. A circle has been drawn round the main stem 150 feet in diameter, and all this area is paved with brick; outside this circle there are eighty-one stems, and inside seventy-five.

THE FRUIT GARDEN.

WIRING GARDEN WALLS.

If there is any one improvement connected with fruit-growing to which English cultivators are more indebted to the French than another, it certainly is their system of wiring garden walls and erecting trellises for training fruit trees. It was, of course, to be expected that not a few, and among them many excellent gardeners should still be wedded to their old familiar nail-and-shred system. I am, however, disappointed to find Mr. Baines, of Southgate, among the little band of sceptics. In *THE GARDEN* of March 28th, Mr. Baines says:—"I consider them (wired walls) as great a mistake as has ever been introduced into gardening in a country, like ours, subject to spring frosts." This surely is an assertion quite as plain as it is bold. But what are Mr. Baines's reasons for such a statement? Simply this, that "on wires, with the shoots from half-an-inch to an inch away from the wall, as this system necessitates, a severe night's frost will frequently kill every bloom; whereas, the same trees, if nailed with their shoots lying absolutely against the bricks, will have enough of the bloom escape for a crop." Will Mr. Baines allow me to inform him that he is under a misapprehension in this matter, and that the system of wiring walls does not "necessitate" the wires being from half-an-inch to an inch away from the walls; on the contrary, the wires may be erected by competent workmen so as to be perfectly close to the wall, so that the shoots of the trees may even lie on the bricks, if that were necessary, quite as much as they possibly can do by the now comparatively antiquated and nearly exploded system, which, not even Mr. Baines, can ever bring back again to disfigure English gardens, and harbour dirt and insects. Mr. Baines's preference for splintering the even face of the bricks by having the nails driven into them, instead of into the joints, so obviously, as one would think, in every way offering themselves for the very purpose, along which, in every third joint, say, 9 inches apart, the slender galvanised wires run almost invisible, is to me inconceivable, and to most people must be very puzzling. If the nails do splinter the mortar of the joints, a little bit of mortar applied after the nails have been driven, will make all good again. But not so if the face of the bricks are splintered. The nails, however, need not be driven into the joints at all, if that is any objection, as a gimlet can be used to bore the holes required, and the face of the joints will thus be preserved quite smooth. In some wiring which I have lately had done in my own garden, each line of slender No. 14 galvanised wire, lies along the neat joints of every third brick almost invisible, "as straight as a needle and as tight as a drum." They also lie as close to the wall as a plumb-line, which would surely please Mr. Baines, as being so suitable for the shoots of his trees, which he thinks should almost cling to the wall in order to save them from spring frosts. Having had large experience in the matter of wiring walls, I have no hesitation in stating, that the introduction of this system, and that of erecting wire fruit-trellises, into English gardens has been a marvellous success. There are, indeed, now-a-days, comparatively few gardens of any importance into which wiring has not been successfully introduced, and in almost every new fruit-garden that is made it is looked upon as a necessity.

ONE WHO PRACTICALLY KNOWS.

ROOT-MOISTURE NECESSARY FOR PEACHES.

The excellent article which you published on this subject (see p. 270), from Mr. Baines, cannot fail to commend itself to all practical gardeners, and I most fully agree with him in his conclusion that drought is the greatest of all enemies to the Peach, and that it is the cause of many of the diseases to which it is liable. We have, at present, two Peach-houses that fully confirm this statement; the earliest is now producing a very heavy and regular crop of fruit, which is stoning on the trees; in the second house, which is just set, the fruit might be counted by thousands; in fact, it is a picture in all stages of growth. Five years ago, when I first saw these trees, they were miserable objects, suffering from Fungus at the roots, brought on by nothing else than lack of moisture, as the

border, houses, and trees, were new, and in every respect excellent. Several ineffectual attempts had been made to fork the Fungus out, but as the border and roots were quite white with it, this was impossible. The leaves of the trees turned white, drooped under sunshine, and fell in showers under the syringe, and whole branches continued to die out as if paralysed. The Fungus was strongest where the border was driest near the hot-water pipes and entirely absent at the back of the house, where the drip from the shelves kept it saturated; I, therefore, resolved to try the water cure, which proved entirely successful, for not only have the trees filled every inch of space that could be made available, but have annually produced excellent crops of first-rate fruit. It is, however, in the cultivation of Peaches on open walls to which Mr. Baines specially refers; and, that they can be grown in that way, I think the most sceptical would agree, if they could just look at our open Peach walls now, when they are complete sheets of blossom. Our system of cultivation is identical with that recommended by Mr. Baines. I would also direct especial attention to the remarks on nailing close to the wall, which are applicable to all kinds of wall trees; for the extension system of pruning, especially with regard to spurs, has been carried to such a length that the object for which the tree was originally planted against the wall appears to be lost sight of.

JAMES GROOM.

ROOT AND TOP GROWTH.

A CORRESPONDENT has put to us the question, "When do Vines begin to make fresh roots?" In answer, we propose to offer a few remarks which we hope may prove instructive to others as well as to our correspondent. We will not, however, confine our remarks to Vines, but will refer to what have been our observations and experience in connection with the reciprocal growth, and *vice versa*, of other plants as well. Our correspondent's query regarding the time at which Vines begin to extend new or young roots into the soil, it is taken for granted, is in reference to Vines in the most normal condition in which they are to be found in a Vinery. This condition, we should say, is that of a healthy Vine in a good border, and one which is not forced, say before the 1st of March, and is not subjected to artificial heat at the roots. Our observations with regard to such a Vine lead us to reply that it does not begin to push out young roots until the Vine has produced young growths quite a foot long, and so far expanded some leaves; and the older the Vine and the thicker its stem, the more will the top grow before any formation of roots takes place. On the other hand, a young slim Vine begins to make new roots before the young stems and leaves attain the length named in the case of an older Vine. The stored-up sap in a given length of the young slender Vine is less than in one that is older and stronger. There are what shall be termed abnormal conditions, under which Vines, both young and old, deviate from what has been stated above. When bottom-heat has been applied to the border at or before the time the buds begin to burst and grow, then Vines begin to root at an earlier period, or even contemporaneously with the top growth. When a Vine is in a border that is heavy, retentive of moisture, and in which the younger and very important fibry parts of Vine-roots die back annually, the commencement of the growth of roots is still later in proportion to the top growth than we have stated. We once rooted out Vines that had approached to their flowering period, and did not find a single young white root in the border, which was cold, damp, and adhesive. Much also depends on how the roots have been ripened the previous autumn. The ripening of Vine-roots is a question of vast importance in Vine culture. When anything occurs to prevent their proper maturation—such as the premature loss of the foliage—the roots never shrink properly up into tough brown fibre that can stand the winter, but die and rot off altogether. A Vine with properly ripened roots will start both its roots and tops more nearly contemporaneously than one the roots of which have been killed, not ripened. A Vine in pot grown under good drainage and in firm soil makes roots earlier than one grown in a badly drained pot and loose wet soil. If a Vine in a pot is started without bottom-heat, its top growth will be 8 or 10 inches long before it begins to root afresh. If the pot is plunged in bottom-heat the roots will start earlier of course, and sometimes they start before the tops, if the tops are cool while the roots are warm. We, however, regard it against the order of nature, and not good practice, to cause a Vine to make fresh roots out of its natural time or order. We dare say many of our experienced readers have noticed over and over again, in forcing Vines with their roots in an outside unheated border, that they made a certain amount of growth with

considerable rapidity, stood still for a while and then started away somewhat abruptly. This is caused by the stored-up sap being exhausted before the young roots are formed to pump up a full supply of sap to the young growths. This is most strikingly noticeable in the case of Vines in a cold retentive border, where the young fibry roots die in greatest proportion in winter. Such ought to be forced, when forced at all, very cautiously, or the results will be most unsatisfactory. To draw out their young growths rapidly by force of fire-heat causes the growth to be weak indeed. The best course to pursue with such Vines is, either to retain the heat of autumn in the soil, or heat it by some other means,—place a bed of fermenting material inside the Vinery, and keep up the heat with as little fire-heat as possible; and, with good inside generalship, it is marvellous with how little roots, we have known a crop of Grapes matured from such Vines in May and June. We have taken out borders, where such has been the case, immediately after the crop was cut, and could find next to no fibre in it—a most desirable state of things, however. It is most astonishing what growths will take place under certain circumstances without any roots at all. We have at the present moment some pieces of the common Hazel hung up in a damp stove, that have growths six or seven inches long, and callosities formed at their butt ends. Then look at a "Vine eye." It will make in some instances young shoots, with leaves, three or four inches long, before a single root is sent out; while, on the other hand, we have had Vine eyes—something being wrong with the bud—that never started at all—but the stored-up sap, not to be baffled or wasted, has sent out a whole bunch of roots, thus going out of the ordinary course in making a desperate effort for life. And so, as a rule, we think it questionable practice to apply conditions that cause—in the case of deciduous plants—root growth before top growth: it is the wrong way of making use of stored-up sap.

Perhaps it has not occurred to some of our readers that most deciduous trees make the full length of their season's growth in a very few days. There are, for instance, the Horse Chestnut, the Lime tree, the Sycamore, the Beech, and many others, that burst their bud cerements, and extend their season's growth at a bound. And many of them attempt the same, even though entirely severed from their roots. We have seen some trees felled in autumn making growths a foot long in early summer. And it is after this production of young branches and leaves that the chief manufacture of young roots takes place. This ought not to be without its lesson to gardeners in the culture of deciduous plants in pots. Take, for instance, the Vine; it has to be shifted out of a small pot into a larger. The operation should be done not when it is dormant, but either before the root growth has ceased in autumn, or just as the new roots have commenced to grow in spring. Or, if Vines in a border have to be lifted and re-planted, it should be done before the leaves fall off, so that there is a chance of young roots biting into the new and congenial soil, or the work should be delayed until the buds are swelling. So, in shaking out a cut-down Vine in spring, we would not interfere with its roots while the bud or buds have not burst, but would let the top growth form a few leaves, and then shake it out, or re-pot it just as the roots are going to start. The fact of the rule, that the growth of roots and leaves is reciprocal, ought to be of much more service in garden practice than it is. The practice, for instance, in forcing deciduous shrubs into bloom in spring, of lifting them just a few days before they are wanted to force, and potting them up with mutilated roots, is far too common. It would be much more in accordance with their nature and habits, if they were kept constantly in pots, or carefully lifted before they shed their leaves, and be shaded and syringed for a time, so that their leaves would suffer as little check from lifting as possible, and insure their laying hold of the fresh soil before they throw off their leaves. Take, for instance, the case of a Rose. Lift it and pot it after all its leaves have dropped off, and let it be forced after such treatment, and the result will be unsatisfactory as compared to another that is lifted in October, while it has yet leaves, and its pot plunged in a gentle bottom-heat for a time, while the top is kept cool. Under such conditions it takes a hold of the soil before the leaves are shed, and it forces vastly more satisfactorily than when managed on the other plan. It is perfectly well known that deciduous plants can be made to manufacture young white fibry roots immediately after their leaves are shed, and with very wonderful rapidity too. But this takes place under unnatural circumstances, and is the reverse way to that of nature in making use of stored-up sap. Let a Currant bush be lifted and planted in the inside border of a warm Vinery, just immediately after it has shed its leaves, and it will soon have young white roots squeezed out of it without a single bud moving for weeks; and when they do move they are weakly and delicate. But let the same bush remain in the open quarter, and it forms its young growths at a bound, while the young roots are not so forward

as those made in the Vinery, till the bush is well clothed with leaves, Here we conclude that root manufacture in deciduous plants, while leafless, is only an exhaustion of the stored-up sap at the wrong end. This relation of root to top growth teaches us another lesson which is well understood in plant culture. Take, for instance, a *Pelargonium*, or even a *Camellia* that has to be cut down so as to denude it of all foliage—the object being to get the plant to burst into growth nearer the pot, and prevent it from becoming straggling and unsightly. It is at the same time in exhausted or improper soil, and it is necessary to its future well-doing that new soil should be supplied to it. If the plant be shaken out of the old soil when it is cut down and denuded of every leaf, there are ten chances to one that the plant will die. So complete is the reciprocal action of leaves and roots, that it will neither produce the one nor the other. The plant should be either shaken free of the soil a time before it is cut down, or allowed first to burst into fresh growth, and then operated on at the root; the latter, for several reasons, is the better way, and the most convenient. A tender plant will not stand, without risk of total destruction, the contemporaneous mutilation of both its roots and leaves; but if the one is left intact, it so far survives the other as to make a successful effort to restore the balance. Evergreen plants, such as *Oranges*, *Camellias*, &c., have a particular season at which their roots elongate or increase with more rapidity than is usual at other stages of their growth; and in ordinary circumstances that season is after they have made their growth, which they do in a comparatively limited period. This is the most desirable time to shift such as require it into larger pots, for the roots will then extend most rapidly into the fresh soil.—*The Gardener*.

AIR-ROOTS ON VINES.

I VISITED the Vineries of Messrs. Baker & Son, at Worthing, the other day, and was surprised to see the numbers of air or stem-roots which their Vines were producing. Their houses are span-roofed, 10 feet wide and 90 feet long, with sunk centre, the platforms rising nearly to the spring of the roof, which, in the centre, is only 3 feet above the bed or platform. On my previous visit, at Christmas, Grapes in good condition were being cut in one house, and the Vines in one of the others had just started. This house, I now find, contains 1,600 bunches of Grapes, all nearly full-grown, the fruit and bunches of good size, and some beginning to show colour. There is a peculiarity with these Vines which has not before shown itself here, and which gives them a most singular appearance when looking down the length of the house. From every joint air-roots have started, and have grown about 9 inches in length. On some joints there are as many as forty, but the amount varies down to about ten or twelve. The variety is the Black Hamburgh, which has always borne freely, but, hitherto, without these air-roots; the latter appear to me to arise from damp. Owing to the Vines being so near the soil of the platforms, the joints have been stimulated to throw out rootlets, which look as if they would soon enter the soil. What ultimate effect such an excessive growth of air-roots will have remains to be proved. C. J. Cox.

[Air-roots on Vines are by no means uncommon. A damp atmosphere, doubtless, encourages their growth; but it seems to be the nature of Vines to throw out such roots, and some varieties do so much more freely than others.—Ed.]

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Young Apple Trees Best.—The experience of an American orchardist, says the *New York Tribune*, illustrates the advantage of planting young trees. Eight years ago, he set out one, two, three, and four-year old Apple trees on the same day, and in the same soil. The first Apples, of course, came from the oldest trees, but at the present time the one and two-year old trees are the most vigorous, and have borne, in the aggregate, the most fruit.

Golden Champion Grape.—Like your correspondent, "N." (see p. 314), I have also failed in fruiting this Vine successfully. I have it growing here on its own roots, in a house planted chiefly with Hamburgs, and though a strong grower it seems to be a shy bearer. In 1872 it never showed any fruit, last year one bunch, and this season four bunches. I am inclined to work another variety upon it; will any of your readers kindly inform me what sort would do best on this stock?—J. M.

Orange v. Grape Culture in California.—It is announced, says the *New York Tribune*, that Grape culture has become so unprofitable in some parts of California, particularly in Los Angeles County, that the growers are tearing out the Vines and planting Orange trees in their places. One noteworthy Vinoyard, the Wolfskill, thirty-five years old, is said to have been kept up for some time past at a loss to its proprietor of about 2,000 dollars per annum. Others in the same neighbourhood have yielded no profit—a statement which will readily be believed when it is remembered that the Grapes sold last season at from 50 to 65 cents per 100 lbs., a price barely covering the cost of production. Great expectations are entertained of success with the Orange (some experiments in raising them having proved very remunerative), and we trust they will be fully realised.

THE LIBRARY.

THE HEART OF AFRICA.*

No more important work on the natural productions of the great unknown countries of Central Africa has appeared than that contained in the two goodly volumes by Dr. Schweinfurth, recently issued by Messrs. Low & Co. This intrepid and highly-gifted traveller, but for the eventual insufficiency of copper bars, wherewith to meet the tribute insisted on by native chiefs, would have succeeded in reaching the point at which Livingstone's advance from the south-east terminated; and would have been able to lay down on his map the sources of the Congo and those other great rivers which have their origin to the south of the watershed of the Nile streams, and which find their outlet to the sea on the west coast. Advances, occupying scarcely two or three months more, would have effected this purpose, and the whole mystery of the interior of the vast African Continent would have been solved. This, however, was not to be; and our stalwart traveller, still in vigorous health, was compelled, in deep disappointment, to retrace his steps northward, leaving to others the glory of seizing the prize, which was so nearly within his grasp. Dr. Schweinfurth has, however, done enough, and to spare, to ensure his fame and establish his position as one of the most accomplished and successful travellers of our day. With many scientific attainments, a robust constitution, and plenty of daring, combined with prudence, he was just the man for the enterprise, of which his valuable volumes form such an accurate and complete record; the fact of his being the first true botanist rendering his statements still more valuable. In the brief space of a review, it will not be possible to follow the explorer during the whole of his route, which can only be touched upon at a few detached points of his adventurous journey.

As he approached the Port of Suakin, on the Red Sea, at which point he intended to disembark and advance towards the course of the White Nile, he observed that "a green carpet of Samphire covered the coast for miles along the land." The generic name of its family (*Sueda*) is a word initiated from the Arab *Sued*, from which we obtain the name of the well-known product, soda. This abundant Samphire region has, it seems, long been turned to profitable account by the Arabs, and, doubtless, an important trade might be established by English enterprise. As he travelled inland, he found that the mountains between Suakin and Singat afforded a habitat for numbers of remarkable plants; among which the most striking forms are those of the *Dracæna* and *Euphorbia*, remarkable especially for their fantastic shapes. They flourish on lofty heights, and are not found at less altitudes than 2,000 feet above the valleys. These Nubian Dragon trees are, it is true, but dwarfs in comparison to their sister of *Oratava*, in *Tenereffe*, but yet form very remarkable features among the vast stone boulders of this Nubian mountain range. The *Dracæna* or Dragon tree is known in Nubia as *To-Omba* or *T'Ombet*. The annexed engraving will convey, with considerable accuracy, the impression of the scene as described by our author. Between Singat and Khartoom, where the advance south was to be commenced in earnest, Dr. Schweinfurth found rich botanising quarters at many points; the vegetation of the hill districts being somewhat analogous to that of Abyssinia, which has been termed the Switzerland of Africa; while in the low-lying regions he found the trees and herbaceous plants approaching in character those of the Nile valley, and occasionally resembling the inter-tropical flora. In the mountainous districts to the south of Suakin he met with the most luxuriant vegetation at great elevations, especially on a mountain, 6,000 feet high, at *Erkoweit*, where the clusters of Beard Moss, and the abundance of sulphur-coloured Lichen give a peculiar aspect to the scenery. The wild Olive is also abundant in that neighbourhood, and entirely disappears in the interior of the great Continent. In the Wady Amet district, a species of *Scrophulariaceæ* grows, which had been honoured with our botanical traveller's name, as *Schweinfurthia Pterosperma*, and which he

* "The Heart of Africa." Three years travels and adventures in the unexplored regions of Central Africa, from 1868 to 1871. By Dr. Georg. Schweinfurth. London: Sampson Low, & Co. 1873.

says met him like a pleasant greeting from his distant home. Before reaching the confluence of the blue and white Nile, many portions of the great Nile stream, with its islands, are described with considerable graphic power; but we must pass at once to Khartoom, where, with a protective firman from the Khedive, he made his arrangements in respect to bearers—that is to say, porters—to carry forward his presents for native chiefs, his gunpowder, his scientific apparatus, clothing, and provisions. Added to the porters, a certain number of armed Nubians was necessary, and these he obtained from the Arab ivory merchants, whose *seribas* or stations, far in the interior, are numerous, and require soldiers to protect them; the southern Nubian forming good material for a military force of that kind. During the first day's journey on board a Khartoom Nile boat our traveller, advancing up the stream, noticed how the once impenetrable forests had been thinned, to the verge of destruction, for fuel and boat-building purposes; and also, in contradiction to the less accurate observations of Sir Samuel Baker, that the soil was nearly as

weight of this valuable article of commerce in a single day. Entering the Bahr-el-gazal, the course by which they were to reach Meshera, the stream became almost choked up with numerous small islands, some floating and others permanent, the shores being covered with forests of exquisitely beautiful Ferns of many kinds. From Meshera the start took place, by land, for the *seriba*, or station, belonging to Ghatta, a great Khartoom ivory merchant who had engaged to aid his farther progress by means of caravans proceeding southwards to collect ivory. It was, in fact, the aid of these Khartoom merchants, Ghatta and others, that enabled the traveller to make his way to a farther point southward, advancing from the north, than had yet been reached by any European. Vast stores of botanical wealth, many of the specimens being entirely new to European science, were accumulated during successive advances, and forwarded by returning caravans to Europe. They form an immense mass of novelty in regard to plant life; and the publication of their scientific description, accompanied by the necessary amount of accurate illustration, will be expected with



Dragon Trees in North-West Africa.

fertile as that of the Blue Nile, and that the common *Sorghum vulgare* yielded ears of grain at least 4 inches long. He was much struck, as they advanced, with the luxuriant foliage and bright pink flowers of *Ipomæa asarifolia*, which covers large tracts of country like a Rose garden. The *Aidemone mirabilis*, grows profusely in the shallow waters, the wood of which is so light that, though growing to a height of 15 or 20 feet, large plants frequently get detached and form, with other vegetable accretions, those floating islands for which the upper portion of the White Nile is so remarkable. Eventually, when far beyond the frontiers of ancient Egypt, our botanist came upon vast tufts of Papyrus, once so plentiful on the main stream of the Lower Nile, and furnishing the only writing material of the old Egyptians, but which is now as extinct in those waters as salmon is in the Thames. Farther on the *Acacia* groves attracted notice. These plants produce gum in such amazing quantities, that in the interests of commerce they ought to attract European notice. It appears that in the winter time one man might collect at least a hundred-

impatience by all European botanists and men of science. The course of the traveller's advance from Dyakin to the *seriba* of the friendly merchant, Ghatta, is very clearly shown on the map attached to volume I.

One of the chief and most natural means of travelling in Central Africa ought to have been the native elephant, which is being rapidly and ruthlessly destroyed for the sake of his ivory tusks. He is larger and more robust than the Asiatic species, and in the days of Ethiopian splendour was successfully domesticated. By means of these animals Dr. Schweinfurth thinks that communications and free trading with the very heart of Africa might be regularly carried on by Europeans far more conveniently, and in a way more tending to the gradual civilization of the country than by the present means of Arab commerce, enforced by demoralised and demoralising Nubian soldiers. At Meshera, an unhealthy station, where a considerable stay was made, the *Kegelia* was in full bloom, its flowers having somewhat the aspect of Tulips, while the growth of the trees resembled that of the European Oak.

Here, too, was found the most southerly boundary of the *Abizzia seracifolia*, with its clusters of white blossoms, like masses of snow-flakes. Throughout the Dinka district, the preparations of farinaceous and milk foods were not found inferior to those of the European *cuisine*. In fact, with the exception of the comparatively modern inroads of negro barbarism in certain districts, striking remains of a civilization, evidently derived originally from ancient Egypt, were apparent. Across vast districts of Steppes of considerable aridity, a rocky and more elevated region was next reached, where the air is described as highly salubrious, and the country luxuriantly fruitful. In the vicinity of Ghatta's Seriba extensive stretches of country are being highly cultivated. Ghatta's domains contain 200 square miles, with a population of some 12,000 native inhabitants, forming a territory which in Europe would be worth millions, but which might now be bought, as we are informed, for 20,000 dollars. Such purchases will, doubtless, be even tually made by English enterprise, and civilization and successful commerce will necessarily follow such undertakings, if backed by sufficient capital.

Dr. Schweinfurth describes his botanical excursions as he advanced as being full of interest; and his health being robust, he falls into transports of joy at his discoveries, and declares himself fairly "enraptured with the unrivalled loveliness of Nature." The forests eventually became scarcely mutilated at all by reckless destruction for fuel, as in the more northerly regions he had passed through, and were extremely beautiful; and at one spot the tall *Uncaria* and *Eugenia*, their tops crowned with spreading foliage, formed a grateful shade, in which great thickets of red-blossomed *Melastomaceæ*, mingled with giant *Aroideæ*. Here, too, was found in abundance the large *Candelabra Euphorbia*, and many trees adorning the hanging rocks are described as yielding edible fruits, such as the *Göll*, for instance, which bears pods like those of the *St. John's Bread*, the wood being used for carved stools, boxes, and other articles of native furniture. There is also the *Strychnos edulis*, with fruit resembling a Pomegranate, from which a beverage, something like, and as refreshing as, lemonade, is prepared.

Here the traveller planted a kitchen garden in the European style, and sowed the seeds which he had brought from Europe, most of which thrived well, and realised his expectations, with the exception of Wheat, which failed. The Tobacco plant, from Virginian seed, attained to great size, with leaves larger than he had ever seen. This garden yielded him much pleasure, and in its immediate neighbourhood, seated under a great tree, he passed many happy hours and days in classifying his botanical specimens, having collected above seven hundred species in five months. Among the bulbs were *Hæmanthus*, *Gloriosa*, and *Chlorophytum*. There were also many ground Orchids, and also the wonderful *Kosaria*. Wild Vines abounded; which, no doubt, by future European enterprise, will be made to yield wines of flavour and character yet undreamed of by our connoisseurs and wine merchants, for we must remember that the American Catauba wine, made from the wild Vines of the Ohio, was utterly unknown and unimagined only a few years ago. Our traveller called his residence at Ghatta Seriba "an idyl of African nature."

An interesting account of the different kinds of Sorghum, African Millet, and other farinaceous grains, is given in these volumes; and the author expresses his astonishment that Rice has never been introduced by the Arab merchants, as many districts are highly favourable to its growth, and the population, as proved by their management of their native grains, are skilful and industrious cultivators. One among the very many interesting statements of Dr. Schweinfurth is his belief that nearly every kind of illness which attacks Europeans in Africa belongs to one or other of the many forms in which malarian fever shows itself; and that quinine, if regularly taken at the rate of ten grains a day, is a nearly certain preventive of any serious attack. The next advance brought our traveller to a point commanding a view of the plains through which the Tondo pursues its course, the more striking features of vegetation being a large-leaved blue-green *Anona* and a handsome *Grewia*, with many winter-flowering shrubs, especially an *Echinops*, with purple flowers as large as a man's hand. In these extensive plains are huge stones as large as rocks, but

smooth as marble, and in the hollows a vast variety of plants of different kinds. The territory and national character of the Niam-Niams are graphically described, as well as the flora and arboreta of that region; and, in alluding to the rivers Roah and Knndoo, he dilates, with evident delight and a true appreciation of the picturesque, on the meeting of the trees growing on the steep banks over the stream, forming tufty bowers, at a height of 80 feet above the water; while the narrow passages through luxuriant woods, to which he gives the name of galleries, are described as of unapproachable richness of aspect. The luxuriance and height of the Grass called *Popukky* is dwelt upon as he advances deeper and deeper into the heart of the country, as well as the beauties of the charming halting-places, surrounded by Zawa trees and the noble *Lophira alata*, which Grant met with on another route, and declared its discovery to be the fairest memorial of his African travels.

Reaching at last a range of hills which, from their geographical position, as well as from the assurances of Niam Niam guides he believes to be the true water-shed of the Nile and its affluents, he declares that day to be the most memorable of his life; and he is afterwards confirmed in his theory by the discovery that the Welle, and other important streams to the south of that range of hills, flow directly towards the west, and are, undoubtedly, as he thinks, the parent stream or feeders of the Congo, the Niger, and other great rivers that find their outlet on the western coast. Still proceeding southward with the caravan of Aboo Sammat, conducted by his agent Mahomed, he found unlocked to him, as he expresses it, new and untold botanical wealth, and as he gradually approached the southernmost limit of his journey, the country continuously increased in beauty and interest, inasmuch that he declares, in his enthusiasm, that the last twelve miles, which brought him to the previously unknown Monbutto country, "were enriched by such beauty as might be worthy of paradise."

His reception by King Munza, whose chair of state recalls, in form the thrones of the Pharaohs, and his astonishment at the dimensions of the great hall in which he was received, combined with the discovery that a region immediately to the south of the Monbutto country was the land of the pigmies, whose descriptions by ancient authors was considered fabulous, filled him with ambition to proceed southward without delay. But this crowning success (another month's advance would have taken him, through an entirely unknown country, to Livingstone station) was denied him. King Munza refused to let any caravan pass through his dominions, lest his own command of the southern ivory traffic might be interfered with. Finding his means insufficient to bribe this potentate, he reluctantly, after lingering long at this farthest point of his wanderings prepared to retrace his steps. While there, however, he obtained as a present from the king one of the pigmies, whose name was Adimokoo, who informed his new master that his nation which he so much longed to see, was that of the Accas. It is impossible in the limited space of a review that a hundredth part of the interesting and important information acquired by Dr. Schweinfurth can be even alluded to; but it may be stated that these volumes will do more to open up the interior of Africa to civilization and commerce, than the works of any modern traveller, not even excepting those of our great and intrepid explorer Livingstone; for Schweinfurth has shown how the way from the north to the great central highlands has been laid open by the recent advances of the great Arab traders, and still farther facilitated by the triumphant exertions of Sir S. Baker. Dr. Schweinfurth's work will be read and carefully studied by all who are anxious to clear up the darkness and mystery which has so long shrouded the core of the great African continent. He has shown that only in certain parts, as in the case of the Gold Coast, is the climate unhealthy; and, for malaria of that kind, clearance of forests, drainage, and, possibly, the application of a true "botanical" cure, the plantation of the Australian gum tree (*Eucalyptus globulus*) may, as it has done in other places, tend to remedy the evil very effectually. We hear of the cure, by means of drainage, being successfully applied to the Pontine Marshes, and to the banks of the Thames about Erith and other places, where the several forms of intermittent fever raged perennially, only a few

years ago, after a truly pestilential fashion. While, as regards our valuable settlements on the West Coast of Africa, it has been the prevailing fashion to talk of "abandonment" instead of "cure." But the announcement of Captain Glover, fresh from the region itself, that thirty miles inland from Accra "men may dig gold like Potatoes," will tend more rapidly than any other kind of argument or persuasion to dispel the half-hearted and puerile dread of a climate which the industrial hand of man may render comparatively healthy. While, moreover, it is now known that at a very short distance from the coast line the climate becomes rapidly healthy in proportion to gradual elevation of the land; a fine open country having been found the prevailing character in many places at a comparatively short distance from the sea coast.

H. N. H.

GARDEN DESTROYERS.

GARDEN PESTS.

By T. BAINES, Southgate.

The Gooseberry Caterpillar.

THE locust-like appetite of this caterpillar renders it most destructive to this useful fruit. The way that a brood of them will completely strip a tree of its leaves in a few days, is really astonishing, leaving nothing but the bare wood, and fruit which the loss of leaf renders worthless. The trees are also very much weakened by the unnatural condition they are reduced to, and, unless the larva is destroyed, the trees are almost certain to be infested with caterpillar the succeeding year, for before the perfect insect takes flight, she will deposit her eggs on the trees, which will quickly come to life, repeating similar destruction to that of their progenitors the year previous. As soon as they are observed, means should at once be taken for their destruction, for, if allowed only a few days, in addition to the injury they do, they are much more difficult to deal with. For some days after they first come to life, they are comparatively tender, and easy to kill. As they get older, they get strength, and are not so easy to destroy, and they also spread over the tree, which necessitates the whole of it being dressed with whatever is used for their destruction. Anything of a dry dusty nature they dislike; even dry road dust will render the leaves unpalatable to them, and cause them to drop off, but, unless they are killed whilst on the ground, they quickly crawl up on the trees again. Air-slaked lime, if applied whilst they are young, from its caustic properties, will destroy them; but the trees should be examined shortly afterwards to see that none have escaped, as, if heavy rain falls soon after the lime is applied, it gets washed off, and some escape. There is nothing so effectual as a mixture of powdered white hellebore and whitening, applied to the trees with an ordinary flour dredger, first thoroughly wetting the whole of the tree with the syringe to cause the powder to stick. The hellebore (to be procured at any druggist's, but it should be freshly ground, as it loses its efficacy if kept long) should be used in the proportion of 1 lb. to 6 of whitening, ground fine, and well mixed together; this will destroy every caterpillar in a few days, even if they have grown large and strong. But the hellebore is poison, and wherever it is used, care must be taken that the whole is washed thoroughly off with the syringe or garden engine after the caterpillars are killed, or the fruit would cause bad effects upon anyone eating it, the very idea of which causes many not to use it. I have frequently used it myself without the fruit being in the slightest affected with it afterwards, but was always careful to see that every trace of the powder was washed off. A good preventive is, in the winter, when the trees are at rest, to put a spadeful of lime on the surface of the soil under each tree, spreading it out from the collar under the branches. This will kill the larvæ, which at this season are lying dormant under the soil, to which they have descended from the branches, after having completed the length of time they were destined by Nature to remain above ground, and from whence, if not destroyed, they will emerge and take wing, when the females will deposit their eggs on the trees, which, in due course, will come to life, and repeat similar destruction of the leaves.

The Rose Maggot.

THE maggot is very annoying to the Rose grower, boring into the best buds, and destroying many a cherished hope of first prizes. There seems to be no possibility of escape from it; every year it makes its appearance, and, if not destroyed in the spring as it comes to life, scarcely a perfect flower will be obtained, especially early in the season. At the time of pruning, every bit of the prunings, with the pips, if any remain, should be carefully gathered up and burnt. As soon as the shoots begin to push, and the leaves expand, the larvæ will make their appearance; they may easily be detected by the web they spin, coiling themselves up in the young leaves. It is here they must be looked for with care and destroyed, going over the trees once a week, crushing them with the fingers, for if allowed to remain, as soon as the buds make their appearance they will spoil them. In the usually confined beds of the amateur, and over-sheltered Rose-gardens of private establishments, this insect is much more prevalent and destructive than in the extensive open grounds of the grower for sale. The more exposed situations of the latter appear to be uncongenial to this and other insects that infest the Rose, for an account of which see an illustrated article at page 26, vol. iv., of THE GARDEN.

The Apple Boring Grub.

THIS insect is the bane of this, the most useful of all fruits grown in this country. Soil and situation, trees small or large, appear to have no immunity from it. When the sanguine fruit-grower has seen the blooming season safely past, congratulating himself upon having escaped the frosts of our fickle spring, and reckoning upon his trees being bent down by the weight of the crop, he often sees many of his best trees drop their fruit by hundreds, until nothing more than a scanty crop comes to maturity, and many of these more or less deformed. The insect comes to life during the spring in due course, first feeding upon the leaves, and afterwards attacking the fruit, boring straight to the core and devouring the pips which causes the fruit to drop off. In the case of large trees little or nothing can be done. With dwarf bush or pyramid trees they may, with a little attention, be much reduced in numbers by going over the trees in the spring and destroying the larvæ as soon as they come to life whilst they are confined to a limited space, being first enclosed in large spider-like webs before they make their exit, from which they are easily destroyed, but if once they escape and become dispersed over the tree little can be done.

The Onion Maggot.

THIS is the larva of a fly that deposits its eggs amongst the leaves of the plant, and works its way down to the bottom of the bulb; and, when they attack the crop, they most generally destroy or seriously injure it. The Onion is much more subject to the maggot in light soils than in heavy land, especially in old worn-out gardens. I have tried various remedies that have been recommended for its destruction, or as a preventive to its spreading; but I have never found anything that was of use after it once attacked the crop. By a judicious preparation of the soil, and the use of some manures, I have found that its attacks were rendered less frequent. In light land, the addition of liberal quantities of new soil, with a good dressing of salt (half a pound to the square yard), applied as a surface-dressing during the autumn or winter, with an inch of soot pointed into the ground before sowing, renders the crop less liable to its ravages. It would appear that the smell of soot is distasteful to the fly, and prevents it depositing its eggs; but, whenever they have come to life, the soot-dressing overhead, often recommended, I have found of no avail.

The Cabbage Caterpillar.

THIS insect is much more dependent on seasons than some others. If we get unseasonably warm weather early in the spring, by which the insect is fully matured and takes wing very early, the chances are that these early butterflies are all destroyed by a frosty night ere they have had time to breed and deposit their eggs. In such seasons we are comparatively free from such as attack the early crop. Later in the season we generally get the larger, more beautiful marked

grubs of the late season, and still more beautiful butterflies, Cauliflowers and tender summer Cabbages are their favourites. yet they also attack Savoy, winter Broccoli, and other varieties of the Cabbage tribe; and, if left unmolested, will quickly leave little more than the stronger and more fibrous parts of the leaves, rendering the plants useless. Sometimes the practice of dusting the leaves over with lime is resorted to; but, unless the plants are attacked whilst very small, it gets into the hearts, rendering the remedy as bad as the disease. Nothing equals hand picking, beginning as soon as the insects come to life, for which a diligent lookout should be kept, as for some days after they come to life a whole colony will be confined to a single leaf, in which condition they can be destroyed much more effectually and in a tenth of the time it takes to find them when dispersed over the plants; but, even if they have dispersed before their presence was detected, they should be diligently sought for and destroyed, for, if left unmolested, they will cause a gap in crops that in private establishments cannot be spared, to say nothing of the unsightly evidence of careless gardening, which vegetable crops reduced to this plight present.

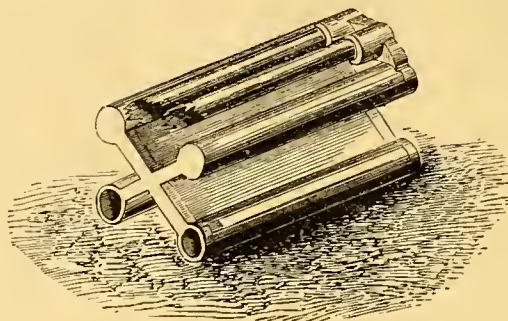
The Celery Grub.

This is a leaf-boring insect, and, almost every summer, makes its appearance amongst the crop, either more or less. The female punctures the leaf, and deposits her eggs under the cuticle, where they come to life and feed securely, destroying a considerable portion of the leaf; if left undisturbed, doing serious injury to the crop. The position occupied by the insect renders any outward application ineffectual to reach it. There is no method that I have ever tried, except going over the crop and crushing them between the finger and thumb. A man will go over a good deal of ground in a day; there is no difficulty in discovering the whereabouts of the insect, as its presence can be easily detected.

In the foregoing papers on the principle insects, &c., that prey upon cultivated plants, the means I have narrated for their destruction are in all cases such as in practice I have proved to be the best out of numbers tried. For every insect that gardens are infested with, numbers of means are often recommended for their destruction that in practice are found ineffectual, or that are so far injurious to vegetable life as to render the cure as bad as the disease. I have also tried to make them as plain as possible by avoiding all scientific nomenclature, and giving in each case details which, I trust, will be sufficient to enable anyone to operate without danger of injuring the different plants affected. But it must always be borne in mind that in dealing with minute animal life, which we wish to thoroughly eradicate, no half measures will suffice; it must be a war of extermination, which nothing but perseverance will bring to a successful issue. And, in the case of numbers of garden pests, it is a campaign that must be fought annually and with determination wherever high-class gardening in any branch is attempted.

MEIKLEJON'S CRUCIFORM BOILER.

ALTHOUGH coals are considerably cheaper now than they were twelve months ago, the economical heating of plant-houses is still a subject of much importance, and one concerning which boilers play a prominent part. Of these, various forms are before the public, and as all claim the merit of superior excellence, a few words respecting a really useful boiler may be of service to your readers. A trial does not always confirm the representations made concerning them by their inventors.



Meiklejon's Cruciform Boiler.

To produce the greatest amount of heat from the smallest quantity of fuel, is the true characteristic of a good boiler, and the possession of this desirable quality cannot be ascertained in a few hours, but only in a trustworthy manner from a hard winter's firing, or a more lengthened period of trial. I therefore place but little faith in the results of boiler competitions. After having for a long time in use various medal takers, circulators of all descriptions, cannons, retorts, saddles, upright and downright tubular boilers, I unhesitatingly give the preference to the cruciform boiler, of which the accompanying are illustrations. Our present

working-stock of this kind of boiler consists of four, in addition to as many more of other sorts, and we find it to be one of the most economical and efficient boilers yet constructed for general purposes. It may be had of any size required. The different sizes with us are heating effectually from 500 to 2,000 feet of 4-inch piping in Pine-stove ranges. The fuel required for them, is not half the quantity consumed to produce the same amount of heat by other apparatus of much greater pretensions. Its construction, as will be seen, is simple; resembling four saddle boilers cast together. The accompanying little

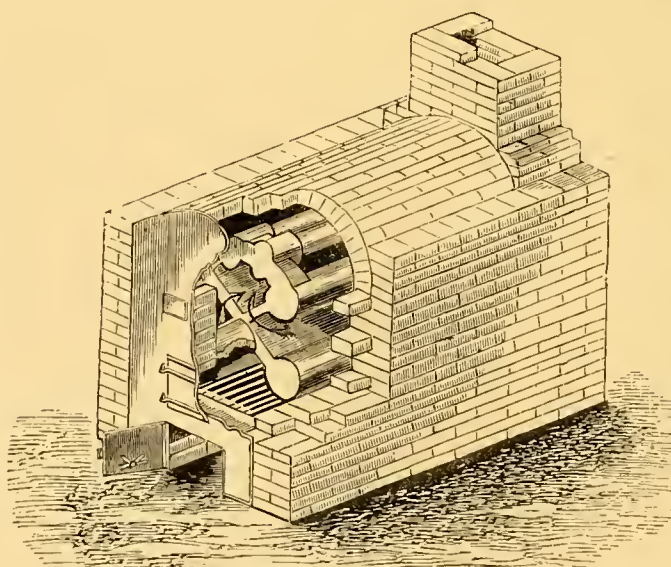


Diagram showing how the Boiler is set.

diagram represents a back view, and shows the flow-pipes and the sockets for the return-pipes. The larger illustration exhibits the whole fitted up, with a few bricks of the setting removed to expose the interior arrangement. The fire is placed under the lower angle, the flames from which pass to the back, where they are divided, and traverse the two side angles before coming to the front; there they are again re-united, and make their exit along the top of the flue, in contact with the flow-pipes from the boiler. In a No. 1 boiler, which is 4 feet long, upwards of 60 square feet of heating surface are thus fully exposed to the action of the fire. Another of its valuable adaptations is, the shallow stoke-hole in which it can be placed. Where a bottom-heat pipe has to be taken from the flow, deep boilers are virtually

unservicable, unless where a depth of drainage exists, which is not always to be had. The material of which this boiler is made is cast-metal, and, under all manner of adverse circumstances, I never yet knew one to fail. The cost too, which is generally a consideration, is, for one of these, small compared with that of some other boilers.

Glovenfords.

J. MUIR.

Glass for Greenhouses.—Will you, or any of your correspondents, tell me what is the very best kind of glass for a well-built house for greenhouse plants? —J. H. H. [The very best glass for general gardening purposes is 24-oz. British sheet.—Ed.]

THE KITCHEN GARDEN.

CROPPING A KITCHEN GARDEN.

I HAVE two plots of ground which I wish to turn into a kitchen garden, one 37 feet square, and the other 39 feet by 35 feet. Will you kindly inform me how to begin, and how to continue to cultivate the same, having regard to the fact that I wish to have as great a variety of early vegetables as possible, of the best quality?

AMATEUR.

[On submitting this question to Mr. Baines, an excellent authority on such matters, he has kindly furnished the following reply:—Your correspondent's question, although relating to a limited space, to be of any use, requires a much more lengthened answer than at first sight might be supposed necessary. From the total absence of any indication as to the nature of the soil; the situation, whether cold and shaded, as such plots nearly always are; if in the rear of a house with a south aspect; or, on the other hand, if the ground is more favourably situated, so that it commands the sun for the greatest part of the day. The absence of such data renders it a difficult task to give advice on the subject, inasmuch as the difference in the conditions indicated render the proceedings necessary to secure success very different. We must suppose that "Amateur" is totally ignorant, from a practical point of view, of the cultivation of the soil for the different subjects he wishes to grow. Let us first look at the condition of the ground, as to its being sufficiently dry, for, if this essential is wanting, it is vain to expect anything early, as, where stagnant water lodges in the soil, the sun's rays are much longer in imparting the heat necessary to promote vegetation. It is the more necessary to point to this, as, in small suburban gardens, those who construct them are often alike ignorant and careless of the essentials in their formation. They are often a mixture of brick-rubbish and excavations from the foundations, in the place of the natural surface-soil which gets buried, or is sold and removed before the building is commenced. If "Amateur's" plots, which he proposes to convert into kitchen-garden ground, are unluckily in the last-named condition, little can be done without the introduction of at least 6 inches of good soil to dig into and incorporate with say 9 inches of the existing soil, which should be thoroughly mixed in the operation of digging. As will at once be apparent, the soil prepared for the seed will then be 15 inches deep. From the way "Amateur" puts his questions, I am led to suppose he is in the same position as many suburban amateurs with whom I am personally acquainted, who have spare time, and are anxious to employ it in the cultivation of their garden, both for amusement and profit, yet are unacquainted with the mode of procedure—of the first operation to prepare the ground for the reception of any crop, digging, &c. By the way, I may observe that this ignorance would appear not to be confined to amateurs alone, but extends to many who call themselves gardeners, if we may judge by the way they proceed in digging, turning up each spit or spadeful in great lumps, as much as 6 inches thick, throwing it over in its place without any attempt at breaking the adhesive mass, leaving the surface tolerably smooth, but the whole under-portion insufficiently pulverised for the roots of any vegetable to ramify and penetrate as they ought. In preparing the soil for the reception of seed, either by the use of the spade or the plough, the end sought is the same, namely, a thorough loosening and pulverising of the soil, as near as the nature of the land will permit, to the depth the roots of the particular crop we intend to grow will penetrate; and the more thorough the breaking up of the soil is, the more easily can the rains and the air (both so necessary to the healthy development of the crop) penetrate. This effectual pulverising of the soil has also the effect of admitting the hundreds of tender-feeding rootlets, ramifying in all directions, laying hold of every portion of the soil in their search for food. Where these conditions of the soil are absent, or only partially exist, the crop is correspondingly unfavourably placed for healthy development. We will suppose that "Amateur" intends to commence operations by digging his pieces of ground. If the land is at all heavy, he will find a steel digging fork a much better implement than the ordinary spade. Let him turn over the whole of his plots, breaking the soil, as he

proceeds, into pieces not larger than a cricket-ball, bringing up the under soil and laying in its place that from the surface; carefully picking out, as he proceeds, all perennial weeds, such as Docks or Couch Grass. If the plots are level, or nearly so, it does not matter which end of the piece he commences at, but if the land slopes quickly in any direction, he should begin at the highest end, that is, throwing each spit up-hill; this is a little harder work than digging in the opposite direction down-hill, but sloping ground should always be dug twice up-hill for once down, as the soil has always a tendency to wash down-hill. Manure will be a consideration. If he can obtain it cheap, he may apply a dressing of 4 inches on the surface before he commences digging, working it regularly into the soil as he proceeds; if it is scarce and dear, he will be disposed to make as little as may be suffice; in that case he had better apply it immediately to the crops he plants as he proceeds in putting them in the ground. The next consideration will be the division of space available to the several crops to be grown, and in this he will, to some extent, be guided by individual partiality for the different vegetables usually grown. In any family, large or small, there are generally some things more esteemed than others, and even some that are never required at all. The season being so far advanced is another consideration; it is now too late to obtain early crops of many things; consequently, the varieties of some things, advisable to plant now, are somewhat different from such as should have been planted some weeks since. Another consideration for "Amateur" is, whether, with his small space, it would not be better to confine himself to a limited number of useful things, than go in for a little of everything; the former I should unhesitatingly advise, as more satisfactory; but as he expresses a wish for as great a variety as possible, I should recommend apportioning the ground in something like the following way, subject, as already hinted, to individual tastes. One-eighth of the whole space to Potatoes, which should consist altogether of early and second early kinds, such as Mona's Pride and Gloucestershire Kidney, with Early Oxford and Regents to follow in succession; these may all be planted 12 inches apart in the rows, and 18 inches betwixt row and row; plant in drills drawn out with the spade, so as to admit of the plants being covered with 4 inches of soil. If manure has not been applied at the time of digging, it should now be put in the drills with the Potato plants, it is immaterial whether it is placed over or under them, covering all up with the soil, and so proceed till all the space allotted to this vegetable is filled. Next we come to Peas, which should occupy another eighth of the available room, and may consist, for present and next month's sowing, of Yorkshire Hero, Veitch's Perfection, and Burbidge's Eclipse; these

varieties may be planted so two inches

from Pea to Pea, in rows 4 feet apart, making a second sowing the first week in May, and a third a fortnight later. The drills in which the Peas are sown should be made 3 inches deep. Broad Beans, French Beans, and Scarlet Runners should have another eighth of the space. Broad Beans—one sowing of Early Long Pod is all I should recommend this season. Plant 2 inches deep, 3 inches apart in the row, with 2 feet betwixt the rows. French Beans, Negro and Paris Red Flageolet, planted 6 inches asunder, and 2 feet between the rows. The Runners should not be planted nearer any other crop than 4 feet, nor less than 5 feet from row to row, with 9 inches of space in the row. Onions, Carrots, and Turnips should have another eighth of the ground equally divided between them. It is too late for a heavy crop of Onions; Danvers' Yellow will be the best for sowing now. Horn Carrot and Red-top American Stone Turnip: these may all be sown in shallow drills, 12 inches apart, covering the seed with half an inch of soil. The Onions and Carrots should ultimately be thinned to 6 inches apart, the Turnips to a foot; the seed should be sown four or five times thicker than this, so as to admit of failures in coming up. Cauliflowers and Cabbages should have another eighth, giving one-third of this space to the Cauliflowers and the rest to the Cabbages. Early London Cauliflowers, or Walcheren and Wheeler's Coccaut, or Early York Cabbage. The Cauliflowers, planted 18 inches apart in

the rows, with 2 feet betwixt each row; either of these Cabbages 15 inches asunder each way. To Celery and Beet, give another eighth of the space, one-fourth of this to the Beet, the remaining portion to the Celery. Beet, Barrett's or Dell's Crimson, sow in rows, 15 inches betwixt the rows, thinned out to a foot apart. Plant the Celery in well-manured trenches, 18 inches wide, the plants 9 inches asunder, allowing 3 feet between each trench. Lettuce, Leeks, Spinach, and Vegetable Marrows should have apportioned another eighth; the Lettuce and Spinach to be sown in rows 18 inches apart, the former well-manured, and thinned out to a foot asunder in the rows. Lettuce, Wheeler's Tom Thumb for early and late sowing; Paris Cos for early, and Victoria for summer and autumn supply. It is much better to sow these where they are to be grown, than to transplant, as they are not so liable to run to seed. The Leeks should be sown on a couple of square yards of ground, and afterwards transplanted in rows a foot apart, 9 inches between the plants in the rows. The Vegetable Marrow should be sown on a raised bed, under a hand or bell-glass, about the middle of May, and gradually inured to the open air, receiving plenty of water in dry weather. We now come to the remaining eighth of our space; this will require dividing for many things, amongst which should be found room for a few roots of Rhubarb, planted 3 feet apart each way. A small bed of Parsley, Mint, Thyme, Marjoram, and other herbs, and a square yard or two each should be allotted in which to sow Brussels Sprouts, Scrymger's Giant, Grange's Early White, Snow's Winter White, and Williams's Alexandra Broccolies, Savoy Cabbages, Coleworts, and Green Kale. These will come in for transplanting on the ground as it is cleared of Potatoes, Peas, Lettuce, Spinach, &c. In this arrangement I have not included either Asparagus or Seakale, as, with the first in a garden of the size under consideration, I should not advise its culture, and roots for forcing of the latter can always be bought for a price that renders it unadvisable to occupy space with it when the room is so limited. The system should be to get in a succession crop for the winter as soon as the ground can be cleared from the spring and summer occupants; in this, not a day should be lost after any crop is exhausted, more especially as the autumn approaches, for then any delay gives an insufficiency of time for the growth of these winter vegetables. This practice is necessary to make the most out of a given space, but it has a corresponding tendency to exhaust the soil. This must be met by liberal dressings of manure; four or five tons of good manure per year will not be too much. "Amateur" should also carefully preserve all his vegetable refuse; this should be kept in one corner of his garden, and all Potato tops, Pea haulm, Cabbage leaves, &c., should, as they are removed, be collected here; when rotten, a few hundredweights of lime should be mixed each year with this refuse-heap before it is spread over the ground previous to digging in; the lime will destroy slugs and their eggs, and will also act beneficially as a fertiliser. If the land is poor, a fourth of a cwt. of guano, will assist the crops much; this should be mixed with five or six times its bulk of fine ashes, or, still better, good loam, if it can be had. This should be sown broadcast over the ground, in showery weather, either before or after the ground is cropped, but with good guano, it is necessary to be cautious that too much does not come in absolute contact with any growing vegetable or it will destroy it. To those unaccustomed to high-class vegetable culture, this manuring may be considered extravagant, and not likely to pay, but it must be borne in mind that there is nothing we have dealings with that is so honest as land, and whatever we put into it, if judiciously applied, and not excessive, it is sure to give us a return with interest. The quantity of manure the market-gardeners apply would astonish anyone who has not seen it, and they make it pay or they would not do it. In breaking up and trenching kitchen-garden ground for the first time, I have dug in 150 tons to the acre; good land so treated never forgets such a dressing as this. I have recommended all to be sown in rows, which gives every facility for the use of the hoe; this implement can scarcely be used too much amongst all growing crops, providing the roots are not absolutely disturbed; it destroys weeds and slugs, both of which abound in badly managed gardens; it leaves the ground in the best condition for the absorption of rain, at the same time checking

excessive evaporation; it does not leave the surface so smooth and neat to the eye as the rake, but it is vastly preferable. As already said, the season for sowing many things is far advanced, and not a day should be lost in preparing the ground, and sowing such things as advised to be got in without delay.]

WORK FOR THE WEEK.

Flower Garden.

BEDDING plants should now be increased in every possible way. A brisk bottom-heat, drip-proof pits or frames, clean sharp sand, suitable soil, plenty of space and plants to procure cuttings from, are the requisite conditions for the purpose. Verbenas, Heliotropes, Ageratums, Lobelias, dwarf Tropaeolums, Pelargoniums, Chrysanthemum Sensation and the green-leaved summer-flowering kinds, Coleuses, Iresines, Alternantheras, Gazanias, &c., strike by means of cuttings in a few days, and may be potted singly into thumb-pots before their roots are more than an inch long. If these pots are plunged in heat, well shaded and kept moist, they never exhibit a check, but grow apace, and in a few days afford young tops for cuttings, and then side shoots for the same purpose; after that, give them another shift into sixty-sized pots. If pots are scarce, all the strongest plants, after being well hardened off, may be planted out next month in frames, kept close for a few days. Coleuses, Alternantheras, and Iresines, being rather tender, should be kept in pots until they are planted out. Sub-tropical plants, such as Solanums, Abutilons, Wigandias, Ferdinandias, &c., should be stripped of what cuttings may be on them every week. Maize, Castor-oil plants, Solanums, &c., should be raised from seed, and the seedlings should not be allowed to get root-bound, otherwise a stunted growth will be the result; they ought, therefore, to be pricked off, as they germinate, into small pots, and be shifted from them into larger ones. Dahlia roots are now yielding plenty of cuttings, which should be taken off when fit for separation, struck in heat, and treated like other strong-growing half-tender plants. Canna roots may be divided, potted singly, and grown in a stove temperature for a short time. Pot some Gladiolus roots for early flowering. Evergreen trees and shrubs and deciduous trees and shrubs may yet be safely transplanted. The pruning of the latter, as well as of Evergreens, should be finished. Shrubbery borders should be lightly pointed over, taking care not to injure the roots in the operation, or to disturb any bulbous plants that may be growing amongst the shrubs. Isolated specimens of newly-planted trees, especially if large, are much benefited by a few shrubs being planted around them for a year or two, to act as a protection from winds, frost, and drought; after they get established the nurses may be removed. Roses of all kinds should now be pruned, and those on pillars or walls thinned and fastened in. Prune, where necessary, Ivies on walls, and fasten any in danger of falling away from them. Uncover Myrtles, Magnolias, Fremontias, Stauntonias, Clematises, and other half-hardy plants on walls, and otherwise put them in order for the summer.

Greenhouse and Stove Plants.

All hard-wooded plants, which it is necessary to pot during the spring, ought to receive that attention by the middle of the month. If cold cutting winds accompany bright weather, do not give any side air near where newly-potted plants are placed, but let the top lights be opened. Shade and sprinkle water about the paths, and upon the stages where the plants are placed. Let all plants as they are potted receive what tying they require to put them in proper shape, especially young growing stock. Any omission in this matter is frequently fatal to symmetrical appearance; as the plants get older the young wood becomes too stiff to bend. If mildew happens to exist on the ripe wood of last year, it will most likely attack the young growth as soon as the plants begin to move. This applies to such plants as *Boronia pinnata*, *Hedera tulipiferum*, and *Leschenaultia biloba*. If such should occur, dust with sulphur at once. Azaleas that have been much affected with thrips last summer would be much benefited by a good washing with tobacco-water now, as the eggs that were deposited in autumn will soon come to life under increased temperature. To such stove plants as are in active growth give water freely both at root and overhead, and keep the atmosphere moist by frequent sprinklings on all available surfaces. A little shade, when necessary, prevents scorching. Air should be given in the morning, and the house should be shut up early. Pot a few Gesneras, Gloxinias, Achimenes, and Caladiums, and place them in heat to succeed those previously started.

Hardy Fruit Garden.

Outdoor fruit trees, as a rule with, perhaps, the exception of Apricots, promise to produce heavy crops. Plums are laden with

flowers, and Cherries have set blossom buds in abundance; Pear-trees, too, are most satisfactory. Finish grafting, more especially that of stone fruits, as speedily now as possible. If not already done, mulch between the rows of Strawberries with litter, the nutriment from which will be washed down to the roots by successive rains, leaving the surface clean for the fruit to rest on when ripening. See that Raspberry bushes are securely fastened to their supports; in most cases they are grown erect and tied to wooden stakes, but in others one-half of the rods from a stool is loosely plaited and brought to meet a similar number of canes from the next, thus forming a series of arches, whilst, in other instances, the rods are cut about 3 feet in length, and are tied together without a stake; in some other cases, too, they are tied to wires or trellises.

Kitchen Garden.

Cabbages and Cauliflowers have started actively into growth; the hoe must, therefore, be kept at work amongst them, as nothing is more productive of good to vegetables than a clean and frequently-stirred surface. Make a general sowing of Cauliflower, and prick off into a warm corner or border those sown last month, as soon as they are fit to handle; and, in the event of cold or wet weather occurring, hand-lights, frame sashes, or hoops and mats may be employed for their protection. Sow some of the early kinds of Broccoli, and, in cold localities, also late sorts. Of the fine curled Italian Endive, sow some seeds in a brisk temperature for early use; but if not sown in a strong heat, the plants are apt to run prematurely to seed. The main crop of Beet may now be sown; but in warm counties, towards the end of the month will be soon enough. It likes an open situation and trenched ground that has been manured for the previous crop. Thin Parsnips when they appear, but not finally; some growers prefer sowing early in this month, but, even about London, Parsnips are sown at the same time as the spring Onions, for they take a long time to germinate and they are not liable to "run." Sow Chicory thinly in rows, about 9 inches apart, for winter forcing. As soon as Globe Artichokes have made growths about 9 inches long, slip them all off except the three strongest, which should be retained for the summer's produce. The best of the slips should be chosen for a new plantation. Cut the heel attached to each smoothly, and then plant them 8 or 9 inches apart in clumps of three, each clump about 2 feet apart, in rows 4 feet asunder, in a deep rich sandy loam, and an open situation. Sow some summer Savoy in a warm border, and increase the stock of the winter kind, either in the same way, or by dividing the old roots. Fresh Tarragon plantations may be obtained by planting rooted slips from the sides of the old roots; Tansy may be increased by division of the roots, and Sorrel by sowing or dividing the roots; Balm, Burnet, Thyme, and Mint may be propagated by dividing the roots; and Hysop, Fennel, Sage, Rosemary, Pennyroyal, and Lavender by slips, which, if rooted, are so much the better; while Chervil, Clary, Sorrel, Samphire, Purslane, and Borage require to be raised by means of seeds. Basil and Knotted Marjoram are best raised in a gently-heated frame, and well hardened off before being finally transplanted. Preserve a piece of a warm border for French Beans; but it is rather too early to sow them yet. Before sowing, open the drills in the morning, if fine, and sow the seeds in the afternoon. Sow Cardoons where they are to remain, in lines 4 feet apart, so that three seeds may be in a clump, and the clumps 2 feet asunder. In the northern counties, Gherkins may be sown in gently-heated frames; but, in warm and southern localities, May is soon enough for sowing; whilst, if a well-sheltered warm border be selected, they may be sown in lines, 4 or 5 feet apart, out of doors in the latter half of May, when they yield their crop at the end of July and in August. Keep up a succession of Peas and Beans, and attend to timely staking. Successional sowings of small salading must be regularly attended to, and Lettuces transplanted, sown, and thinned. Sow Turnips as required; and, in case of the coming summer being hot and dry, a small sowing of early white Vienna Kohl Rabi may be found useful.

Plant Origin of Japan Lacquer.—It has been generally supposed, says the *Scientific American*, that the beauty of Japan lacquer-work was due to ingredients derived from unknown plants, and that the secret was confined to the Oriental workmen. Recently, however, in Holland, objects of art have been produced, lacquered and covered with mother-of-pearl in pieces, facsimiles of those made in Japan. The lacquer used is prepared from the hardest varieties of gum copal, principally that of Zanzibar, which is coloured black with Indian ink. The articles are covered with several layers of this substance, upon which, while still wet, or rather pasty, the mother-of-pearl is inlaid. Drying in a furnace follows, another coat of lacquer is applied, then more drying, and smoothing with pounce. These operations are repeated until the surfaces are perfectly united and smooth, when a final polish is given with tripoli.

SOCIETIES, EXHIBITIONS, &c.

ROYAL HORTICULTURAL SOCIETY.

APRIL 15.

Rhododendrons.—These, though limited in number, were shown in excellent condition on this occasion by Messrs. Lane, of Berkhamstead, who had a nice group of plants and some splendid trusses of cut flowers. Among the varieties, we noted *R. hybridum roseum*, a richly-coloured crisped variety, with fine wax-like foliage; *Verschaffeltii*, a delicate lilac, the upper petal spotted with maroon; *Queen of the West*, a bright rosy-lilac, each petal being beautifully crisped; *Limbatum*, a very distinct variety, with white flowers margined with bright rose; *Auguste Van Geort* is a most profuse bloomer, the flowers being of a deep purple-lilac, and the foliage of good substance. The best white in this group was *Bodaertianum*; this is a waxy white variety, with the faintest trace of blush in the youngest flowers.

Cinerarias.—With these, Mr. J. Standish, Nurseries, Ascot, was first; a second prize being awarded to Messrs. Dobson, Woodlands Nursery, Isleworth. Both collections contained compact and well-grown plants, the colours being bright and distinct. In the Amateurs' Class, Mr. James, gardener to W. F. Watson, Esq., Redles, Isleworth, was deservedly first, with very nice plants, dwarf and well bloomed. Mr. R. Wareham, gardener to J. Mitchell, Esq., Coppins, Iyer, Bucks, was second, with larger plants, the strain being better than in the last group, but the plants were not so evenly bloomed.

Azaleas.—Messrs. Lane staged nine well-bloomed plants, to which the first prize was awarded. In this group, the most notable were *Comet*, a scarlet variety shot with purple; *Flag of Truce*, a very beautiful semi-double white, the flowers being very pure; *Roi d'Holland*, a brilliant scarlet; *Roi Leopold*, deep rose, shaded vermilion, and *Gloire de Belgique*, a fine white, inclined to sport into rose. The two best scarlets in this collection were *Vesuvius* and *Stella*, both very vividly coloured and attractive. The second award went to Mr. Charles Turner, of Slough, whose plants were much smaller but still well-bloomed, and well suited for ordinary purposes of decoration. The most notable were—*Apolla*, a fine white, inclined to break; *Erbprinz Ludwig*, a semi-double of the brightest rosy-lilac; *Mrs. Turner*, salmon, edged with white and beautifully spotted. The most attractive plant in the whole group, however, was *Charles de Buck*, an immense flowered variety of the brightest rosy-crimson imaginable. In the class for plants in 12-inch pots, Mr. G. Wheeler was first, with very compact specimens, including *Model*, a fine rosy-lilac; *Chelsoini*, a good old scarlet variety, with crisped petals; *Stella*, one of the best of the scarlets; *Duc de Nassau*, a semi-double lilac, and *Magnificans*, pure white. The second award in this class was given to Mr. R. Marcham, who had well-bloomed plants, the most notable being a plant of *Criterion*, a rosy variety, edged with white, the upper petal being spotted with deep rosy-crimson.

Clematis.—Messrs. Jackman, of Woking, staged about thirty plants of their new hybrid Clematises, which we admire the more, the more we see of them, so deserving are they of general culture, either in pots or planted out. Among those staged on this occasion, we noted the following as distinct and good:—*C. Baroness Burdett Coutts*, a large-flowered variety, of a delicate rosy-lilac; *Lady Stratford de Ratcliffe*, a beautiful lavender-blue, large and fine; the *Queen*, a delicate lilac; and *Vesta*, an eight or ten-petalled flower, of remarkably good form and pearly whiteness, with purple stamens. The majority of the plants were 18 inches to 2 feet high, and as much in diameter, bearing from thirty to sixty flowers each.

Roses in Pots.—Messrs. Veitch & Sons exhibited a very fine collection of fresh healthy plants, well bloomed. The best in this group were *Charles Lawson*, deep rose, General Jacqueminot, a well-known old crimson, and *Marguerite de St. Amand*, a silvery-rose or pale lilac. The best Teas were *Madame Willermoz*, one of the best whites, and *Madame de St. Joseph*, a fine salmon-flesh, fine in the bud, and a fine variety for cutting for bouquets. Mr. W. Paul, of Waltham Cross, had a larger collection of smaller specimens. Among the Tea-sectored varieties we noted *Marie Van Houtte*, a delicate sulphur, *Souvenir de Paul Nerou*, a fine white variety tinted with salmon or flesh colour. The best in this group, however, was a plant of *Catherine Mermet*, a really superb Rose of the most delicate flesh colour. Two good stands of cut Roses came from Mr. J. Walker, Thame, Oxford, containing fine blooms of *Maréchal Niel* and *Gloire de Dijon*, two of the best Teas. Mr. G. Paul, Cheshunt, showed cut flowers of *Cheshunt Hybrid* and *Madame Lacharme* Roses, the blooms of the latter being the best we have yet seen, and of remarkably good form, round and full.

Orchids.—Mr. Denning, gardener to Lord Londesborough, furnished half-a-dozen well-bloomed plants, including the following: *Dendrobium Jenkinsii*, a pretty scandent species with orange flowers; *D. fimbriatum oculatum*, with at least thirty spikes; *Cattleya Skinnerii*, a very good variety, with rich lilac-purple flowers, the throat of the lip being pure white; and *Cattleya citrina*, a fine specimen, on a block, bearing eleven wax-like lemon-tinted flowers, most deliciously scented. The most notable plants in this group were fine specimens of *Arphyllum giganteum*, bearing fifteen fine spikes of shell-like flowers, of a bright purple colour; and a plant of *Vanda cœrulescens* bearing three fine spikes, on the largest of which we counted twenty-three flowers of a deep cerulean blue, with a deep tinted lip. Mr. G. Wheeler was second with half-a-dozen well bloomed plants. In the Nurserymen's Class, Mr. B. S. Williams, of Holloway, staged six fine plants, including one of the finest plants of *D. nobile* we have ever seen, and a splendid plant of *D. infundibulum*, a fine variety, with a Roman red stain on the lip in place of the golden-

yellow blotch usual to this species. In this group there was a magnificent specimen of *Aërides Fieldingii*, with at least eight fine drooping spikes of deep rosy-lilac spotted flowers, and a fresh and healthy specimen of the purple spotted variety of *Cymbidium eburneum*. In the Miscellaneous groups, Mr. Denning had a rare and valuable collection, including the yellow-flowered *Dendrobium senile*, a dwarf species, the pseudo-bulbs being densely covered with long white hairs; two splendid varieties of *Masdevallia Harryana*, and one of *M. Lindeni*, with its glowing lilac-purple flowers; and a good plant of the rare old rosy *Odontoglossum* (*O. roseum*). Messrs. Veitch & Sons had a splendid group, including many of the latest novelties already referred to in our columns. On this occasion we noted *Odontoglossum vexillarium*, with its rich rosy flowers; *O. naevium*, with white purple-spotted flowers; *O. Alexandræ*, a dense flower, very richly coloured; and the rare little Japanese *Aërides* (*A. japonica*).

Miscellaneous.—Messrs. Cutbush staged some nice plants of *Cinerarias*, well-bloomed, and a few plants of the beautiful old double-yellow Wallflower, so useful for cutting. Mr. Marchant, gardener to J. Mitchell, Esq., Coppins, Iver, Bucks, had half-a-dozen well-grown rosy and white Chinese *Primulas*, of a good strain. Mr. W. Bull staged a noble group of *Cycads*, to which an extra prize was awarded. We allude to these beautiful plants in another column. Messrs. Veitch & Sons contributed a fine group of early-flowering decorative plants, including greenhouse *Rhododendrons*, *Azaleas*, *Libonias*, *Epacris*, and *Clematis*. In this group we noted a fine pan of the pure white *Primula nivea*, and another of the rosy-flowered *Hydrangea*, *Stellata* fl. pl., a most useful decorative plant; two fine plants of *Rhododendron*, Countess of Haddington, and Princess Alice, were profusely bloomed. These, together with a profuse sprinkling of the choicest *Orchids* made up a most attractive group. A fine bank of *Cyclamens* came from Mr. James, and these obtained an extra prize. Messrs. J. Standish & Co. sent a fine assortment of decorative and early-blooming plants for cut-flowers, including the white forcing *Pink Lady Blanche*, *Abutilon Boule de Neige*, *Azalea Juliette*, a rich rosy semi-double variety, and *A. Sigismund Rucker*, a variety tinted like *Criterion*, but a much finer flower; also the hardy *A. mollis*, with orange-red flowers; and *A. linearis*, another hardy species with very narrow rosy petals, 2½ inches in length, and only a line or two broad. These, together with the feathery-leaved *Acers* and *Cinerarias*, made up a fine bank. Messrs. Barr & Sugden staged a fine group of early flowering *Narcissus*, containing many rare and beautiful flowers; this collection was much admired. Lord Londesborough sent a fine group of *Orchids*, containing some rare plants previously alluded to. Mr. B. S. Williams staged a nice assortment of *Palms*, *Ferns*, *Orchids*, and *Cycads*, and a specimen of *Primula cortusoides amena alba*, a pure white variety, that will be invaluable as a pot plant when plentiful; a plant of *Sarracenia Drummondii* bore four of its large lurid purple flowers, and a plant of the ivory white *Chysis bracteata* was well flowered. Messrs. Veitch & Sons staged an attractive group of cut-leaved *Acers*, some of which were very elegant; in colour, they vary from fresh green to the deepest bronzy-purple; even if these do not prove sufficiently hardy for outdoor culture they will be invaluable additions to the greenhouse or cool-conservatory. Herbaceous plants and *Alpines*—Mr. Parker, of the Exotic Nursery, Tooting, staged about forty specimens of spring-blooming hardy flowers in pots, and these were fresh, well bloomed, and much admired. Among them we may notice *Epimedium roseum*, with heart-shaped foliage and deep rosy flowers; the beautiful *Primula nivea*; *Iris nudicaulis*, a deep rich purple; *I. pumila*, one of the best known and most beautiful of all the dwarf kinds. The pot of *Triteileia* (*Milla*) *uniflora* was the finest we have ever seen, being one dense mass of foliage studded thickly with hundreds of its white star-like flowers. Its variety *ilicina* has blue flowers, and is sometimes known in gardens as *Leucocoeryne alliacea*. Two pots of *Scilla campanulata* and *S. nutans rosea* were well bloomed and very attractive, as also was a fine specimen of the golden-rayed *Doronicum austriacum*. A pot of *Bellis aeneobefolia*, with its golden-marbled foliage and crimson flowers, contrasted well with a beautiful mass of the blue-flowered *Aubretia purpurea elegans*, and this contrast was again further enhanced by a fine golden mass of *Primula elatior*, "Golden Plover." Mr. R. Dean, of Ealing, staged about two dozen smaller plants well flowered. Among them we noticed a fine variety of the double white Daisy, a first-rate plant for spring bedding; *Myosotis dissitiflora*, a perfect mass of deep blue flowers; also, the pink-flowered variety of *Bellis aeneobefolia*, and several pots of the old double lilac and yellow *Primroses*. Tom Thumb bedding *Pansy*—"Yellow Boy"—is dwarf and compact, with richly-coloured flat flowers of a deep golden-yellow, and, if as well adapted for bedding as it evidently is for pots, it will prove a most valuable acquisition.

Fruit.—The show of fruit was limited in quantity, but in quality excellent. In the class for Grapes, Mr. W. Wildsmith, gardener to Viscount Eversley, Hockfield Place, Winchfield, was first, with two superb bunches of Lady Downes cut from the Vine on the 4th of February last and preserved in water. Second, Mr. H. Harris, gardener to Lord Ashby, Nascby Woolleys, Rugby, who had two fine bunches of Black Hamburg, of this year's growth. The competition here lay between cultivation and preservation, and the award went to the latter. The first prize for white Grapes was also taken by Mr. Harris with nice clusters of Sweetwater. Strawberries were very fine. The first prize being awarded to Mr. Sage, Ashridge Gardens, Great Berkhamstead, who had a very fine basket of Keen's Seedlings, very tastefully set up in a round basket. Second, Mr. D. Pizzey, gardener to Sir E. Perry, Fulmer, Slough. Easter Beurre and Ne Plus Meuris Pears were shown by Mr. Jones, of Frogmore, who also set up a fine group of Apples, to which an extra prize was awarded. Two fine smooth Cayenne Pines also came from the Royal

Gardens, Frogmore, and these were splendid examples of good culture. Mr. W. Gardiner, gardener to E. P. Shirley, Esq., Stratford-on-Avon, also staged a nice collection of Apples, containing about two dozen varieties, all in a remarkable state of preservation, though scarcely so fine as those from Frogmore. Cucumbers came from Mr. J. Douglas, gardener at Loxford Hall, Ilford, and from Mr. D. Pizzey, of Slough, and both were awarded equal first prizes. Broccoli were very good, the best exhibited being Watts's Excelsior, but, as these were not for competition, the first award went to Mr. E. Clarke, gardener to J. R. Hall, Esq., of Sutton, Surrey, who had some good Walcheren; second, to Mr. Norman, of Coombe Bank, Kingston-on-Thames; and third to Mr. C. Osman, gardener to the South London District Schools, Sutton, Surrey.

First-class Certificates were awarded to the following new or rare plants, viz.:

Oncidium fuscum (Veitch). A form of Reichenbach's *Miltonia Warscewiczii*, having rosy-tinted flowers in place of the yellow and brown ones of the normal type. It is even more ornamental as a garden plant, and well worth culture.

Cattleya gigas (Veitch) is one of the finest of all *Cattleyas*, and will be much sought after by growers. It has large rosy-lilac flowers, the broad lip being mottled with deep violet-purple.

Ficus Parcelsii (Veitch) is one of the finest white-variegated plants we have ever seen. Its leaves are as large as those of *Ficus elastica*; but are thinner in texture, and coarsely serrate along their margins. They are bright green, irregularly blotched profusely with creamy-white and dark green. If the plant is of free growth, as its appearance indicates, it will form one of the finest of all variegated decorative plants introduced of late years.

Clematis Lord Gifford (Noble) is a beautiful purple-lilac variety, and a vigorous grower.

Clematis Marquis of Salisbury (Jackman). This is a most vivid purple variety, and evidently a most profuse bloomer.

Clematis Countess of Lovelace (Jackman) is a light bluish-lilac form, with fresh vigorous foliage.

Ceterach aureum (B. S. Williams). A strong-growing tropical form of our common *Ceterach officinarum*, having fronds 12 to 15 inches long, and 3 to 4 inches broad. The fronds are of a deep green colour, and are densely covered behind with silvery scales, which turn brown as the fronds develop themselves. It is a distinct plant, and one well worth growing.

BOTANICAL SOCIETY OF EDINBURGH.

APRIL 9TH.

The president in the chair. Mr. Sadler read a series of notes by Mrs. Wright, Halston Hall, on *Eucalyptus globulus*. This tree, which is a native of Australia, grows very rapidly—as much as 6 feet in a year. It had been introduced, and was now largely grown in Algeria, Spain, and the south of France. Its medicinal properties had been attracting much attention in France, and the alleged cures by it had been making a great sensation there. It was stated to have been employed with wonderful effect in cases of asthma, low fever, rheumatism, and it had been employed instead of quinine. During the Franco-Prussian war, the fresh leaves of the tree had been employed effectively in cases of hospital gangrene. Mrs. Wright was assured that it would be useful in cancer and epilepsy. The president said that this seemed to be one of the articles sent to Europe from all parts of the world, which were to be infallible remedies for various diseases. It was a most remarkable thing that these so-called remedies were to be applied to the most unmanageable inconsistent diseases. This one was to cure asthma, low fever, hospital gangrene, epilepsy, and cancer; to make us perfectly safe, hydrophobia and the bites of venomous snakes would only be required to be added to the list. He only wished they had sufficient specimens to make a trial of its curative powers. Dr. Cleghorn said that the tree had been introduced into India, and that in fifteen years it stood 75 feet high, and was then used for building purposes. Mr. Etheridge said he had seen a *Eucalyptus globulus* tree in Australia, which, when cut down, measured 375 feet. A red gum exuded from it, the wood was of a blood-red colour, and when thrown into water it sank. Throughout the Australian colonies the tree was believed to be an infallible cure for rheumatism. Mr. James McNab, curator of the Royal Botanic Gardens, read his monthly report on open-air vegetation at the gardens. The unusual mildness of the winter and spring had, he said, been instrumental in bringing forward forest vegetation in the neighbourhood of Edinburgh to an extent he had never before observed at the same date. At present many forest and ornamental trees were in flower, such as the Norway and other Maples, various species of Elm, Willow, Alder, Birch, Pyrus, Prunus, particularly the common Guin, which was quite white with blossom. A green hue pervaded a large proportion of forest and ornamental trees, such as the Horse Chestnut, Elm, Larch, Whitebeam, Laburnum, Balsam Poplar, and many varieties of Thorns. The common Thorns were in full leaf, and he had seen one with the flowers fully expanded. He had never before observed a Thorn come into flower in April. The temperature had been during the past month only three times at or below the freezing point, viz., on the 25th and 26th March, and 4th April. It was remarkable that there had been an almost total absence of easterly winds, which often proved so destructive to the blossom of fruit trees, while strong west and north-west winds had prevailed. He showed the flowers of 236 species of plants, trees, and shrubs picked in the open air on 6th April—an unusual number at this particular season. The ground temperature had also been unusually high. A tortoise, which had been in the Botanic Gardens for fifty years, and which usually buried itself in the earth in the beginning of October, and did not appear again till the second week in April, had this year emerged on the 15th March—a circumstance quite unprecedented.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

HYDE PARK; ITS HYACINTHS AND TULIPS.

By NOEL HUMPHREYS.

THERE is much to admire as well as much to criticise in the management of this, the largest of our metropolitan parks. It is, doubtless, to be regretted that some of the fine old trees are fast disappearing—some from their venerable age, and others, such as those which were enclosed within the great glass dome of the first Crystal Palace, from causes and exigencies which might, perhaps, have been avoided. Yet, it is a consolation to find that young trees are being judiciously planted to replace the gaps that London smoke, combined with accidents, and, in some cases, want of wise and timely supervision, have but too fatally made. It is doubtful, however, whether the young trees will ever attain the size and magnificence of the ancient giants, whose venerable trunks are, year by year, disappearing. Some of the younger trees, now twenty or thirty years old, have grown but slowly. They are not absolutely stunted, but they are, undoubtedly, small for their age; and their general aspect does not display the vigorous character one would wish to see. This is, no doubt, caused by the gradual, but persistent, hemming-in to which they are compelled to submit by their deadly enemies, the army of smoke-emitting chimneys. That is a difficulty that park-management will have to contend with, in an increasing degree, year after year; but it is one which yet leaves us many rays of hope. The smoke-plague may, some day, be abated by the enforced use of smoke-consuming grates; but, even if the proverbial slow working of our legislative machinery should be too many centuries in effecting this reform, there is no occasion for absolute despair; for open spaces in London, long since closed in by miles upon miles of dense masses of building, have yet some nice trees remaining. Lincoln's Inn Fields may still boast of trees and shrubs that bravely defy the smoke; and so may Russell Square, Brunswick Square, Grosvenor Square, and other spaces that are, beyond dispute, in the very heart of London. The smoke does not kill our tree vegetation outright; but it blackens it, disagrees with it, and checks its growth. Yet we shall still have Oriental Planes and other town-thriving plants in spite of it, even in the very core of our big city. So it will be with Hyde Park; and, where tree growth fails, we may eke out with flowers; and this reflection leads us to the magnificent show of floral splendour that has been made along the whole eastern side of the Park, facing Park Lane, for the last few years, but more especially during the present season. The Hyacinth show has been truly superb. It is now considerably past its best, on a close inspection, but at a little distance the long succession of masses of splendid colour seems to glow in the bright verdure of the early spring turf, like giant gems set in a vast gypsy ring of some precious kind of green-coloured gold. These densely-filled beds of flowers succeed each other, varying distinctly in colour, for nearly the whole length of Park Lane, till they blend into a distant rainbow horizon of many hues, mingling harmoniously with each other. Those masses, which are formed of a superb deep purple kind, verging to black, produce a magnificent effect when followed by a contrasting mass of white, which, in its turn, is succeeded by one of deep rose-colour; and then comes the purple-black again, and then one of soft corulean-grey, and then mauve, and then deep red, and ochreous yellow, and then white again, till the eye can scarcely distinguish, in the distance, where or how the still succeeding masses blend into each other. The almost invariably fine and perfect character of each spike of flower, of all the varieties, does infinite credit to those skilful Dutch growers of the bulbs, whose fields of Hyacinths, acres in extent, scent the air, from Haarlem to Leyden, in the early days of April. It is indeed wonderful how such uniform perfection is achieved, when the vast numbers produced are taken into consideration; for, in a single bed of the Hyde Park display, I

counted 300 flowers, all equally good, without speck or blemish. The Tulip display is equally fine, and has the advantage of being still in full perfection—indeed, scarcely at its best; so that those who lose no time in hastening to see it will enjoy the sight of these gorgeous Tulip-beds in all their perfection. Some of the masses are, indeed, still in green bud, and this is a defect of management; for, if the kinds in question are rather later-flowering sorts, they might be planted earlier, to give them a little start. This, however, is a very small matter to notice, when the general display is so truly gorgeous. Many admirers were lingering over the display last Saturday with evident interest; taking down the names of the most striking kinds, with the intention, as was plain enough, of turning their newly acquired knowledge to account in the selections for their own private Tulip-beds next season. Among the kinds producing the most decided effect were the pure whites, the pure canary-yellows, the Gloria Solis, and the Kaiser Kroom, which, being translated from the Dutch, may mean the Chrome Emperor; for the lower part of the flower is of a bright blazing orange-scarlet, and the upper part a full and dazzling yellow chrome. These are varied by masses of a double kind, of a rich bluish-magenta colour, succeeded by double whites, rich crimson, and many others; but some of the old favourite kinds, the whites, carnation-striped with crimson, and the yellows, tiger-striped with black or purple, are not represented. There seemed to be a good deal of disappointment among the visitors on account of the Hyacinths being without names, which is certainly an omission, seeing how eagerly those of the Tulips were "booked" by the spectators. The display of Crocuses, of the best kinds, which formed an edging to the Hyacinth and Tulip beds, while they were still only in bud and promise, are quite over; but their green foliage still forms a pretty and appropriate bordering. While on the subject of the general "keeping" of Hyde Park, there is one matter which requires notice—it is that the turf (in the portions of the park devoted to flower-gardening) is in many places defective; for, under the drip of large trees, or from other causes, there are large and very ugly bare patches, which ought to be repaired with fresh turf each season. No such blemishes could be found in the Bois de Boulogne, or even in the pretty little park at Brussels; and in the chief pleasure-ground of the richest metropolis in the world, they certainly ought not to exist. No time ought to be lost in attending to these blemishes in the turf, which occur in many other parts, as well as those devoted to floral displays. It is not the battering of the turf for a considerable distance on either side of the pathways which leads across the park, from the Bayswater Road to Kensington, that is alluded to. These pathways are generally protected as much as possible by light iron fences, which would fulfil their object, but that certain sections of the public are so jealous of their liberties—even the liberty to do a little bit of mischief, if it so pleased them—that the very fences set up to protect the turf, though for their own enjoyment, are looked at askance, and no opportunity of tramping over it in spite of them is ever let slip. It is the more essential to keep the whole of the turf as perfect as possible just now, because the verdure of the trees, under the influence of the genial warmth of the last few days, is becoming bright and May-like, even before its time, and it is a pity that stunted patches of browned turf should clash with the general vernal aspect which the park is daily assuming. Since Tuesday, the Lilacs in the shrubberies are recklessly bursting into bloom, utterly regardless of nipping night frosts that may yet come. The Horse Chestnuts have rapidly unfolded their big leaves, soft and tender both in hue and texture—and their spikes of green buds are shooting upward and from the end of every branchlet, to make the "Hyacinth-tree" one of the spring glories within a fortnight's time if the present glowing weather continues. On the bank above the Serpentine, too, is a fine clump of Ashes, which is well worth inspection. Few have any idea of the wonderful variety which is to be found among them, both in foliage and habit. It may be stated that there has been, in the shrubberies next Bayswater Road, a good deal of random butchering (not pruning), which has so fearfully disfigured long stretches of Lilacs, Ribes, Aucubas, and other things, that they had far better be cleared away, and their present wrecks replaced by turf.

NOTES OF THE WEEK.

— WE have received from Messrs. Backhouse, of York, a fine specimen of one of the loveliest of Alpine plants, viz., *Dianthus glacialis*. This, in the sturdy dwarfness of its growth, and the singularly delicate but rich tint of its rosy-pink flowers, is a worthy rival of the now pretty well-known *Dianthus alpinus*. It is not such a large-flowering or deeply-coloured plant as the last-named species, but it possesses a charm of habit and hue peculiarly its own, and which will ever secure for it a first place in the ranks of dwarf-hardy rock-work plants.

— AT a sale of Orchids which took place at Stevens's on Wednesday last, *Masdevallia Veitchii*, "a splendid mass with sixteen breaks," fetched £10 10s.; *M. Harryana*, £3 15s.; and *M. ignea*, £5 15s. 6d.; *Cypripedium Argus*, a distinct species from the *Philippines*, so named in allusion to the numerous eye-like spots which it has upon its petals, fetched £3 10s. Altogether the sale which consisted of some 286 lots, realised about £500.

— THE Plane trees on the Thames Embankment have already put forth leaves. They were amongst the first this early season to exhibit signs of vitality, and, unless checked by some inopportune frost, they will, we believe, soon exhibit all the wealth of foliage for which Plane trees are remarkable in the summer months. Some of a larger size, close to Covent Garden, as yet show no fully-developed foliage; though, within these last few days, their buds have swelled considerably. Two Poplars, growing beside them, were in full leaf quite three weeks ago. Where early leafing is desirable, these are, therefore, useful trees to plant.

— SOME fine specimen Camellias are just now flowering most profusely in the conservatory at Chiswick House. Of these one of the most notable is a noble plant of *C. reticulata*, a well-known kind now rarely seen in even the best collections, possibly on account of the semi-double character. There is, however, an old plant of it in one of the pits at Chiswick, where it blooms most abundantly every spring. A year or two ago, branches of this Camellia, bearing flower-buds, were grafted on dwarf stocks of the common kinds, and two or three dozen of these miniature plants in flower were exhibited at South Kensington, and attracted considerable attention at the time. One of the largest specimens of *reticulata* with which we are acquainted is at Grove Bank, Kingston.

— A NEW parasite, or rather a newly-imported parasite, which is likely to prove a trial to gardeners, has appeared both in England and on the Continent. It is a fungus, which attacks Hollyhocks most destructively. It is believed to be indigenous to Chili, and its botanical name is *Puccinia Malvacearum*. It was first observed near Bordeaux in April last, and appeared in many places in England during the summer, committing so much havoc among our Hollyhocks as to render them very scarce this year. Commerce has, no doubt, been the agent by which this pest has been introduced; to it we are also indebted for the American Water Weed, and it will, probably, inflict other of the evils of distant lands yet upon us.

— THE members for Canterbury have shown their appreciation of the objects of the Canterbury Horticultural Society by presenting, for competition at the show proposed to be held in Tower House Grounds in August next, a handsome silver cup of the value of five guineas. In order that the competition for this gift may be as popular as possible, the committee have determined that the prize shall be awarded for the best general collection of fruit and vegetables, exhibited by a citizen amateur grower who does not employ the services of a gardener. If the gift is supplemented by the subscriptions of the citizens, the promoters of the show will be enabled to issue a list of prizes of a substantial character, and a really first-class exhibition will be the result.

— AT a meeting of the fellows of the Royal Horticultural Society held in January last an attempt was made by a number of fellows to have the privilege of voting by proxy, long enjoyed by lady members, extended to gentlemen. Nothing was then done, but at the annual meeting in February a similar attempt was made, and then Viscount Bury promised, on behalf of the council, to have a bye-law framed which would give the proxy vote to the fellows, and submit it for discussion at a special meeting to be subsequently summoned. At the same time the president and council reserved to themselves the right to discuss the question when it came before the special meeting. On Tuesday last the bye-law was submitted, and the president, in placing it before the fellows, said the council were, with one dissentient, unanimously opposed to the proxy principle, under which, he said, no council could work with self-respect, but they had fulfilled their promise, and now the time for discussion had arrived. Thereupon Mr. Bateman moved and Mr. Wilson seconded, the adoption of the new bye-laws. A warm discussion followed, and, eventually, on the motion of Dr. Denny, seconded by Mr. Liggins, an amendment repealing the bye-law which gave the

proxy vote to ladies was passed by a considerable majority. Hence not only was the resolution providing vote by proxy for male fellows negatived, but the privilege which has been enjoyed by lady fellows was taken away by the amendment.

— THE fruits of *Sapota Achras*, known in the West Indies as Sapodilla Plums, are now being sold on barrows in the streets of London, under the name of "*Nespras nepelica*," at the rate of eight a penny.

— TO grow the Bay tree at all in the north country is considered a triumph, and to see it in bloom a novelty, which few have witnessed. At Exmouth, however, at the present time, each branch is completely wreathed with its singular blossoms, which collectively might easily be mistaken for a bottle-brush, clothing, as they do, the branches so thickly as to make them look like those of a *Metrosideros* or *Melaleuca*.

— THE brilliant weather of the past week has invested our spring flowers with fresh brightness, and many of the beds and borders in our London parks are becoming attractive earlier than usual. At Battersea, the plants in several beds near the West Lodge, are beautifully in bloom, and a narrow border near the same spot is particularly effective, having been planted with a row of double white and double red Daisies, all finely in bloom, and edged with the Golden Pyrethrum, the whole forming quite a charming combination.

— AMONG the many additional resources of out-door recreation about to be provided at Alexandra Palace during the ensuing season none will possess greater prominence than the fine sheet of ornamental water now nearly completed. It covers some six acres, in close proximity to the palace. Much skill is shown in so arranging the plan of this lake as to conceal at any point of view its full extent, and the varied outline, islands, and buildings which adorn it render it an exceedingly ornamental, as well as attractive, feature of the grounds.

— A NOVELTY, in the way of a pot-coverer, has been invented by M. Gorse, 10, Rue Lepratier, à Paris, which may recommend itself to the notice of those who cultivate plants in rooms. It consists simply of a circular piece of zinc made to fit the top of the pot, and divided into two semi-circles, united by a hinge at one point of contact. In the centre, a space is left, which allows free passage for the stem of the plant. The utility of M. Gorse's invention seems chiefly to point to the fact that plants thus protected will require much less water than they otherwise would do, as the evaporation from the soil in the pot is very considerably diminished.

— IN answer to a question put to Lord H. Lennox, respecting the surroundings of the Bethnal Green Museum, his lordship said: "It is quite true that one of the obligations under which this Museum was, in 1868, transferred to the Government was that the vacant spaces around it should be laid out and permanently maintained by the Board of Works as a flower garden for the recreation of the people. Owing to some inadvertence, the Board of Works was not made aware of this condition until last June; and when it was, my predecessor, Mr. Ayrton, gave instructions that a sum of £700 should be inserted in the estimates of the ensuing year for the commencement of the garden. Matters stood thus when I acceded to office. But considering the uncertainty which always prevails as to the time when estimates are voted, I feared that another year might in this way be lost. So, with the sanction of the Treasury, I ordered the works to be begun. They have been begun, and will be pushed forward with the utmost energy, so that as soon as possible the people of the East-end of London will have these gardens, as is their undoubted right, finished and made available for their recreation."

— A CORRESPONDENT informs us that the rare and botanically interesting plant, *Megacarpaea polyandra* (De Candolle), is again flowering at Glasnevin. The plant, which is blooming, was raised from seeds saved at Glasnevin six years ago, and this is the first year during which one of these seedlings has flowered. It therefore takes a longer time to come to maturity than most *Cniciferae* do. In general appearance, this *Megacarpaea* bears a greater resemblance to Umbellifers than it does to *Cniciferae*, and is a good deal like the Parsnip (*Pastinaca sativa*). The flowers are produced in close corymbs, resembling umbels, and are of a greenish-yellow colour. The leaves are large, broad, and pinnatifid, quite like those of many kinds of Umbellifers, and the plant is strong and about the size of them; besides, the fruits are short, flat, and broad, more like *Cremocarps* than *Siliculas* or *Siliculas*. The most remarkable peculiarity is, however, in the *Andrœcium*, which is nearly allied to that of *Papaveraceæ*, each flower having constantly from twelve to sixteen stamens. It is a native of the higher regions of the Himalayan Mountains, and, to cultivate it successfully, it requires to be grown on a cool moist border, which is shaded from the mid-day sun, but otherwise, it is quite hardy for out-door culture in this country.

THE FLOWER GARDEN.

SNOWDROPS *AU NATUREL*.

SNOWDROPS, as the very first of the flowers that greet the new year, possess a charm peculiarly their own. The milk-white flower, as its Greek name implies, often finds its way through long-lying frozen snow; and when its pretty oval bud, like the egg of the future flower, first pierces the icy covering, its daring pertinacity to arise from its cold bed and bloom, even in the very earliest dawn of spring, takes us by surprise. The first sight of it is, undoubtedly, pleasure-giving in a high degree. Its early appearance, even within the prosaic and as yet desolate lines of the flower-border, is always hailed as that of the flower of promise, the *avant courier* of all the bright blossoms that are to come. But while its simple beauty is always attractive, under any circumstances, it becomes much

petals of the corolla. The third kind is the larger and more robust species, *Galanthus plicatus*, a native of the Crimea. It may be distinguished at a glance from the former species by its taller growth, larger and more closely folded flowers, and its much broader foliage. The largest of our known Snowdrops is *Galanthus Imperati*, which may possibly be a chance variety of *nivalis*; and, if so, it tends to confirm the regret expressed by Loudon, in his "Encyclopædia of Plants," which is to the following effect:—"It is rather singular, and, also, to be regretted, that no variations or hybrids have been produced from this early and pretty little flower." The species or variety named *Imperati*, from its superior size, is not so pretty as either *nivalis* or *plicatus*, in consequence of its far less regularly-formed flower; but, in hybridising, it might prove a very valuable parent for the purpose of producing varieties, some of which might very probably prove superior to either of the parents. Such vast improvements



A group of Snowdrops on Root-work.

more so when made to appear in a seemingly natural locality of its own selection, as when its blooms are made to gather about the base of a mass of rock or root-work, such as that in the charming garden at Weybridge, alluded to in the last number of this journal. Snowdrops, as there introduced, produce the prettiest possible effect; especially where in sheltered nooks they bloom in closely assembled clusters, with more than usual luxuriance. The annexed wood-engraving of this wild little nook, exhibits three out of the four kinds that are at present known. To the right, straggling picturesquely among the interstices of the angular masses of Moss-grown root-work, is *Galanthus nivalis*, which delights in moist expanses of turf about the slopes of hills or the edges of woods and copses; and also the double garden variety, which, if less graceful than its simple, slender cousin of the woods, produces more effect, in consequence of its wider opening, caused by the expansion of the numerous green-bordered

have been realised wherever the system of hybridising has been perseveringly and skilfully carried out, that a few novel and charming varieties of our favourite Snowdrop may be expected so soon as some one or other of our enthusiastic florists determines to attempt the interesting work of a new floral creation.

It has been remarked that the Snowdrop, with all its exceeding grace and modestly-drooping beauty, and especially as fearlessly exposing its delicate milk-white bells to the storms and frosts of winter's most terrible month, should not have attracted the attention of our early poets. Chaucer, who found such daintily-delicate words wherewith to sing his exquisite song of the beauties of the Daisy, yet says nothing of the exquisite Snowdrop. Even Shakespeare, who with a touch, a single touch, has inimitably described so many of our native flowers, says not a single word of the Snowdrop. Even the truthful and poetic beauty of its name one would think

would, if he had heard of it, have charmed his pen to jot down some delicate epithet from which it would have been for ever inseparable. It is true that, if known in his time, it may have been called by another name, for we find our old botanist Gerard, a contemporary of the poet, speaking of it as the bulbous white Violet (*Viola bulbosa alba*). Yet this would not have deterred Shakespeare from bestowing his praise; for we find him exclaiming, "What is there in a name! a Rose by any other name would smell as sweet;" and surely, in his eye, the Snowdrop by any other name would have seemed as beautiful. It appears probable that the popular name of Snowdrop was not generally known in his time; yet, although a Latin denomination was preferred by the old botanist, he, nevertheless, admits that "some do call them, also, Snowdrops." There are, indeed, scores of poetic and appropriate popular names for plants that have never found their way into the works of learned classifiers.

Even in Milton's time the poets had not sung the charms of this delicate little flower, nor spoken of the interest of its early apparition, rising, as it often does, from a winding-sheet of snow, like the pale spirit of the departed flowers of the departed year. The explanation seems to be that, although now found wild in many parts of England, it was not originally a native plant, but was introduced from Italy at a comparatively early period, perhaps about the reign of Henry VIII., when foreign plants and trees first began to be largely introduced from the south of Europe and Flanders. It would seem that it was still rare in Elizabeth's time; and, though known to such indefatigable botanists as Gerard, was as yet a stranger to our flower-loving poets.

Tickell, the friend of Addison, is the first poet who mentions the Snowdrop, in his amusing poem, "Kensington Garden," in which he attempts to account poetically for its appearance in our parterres by a prettily conceived fairy tale, in which a metamorphosis into a flower takes place.

. . . the little shape, by magic power,
Grew less and less—contracted to a flower;
A flower, that first in this sweet garden smiled,
To virgins sacred, and the Snowdrop styled.

Thus won from death, each spring she sees him grow,
And glories in the vegetable snow.

Thomson, in his celebrated poem "The Seasons," does not overlook the graceful Snowdrop.

Fair-handed spring unbosoms every grace;
Throws out the Snowdrop and the Crocus first.

A passage which is prettily paraphrased by Savage—

The virgin Snowdrop first appears,
Her golden head the Crocus rears.

After that period, this little flower became a great favourite with our poets; and its modest drooping beauty is quaintly and fancifully made the theme of scores of more or less elegant verses, which, were one writing a monograph of the Snowdrop, could not possibly be passed over without quotation.

The restricted, but picturesque, domain accorded to this delicate flower among the artistic "radifications" of the Weybridge root-work, is so charming and so appropriate, that it forms a little flower-poem in itself—"a song without words," which leads naturally to the recollection of what some of our poets have said, or have not said, about our charming little friend *Galanthus nivalis*, and her near relative *plicatus*.

H. N. H.

ON PRUNING ROSES.

MANY fail in producing good Roses on account of not having a thorough knowledge of the operation of pruning. Nineteen out of twenty who attempt the pruning of Roses know nothing about the operation, although they may be clever in other branches of gardening; they cut away remorselessly at every variety alike, although it is well known that most of the yellow Roses cannot bear the touch of steel, neither will they live within three miles of a large town—they do not like smoke. Noisette and climbing Roses should be pruned very sparingly; merely cutting away the tip ends of the long shoots is quite sufficient, as all the bloom-buds spring from the ends of these shoots. Where there is too much wood, cut a good portion of it clean out from the base. The best instrument to prune with is the new French *sécateur*, with boxwood handle, the price of which runs from 4s. to 5s. This instrument is much superior to the common

pruning scissors. It makes a cut as clean as if done with a sharp knife; in fact, the cutting blade may always be kept sharp with the aid of a stone. I know of no pruning instrument equal to it. I will presume that the Rosarian is well acquainted with the habits of growth and other matters connected with the hybrid perpetual Roses, without which success is problematical and failure almost certain. I will proceed therefore to lay down some practical directions, which will be of some assistance even to the initiated as reminders, and by strictly following which the inexperienced may have good hope of success. I will suppose the operator placed before the tree designed for his attack, with the *sécateur* or Rose scissors. If a standard, he will have to consider the symmetrical shape of the head, and study the habit of growth of the variety to provide for it. He must also remark the condition of the individual plant, whether it is in good health and vigorous, or sickly and almost worn out, and form his plan of action accordingly. Having decided upon this, in operating, three things must be strictly stamped on his mind. First, vigorous growers must not be shortened or cut back so much as moderate or weakly growers require; about 9 or 10 inches of the last year's wood may be left in the former case, in the latter four or five, or even less. Second, every portion of dead or withered wood must be cleanly cut out; even such as apparently seems sound, if on cutting, the pith be found brown (caused by the ravages of an insect) must be entirely removed. Third, all cross shoots must be cut out, and the centre of the tree left as open as can be, in order to admit air and the sun. All thin and spindly wood must be removed, for it is impossible to get a fine Rose from such twigs, and in some varieties these weak shoots are numerous. Remove all such at once with a bold stroke. In all cases the branch must be taken off at a plump, healthy, well-developed bud, which must point outwards, and be cut at an angle of 45 degrees. The cut must also be clean—no splintering allowed. If not cut perfectly clean, another bud must be sought for lower down, and the attempt be made again. No snag ends must be left above the bud. Practice makes perfect, and the young amateur would do well to commence with inferior plants till he acquires decision and dexterity in manipulating his weapon. Bushes must be treated in a similar manner, noting particularly their habits of growth, but modified as to their forms according to circumstances. When bushes are grown upon Manetti stocks, one of the primary duties of the pruner will be to look for suckers, which in this class of plants steal up so insidiously from the part about the root, and so closely resemble the shoots of the actual Rose itself, as to require an experienced eye to detect them. The sucker may generally be known by the foliage having a shade of blue in it; but, in doubtful cases, it is best to trace it to its origin, removing the soil necessary for the purpose, when, if an impostor be discovered, it must be entirely cut away as close as possible to the stem, and the earth restored. In order to renovate an old plant, especially if a standard, the whole wood may be cut away down to the worked part, leaving the top somewhat resembling the knob of a walking stick. Large numbers of latent eyes will soon appear, a few of the strongest and best placed of which must alone be retained; the others must be removed with a sharp-pointed knife. Pillar Roses must be well spurred back to good, firm, and plump buds, always bearing in mind the habit of the variety, as previously remarked. Briars are very liable to send up suckers in the spring, especially before the head has developed its foliage, which gives it power to draw sap. If on the stock, they are easily eradicated; but, if from the ground, it will be necessary to throw out the earth with a fork, and their origin sought for and cut off close, as before observed. In a late cold spring, accompanied, as is often the case, with north-east winds, the operation of pruning ought never to be undertaken till the end of March, or, better still, about the beginning of April. If the nights are very frosty, pruning should be delayed, as it excites the plants, and too often the tender shoots and buds are damaged and destroyed by spring frosts even so late as May. When the young shoots are thus damaged, it is wise to cut back again to a good plump dormant bud, as it is an ascertained fact, that a good Rose can never be produced from young shoots which have thus been damaged. Tea-scented and China Roses—indeed, all the tender kinds—should never be operated upon until the end of April or beginning of May. Where the collection is a large one, it is better to prune at intervals, so as to secure a constant succession of blooms. When the work is completed, every particle of the wood should be raked off the beds; nothing looks so untidy as the prunings left lying about. To ensure the Rose trees doing well, every one should receive a good mulch of rotten manure, which should be pointed in around it, and a plentiful allowance of liquid-manure should be given once every three weeks during the growing and blooming season. This will ensure noble blooms, and promote the growth of robust wood for another season. Some varieties of Roses are very subject to throwing out one or more very robust shoots during the blooming season; this is

particularly the case with Gloire de Dijon. These shoots should be stopped by nipping out the points with the finger and thumb; laterals are then thrown out which flower abundantly. Indeed, with Gloire de Dijon, and other Roses of similar habit, it is the only method of obtaining an abundance of blooms.

HENRY TAYLOR.

PLASTERED EDGINGS.

OUR London Parks have of late years shown many improvements, but the raised mud-wall-like edgings of which we give an illustration cannot be included among them. Now and henceforward may be seen men with barrowfuls of a muddy and offensive compound, forming these miniature ramparts, which when first put up, and frequently for nearly the whole summer, are quite a blemish. Sometimes the plants above the edgings droop quickly so as to hide the eyesore, but none the less is the system an objectionable and needless one. These raised edgings were first employed for the display of plants with rosettes like the Houseleeks, but it soon came to be the fashion to raise every bed in this way. I maintain that in no case do the plants look better so arranged than in beds with a gently rounded margin. While, as to watering, the walled-up beds in the parks are watered with greater difficulty than the bed with the ordinary gentle slope. In addition to the offensive aspect of the little walls when first plastered up, there are the cracks which come after, and which are well shown in the annexed cut.



It is to be hoped that these edgings may not be imitated much in our private gardens, and that this fashion in our public ones may not endure long.

L. A.

SPRING-FLOWERING PLANTS.

As hardy plants of all kinds that blossom early possess unusual interest, some account of what I saw in this way, during a short holiday tour at Eastertide, may not be unacceptable. My first "call" was at Messrs. Rollisson's, where I found *Primula nivea* flowering freely, and in tolerable quantity. Its trusses, of snowy whiteness, are large and showy. Associated with it were *Androsace Chamæjasmae*, another white-flowered plant, with a pinkish-coloured eye, and its relative *A. carnea*, a kind with rose-coloured flowers. Respecting *Primula nivea*, I observe complaints that it is difficult to cultivate; but here plants of it seems to thrive perfectly, even with little or no attention. In Mr. Parker's nursery, close by, I met with numbers of well-known spring-flowering plants, and also with others not yet so well known as they should be. Among the latter, the most attractive were a distinct species of *Narcissus*, named *triandrus*, a kind having flowers of a fine lemon-yellow hue; *Picaria grandiflora*, a relative of our common Lesser Celandine, but in every way much larger, and thoroughly worthy of a place in all collections of early spring-flowering plants; *Triteleia uniflora lilacina*, a fine variety of the now well-known common form, having flowers of a fine mauve colour; *Puschkinia scilloides*, a showy bulbous plant, allied to the Squills, bearing handsome racemes of bell-shaped flowers; a nice tuft of *Saxifraga Rocheliana*, a mass of large white flowers; and *Arabis purpurea*, a low-growing kind, bearing a profusion of lilac-coloured blossoms. Foremost among plants of a more common description were *Anemone apennina*, of which there was a large patch finely in flower, large quantities of various Grape Hyacinths, a very fine tuft of *Doronicum austriacum*, than which I know of nothing more striking and beautiful amongst herbaceous plants in April, being, as it is, literally studded with golden-yellow flowers, some three inches in diameter. *Othonna cheirifolia*, an old Composite plant of distinct habit and foliage, is also now studded with yellow blooms, and a good assortment of Daffodils, conspicuous among which were the varieties known as the Emperor and Empress, both large and fine kinds. At this establishment, too, I noticed a good collection

of aquatics, amongst which *Aponogeton distachyon* was finely in flower; and I also observed a nice tuft of *A. d. minor*, sometimes called *longifolium*, together with another kind called *A. acuminatum*, and a very nice tuft of the lesser double Marsh Marigold (*Caltha palustris flore pleno minor*). In Mr. Barr's grounds, which are contiguous to those of Mr. Parker, I found a grand display of Daffodils, consisting of nearly all the sorts in cultivation. Conspicuous amongst them were *Narcissus minor*, of which there was a large patch densely ornamented with orange-yellow flowers, the "noses" of which, as Parkinson says, "do lie on or touch the ground." Of *N. odoratus* and its varieties, bicolor, and numerous forms of *N. poeticus*, there was no scarcity. Masses of Grape Hyacinths, Fritillaries, Summer Snowflakes, and various other hardy bulbs, I also found here in profusion. Here, too, I met with a good bed of the lovely *Collinsia verna*, studded thickly with showy sky-blue and white flowers. This, though seed of it has been offered annually for these past ten or twelve years, is by no means an annual often met with, a circumstance attributable, I think, to a want of knowledge as to the best time of sowing it. The seeds of the plants here were sown last September in the open ground. The white-flowered variety of *Sisyrinchium grandiflorum*, a fitting associate for the common form on rock-work or on sheltered sunny borders, was also in flower in these grounds, in which I also noted several other highly interesting plants, such as *Erythronium grandiflorum*, *Cyclamen repandum*, one of the prettiest and most lasting of what are called Sowbreads, its deep purplish-erimson flowers having been produced in abundance during the past two months; and a good batch of the Golden Plover variety of *Primula elatior*. To visit Kew was my next determination, and, on my way to the herbaceous department, I passed through one or two of the plant-houses. On the shelves of No. 4, the show-plants that are especially well suited for pot-culture, viz., *Funkia undulata variegata*, used as an edging to beds at Battersea, and *Hemerocallis Kwansa variegata*. During the early spring months, the foliage of these two plants is highly attractive, owing to the distinct character of its variegation. The usual spring-flowering climbers are made use of here, such as *Kennedya*, *Hardenbergia*, and *Clianthus*, and among others I noticed a handsome free-flowering plant which is not so frequently met with as it deserves to be. I allude to *Lonicera sempervirens minor*, the tubular flowers of which, hanging in scarlet clusters as they are at present, are very showy. Among other plants in pots, *Malvastrum capense*, a pretty shrubby white-flowered Malvad from the Cape of Good Hope; *Rhododendron ciliatum*, a pale-flowered Himalayan species; and *Thomasia solanacea*, a shrubby plant, producing an abundance of *Solanum*-like flowers, were to me the most attractive. In what are called the Alpine frames, I found several treasures, which, when sufficiently known and more plentiful, will be sure to be highly appreciated. First among these, was a variety of the Wood Anemone, named *purpurea* (why, I know not, as its flowers are sky-blue), a distinct variety, each flower being fully as large as a half-crown piece. The next plant that attracted my attention was a potful of *Trifolium uniflorum*, about an inch high, thickly studded with handsome rose-coloured flowers, just commencing to open. This little Clover, when plentiful, will, doubtless, become a useful plant for rock-work or for the front of mixed borders. *Androsace Laggeri* is another pretty plant thickly laden with deep rose-coloured flowers, and among others I noticed *Smelowskia alpina*, a diminutive white-flowered Crucifer, *Romanzoffia sitchensis*, somewhat resembling a small form of *Saxifraga granulata*; and a singular form of *Scilla nutans*, called *bracteata*, which has green bracts or leaves, interspersed among its blue flowers. The herbaceous grounds are, at present, comparatively uninteresting. I did, however, find in them a nice tuft of *Adonis vernalis*, flowering freely; several kinds of *Orobanchaceae*; a *Narcissus*, named *galanthifolius*, with flowers creamy-white throughout; *Andromeda tetragona*, and a few *Epimediums*. The last, however, owing to continual shifts and changes, are by no means so fine as they were a dozen years or so ago. *Narcissi*, too, at Kew are by no means equal to those in private collections, many of the species being so puny and miserable as to be scarcely recognisable.

T. S.

SAXIFRAGES.

By J. C. NIVEN, Botanic Gardens, Hull.

The Mossy Group.

Saxifraga muscoides of Wulfen, is the patronymic I shall adopt as the typical specific title under which we shall find several well-defined and constant variations arrange themselves. Why Engler should have preferred in its stead another name, viz., *S. moschata*, of the same author, I am at a loss to know. The former is in every sense of the word, appropriate, seeing that it means the "moss-like" Saxifrage, and conveys at once in its title the special characteristic of the plant; the latter, most inappropriate, meaning, as it does, the musky Saxifrage, thus endowing it with an odour of sanctity which I have yet to learn that it possesses even in the smallest degree. Nevertheless, some of my botanical friends will say—"Oh! but you are ignoring that grand fundamental law, that priority in matter of time gives precedence in plant nomenclature." I am, however, at a loss to see the sense of perpetuating an inappropriate name through all time on any grounds whatever, and have selected that which I consider best. Another synonym which is equally appropriate with the above, is *S. muscosa*, given by Suter in his "Swiss Flora." The typical species may be thus briefly described as forming a dense hemispherical mass of beautifully even green rosettes. The radical leaves, or those of which the said rosettes are composed, vary somewhat in shape; occasionally they are linear, but, when carefully dissected the one from the other, it will be found that the great majority are three-cleft at the apex—the centre division, extending far beyond the two secondary lobes, becomes linear in shape, and hence the plant has been described by some authors as possessing only linear leaves; the foot-stalk of each leaf clasps the parent stem in a sheathing manner; the flowers are produced freely, and are supported in groups of two or three on stems about 3 inches high, each flower being subtended by a foliaceous bract, and the whole of the stem, bracts, and calyx covered with a dense glandular pubescence. The petals expand horizontally, and are of a greenish-buff colour, varying with age to yellowish-buff. Neatness of habit, regularity and symmetry of growth, recommend this species to general notice more than anything in the way of brilliancy. This little plant is said to be found among our native Saxifrages growing in the lake district, but it is so long since the locality has been verified, that we may take it for granted that it has disappeared—in fact, there always was a general air of doubt as to its being indigenous. Be this as it may, it has no narrow or limited notoriety on the continent, where it grows in some of its modified forms through almost the entire Southern Alpine region; singularly enough, though not recorded in the north, I have received it in one of its most minute forms from Iceland.

S. muscoides var. *pygmæa* of Haworth, has all the peculiar beauty of the present species—not reduced to be in keeping with the diminished size of the pygmy plant—but absolutely concentrated, thus, making this variety decidedly the more beautiful of the two. The leaves of its tiny rosettes are more fleshy than the former, broadly rounded at the point, notched into three equal little lobes, and never presenting the linear form; each leaf is incurved like a little shell, and the whole plant is a very model of neatness; the flowers are greenish-yellow, produced freely on glandulose foot-stalks scarcely 2 inches high; both the original species and its pygmy sport are readily amenable to cultivation, and thrive in any light garden soil, but both are slow growers. It is a native of the Pyrenees, the Maritime and the Tyrolean Alps, and, very possibly, has a wider range, but being so minute and compact in its growth, it would be readily overlooked by the plant collector.

S. muscoides var. *crocea* of Gandin.—This variety, which has long been known in cultivation as *S. atropurpurea*, a name that must have appeared to many cultivators, as well as myself, thoroughly inapplicable, especially as its blossoms, when they expand, are invariably of a yellowish colour, and, as they die off, acquire a slight chocolate tint along the margins. I have grown it for years, and have occasionally seen the faintest pink suffuse the petals of an old flower here and there, but that formed the only faint shadowy approach to the dark purple colour its name would indicate. There is no doubt, I think, that it should be correctly considered the variety *crocea* of our typical species *muscoides*. Its rosettes are much larger and more lax than in either of the previous varieties; the leaves are sometimes linear and entire, and sometimes divided at the points into three linear segments; the whole is of a dark green, and forms nice compact free-growing tufts. The flowers, the colour of which I have before described, are produced pretty freely, and supported on foot-stalks about 4 or 5 inches long. Its only wild habitat, as recorded, is on the Savoy Alps.

S. muscoides var. *atropurpurea*, of Sternberg, produces rosy-purple flowers. I should very much like to have cut off the first portion of the specific title and left it as *purpurea* alone, but when I give my

readers the history of this variety as I now possess it, they may, possibly, agree with me that it may yet claim the specific name in its full intensity. So to my little history. About five years ago, I saved a pinch of seeds from the so-called species *atropurpurea*, with yellowish flowers, and sowed them, not that I expected any special result whatever therefrom; during the summer they were potted off into small pots, and left to the chapter of accidents; the following spring I was no less surprised than delighted to find the first to flower produced petals as highly coloured as the well-known *oppositifolia*, in fact, a beautiful rosy-crimson, and, what is more, with only three exceptions in the dozen plants, all had the same beautiful colour, with varying shades of intensity. Especially interesting is this little episode in my Saxifragean experience, in the fact, that I never remember the general rule so markedly set to one side, that seeds, when once the specific identity is broken, always tend to depart from the parent type; here, in place of departing from it, they absolutely restored a character which, doubtless, once existed in the parent plant, but had been, to my knowledge, long lost; such an occurrence has an interest far beyond my paper on Saxifrages. Having thus given you the origin of my becoming possessed of the true variety *atropurpurea*, I should add, that in addition to the altered character of the flowers, there is a difference in the foliage, all the leaves are trifurcate, and from the original rosettes short procumbent stems are freely given out, so that it is not so caespitose or tufty in its growth, and, in fact, is a freer grower. I wish it were a more abundant bloomer, and have no doubt that when it has fresher air and less smoke than as cultivated in our old garden it will improve in the latter respect.

S. Rhei, though classed by Engler as a more lax form of *S. muscoides*, is sufficiently distinct to retain its old specific title as given to it by Schott. It appears much closer allied to the following than the preceding species; it forms large compact rosettes with leaves three to five-lobed; it produces from the base of the old rosette several little procumbent short shoots, the arrestment of whose terminal growth constitutes the rosettes for the following year. Its flowers are few, of a greenish colour, arranged in a capitate manner, and supported on a leafy peduncle, 3 or 4 inches long; the whole plant is covered with a very short pubescence. My original plant came from Corsica, and maintained its distinct character for a series of years, but all seedlings, raised on several occasions, merely seemed to rival one another in their divergence from the parent type.

S. exarata of Villars and *nervosa* of Lapeyrouse are names with which all Saxifrage growers will be familiar; so similar, however, were the plants that represented these names, it did not require much examination to determine that they were really identical, and both referable to *S. exarata*. Within recent years the true *nervosa* has got into cultivation, and I am quite disposed to endorse Engler's idea that it is a variety of the species with which it has been so long confounded, and, as such, I shall consider it. Our typical plant is a nice dwarf compact grower, of caespitose habit, and a peculiar greyish-green foliage. Its rosettes consist of five or six upright leaves, three-cleft at the summit, with a long narrow blade below, running down into the stalk. The flowers are white, suffused with a greenish tint; they rise from the axils of leafy bracts, four or five being borne on each peduncle, and the whole plant is covered with a short pubescence, which assumes a true glandular character in the flower-stem and calyx. It is a very free grower, and a good distinct species, retaining its character well from seed. The plant enjoys a wide European distribution, being met with in almost all southern Alpine districts.

S. exarata var. *nervosa* of Lapeyrouse, is a perfectly-formed diminutive variety of the former, harder and more woody in texture. It grows in dense compact little tufts, usually most at home in the chinks and crevices of the rocks; in fact, it holds just the same relationship to its specific type as *pygmæa* does to *muscoides*. The variety is recorded as found abundant on the Pyrenees and the Maritime Alps, and, possibly, has a wider range. In cultivation it likes a fair admixture of peat soil, good drainage, and a firm nip between the stones, whether grown in a pot or in the open rockery.

S. pedemontana of Allioni, a good distinct species, is a native—as the name implies—of the Maritime Alps, near Piedmont. It forms somewhat lax rosettes of broadly cuneate leaves, gradually narrowing down to the base of the petiole; the leaves are covered sparsely with short erect glandular hairs, which form a marked ciliary character to the margin of the leaf; they are three-cleft, the two lateral clefts being again notched or divided, thus giving the appearance of being five-cleft; the divisions are erect, about uniform in length, and somewhat acutely pointed, with a slightly scarious termination. The flowers are produced on slender glandular pedicels, the foliaceous bracts that subtend each flower being first five-cleft, then three-cleft, and, ultimately, entire. They are pure white, and are sometimes so closely aggregated together as to give them a

capitate appearance, while the bracts assume the character of a well-defined involucre. The petals are obovate, tapering towards the base. Though not a rapid grower under cultivation, it is stated, in its native habitat, to form large pillow-like masses of a beautiful lively green. It is not absolutely confined to the Piedmont district, as its name might be supposed to indicate; but occurs pretty freely through the Swiss and Tyrolean Alps.

S. aromatica.—This I purpose substituting for the garden name *corsicana*, which has been given to a very distinct species of Saxifrage introduced from Corsica, some three years ago, by our indefatigable friend, Mr. Maw, for reasons which I shall presently explain. I have examined it carefully, and do not find any described species in Engler's "Monograph" to which it can be referred. Seeing that this is the most recent enumeration of the present known Saxifrages, I therefore conclude that it must be new, and feel almost disposed to give it a new name, based on the great resemblance of its leaves, when in a fully developed state, as they occur in the mature rosette, to the fleshy and powerful fore-feet of the mole. I thought of suggesting the specific name of *S. talpæpediformis*. This, however expressive, is objectionable on the score of length. During the process of minute examination, I detected a delicious aromatic perfume given out from the resinous glands of the young growth, and it struck me that the specific title *aromatica* would be equally appropriate and certainly more euphonious. This, therefore, I have adopted. A brief description of the plant is as follows:—dense and somewhat hard in growth; its rosettes are large, nearly 1½ inches in diameter. The leaves are fleshy, exceedingly broadly wedge-shaped, notched at the upper part with five tolerably deep segments, the two lateral ones being each further subdivided, making each leaf appear seven-cleft; the entire portion tapers rapidly into a somewhat broad and short petiole, provided at the base with long irregularly-jointed cilia; the whole surface of the leaf, especially on the upper side, being covered with short glandular erect hairs; the points of each of the linear divisions are slightly mucronate and incurved. The young branches given off from the base of the rosette are coral-like red in colour, erect in habit, and provided with leaves, which appear to vary a good deal in the depth and number of indentations; sometimes the divisions are obtuse, sometimes acute; in every case, the petiole rather exceeds the blade in length; the young growth is as remarkable for laxness as the mature rosettes are for denseness in their leaf arrangements. The inflorescence consists of a leafy lax cyme 6 or 7 inches high, branching from the bottom, the lower leafy bracts being trifurcate, the upper ones entire, the whole covered with short glandular hairs; the divisions of the limb of the calyx are lanceolate, incurved at the points; the petals are pure white, obovate and unguiculate; of this species, no doubt, the true position will be between *geranioides* and *ladanifera*; to the latter it claims relationship in the resinous perfume, to the former in the peculiar branching character of the cymes.

CASTOR-OIL PLANTS.

At page 75, vol. V. of THE GARDEN, we gave a descriptive list of a number of the best varieties of the Castor-oil plant (*Ricinus communis*), now in cultivation, together with an illustration of one of the finest and most effective kinds, *R. sanguineus*, so named from the blood-red colour of its stem, branches, leaf-stalks, and larger leaf-veins or nerves. Of this plant, our present illustration represents more clearly the appearance of the inflorescence, and the contour of the individual leaves. The habit of the entire plant is well shown in

the figure on page 75. To those who have seen the splendid specimens of Castor-oil plants, thriving as they do during summer, in the open air, in Regent's Park, and elsewhere about London, it is hardly necessary to recommend them as ornamental subjects of a very high order. Their culture, moreover, is attended with no difficulty. The seed should be sown in heat, about the middle of February, and the plants should be gradually hardened off, so as to be fit to put out by the middle of May; the better and richer the soil, and the warmer the position, the finer and more vigorous will be the growth of the plants. In summer, copious watering is indispensable. The *Ricinus*, in most of its varieties, is a grand plant for making bold and effective beds near those of the more brilliant flowers, and tends to vary the flower-garden finely. It is not well to associate it closely with bedding-plants, in consequence of its strong growth and the shading power of its large leaves. A good plan is to make a compact group of the plant in the centre of a wide circular bed, and surround it with a band of a dwarfier subject, say the *Aralia* or *Caladium*; and then finish with whatever arrangement of flowering plants may be considered most suitable. A bold and striking centre may thus be obtained, while the effect of the flowers is much enhanced,

especially if the planting be nicely graduated and tastefully done. For such groups, the several varieties of the Castor-oil plant are not to be easily surpassed.



Foliage and flowers of *Ricinus sanguineus*.

Select Dahlias.—Will you kindly furnish me with the names of a few good Dahlias both ordinary and fancy kinds?—ARDOCK. [The following are excellent varieties, viz.:—*Acme of Perfection*, primrose yellow; *Ada Tiffen*, light peach, tinged with rose; *Alexander Crumond*, maroon, shaded with crimson; *Arbitrator*, buff or fawn, suffused with purple, yellow at the base of petal; *Blue Beard*, shaded crimson; *Cremorne*, yellow, tipped with red; *Crimson King*, fine crimson; *Duke of Edinburgh*, deep yellow; *Duke of Cambridge*, shaded orange; *Emily Williams*, light ground, edged and tipped with vermillion; *Herbert Turner*, French white, with soft tinge of lilac;

James Cocker, purple; *James Service*, dark crimson; *John Standish*, bright red; *Lord Hawke*, yellow buff, tinged with red; *Lord Salisbury*, light rose, heavily tipped with lake; *Maid of Essex*, pale ground, regularly tipped with rosy-purple; *Marchioness of Lorne*, orange, lightly edged with purple; *Miss Bateman*, yellow, suffused with red; *Mr. Sinclair*, rose, tipped with purple; *Mrs. Austin*, yellow, edged with red; *Ne Plus Ultra*, fine lilac; *Prince Arthur*, beautiful clear yellow; *Sarah Read*, light ground deeply edged with pink; *Thomas Goodwin*, very dark maroon; *Thomas White*, very fine maroon; *William Keynes*, orange; *William Pringle Laird*, lilac. **Fancy Dahlias:**—*Carnation*, clear white, deeply flaked with dark rosy-purple; *Dolly Varden*, white, striped with purple; *Egyptian Prince*, bronze red, striped with deeper red; *Harlequin*, white, striped purple; *Herbert Purchase*, rosy ground, striped and mottled with crimson; *Jessi Gill*, yellow ground, striped with rose; *Lady Spokes*, striped, fancy white mottled and striped with pink; *Laura Haslam*, pale yellow, tipped with white; *Marquis of Lorne*, light ground, flaked with purple; *Monarch*, very dark, tipped with white; *Mrs. Bennett*, light ground, striped with lilac; *Mrs. Goodwin*, fawn ground, striped with red; *Mrs. Saunders*, the finest fancy Dahlia of its class, yellow, tipped with white; *Rev. J. B. M. Camm*, yellow, flaked with red.—ED.]

Edgings for Garden Walks.—Various plants have been recommended for forming edgings to garden walks, but I suppose none are so universally used as dwarf Box, and where Box will grow freely

and well, few people will be disposed to look for a substitute. However, there are places where Box does not thrive well. In a general way, it does not flourish in dry hot soils or in very shady places, and, under unfavourable conditions, it is apt to die off and become patchy, and in consequence looks untidy. Amongst plants, that make a neat edging in situations where other things do not thrive, may be mentioned the various forms of hardy *Sempervivums* or *Houseleeks*. They will grow anywhere, and there is no particular preparation required like what is necessary for Box. One or two rows may be planted close together, and a neat thick edging is formed that scarcely anything can improve. In planting, it will be necessary for the sake of uniformity to plant each row of one size. And if once or twice during the summer the offsets are pricked off before they attain any size a perfect outline will always be maintained.—E. HOBDAV.

Bulbous Roots adapting themselves to their proper Depth in the Earth.—My attention was first directed to this some thirty years ago. In a garden at Pontefract, I made several alterations, one effect of which was to disperse and bury, 12 inches under the surface, a bunch of *Snowdrops*. At their usual season several of them duly sent up leaves and flowers. As soon as the foliage began to decay I took them up, with the view of planting them again in a cluster. I was, however, surprised at finding that the old bulb at 12 inches deep in the ground had entirely perished, except the skin and stalk. Upon the latter a new bulb had formed, about 4 inches under the surface of the soil. This proved to be the case with all that I dug up. The circumstance had escaped my memory until last year, when (thinking I should leave my present house and garden) I dug up my tulip roots. I found that some of them had been raised above their proper depth in the earth, and that some were upon the surface. The latter showed a skin the size of the original, but contained merely a small offset, about the size of two Wheat-corns. A tap-root had struck down, from which, at 4 or 5 inches below the surface of the earth, strong healthy bulbs were thrown off. It is desirable to ascertain what bulbs obey this law.—THOMAS ARNALL, in the *Pharmaceutical Journal*.

Flowers in Devonshire in April.—Orchards here are now gay with groups of Daffodils and marshy banks with *Caltha*, the former pale yellow, the latter shining gold. On the bank of the high road between Ottery and Sidmouth we met with the beautiful blue *Periwinkle*. Primroses are in wonderful profusion—banks and hedgerows, fields and ledges of the cliffs, being full of them. Ferns are just beginning to show, the black *Spleenwort* is spreading out its bright green fronds, and the Hart's-tongue is gradually uncurling. Long tendrils of Bramble have just begun to overhang the sandstone rocks through which the road is cut. All the Devonshire Apple trees are draped with grey Lichen, which, before the leaves and blossoms appear, gives the orchards an ancient and weird appearance. Golden Saxifrage forms a brilliant carpet in the glen of Harpford Wood. This little plant has a most charming effect when growing in masses between beds of Fern and wood Anemones. In some of the lanes we have found the *Columbine*, or *Aquilegia*, not yet in bloom. We had been told that Cowslips do not grow in Devonshire, but although in the meadows their places seem usurped by Primroses, yet close to the sea-coast we have found many plants of Cowslip; near Torquay the cliffs are covered with them. Thrift, which forms delightful blue-green pincushion-like tufts on the ledges of the Sidmouth cliffs, is now covered with pink blossom. Gorse is, also, here, as elsewhere, in full blossom, and between the bushes the turf is studded with Dog Violets. Alkanet, the flowers of which are bright dark blue, grows in the lanes and is very handsome. Near Brandsemo we found the *Creeping Lithospermum* (*Lithospermum purpureo-cæruleum*), which has a dark green leaf and sessile flowers of blue and purple colours. In cottage gardens the favourite flowers appear to be Anemones. Camellias, too, are in blossom out-of-doors.—MARY.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Weeds on Walks.—Can any of your correspondents inform me what is the best application for destroying vegetation on gravel walks? I am told that one part sulphuric acid to eight parts of water is good. Salt, I find, is only a temporary cure.—J. G., *Dulwich*.

A New Hardy Clematis.—MM. Thibaut and Ketolcer announce, under the name of *Clematis integrifolia* de Durand, a new hybrid between *C. integrifolia* and *C. lanuginosa*. It grows about 4½ feet high, and bears large dark violet velvety flowers, from 3 to 4½ inches across, with yellow anthers. It blooms continuously from the end of May to the middle of October.

Helleborus niger major.—All who are interested in the decoration of out-door gardens in the latter end of October and in November, should, in addition to *Asters*, *Chrysanthemums*, *Sternbergias*, and *Colchicums*, procure some of this variety of *Helleborus*. It is not the old and well-known Christmas Rose; on the contrary, it differs from it in flowering quite a month earlier, and in producing larger blooms. The old variety forms a good succession to this kind of Christmas Rose, which succeeds perfectly in any ordinary garden soil, and without any special care whatever.—W. F.

THE INDOOR GARDEN.

THE SCARLET TREE-RHODODENDRON.

THE Tree-Rhododendrons in the conservatory of the Botanic Gardens, Regent's Park, have been very magnificent this season, and are still in considerable beauty, though their time of greatest glory is nearly over. The Rhododendron, or tree of Roses, as its name implies, is certainly one of the most splendid of the flowering-shrubs that horticultural enterprise and skill have introduced and naturalised in our gardens; and if the grand Tree-Rhododendron of Nepaul, a true tree, which attains, in our conservatories, a height of from 15 to 25 feet, could be acclimatised, either by a long succession of seedlings raised in the open air, or by judicious hybridising, so as to stand our winters without artificial protection, it would take rank as the grandest of all ornamental flowering trees; for a tree it is beyond dispute, with a straight sturdy trunk, often rising to a height of 8 or 10 feet before it branches. It is possible that, by hybridising, the tree habit might be lost in the bush character of most of the other kinds, and then, the special object of the treatment would be lost, however splendid the flowers of future hybrids might prove, as they have already done. It is, therefore, from seeds of pure strain, raised in the open air, or, at all events, pricked out very young, that the desired result is the more likely to be achieved. When we note what splendid success has followed the earnest and persevering treatment of the *Clematis* tribe, nothing need be despaired of. Even with the broad-leaved Lilac, so indisposed to "sport," considerable success has been attained; the grand variety named in honour of the late Dr. Lindley being an infinite improvement upon the original species, handsome and free-flowering as it is, and one of the chief glories of our spring shrubberies; for the new Lindleyana flowers even more profusely; the trusses of flowers, as well as the individual flowers, being larger, and the scent (of sweet spring-like character) more powerful, and, at the same time, more delicate. With these successes in full view, to say nothing of the charming novelties which we enjoy in the splendid array of double-flowered and grandly-foliaged *Pelargoniums*, as well as many other novel and scarcely-to-be-expected results of persevering horticulture, there is hope of seeing Tree-Rhododendrons ornamenting our shrubberies, gorgeous with hundreds of great scarlet trusses of flowers, each truss as big as a bunch of *Pæonies*. Many of our leading nurserymen have risen to the height of real science in their profession, and are true artists in their pursuit of magnificent colouring and its endless blendings, from the fullest and most dazzling tones to the most soft and delicate tintings; all of which the nature of their studies and the practised experience of a cultivated eye enable them so well to appreciate and so often to realise, even beyond their own most sanguine expectations. The Persian king of the old story, *blasé*, satiated with all existing pleasures, and sighing for a new one, might, perhaps, not have been so long disappointed had he lived in our time, and asked one of our magic-working nurserymen for a new flower, more fair, more sweet, more beautiful even than the Rose. So, like the Persian King, I fearlessly ask for a new pleasure, and beg that it might be a hardy scarlet-flowered Tree-Rhododendron; and doubtless, after this notice, and a little patience, I shall be sure to get it, notwithstanding many difficulties that might be urged; for my horticultural friends are Napoleons in their way, and have expunged the word "impossible" from their vocabularies. H. N. H.

CHRYSANTHEMUMS.

THERE is no better time than the present at which to commence the culture of this deservedly popular flower. Cuttings struck now will make fine bushy plants from 18 inches to 2 feet in height by next October, and when in this dwarf state and well-flowered, they are better for small conservatories, or for the ordinary purposes of indoor decoration, than plants of larger size. Some prefer to propagate their plants in the autumn, but I have for some time discontinued the practice, since spring-struck plants are, for decorative purposes, better in every respect; and it is now possible to purchase cuttings of

all the best kinds, and these actually cost less than the expense of saying nothing of the trouble, incurred in wintering old plants, or autumn-struck cuttings. Many years ago poor old Sam Broome taught us the value of the *Chrysanthemum* as a decorative plant for town gardens, but, as a class, horticulturalists seem slow to learn and put into practice the annual lesson still taught in the gardens of the Middle and Inner Temple, where local circumstances and surroundings are by no means so favourable for vegetation, as the more open suburban parks and squares, and private gardens. If *Chrysanthemums* are now thought of, put in the cuttings at once, and they will be well rooted in a fortnight in a propagating case or frame. Directly the young plants commence to grow, stop them at the third or fourth joint, this will cause them to throw out laterals and make them bushy, and as soon as they break again pot them, say, two or three together in a 12-inch pot. The small-flowered kinds, or Pompons, do well two together in 32-sized pots, and make fine bushy little specimens either for conservatory or window decoration. The *Chrysanthemum* is one of the quickest-growing plants we have, and is a gross feeder, and nothing suits it better in the way of compost, than a mixture of fibrous loam, road-scrappings, or coarse sand, and one-third well decomposed hot-bed manure. Set the plants outside towards the latter end of May or beginning of June, and never let them want for water, or the loss of their lower foliage is an inevitable consequence. As soon as the pots get full of hungry roots, water liberally with clear manure-water, gradually increasing the strength as the flower-buds appear. The plants should be neatly tied out to stakes, as this not only improves their shape, but makes them form a sturdier growth, by admitting a more extensive circulation of light and air. This last point is of immense importance in the culture of all decorative flowering-plants. Plants grown as above recommended will be found useful additions to the greenhouse during the dull autumn months, when flowers are generally few and far between in most small establishments.

J. T. S.

THE CINERARIA.

For the decoration of a cool greenhouse or conservatory few plants that involve so little trouble are more showy in early spring than the *Cineraria*. Seedlings, if the seed-bearing plants have been carefully selected, are now generally so good that, except for the purpose of exhibition, it is hardly necessary to grow named varieties. When *Cinerarias* are required for winter blooming, the seeds should be sown early in April so as to give time for the plants to be grown steadily on without any undue excitement in the shape of fire-heat; in fact, from the time the seeds are sown till the plants are in flower the less artificial heat, beyond securing them from frost, they have the better. Under cool treatment, and if well supplied with water and freely ventilated, their growth is robust and firm and less liable to the attacks of insects. If in any stage of their growth they are kept too close and warm, green fly will surely make its appearance, and *Cinerarias* do not stand fumigating well. I have seen more than one lot of good plants destroyed by careless fumigating. Sow the seeds thinly in a mixture of sandy-loam and leaf-mould (about one part of the latter to two of the former). Cover the seeds with silver-sand, and place a square of glass over the pots or pans in which the seeds are sown. This obviates the necessity for much watering, which has a tendency to sour the soil, and carry small seeds down too deeply for quick germination. The seed pans may stand in a close frame till the seedlings are large enough to handle, when they should immediately be pricked off 2 inches apart in pans or boxes, and the frame kept close for a week or so afterwards, when a full and free ventilation may be given. The great thing is to grow them on steadily, never allowing them to experience any check, either from want of water or root-room. Many seedlings are irretrievably ruined in the seed pans, and no after care or management can effectually remove the debility contracted by bad treatment in early youth. When the leaves of the young plants begin to meet in the pans or boxes, they should be potted singly into large sixty-sized pots, and should stand in a cool frame facing the north, in coal-ashes, and should after the first week have abundance of air, even to the extent of removing the lights in calm, warm weather. The attention required from this time onwards consists in shifting them into larger pots as they require it, liberally supplying them with water, and, also, on hot bright days damping the ashes around them. This, even in the hottest weather, will cause a nice genial atmosphere to surround the plants, from which they will derive immense benefit. This last shift

into the blooming pots when the plants are required for very early blooming should be not later than the end of August, so as to get the pots well filled with roots before the short days. The strongest plants may be potted in 8-inch pots, which is large enough for good specimens, and the smaller plants into 6-inch pots. There is never anything gained by over-potting, but rather the reverse. For the last shift, the soil may be richer, and may be composed of about two-thirds of good fibry loam and one-third old decayed cow or pig-dung, thoroughly mellow and crumbling, and just a sprinkling of soot may be added. If the loam is very adhesive, a sprinkling also of coarse sand or crushed charcoal will be beneficial. In all stages of their growth the pots should be well drained, for, though the *Cineraria* delights in moisture, anything in the shape of stagnation is fatal to success. In potting (the last shift especially) ram the soil in the pots firmly. Loose potting, when applied to soft-wooded plants, may, for a time, induce rapid growth; but if you want bushy sturdy plants, with the growth built up solidly, to be succeeded by an abundant bloom, firm potting is essential. A plant that is firmly potted has more food available within its limited space, and will not suffer so much from drought, if by any chance any delay has arisen in watering. For late blooming, June will be time enough to sow the seeds. I have often selected a few of the best seedlings in May, just before they had done blooming, placed them in a coal-ash bed under a north wall, where, without any trouble, they ripened and scattered their seeds, which quickly came up by thousands; and I have never had healthier or stronger plants for spring blooming than I have obtained from this somewhat primitive method. The truth is, there is far too much nursing and coddling with this class of plants, and that is the principal reason why they are so susceptible to the attacks of insects. An acquaintance of mine, some years ago, used to grow for market *Cinerarias* and *Calceolarias* with amazing success. His houses were simply dug out of a stiff clay soil, and the earth from the pathways formed the beds on each side, on which the plants were placed, covered with a low-span roof, not over-well glazed. The plants stood on a cool bottom near the glass, were never over-heated, and had an abundance of ventilation, and, as a consequence, were free from insects, and grew with remarkable vigour. In a well-constructed house, the chief causes of failure in this class of plants are deficient ventilation, too much artificial heat, and a lack of humidity in the atmosphere. One word more as to liquid-manure. This may be beneficially given at every alternate watering after the flower-buds are formed. If given clear, and not strong, the plants will flower largely, and the flower will be finer. There is nothing much better than sheep droppings, with a little soot added, for soft-wooded plants.

E. HOBDAY.

Small Conservatory Stove.—In THE GARDEN of the 7th ult., I notice an inquiry as to the best stove for a small conservatory. There is a capital American stove which, if it can be had in England, would exactly suit your correspondent. It is called the "Beacon Light Base Burner," a self-feeding stove; the coal chamber holds sufficient to burn over twelve hours without any attention whatever, and it gives out sufficient heat to keep out 48° (F.) of frost, or 16° below zero, as we have had it here this winter. There are several sizes. I have had one of the smallest in use for two winters, and it works admirably. In your comparatively mild climate, I doubt if it would require to be supplied with coal more than once in the twenty-four hours; all that would be necessary would be to shake out the ashes morning and evening. The coal used is anthracite. There is no smell, no gas gets out of it, as it is close. There are panes of mica in it which give it a cheerful appearance as the fire is seen through them.—PETER JACK, *People's Bank of Halifax, Nova Scotia.*

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Leucopogon Richei.—This pretty little plant, though not very well known, is quite deserving of attention, both on account of the beauty of its flowers and their use in bouquets. They are white, delicately-scented, and retain their freshness for some time after having been cut. The plant is, therefore, a desirable addition to every collection.—R. B. F.

New Plant Manure.—M. Quibou has found M. Jeannel's mineral manure (see p. 152, vol. III. of THE GARDEN), to be useless and even injurious to many plants grown in the open ground, and also in pots under the usual conditions. The only instance in which he found it to be of any value was in the case of plants grown in small pots and in barren worn-out soil, that is, under conditions which very seldom occur.

Arthropodium cirrhatum.—This attractive New Zealand flowering plant has been cultivated in the succulent house at Kew, for some years. Mr. W. Bull recently exhibited a remarkably well-grown plant of it, bearing an erect branching spike of white star-shaped flowers. The plant is graceful in habit, being furnished with curving glaucous foliage about 2 feet in length, and from an inch to an inch-and-a-half wide. It blooms freely in a cool greenhouse or conservatory, and deserves more general cultivation than it at present receives.—B.

A HOLIDAY TOUR.

By THE EDITOR.

Two Great Artificial Waterfalls near Rome.

ARTIFICIAL WATERFALLS, like artificial rocks, are frequently more suggestive of the puerile than of the picturesque, and this not merely in small places, but in great public and private gardens, where no expense was spared in their construction. This being so, it should not be forgotten that two of the most famous waterfalls in Europe—famous, that is to say, for their sublimity and beauty, are both artificial. These are the falls of Terni and of Tivoli. The greatest is that at Terni; it is the result of one of the great works of the Romans before our era, and was made by conducting a river (the Velinus) over a precipice of great height into another river (the Vera). This was done in order to relieve a district of superfluous water, and to guard against inundations. The falls are in the neighbourhood of some striking woodland-scenery, the railway near at hand running on its way towards Rome, through some deep defiles clad with evergreen Oaks, that make the waving slopes charming indeed, as contrasted with the generally bare and brown hills of Italy in winter. Near, too, are the ruins of the bridge of Augustus, which formerly joined the hills above the river to allow of the passage of the Flaminian way, and is now a stately and picturesque pile, standing firm in the busy water, and abundantly draped with Maiden-hair Fern, and other plants. The most trustworthy evidence places the total height of the falls at between 800 and 900 feet, but some say they are nearer to 1,200 feet high. The fall is broken into three parts, an upper fall of about 60 feet, the second or great fall at something under 600, and, finally, the lower and more broken fall a rush of foam about 250 feet high. As it is not often that great poets condescend to describe artificial waterfalls, it will be best, perhaps, to quote Lord Byron's well-known description of the falls of Terni:—

The roar of waters!—from the headlong height
Velino cleaves the wave-worn precipice;
The fall of waters! rapid as the light,
The flashing mass foams, shaking the abyss;
The hell of waters! where they howl and hiss,
And boil in endless torture; while the sweat
Of their great agony, wrung out from this
Their Phlegethon, curls round the rocks of jet
That guard the gulf around, in pitiless horror set,
And mounts in sprays the skies, and thence again
Returns in an unceasing shower, which round,
With its unemptied cloud of gentle rain,
Is an eternal April to the ground,
Making it all one emerald:—how profound
The gulf! and how the giant element
From rock to rock leaps with delirious bound,
Crushing the cliffs, which, downward worn and rent
With his fierce footsteps, yield in chasms a fearful vent!

To the broad column which rolls on, and shows
More like the fountain of an infant sea
Torn from the womb of mountains by the throes
Of a new world, than only thus to be
Parent of rivers, which flow gushingly,
With many windings, through the vale:—look back!
Lo! where it comes like an eternity,
As if to sweep down all things in its track,
Charming the eye with dread,—a matchless cataract,
Horribly beautiful! but on the verge,
From side to side, beneath the glittering morn,
An Iris sits, amidst the infernal surge,
Like Hope upon a death-bed, and, unworn
Its steady dyes, while all around is torn
By the distracted waters, bears serene
Its brilliant hues with all their beams unshorn:
Resembling, 'mid the torture of the scene,
Love watching Madness with unalterable mien.

Byron thought the falls of Terni “worth all the cascades and torrents of Switzerland put together.” The cascades at Tivoli are no less interesting. Our excellent page illustration of these will show what they are better than any words. In this case the great falls of the river Anio tumble into the valley from a height of about 320 feet. Here the smaller falls or cascades are mill-streams, &c., artificially diverted from the river, and the course of the great cascade itself was diverted into a new channel in consequence of an inundation in 1826. Here the landscape surroundings of the falls, the associations

of the place, and the rich vegetation, all combine with the falls to produce a very charming effect. With these facts before us who shall say that artificial waterfalls, &c., must, of necessity, be either puerile, or in any way, less satisfactory than any others? Good opportunities for making the like seldom exist, and where they do not, the best way would be to be content without making any attempts after the picturesque in this way. There can be no doubt, however, that many suitable situations for forming effective cascades exist in many of our great gardens and parks; and the result of turning a streamlet over the brow of a cliff or rocky brow, may be well worth considering by many interested in landscape gardening.

Florence.

A city cradled in many hills—hills dotted over everywhere with villas standing in vineyards and orchards, with which the country is so fully covered that there is no room for hedges or dividing lines of any kind. A fair city with many evidences of northern taste and neatness in its gardens; with most picturesque and interesting surroundings, and offering much more interest to lovers of gardens than Rome. Efforts are being made to improve its public gardens or promenades, and at great cost. The fortifications which once surrounded the city, like nearly all old Continental cities, have been removed, and the space thus cleared is occupied by public walks and gardens. Mars has, in fact, been thrown over for Flora—rare event. These gardens, where they deviate in plan from a planted road or avenue, seem to have but one fault; too many walks. To use an inch too much of these necessary, but not picturesque, objects is unpardonable. Here, in some places, there are four walks where one would suffice, and where there should be a pretty, if limited, expanse of Grass, there is a network of wide walks. A very bold improvement has been made here in the way of a public garden. A long and excellent drive winds up one of the hills immediately commanding the city, and affording many views of it and its surroundings. This new drive, admirably formed and planted, is bordered in many parts by gardens, all public property. These again, are somewhat disfigured by too much detail of the wrong kind in the way of grottoes, fountains, and high stone edgings, which, however, a purer taste will, it is to be hoped, one day modify. Florence is near the marble quarries, and takes advantage of the fact by placing marble seats in this new garden, each 12 feet long and nearly 3 feet wide, formed of one slab. It is not every city that can afford marble seats, but the use of stone seats in gardens is not uncommon as far north as Lyons, and it must be owned they look much better than those of either iron or wood. The limestone seats in the Lyons garden look quite as well as those of marble, and are good and massive in design. In these countries they have an advantage beyond that of not requiring paint, and they are not so easily burnt or made away with in times of commotion. Apart from these considerations, there can be no doubt that the use of stone seats of good and simple design, and of some easily-procured stone, would be an improvement in public gardens, &c.

The Boboli Gardens at Florence.

These have a good deal more character than is common in the best public gardens even of great cities. They resemble nothing else in the way of a garden in Europe. An illustration, published in *THE GARDEN* some time ago (p. 442, vol. iv.), conveys an exact notion of their general effect from one of the most important points of view. The whole is a curious mixture of palatial, botanical, and horticultural gardens, and, for the greater part, is on the slope of a steep hill, rising almost directly over the city. The main features are groves of evergreen Oaks and lines or avenues of Cypress, the various gardens being arranged in spaces between these; and the effect, from want of breadth in any part, gives one the idea of wandering through the wards of a gigantic key. The longer and more open avenues sometimes have a striking, and withal a simple and quiet aspect. But, beyond this, the effect generally is as weak as it ever must be where the surface is frittered away, and there is no central lawn or opening. Many small and modest private gardens have a much more open, cheerful, and altogether charming effect, than such huge mazes. The Boboli Gardens are happy in a very army of

THE CASCADES OF TIVOLI.



statues, but their charms would be greater if all but half-a-dozen of these were removed; sometimes—as in the central avenue, where a bold group stands out clear against the imposing avenue of high Cypress trees—the effect is good. But when the eye catches sight of a company of the above-mentioned army, in skirmishing order, in front of a line of clipped trees, the effect, to say the most of it, is not of a very high order. It is spotty and meagre, and the eye is diverted from the trees without being consoled by the statues, which are frequently noseless. In discussing disfigurements of public gardens, writers usually take it for granted that the British rough or snob, or whatever he may be called, is the most savage of all, in this respect. And they sometimes mercifully account for his shortcomings by reminding us how far removed from all those refining influences of other and more artistic countries the poor fellow's experiences have been. Well, in no part of Britain can one see in any public garden so much and such frivolous destruction and disfigurement of valuable public property as in the Boboli gardens, in beautiful and artistic Florence! Most of the many statues within reach of the hand are mutilated; all that can be got at by the pencil are scrawled over with names; yet many are considered valuable works of art. The Boboli Gardens contain also a botanic garden, in which the larger kinds of trees were, after a good old fashion, planted in beds about the width of those frequently employed for Asparagus. This, however, does not rob them of all interest. There are huge Orangeries, filled with plants destined for the open air in summer; but, though fine as a promenade, and commanding fine views of the city and its surroundings, it has few of the charms that a well-designed public garden should possess. The wealthier residents of Florence and its environs are more devoted to gardening; and there are some rich collections and interesting gardens. Among these, none is more worthy of a short description than that of Prince Demidoff,

St. Donato.

Here, though the outdoor garden is large and well-planted, the interest centres in the house-plants, of which there is a very rich collection, and, I think, the best grown I have ever seen in any private garden on the Continent. It differs, however, greatly from rich collections with us in the arrangement. An enormous range of cool and intermediate houses, placed end to end, and communicating with each other, is arranged throughout with the most exquisite taste, applied to the very best materials in the way of fine-foliaged and choicest flowering plants. The roofs and sides of the buildings, pots, &c., and all other objectionable, if necessary, surfaces, are so successfully concealed, that one sees only tortuous vistas, shaded by tropical leaves, and bright with flowers, the vegetation and flowers varying as one goes from house to house. Nothing could well exceed the interest and the beauty of the scene in the eyes of a lover of plants; indeed, the general effect is so striking that during one visit there is little time to notice many rare and finely grown specimens. One huge example of a fine plant, sometimes called the Alexandrine Laurel (*Ruscus racemosus*), cannot, however, be passed by thus, as it rises to a height of 20 feet, while drooping from every point are superb leaves. This specimen is an example of bold, as well as successful, culture; the plant, an uncommon one, is usually only seen well-grown when planted out, as in the College Gardens at Dublin; but here it is grown in a huge tub, and as some unusual means of supporting the strong shoots and heavy leaves was required, a trellis, over 20 feet high, with a small mast in the centre to support it, was made, and from this it droops as gracefully as from a pillar or cross-beam. The specimen is about forty-five years old. This plant deserves to be grown wherever there are large cool and intermediate houses to embellish. The back walls of all the cool houses here are very well covered by Camellias, a practice worth adopting generally, as, apart from the beauty of the flowers, the glossy leaves of these plants furnish a wall so admirably at all seasons. The practice of training Banksian Roses and other climbing plants round the stems of trees, is not uncommon in Florentine gardens; and, in the houses here, there is a modification of it not without merit. Climbers, such as Bignonias, are trained round the stems of tall *Dracenas* and the like; good cultivators will probably smile at the

practice; but, nevertheless, these little attempts to give a natural grace to cultivated plants deserve a word of praise. Among the plants best represented in the garden are the Australian Proteads, which form a collection of which any botanic garden might be proud. A plant of *Dasy-lirion longifolium* here is so old that it has a bark like a Cork tree. In the grounds a plant of the Weeping Cedar (*Hegeli*) is the most striking Conifer to English eyes, though the Red-wood of California seems to grow as well here as at home. This Cedar deserves a place in every collection of Conifers, especially in the home of evergreens—England. The fine evergreen Hawthorn, *Cratægus* or *Photinia serrulata*, is a great ornament of the grounds, as it is of many in Italy, growing from 10 to 25 feet high, and generally showing among its large green leaves a good many that have faded off to reddish crimson. This gives the shrub a most striking appearance; later on it is covered with large trusses of flowers.

Venice.

This fair city may be said to be rooted on an Oak forest (of piles), but they, like all the marble and the stone, and, indeed, everything else, had to be carried from far beyond the bitter marsh which, prairie-like, bounds the shallow waters, and on which nothing more precious than Rushes or sea-shore weeds flourishes. With every house on piles, he is hopeful, indeed, who expects any gardening interest here, yet small courts and spots of made-ground beside some of the palaces are converted into miniature gardens, and one of the most tastefully-disposed and, in every way, pretty city gardens I have seen is that of Count Popadopoli, in Venice. On entering it, a pretty open lawn of considerable extent forms the foreground to a living picture of many graceful groups and masses of trees and shrubs. The lawn itself, of a deep rich green—to which our English eyes are not accustomed—is a novelty. It is wholly composed of a Grass-like plant, called *Convallaria japonica* in Italian gardens; in ours, where, however, it is seldom seen out of botanical collections, it is named *Ophiopogon japonicus*. The Italians say it is the best plant they have for forming lawns; or, rather, for surfacing the earth with verdure, for assuredly it would not stand the test of a garden party. However, lawns composed of one plant only can never be used as carpets, and it is something where lawns of turf cannot be had to have a plant that may be relied on to mantle the earth with green at all seasons. This the *Convallaria* does, and this Venice garden did not show a square yard of bare earth anywhere over its two acres of surface. It was, therefore, much more agreeable to the eye than those gardens in which continual digging always leaves a large extent of surface bare and brown. The *Convallaria* is seldom or never cut in or cut down, and will endure four or five years in good condition. For English gardens or pleasure-grounds, this plant may be recommended as one that does thoroughly well beneath trees in poor sandy or dry ground. It grows from 4 to 6 inches high, and may be had in quantity from Italian nurserymen. This garden, like all the houses, is, of course, formed within a wall of piles, and over 50,000 cubic yards of soil, sand, rubbish, and mud were used to make it. On this some forms of vegetation thrive, particularly the Aleppo Pine (*Pinus halepensis*). This has stood when all other Pines failed here, which should be noted by those interested in sea-side trees. The finest evergreen shrub here is *Euonymus japonicus*, so valued in England. It attains a height of 12 feet, and is one of the best evergreens for sea-shore gardens. The Funereal Cypress is the most graceful tree; it, too, is not averse to the shore, and Hollies do capitally, and so does the Loquat; *Sterculia platanifolia* also forms a fine tree here. Well-stored, however, as the garden is with plants, both indoors and out, its main charm is in the design. Towards the back part of the open sunny lawn are the varied masses and groups of trees and shrubs; and, behind these again, almost hidden from the main point of view, a winding walk, bordered everywhere throughout its length with *Convallaria* turf, which here and there spreads into a little lawn, on which Yuccas, tree Pæonies, Spiræas, or Ferns are grouped or dotted. Hardy Ferns, placed here and there among the Grass, in half-shaded places, had a good effect. There were edgings of the common European and Ivy-leaved

Cyclamens, which abound in the woods in Italy, and which would thrive quite as well in our own gardens, if it were the fashion to plant them therein. Thus, between the margins of the lawn and the fringes of the side-walks, there was ample room to place every specimen, so that it could both attain full size, and be seen to advantage, while the confines of the garden were curtailed by judicious planting, and the effect of the whole was most pleasing from the open sunny centre, giving one the opportunity of enjoying and understanding the picture as a whole—a satisfaction always denied to us in the maze-like garden, be it large or small. There is a botanic garden in Venice, but a very small and poor one, now turned over to a nurseryman, who is permitted to repay himself by the sale of plants—a paltry arrangement for a city of marble palaces and churches. Such public gardens or promenades, as there are on the Lido, are poor in character and badly kept, unlike those of Genoa and Florence. It is pleasant to witness, here and there, from the water streets such evidences of gardening under difficulties as those shown in the illustration (see p. 357). In a small court here I noticed an enormous plant of the fragrant *Pittosporum Tobira*, 20 feet high, and about as much through.

A Verona Garden.

There is a garden at Verona not included, generally, among the famous ones of Italy which will repay a visit. The Giusti Gardens at Verona have no plant treasures not common to most Italian gardens, but they contain, what is probably the noblest grove of Cypresses existing, and this distinguishes them, as Bushey Park is distinguished for its Horse Chestnuts, or Warwickshire for its Oaks. Immediately on entering, one is amazed to see an avenue of Cypresses shooting up almost as high as the Giant Californian Pines, yet much slenderer in spread of branches than Lombardy Poplars. One of the first trees met with is 120 feet high, tapering gradually as a Grass stem, waving gracefully in the Alpine air, yet the stem is straight as a needle throughout, and the point rising far into the sky like a wand broken into leaf. The garden occupies a very abrupt slope, a little below the base of which the avenue begins, and, as it rises on the hill-side, one sees the trees from various points of view, in nearly every instance remarkable for their great height and perfect health; one specimen is 125 feet high. Most of the trees are the common Italian Cypress, *C. sempervirens*; but, as if to contrast with the common and most valuable form, there is, also, near at hand, a huge specimen of the more spreading variety (*horizontalis*). Above the avenue and on the top of the steep hill are other Cypresses of the same kind; from the base of these one can look down on the slender spires rising from below, so that the trees seem to assume a new aspect at every step. The steep hill, probably, has helped the trees much, for, northwards, the silvery heads of the Tyrolean Alps seem quite near. The effect of the whole is beautiful in a high degree to the lover of trees. The peculiar and striking aspect of the garden is wholly owing to the Giant Cypresses; the other usual elements of Italian gardening are in the Giusti gardens, but they have no more to do with its broad effect on the visitor than the flooring has to do with that of York Minster. Apart from suggesting the desirability of judiciously planting this beautiful tree, the Giusti gardens convey a lesson as to planting, with a view of showing the full beauty and character of a tree. The varied masses of contrasted individual forms, seen in well-planted gardens, is a great improvement on the monotony so common, but more than this is often wanted. It would be difficult to find a garden with a hundred kinds of developed trees more impressive than this with one. The forms in mixed masses neutralise each other to some extent, or rather prevent the eye from fully enjoying the highest expression of any one fine form. To show a fine tree in the completest manner, we must plant an isolated group of it. Such things may not be in small places, but they deserve attention from those planting in parks, wide lawns, public gardens, and especially arboreta. This plan should, above all things, be carried out where the conditions suit a tree, and it is a species considered of much importance. Many of the most valuable trees of northern and temperate countries, from the Olive to the Cedar of Lebanon, vary greatly in form, and it is by the grouping system that this variation will be seen to

most advantage in plantations. As to imparting character to a given spot, the mixed system is, of course, quite inferior to skilful grouping. This subject also suggests a comforting reflection for those whose soil or climate forbids the growth of many trees. A very few kinds fully developed, and so placed as to well show their size and beauty, may afford far finer sylvan pictures than a host of kinds arranged on the general mixture principle.

Genoa.

There is a curious garden at Genoa, that of the Villa Pallavicini, which well shows some diverse features of Italian gardening. It is on one of those steep hills which overlook the sea; it occupies a considerable space, for the most part covered with the native Evergreen Oak, through which many shady walks are made. These wind up the woody slope, and open here and there into little glades, embellished in various ways. For the greater part of its space, it is not laid out in what is called the Italian style; though there are the usual, and, on such slopes as this, the necessary terraces near the house. After these, however, the shady woods, with their native Oaks and Pines, and numerous wild Ferns and streamlets, and their many different peeps at the blue sea beneath, are refreshing. There is much to admire, were it not for the introduction of puerilities that might, perhaps, be in place in a tea-garden or in a rollicking play-ground, but not in a true garden. Sundry grottoes met with are arranged so as to syringe the visitor with water in various ways; and, as he escapes by the only open path, other cleverly-arranged water-jets attack him at every point. Imagine such a *bêtise* in a garden rich with plants, and which, if it only possessed those native to the spot, would be lovely! There are half-a-dozen different contrivances, in different spots, for squirting water in this manner! However, here is an experimental plantation of Palms, and the larger kinds of succulent plants, that have been planted in the open ground for some years, and which compensates us for this infantile fooling. Here we notice that *Agave Salmiani* is much more massive and stately in port than the common American *Agave*, fine as that is in Italy. *Cocos campestris*, *Corypha australis*, *Cycas revoluta*, *Dasyllirion* in variety, and many species of *Agave*; presently masses of our greenhouse *Azaleas* are seen in bloom; and soon we come to a knoll of Pines and Oaks, where the golden light has some difficulty in penetrating; and here are sarcophagi, a warrior's tomb, &c.—an ancient cemetery, in fact. Some antique sarcophagi, perhaps? or, it may be, the tombs of the owner's ancestors? Nothing of the kind—it is all artificial! Presently an Egyptian obelisk is seen, reminding one of some of those at Rome, but on getting nearer we find it is of terracotta! After this we ought to be grateful that the trees, too, are not artificial. Happily, a little way off, by the streamlet, there are masses of Maiden-hair Fern; there are plenty of Camellias, and other flowers (greenhouse ones with us) to soften matters a little. Passing by these, we soon arrive at a stalactite cave of distressing gloom and dimensions, after wandering through which a boatman is discovered, who ferries us through another tortuous winding or two of the cave, and soon ushers us into the full sun in a small lake, with marble statuary and fountain, and round its margin a pretty flower-garden. Even this, however, like much of the place, suffers from being too much "cut up" and frittered away by small temples and tortuosities of various kinds. A Camphor tree in this garden is very fine, almost as handsome as a Plane in the spread of its branches. There is also a fine Cork tree, said to be the finest in Italy, but it is not half the size of the trees at Caserta, near Naples, nor quite so good as a tree at Linton Park, in Kent. There is a very remarkable specimen of *Cycas revoluta* planted out for some years, with a clear stem of 4 feet, which shows that this plant will flourish in a cooler temperature than is generally supposed. The garden, notwithstanding the objectionable features spoken of, is one of the best in Italy; its best aspects, however, rather arising from the beauty of the position and the natural woods which occur on it, than from the gardening. There is a noble greenhouse shrub cultivated here, and in many Italian gardens, called *Enkyanthus quinqueflorus*, reminding one of *Kalmia latifolia* in the flower, but a

finer shrub. It is abundantly grown in tubs for placing in the open air in summer, and flowers very handsomely in spring. It well deserves extensive culture for conservatory decoration. There are some effective little arrangements in the public gardens at Genoa; and here I noticed, for the first time, our English Stonecrop (*Sedum anglicum*) used to surface the ground instead of turf. This it did very well indeed, and the effect of the fine *Dasyliirions* and dwarf Palms was much heightened by their springing from a surface everywhere verdant. Several of the dwarf green Stonecrops might be used with advantage in this way where turf will not grow well.

THE ARBORETUM.

SEA-SIDE PLANTING.

It certainly never would have occurred to me that trees and shrubs should be planted close down to an exposed sea-shore for any purpose except for shelter, and it was under this supposition that my last note was written. Mr. Scott, however, appears to plant in positions of this character wholly for ornamental purposes; at least, this is the only object which can be gained by planting such shrubs as he mentions. The hardness of these close to the sea is quite in accordance with our experience, with the indispensable proviso that there must be an outer hedge, or strip of storm-proof plants. Provide this, and many ornamental plants will grow kindly. There is, after all, only one tree which we find valuable both for ornament and shelter in extreme exposure to the sea, and that is the *Pinus Pinaster* and its smaller variety *maritima*. Mr. Scott says it will not thrive on clay. More is the pity; but let me strongly recommend it to all who plant for shelter on a free soil near the sea. It seems to delight in the blast; and, although sometimes tardy of growth at first, and even frequently "knead" when it does get a start, and although limb after limb may be torn from it in high gales, still, it conquers in the end, thrusts out sturdy limbs to windward, and (this appears its peculiarity as compared with all other Conifers) it never loses the deep rich green of its foliage. What is the value of the timber I know not, but wood of any sort cannot be grown for much profit close to an exposed coast. Further inland it grows to a considerable size. I have to day measured one, within a mile of the sea, 10 feet in circumference at a height of 4 feet. One more point in its favour, and I have done eulogising the *Pinaster*. The huge cones, which it bears in abundance, make capital fuel. Put half-a-dozen into a sulky fire, and you have a blaze in five minutes. It is a tree which does not bear drawing up, as most Conifers do. Unless the breeze has free access to all parts of it, the rugged bark will rot, and the whole tree decay. As for the Bramble, which Mr. Scott says truly is "one of the most persistent sea-side plants we have," it cannot be made to grow freely where it has not appeared spontaneously. We have sent from the woods here sacks of Bramble roots to Roxburghshire at the request of friends who envy the matchless game-covert which they afford, but the result was not encouraging. Has Mr. Scott tried the *Cupressus macrocarpa*? It thrives excellently in sea air, and grows rapidly, though I have never seen it tried close to an exposed coast; but at Castle Kennedy there are fine masses of it, in a severe exposure, doing very well. With a little shelter we find it invaluable.

SALMONICEPS.

TREES AND SHRUBS IN THE CHANNEL ISLANDS.

I VISITED the Channel Islands in January last, and was surprised to find, at this early season of the year, so many trees and shrubs flowering in the parterres and pleasure-grounds of these sheltered islands. The climate and temperature, indeed, seemed just suited to the requirements of the strangers. I noticed interesting plants in full flower in January in Guernsey, Jersey, and Sark, such as we cultivate ordinarily under glass. First, I would speak of the Australian introductions. Large masses of the graceful *Acacia dealbata*, with tree-like boles and beautiful racemes of yellow bloom, gave great beauty to winter-lawns. The thickness of some of the trees was considerable, and showed many years of growth. *Acacia Mela-*

noxydon, with its bright green phyllodia, was also a veritable tree; its little globes of yellow blooms were not yet expanded, though fully formed. *Hakea rosmarinifolia*, covered with beautiful pink blossoms, was exceedingly attractive, and seemed perfectly at home in Guernsey. It is one of the *Proteaceæ*. *Metrosideros speciosa*, one of the *Myrtaceæ*, had its heads well swollen, and giving good promise of bloom in April. I noticed also fine shrubs of *Aster argyrophyllus*. It is musk-scented, and its composite flowers are white. It is a native of Van Dieman's Land. Conifers seem to take kindly to the Channel Islands. *Dacrydium cupressinum*, a native of New Zealand, and also *Phyllocladus trichomanoides*, a fern-leaved Conifer, were growing most vigorously at Rozel, on the north coast of Jersey. The boles showed several years of growth. *Fitzroya patagonica*, a graceful drooping evergreen, seemed to luxuriate in the climate of Jersey, growing not far from another pendent Conifer (*Abies Morinda*), a native, I believe, of the northern mountain-ranges of India. Lastly, *Araucaria brasiliana* put in a very healthy appearance in Mr. Carré's grounds, at Valnord, in Guernsey. It is more graceful and of looser habit than its ally on the western coast of South America, *Araucaria imbricata*. *Rhododendron arboreum* showed a perfect blaze of bloom in the middle of January; and I noticed, likewise, at Rozel, *Rhododendron Thomsonii*, *Edgeworthii*, and *formosum*, giving promise of future bloom, without other protection than surrounding evergreen vegetation; and the same remark may apply to *Rhododendron cinnamomeum*, a white-flowered species from Nepal. The beautiful Gum trees of Australia give great effect to lawns and pleasure-grounds. I observed among them *Eucalyptus pendula* and *piperita*; and, though rare, *E. pulverulenta* thrives well, I learn, in Guernsey. They belong to the *Myrtaceæ*, and, like them, their flowers are dense masses of stamens. The *Escallonia*s, from the west coast of South America, are very ornamental, and seem to acclimatise readily in gardens near the coast, being covered with their lovely flowers in mid-winter. I noticed several species, but *E. macrantha*, a native of Chiloe, far surpasses the rest in beauty. Large trees of *Enonymus japonicus*, with their shining evergreen foliage, were literally covered with their rich coral-red fruits. Two New Zealand *Cordylines*—*australis* and *indivisa*—ornamented the lawn of Mr. Carré's house, and appeared quite acclimatised, having stood fifteen winters without protection or shelter. They, alone, are worth a visit. Three kinds of *Pittosporum* flourish as shrubs in the Channel Islands, and attain fair proportions; these are *Pittosporum Tobira*, *Mayi*, and *Novæ Zealandiæ*; the first was in full bloom in January. *Bambusa gracilis* and *arundinacea* were flourishing vigorously in Guernsey without the slightest shelter. They had attained the height of upwards of 15 feet. Dense masses of the Tree Heath (*Erica arborea*) were everywhere abundant in the Channel Islands. Every cottage-garden had its Heath shrub in bud or flower, according to its exposure. I was much surprised to see *Lapageria rosea*, a native of the island of Chiloe, which in England we treat as a greenhouse plant, still lingering in bloom in the open air on the first day of the new year; it had borne a profusion of blossoms during the autumn. By the side of the fish-ponds at the Seigneurie, in Sark, I observed a curious plant, with large rough leaves and a spadix dotted over with red seeds. This was *Gunnera scabra*, found by Darwin growing on the sandstone cliffs of Chiloe, a coarse-growing plant, whose leaves, he says, sometimes measured 6 feet in diameter.

PETER INCHBALD.

The Lodge, Hovingham, April, 1874.

PREPARATION OF GROUND FOR TREE-PLANTING.

By JOHN DARLING.

THE history of arboriculture in our country in former times has too often been but a record of short-sighted economy. Except, perhaps, in the vicinity of the mansion-house, where shelter and ornament compelled the appropriation of good soil to the growth of timber, it was only such portions of the estate as were totally unfit for agricultural purposes, or even pasturage, that were devoted to the growth of trees, and not only was the poorest soil considered sufficient, but no care was evinced to remedy its defects. It seldom seemed to be a matter of consideration to make the growth of timber profitable. It

is time that the maxim should be applied to this which has been applied to many other departments of national industry, "What is worth doing, is worth doing well;" and, since the produce of the forest requires a lengthened period of time to arrive at maturity, it is all the more necessary that a reliable foundation should be laid to sustain the hopes of a future remuneration. Perhaps the fear of not realising a return in their lifetime for the necessary outlay has deterred many proprietors from laying down their plantations in such a manner as they could have wished; but such a motive is surely unworthy, and can have no weight at the present day, when timber, in almost all its stages of growth, is such a valuable commodity; and since it has hitherto been, and most likely will still be the case, that, except for the purposes of shelter or ornament only, soils of an inferior quality will be devoted to the growth of timber, it is the more necessary that pains be taken to make the most of the material. In making a few remarks on the preparation of ground for planting, we shall state them in the following order:—1. Clearing the ground; 2. Fencing; 3. Making roads; 4. Drainage; 5. Making pits.

Clearing the Ground.

On the greater part of land which has not been used for agricultural purposes there will be much matter detrimental to the growth of young trees if left untouched. Heath, Broom, Furze, Brambles, and other coarse ligneous plants must all be removed, that there may be nothing to impede the full development of the trees. We would prefer burning, as the surest and most expeditious mode of checking the growth of Heath, where such an operation can be performed with safety, and, where danger is apprehended, the flame can be stopped by turning over a line of sods across the direction of the flame. Even burning will not eradicate Heath, but will so check its growth that, by the time it recovers, the trees will be beyond all danger of injury from it. Were it not that, where the Heath is rank, the young trees might be choked by it, we do not consider it otherwise detrimental. Broom, if old, can easily be destroyed by cutting over above ground; but, if young, the stems will be covered with eyes, and such cutting will only induce a more rapid growth; therefore, it will be necessary to take such up by the roots. Whins are in this quarter more detrimental to the growth of plantations than other underwood plants, as well as more difficult to eradicate, and, where

they grow close, simply cutting over above ground is altogether lost labour. The greatest care should therefore be taken to remove them by the roots, and any necessary expense incurred by this operation will be amply repaid in the smaller amount of labour required in the future management of the plantation. Raspberries and Brambles will sometimes, especially on gravelly soils, be found a great nuisance. It is next to impossible to eradicate these; perhaps the best plan is to cut the canes successively till the young trees are beyond reach of injury from them. All other spontaneous growths, such as Birch, Hazel, &c., which, in almost all cases, will be entirely unworthy of a place in

the new plantation, should be cleaned off, so that not only the growth of the young trees may not be impeded, but also that subsequent operations on the ground may have as little interruption as possible. In certain localities, the clearings may be of value as firewood, and may somewhat lessen the expense of preparation. If such is not the case, let them be collected into heaps and burned, and the ashes blended with the soil.

Fencing.

We consider fencing the next indispensable operation in the preparation of ground for planting. It ought never to be considered a point of minor importance, but ought to be attended to immediately after the clearing of the ground, lest the future operations of making roads, drainage, and pitting might suffer damage from stray cattle, or other causes. In selecting a fence for a plantation the first object to be aimed at is durability; next, the least possible ultimate expense. In some cases a necessity for ornament may guide the selection, but in all other cases, and where the requisite material can be obtained, we would prefer a stone dike, both for durability



Court-yard gardening in Venice (see p. 355).

and ultimate cheapness. In many situations, however, it may be difficult, or altogether impossible, to obtain stones; in such cases a wire railing with Larch posts offers a good substitute; and, if economical considerations extend beyond the present, a little extra labour and expense in charring the ends of the posts or dipping them into some solution to resist the decomposition which inevitably ensues from contact with the soil, and coating the part exposed to the atmosphere with boiling coal tar, or other solution suitable for the purpose, will eventually remunerate, by increasing the durability of the paling; but, where cheapness guides the choice, a dike and ditch, with a hedge of Whins on the top—the materials of which the dike is built being taken

from the outside—will form a fence of considerable efficiency, although this is, at best, but a clumsy and not very certain protection to the plantation, especially for the first three or four years, when the trees are young. In such places as require an ornamental fence, a hedge is no doubt the most suitable; Beech, Hornbeam, Holly, and Thorn are the more common materials, but the two former do not offer such resistance to animals as may, in many instances, be desirable; the two latter will, in time, make an excellent fence, especially Thorn, which offers greater resistance to animals than Holly, and is also much cheaper. Holly, being an evergreen, may be preferred in some instances; still, as a general rule, we would prefer Thorn. Hedges, however, require to be protected a number of years by a paling. Care should be taken to select such material, and give it such treatment, as will make the paling last till the hedge is a sufficient fence. Hedges also entail considerable expense, not in the original laying down merely, for continued yearly attention must be paid to them; but they amply repay it all by the charm they give to the landscape.

Making Roads.

In a highly civilised and commercial country, such as this, time is of great value. It ought, therefore, to be the object of the planter to provide the greatest possible facilities for the removal of felled timber, as such facilities will greatly enhance its value. In former times this was never thought of till the trees were of large growth, when gaps were made in the fences, if any fences existed, and avenues cut through the wood. This must often have been at hazard, and the soil was in all cases unfit for bearing the conveyance of heavy burdens, added to which, the stumps and roots of the cut trees combined to form a road as execrable as any in the backwoods of Canada; nor are roads needful for the removal of felled timber only, but for the protection of the plantation when, in a growing state, they are highly advantageous, and also for preventing the necessity of removing prunings or thinnings over the fences. All these considerations enforce the necessity of forming roads at the commencement of operations for planting. We are not prepared to specify the particular distances at which they should be made; this must be regulated by the extent, plan, and situation of the plantation, keeping always in view the economy of labour in conveying timber of large growth to the roads, taking advantage also of level tracts or gentle declivities leading to the outside of the plantation, and avoiding, if possible, steep ascents, thus lessening, as far as possible, the amount of animal labour required. In forming the roads, particular attention must be paid to drainage, especially where the soil is not hard. In most cases a drain on each side, with the material taken from them laid over the centre of the road, so as to give it a convex form and throw the surface water into the ditches, will be sufficient. When the inclination of the ground renders it necessary to provide cross drains, they should be built with stone, and have very strong stone covers. We would not be inclined to lay down a road less than 7 yards in width, so that loaded carts might pass with ease without injuring the edges of the ditches, and also to give room for loading and turning carts. A road made in this manner when a plantation is laid down will, by the time the timber is fit for cutting, be in a state to bear any ordinary load.

Drainage.

The next operation is drainage, which, except on very dry soil, is all but indispensable. In proceeding with this, it is necessary to examine the inclination of the ground that the main drains may have the advantage of all the fall possible. The distance of the main drains from each other must be regulated by the nature of the ground. If level, or nearly so, the small drains cannot be expected to be effective farther than from 150 to 200 yards; but, where considerable declivities exist they will act farther, and the mains should be carried along the natural hollows. As a general rule, small drains should not be less than 2 feet deep, and, if the fall permit, an additional 6 inches would make them much more effective. If the ground is very wet, we would not be inclined to place them farther apart than from 24 to 30 feet. Where the ground is not so wet, the distance may be increased by 6 or 9 feet. To keep the drains clear, the mains require to be from 4 to 6 inches deeper, and where a natural fall does not exist to carry off the water from the mains, no labour must be spared to secure it. It sometimes happens that very steep ground requires to be drained—in such cases, instead of leading the drains directly down the declivity, we would carry them obliquely across, taking care that sufficient fall is secured to carry off the water speedily. The propriety of this mode will be apparent when we consider that the particles of water in the soil of a deep declivity will have a greater tendency to settle down the declivity than sideways into a drain running straight to the bottom. A drain carried obliquely across the face of the declivity catches all the moisture as it percolates downwards, and, if a quick fall is secured, the water will

have no inducement to penetrate into the soil below the drain, but will run off and secure a perfect drainage; whereas drains cut straight down the declivity would do little more than carry off the rain water which might fall into them. The advantage of judicious draining must be apparent to even the most casual observer. Stagnant water about the roots of the young trees prevents that development of the roots necessary for their healthy growth—hence, on undrained ground, young trees have a stunted unhealthy appearance, make little progress, and in many cases die out altogether. It may also frequently be noticed, on ground where the drains are too far separate, or too shallow, that the trees by the sides of the drains are thriving and growing rapidly, while in the centre between the drains they have the stunted appearance peculiar to undrained ground.

Making Pits.

This operation is necessary for all hardwood trees. In ordinary cases, slit planting is sufficient for trees of the Fir tribe, but hardwood trees will not succeed so well unless better pulverised soil is provided than can be got by slit planting. For trees of the size ordinarily got from the nursery, pits 2 feet in width, and depth regulated by the nature of soil, will be sufficient. The pits should be dug some months previous to the time of planting, that the action of the weather may pulverise the soil, and make it more congenial to the tender roots of the young plants. Ordinary-sized hardwood plants, on gravelly soil especially, with a southern exposure, will require pits of much larger dimensions. In such situations pits of the ordinary size will retain too little moisture to sustain the young trees, whereas if a greater area and depth of the soil is loosened, and the stones removed, the original channels through which the water percolated are disturbed, and far greater power given to retain moisture. In such situations, Firs, especially if intended for standards, would require to be treated similarly, and even in ordinary soil, if Firs are of larger size than common, they will require pits prepared for them.—*Scottish Arboricultural Society's Transactions.*

THE FRUIT GARDEN.

OUR SHORTCOMINGS IN HARDY FRUIT CULTURE.

If a foreigner, unacquainted with the fruit-growing capabilities of this country, was told that American Apples sell at fourpence each in Covent Garden Market in January, he would at once say, "These English must be fond of Apples, have plenty of money, and their country is incapable of growing this fruit." But, if, in addition, he was informed that there are few countries better suited to Apple culture, and, moreover, that the last was a moderately good Apple year, he must come to the conclusion that our Apple culture is nothing to boast of. There are several causes which have brought about this state of things. We are less provident than some of our neighbours. The really useful, except in matters of the first magnitude, is not studied as it deserves to be. The general prosperity of the country causes us to look with indifference upon anything that at first sight has an appearance of comparatively little importance. The large land owners and occupiers have never been alive to their own interests, or to the requirements of the country, in the matter of fruit. And yet it does not require much consideration to convince anyone that the subject, whether looked at from a financial point of view, or in relation to providing a most necessary article of food for the people, is anything but a matter of little importance. If we except the cider-producing districts, and the market growers in the immediate vicinity of some of the large towns, comparatively nothing is done throughout the length and breadth of the kingdom in providing for the people this most wholesome and useful of all fruits. Even in many private establishments of considerable pretensions, not enough are grown to supply their wants. The occupier of a farm rarely thinks of planting a fruit-tree; his agreement generally binds him in the strictest manner from ever lopping a branch from a hedgerow-tree; yet he may with impunity grub up an old orchard, without any obligation of planting a new one. The absence of a lease, and consequent uncertainty of tenure, with no certainty of reimbursement for permanent improvements, naturally causes indifference as to a crop that he is uncertain of ever reaping any benefit from. Benevolent and political economists vie with each other in schemes for the improvement of the labourer in rural districts, by providing him with a better

cottage and garden for the growth of his Potatoes and Cabbages; but, in pulling down his old abode, the tree on the gable, which did something considerable towards paying the rent, comes down along with it, and there is often little or nothing done in the shape of instruction, or assistance, to induce or enable him to supply its place. Yet this is a means by which those who interest themselves in the improvement of the country labourer, might do much for his benefit directly, as well as spreading a knowledge and taste for a pursuit in which we are, as a nation, behind many other countries. Even village horticultural societies, whose objects are to spread a taste for gardening amongst the poor, do little comparatively to encourage the cultivation of the more useful species of fruits. So far as the cultivation of fruits, more especially the Apple, which I hold to be of more importance than all others which we grow put together, I see little chance of their being produced in such quantities as to bring the price within the reach of all, unless the subject is taken up by the great land owners of the country, and by their planting and urging upon their tenantry the importance of the little attention necessary for the well-being of the trees. The quantity of Apples that might be grown in the hedgerows without injury to other cultivated crops, is incalculable. Against this I have heard it urged that it would be impossible to prevent marauding; that every boy in a parish would become an Apple pilferer. If only a few acres were planted in a district, to some extent this might occur; but, if this system of culture were carried out to the extent it ought to be, such would not be the case. Again, it is urged, if Apples were produced in such quantities, they would not be worth the trouble of gathering. Those who argue thus, forget, or are ignorant, that the land through the kingdom, is not all suited to the growth of this fruit; probably, not more than one fourth might be calculated upon as suitable for its culture; and, in these, as with other things, a considerable reduction in price, would increase the consumption, to an incalculable extent.

Another fruit, the Damson—particularly the Yorkshire variety—is especially suited for hedgerow planting. It is hardy, a good cropper, and the tree, from its upright habit of growth, gets out of the reach of cattle. With Apples, for the purposes under consideration, it would be necessary to select such kinds as were found to succeed well in each respective neighbourhood; they would also require to be specially prepared, by being grafted higher than for ordinary use. They should also be strong upright growers, so as to be out of the reach of cattle, which are excessively fond of this fruit. Fortunately, there is no lack of good varieties, of which some do well in one locality, some in another, and others will succeed almost in any situation where Apples will grow. The great number of varieties of this fruit in cultivation have checked its extended culture by the disappointment many of them have caused. Hundreds of them are not worth growing, either as to the quality or quantity of the crop they produce, as compared with a limited number of sorts of sterling merit that grow well in most parts of the kingdom, and are everything that can be desired in the quality, quantity, and keeping properties of their fruit. New varieties every year keep making their appearance, but few of them, when they come to be tested, growing side by side with approved kinds already well known, are found to possess a single quality superior to the old ones. There is one most essential property capable of development in new varieties that raisers appear to lose sight of completely, that is, the production of a race of late-flowering kinds that do not blossom until the season is so far advanced as to materially lessen the danger from frosts. What we want is a thoroughly good representative of the different sections of Apple, with the late-flowering disposition of the Court Pendu Plat variety. This Apple, as is well known amongst hardy fruit growers, is quite three weeks later in both flowering and leafing than other kinds; it is also good for dessert, a fair keeper, and a handsome fruit. Anyone who could raise half-a-dozen sorts of dessert Apples with the late-flowering habit of Court Pendu Plat, combined with the quality of fruit and free-bearing disposition of Irish Peach, Margil, Cox's Orange Pippin, Ribstone Pippin, Sykehouse Russet, and Sturmer Pippin (these should be associated with culinary sorts having this late-flowering habit and the general

merits of Lord Suffield, Blenheim Pippin, Alfriston, Dmelmow's Seedling, Yorkshire Greening, and French Crab); anyone, I repeat, accomplishing this would deserve honours equal to any ever conferred on an individual connected with horticultural pursuits, as well as something more substantial. But, with the above, or any other possible selection, there are some that will not succeed on all soils; and, in planting fruits, especially Apples and Pears, it is always best to ascertain what sorts are found to succeed best in the neighbourhood. Even for the supply of a private family, it is much better to restrict the number of varieties grown to a dozen kinds that are found to do well, than to grow half a hundred, many of which will either grow or bear indifferently, and not have distinctive merits enough to make them worth cultivating. The practice of the market growers, in any part of the country, is much sounder than that of most gardeners in private establishments. The former confine themselves to the growth of such sorts as are found to succeed best in the locality; the latter generally grow four times the number of kinds, either of use or required, even if all would succeed well. For instance, the American-grown Newtown Pippins are magnificent Apples of surpassing excellence; whilst the same variety grown in any part of England, that I have seen, could not possibly be recognised, were it not that they retain the black spots on the skin peculiar to this variety. The same holds good with Pears. What is the use of growing twenty sorts that all ripen in November, when a third of the number may be selected that possess all the merits of the rest? Another very common mistake is to plant the best, and often tender kinds, in districts wholly unsuited to any but strong-constituted second-rate sorts. In Lancashire, the better kinds of Apples and Pears do not succeed, except near the coast, and even where these do well and bring good prices, the market growers find it more advantageous to confine their practice to good-constituted, free-bearing, second-rate sorts. An acquaintance of mine who lived some half-a-dozen miles from the coast, used to grow acres of Hesse Pears; the crops he got were enormous, but instead of the trees being planted in the ordinary fashion, they were grown on ridges; strong stakes were driven down in rows, the trees were tied to them, spreading their roots out on the surface, and then covering them to the requisite depth from the alleys. The ridges ran north and south, with treble the distance between the rows that existed between the trees. This was to admit of ridge Cucumbers being grown on alternate ridges, the Pears sheltering them from the strong west winds coming off the Channel, that otherwise would cut them to atoms. The raisers of new Apples and Pears, I consider, make a mistake in working altogether from the best sorts, that are only suitable for cultivation in the most favoured localities as to soil and climate, and which are only likely to produce varieties suitable for similar situations. Would it not be better to work from free-bearing hardier sorts, that succeed in situations less favoured, with a view to increasing the varieties that succeed in such places? The culinary Apple, Lord Suffield, is evidently a seedling from Keswick Codlin, and, notwithstanding the free-bearing disposition of the latter, how many raisers would ever think of breeding from so common a kind? Yet, Lord Suffield has the merit of thriving freely, and bearing, even in a small state, until its branches are bent to the ground, in situations so unfavourable to Apple culture that not half-a-dozen of even the most common sorts would live; yet, there is probably not a culinary Apple in existence for which the demand is so great for planting, even in good Apple districts, as this variety.

It is a great disappointment, after planting a lot of fruit trees, to find that half of them, when they ought to come into bearing, are so far unsuited to the locality as to be useless; yet this is a common occurrence, arising through a want of knowledge of the kinds adapted to the district. In the selection of Apples, Pears, and Plums for planting, it is usual to divide the kingdom into south, midland, and northern districts; this is generalising far too much. There is scarcely twenty miles of a single county in any direction where very great differences in selection are required to be made, and nothing less than close personal observation, over a series of years, can enable anyone to make a selection suitable for any

given neighbourhood. In the choice of a situation for planting with fruit trees, care should always be taken that it is sufficiently sheltered from the west and north-west winds, as the storms we have from these points are most destructive to the crops on standard trees. Where it is the intention, with orchards or large breadths of land planted with fruit trees, to keep the ground dug, the best practice is to plant the trees one-fourth further apart betwixt the rows than the distance between the trees in the rows; this gives room for a row of Currants or Gooseberries between each row of trees. The bush fruits so planted, frequently escape the effects of frost or cold springs, through the shelter afforded by the trees; and, with Black Currants, the shade is beneficial rather than otherwise.

As to the storing of fruit through the autumn and winter, it too often happens, even in private establishments, where the gardener is expected to produce Apples and Pears in good condition, so long as they are in season, that any sort of a place that can be called a fruit-room is thought good enough for the purpose. Yet, I feel confident that four out of every five of such places are totally unfit for keeping fruit as it ought to be. There is nothing with which I am acquainted that is more susceptible of taint, not only from actual contact, but even from being near anything affected with mould, or, in other ways in a state of decomposition. I have seen the flavour of a fine collection of Apples and Pears completely spoiled by being placed in a fruit-room, the shelves of which had begun slightly to decay. To preserve the natural flavour of these fruits, without imparting anything objectionable to them, as also to keep them from shrivelling, requires the atmosphere of the fruit-room to be balanced to a nicety. It is scarcely possible to place any material over dessert Apples or Pears without affecting their flavour; even Wheat-straw, in the sweetest possible condition, perfectly dry, will frequently spoil the flavour, through the moisture the fruit gives off causing the straw to mould, even so slightly as to be only perceptible by a faint odour. No second-storey apartments are fit for fruit-keeping, being too dry; the best fruit-rooms I have ever met with have been underground; a cellar in a thoroughly dry situation, where a sufficient amount of air could be admitted for a time after the fruit was gathered to dispel the moisture given off from it. I have in such a place often kept Alfriston and Bedfordshire Foundling, plump and in good condition, until the succeeding year's crop was gathered, which is considerably longer than these Apples usually keep. After a dry summer, when all fruits are usually longer before they ripen here, Easter Beurré and Beurré Rance were plump and full flavoured until the middle of May, and Nec Plus Meuris equally good until June. After a wet sunless summer, Easter Beurré sometimes will not ripen; it is often gathered too soon, which has the effect of causing this Pear to be worse to manage in this respect. I accidentally found out a means of remedying this; an old Peach-blind happened to be thrown upon one of the boxes filled with this kind; this was early in the winter, it was not removed until March, when the fruit were in fine condition, plump and soft, others from the same tree being tough, leathery, and unfit for table. Evidently, after dull sunless summers, this variety loses too much water by evaporation when fully exposed, the absence of which prevents the ripening process from taking place. Since then, I have always after such summers covered the fruit in the way described, laying the material three or four thicknesses over them, being very careful to use nothing except linen fabric that has been long exposed to the weather, so that it has not the slightest remaining smell of the size or dressing used in its manufacture. Pears that are kept in drawers made for the purpose and shut up, I have always found to be strongly affected with the odour of the wood. Apples and Pears are frequently kept plump and fresh in appearance long after their natural season for ripening, by covering them with bran, dry sand, or similar materials. Culinary Apples so treated are passable, but dessert fruit, either Apples or Pears, are insipid and worthless. All these materials—bran, dry sand, &c.—possess elements of decomposition, which, in their evolution, are, inevitably, imparted to the fruit; for them, the well-bleached linen alluded to will be found a most satisfactory substitute. T. BAINES.

THE FIG.

COMPARATIVELY few ever taste really choice dried Figs in this country, and, fewer still, green Figs in that perfection which they attain under circumstances favourable to their growth. It is singular that this delicious fruit has never yet received in this country that cultural care which has been given to the Grape and Peach; hence, the fact, that we seldom see it in perfection, and how can it be otherwise, the back wall of a Grapery or Peach-house, being the place usually assigned to it, although it is a fruit that loves cloudless sunshine and the balmy mountain breeze. Mr. Rivers and others have done something to spread a more general taste for this fruit among us. Jewish history tells us, that during ten months of the year fruit was found upon Figs, and that they were of three different sorts, namely, the early Fig, the summer Fig, and the winter Fig; the early Fig ripened towards the end of June, and was the most beautiful and delicious of the season. "One basket had very good Figs and new, even like the Figs that are first ripe," said Jeremiah. And the prophet Hosea uses this beautiful figure regarding them, "I found Israel like Grapes in the wilderness, I saw your fathers as the first ripe in the Fig tree at her first time." The way that this fruit was gathered in Judea is seized upon by Nahum to give expression to one of the most beautiful illustrations in the Bible—"All thy strongholds shall be like Fig trees with first-ripe Figs; if they be shaken they shall even fall into the mouth of the eater." The summer Fig made its appearance in June, when the early fruit began to drop off; it began to ripen in August; unlike the early Fig, they could be kept for a long time. The winter Fig appeared in August, and came to maturity about the end of autumn. After the tree had lost its foliage, if the winter was mild, the fruit was allowed to remain upon the tree until spring, and was then eaten as a dainty; it was larger than the early fruit and darker in colour. We cannot wonder that a fruit, so productive and delicious as the Fig, was seized upon both by prophets and poets in order to give force and expression to their language; for, besides yielding luscious fruit in abundance, the tree afforded a refreshing shade from the fierce rays of the sun—indeed, it was a common practice with the Jews to remain, during the heat of the day, under their Vines and Fig trees. That the Fig tree in Canaan was—as with us—often barren and liable to shed its fruit untimely, we can glean from the Scriptures and other historical works. "Let it alone this year," says the husbandman, "until I dig about it, and dung it, if it bear fruit well; and, if not, then, after that, thou shalt cut it down." Of the different varieties of this fruit grown in Palestine we know little or nothing; but there is every reason to suppose that they were not numerous. We see, from a notice of this fruit in THE GARDEN (see p. 290), that in the days of Cato only six varieties were known. We also see, from the same notice, what an important place this fruit occupies in the history of other nations besides that of the Jews; but, apart from its historical associations, the Fig has enough in itself to recommend it to a high place amongst dessert fruits. If it bore three successive crops in the open air in Palestine, surely the same result might be attained under glass in this country. But, with us, the places are comparatively few where the Fig may be said to receive the same attention and cultural care as is bestowed upon other choice fruits. A young gardener may be brought up in many of our best places, and yet never have an opportunity of seeing this fruit grown in perfection. It is not necessary to enter into detailed descriptions of the different modes of culture practised in reference to the Fig in England, but there are certain conditions requisite before it can be grown in perfection; that climate has a greater influence in the development of the Fig than soil, I am quite convinced; under glass we have an artificial atmosphere to create, and it rests, in a great measure, with the cultivator whether he so regulates the means at his disposal as to produce fruit of the best quality—an inference which also holds good with regard to all artificially forced fruits. Another essential point in the successful cultivation of the Fig is, a complete command over the roots, this can be done with more facility when they are grown in pots, than when planted out; indeed, the pot system has many advantages when properly carried out. The finest Figs which I have ever seen were grown in pots in a house fully exposed to the sun, and where no other

plants of any description were cultivated in the house, the floor was concreted, on which the plants were placed in rows, a prepared compost of stable-dung and leaves was placed around the pots up to the level of their brims, and this, besides yielding a slight-bottom heat kept the pots moist in a house fully exposed to the glare of the sun; the roof, which was iron, was made as low as possible, and culver-shaped; diluted liquid-manure was, occasionally poured upon the floor, and this, as it evaporated, helped to give health and vigour to the plants and to keep them free from the red spider. When the fruit began to drop, a mulching of dried Fern was spread over the compost and from this the Figs were gathered every morning and evening. During two months in mid-winter the plants were allowed to rest in the open air while the house underwent a complete renovation.

J. T.

BLACK ORANGES.

PARAGRAPHS are going the round of the papers dilating upon an American story to the effect that an extensive Orange-grower in Louisiana has this season produced a fine crop of jet-black Oranges. This *lusus nature* is described in the transatlantic press as being of a more extraordinary character than that so anxiously sought for among the Dutch florists of the seventeenth century, namely, a "black Tulip"—a phase of the Tulipomania which Alexander Dumas has immortalised in his picturesque romance, "*La Tulipe Noire*;" more extraordinary, even, than the "coal-black Rose" of the negro ballad. The reported black Oranges are, it must be confessed, a possibility; for though we have not, as yet, a black Rose, we have, at all events, a bright green one—a curious variety of the single Dog Rose—which exhibits no deformity, no abnormal growth, but has regularly-formed delicate green petals, as beautiful and perfect in texture as those which exhibit the tender blush-pink of the typical plant. We have also seen green Dahlias and black Apples. But to return to the black Oranges. Those who have seen the egg of a cassowary may picture to themselves the precise effect produced by the fruit of this new variety, so exactly does the surface of the egg resemble that of the rind of an Orange, while its colour, so unlike that of any other egg, is indisputably black. It certainly does appear within the range of possibility that a seedling Orange tree, from some peculiar constitutional character of the seed, may bear black fruit instead of orange-coloured. The seeds of other plants often produce both flowers and fruits differing in form and colour from those of the parent; and the Orange is, perhaps, the most liable of all well-known plants to produce from seed plants yielding fruits of most unusual and grotesque shape, entirely differing from the spheroidal conformation of the more usual types of the fruit. Yet, no very striking deviations of colour have hitherto occurred. The fruit-rind of even the strangest-looking varieties has constantly presented some tone of yellow, varying from the palest straw-colour, through infinite gradations of green-yellow, full-yellow, and orange-yellow, to the deepest tones of rich golden-orange. It must, therefore, be by a very unusual and striking aberration of physical habit that a positively black-fruited kind has been produced. But this endeavour to account for a singular botanical novelty may, after all, be rendered futile, as applying, perhaps, to a thing which has no existence in reality, for the Yankee dressings up and padding by which it is thought, after the American fashion, to get "laughing gas" out of this asserted freak of nature, as well as political satire, makes the whole thing look rather like an ingenious hoax. For instance, it is suggested, that this strange vagary of plant-life having taken place in Louisiana, in the Orange-groves belonging to Mrs. Beecher Stowe may have been the necessary consequence of her enthusiasm as an Abolitionist, and her intense interest in niggers. It is, moreover, superadded, as a singular corroboration of the foregoing nigger theory, that in the immediately contiguous Orange grounds, still belonging to good Southerners, the whole of the fruit remains of the usual rich golden-yellow. That a single tree, bearing black Oranges, might have appeared in the Orange-groves of Mrs. Beecher Stowe (if she have any), or in those of any other proprietor, is certainly possible. It is even possible that a peculiar kind of

blight may have blackened the fruit of a whole district; but when we are told of the black crop ceasing accurately at the boundary line between two properties, we necessarily lose faith in the whole story, and feel that, if black Oranges be indeed a desideratum, that in all probability they will have to be waited for very patiently, and then, perhaps not found, even amongst the most wonderful forms of the "fruits of the future."

OUTDOOR GRAPES.

SOME years ago I planted a border in my garden with Vines, more for the purpose of covering an unsightly mud wall than with the idea of obtaining fruit; but, as the results obtained in this way have very much exceeded my most sanguine expectations, I will relate my experience. The border is mainly composed of brick rubble, old mortar, and ordinary garden soil, and the Vines were planted without any preparation whatever. I selected *Esperione*, because its foliage becomes so very richly tinted as it is dying off in the autumn, and this has, quite contrary to my expectations, produced some nice crops of fruit, the best clusters of which are certainly eatable, but most valuable for wine making. There are half-a-dozen Vines of the old Black Cluster, a variety one so often sees recommended as a good and free-bearing Grape for out-door culture; yet, so far as my own practice goes, it is not nearly so certain a cropper, nor yet so prolific, as the first-named, which, if it never produced a berry, would yet be invaluable as a hardy-climbing foliage plant. I attribute much of my success to the open condition of the border, which is literally a mass of old foundations; and, for like positions, I know of no more profitable use than the culture of Grapes for wine making. These Vines were planted twelve years ago, and have never been manured but once during the whole time. My garden is only a mile or two from the Trent, so that it can scarcely be called the sunny south. I should be glad to hear how far north the Grapevine will ripen its fruit in this country.

J. C. P.

Melton.

Wiring Garden Walls.—It has so happened that I have had no practical experience with wired garden walls; but from what I have seen of them in different garden establishments which I have visited, I have, like your correspondent of last week (see p. 332), been led to regard the system as a very decided improvement upon the old nail and shred method, which is open to many objections. And I confess to having been somewhat puzzled on reading Mr. Baines's unqualified condemnation of the wiring system. Nor was I much less astonished at his assertion that nails ought to be driven into the bricks, and not into the joints. Surely Mr. Baines's nails must be sharper, or his bricks much softer than those with which I have had to deal, or he would not be able to get one nail in fifty to enter a brick. Even, however, if this were not so, I would certainly hesitate to disfigure the even surface of the bricks, by driving nails into them; joints can be re-pointed if desired, but splintered bricks cannot be so easily replaced by whole ones. My only object, however, in noticing this matter is to endeavour to elicit from some of your readers, who may have had experience with wired walls, if there really exists any reasonable objections to the use of them? If so, it cannot surely be the distance at which the branches are kept from the surface of the walls, which need not be more than the thickness of the wire itself, and that is, of course, infinitesimal.—P. GRIEVE.

—I have not the least doubt that "One Who Practically Knows" (see p. 332) is well acquainted with wire-work, but that he is no fruit grower is evident. When the writer talks of boring holds in the mortar with a gimlet, to admit nails in Peach-training; the next thing I should expect him to tell us is, that he prunes his trees with a chisel. Nearly twenty years ago I had walls as well wired as ever "One Who Practically Knows" could wish to have them, and I can point to numbers of places where the system has been done away with for the reasons I have given, and others which I did not mention.—T. BAINES.

Flavouring Strawberries.—When my Strawberry sets are fully coloured in the Pine-stoves or Melon-houses, I remove them to a late Vinery—an operation which not only vastly improves their flavour; but the display made by them in such houses my employer much enjoys. Walking in a temperate climate, inhaling the delicious fragrance of this fruit, is a treat easier to realise than describe.—R. GILBERT.

A New First-class Pear.—The current number of the *Revue Horticole* contains a coloured plate and a description of a new Pear named *Favourite Morel*, a seedling from Williams's *Bon Chrétien*, raised by M. Morel, of Vaise-Lyon. The fruit is of good size, and handsome in shape and colour, the flesh is white, fine-grained, melting, juicy, and agreeably acidulous, ripening from the end of September to the middle of October or later. The tree produces abundantly, and does well on the Quince stock. M. Carrière recommends the fruit as being in every respect of first-rate quality.

TREES AND SHRUBS IN AND NEAR LONDON.

It has been said that there is no street in London in or from which you cannot see a tree; a statement not literally true; but there are more trees even in the middle of London than a stranger would guess. The tall Oriental Plane in Wood Street, Cheapside, has a rook's nest in it. A sister tree, and, perhaps, a larger one, spreads its arms over Stationers' Hall Court, and there are two good ones, much haunted by sparrows, in the mysterious region of Doctors' Commons. In one of the courts of Bartholinew's Hospital are some well-grown trees, and others adorn the garden of Mercers' Hall. The Bank of England itself, square stone manseum as it looks, has a garden in its heart, gay with flowers and bushes. One of the most unlikely places for greenery is a sunk court in the stony area of Somerset House, yet there three or four Hawthorns manage to live and grow. In Gray's Inn is a shady Elm avenue, trees not the same, but successors of those under which Lord Verulam used to pace and meditate, and baply made there his pretty piece "Of Gardens." The famous essays are dated "from my chamber at Graies Inn, this 30 of Januarie, 1597." "The Creator first planted a garden," he says, "and indeed it is the purest of human pleasures; it is the greatest refreshment to the spirits of man; without which buildings and palaces are but gross handiworks." In many another space and square, and in many an unsuspecting nook in the very thick of the town, as, for example, behind certain houses near the British Museum in Great Russell Street, and behind others in Great Ormond Street (among which latter is a Fig tree of unusual size), and among the crooked lanes south of Westminster Abbey, trees continue under all difficulties to present to those in populous city pent the boon of their varying interest and beauty. The roads, walks, shrubberies, and flower-beds of Kensington Gardens and Hyde Park are kept, on the whole, in pretty good order; in some parts exquisitely, in others not so well as one would naturally expect, considering the metropolitan importance of this two-fold *rus in urbe*, and the large sums of money annually expended on it. The old trees, the pride and glory of the expanse, are, to all appearance, allowed to rot, and fall one by one without any of those attempts to prolong their lives which are successfully made for so many of their leafy brethren in the parks of other countries and of private owners. As a tooth cared for by the dentist, a tree may be saved for ever so long by timely attention. A plate of zinc, or a kind plaster of tar, would often give the dryad a new lease of her mansion. Caked and hardened ground should, in some cases, be stirred—new earth deftly supplied—an artificial shower, at need, drizzled from the far-shooting hydrant or hose. But this and that majestic old tree must not only strive against the acids and soot-flakes of London air, but endure the slow rot of rain sinking into its hollow places, and the racking of the wind upon its weaker joints and branches; and one vegetable King Lear after another breaks, falls, and lies ruined. As a further proof of neglect, you will often find the prostrate trunk or huge dis severed limb lying for many months in the place of its downfall, obstructive, puddle-making, ugly, slovenly, discreditable. The corner of Kensington Gardens, near the fountains at the top of the lake, a very conspicuous part, lay in a dismal condition for several years past, with mud, dust, baldness, and ruined trees. It has lately begun to look a little better, the rubbish having been, at long last, cleared away, and the Grass allowed to grow by the simple expedient of partly fencing it on one side. But other parts of the gardens are in an ugly and neglected state. That huge knotted Elm, surrounded by a bench, near the water, the greatest of its tribe in these woods, still stands firm and apparently sound; but decay may be at work. I cannot gather that any regular inspection of the trees is made. A very pretty and well-tended piece of shady garden, not much known, is that which adjoins on the east the open grounds at the back of Chelsea Hospital, with a railing between. This eastward garden, with smooth winding walks, lawns, flower-beds, summer-houses, clumps of shrubs, and some handsome taller trees, still bears the name of Ranelagh, and is part of the famous Ranelagh Gardens of the last century, which further extended over the ground where you now see that huge barrack for the household troops. The north part of the present Ranelagh, a wide quadrangular space, sheltered by trees and shrubs, the red walls of the hospital peeping up on the westward, is occupied by the Old Men's Garden, a number of little plots of ground cultivated by the same number of pensioners for their private amusement and benefit. There are ninety-two of these little gardens, each about 18 feet square, only divided one from another by narrow walks, where you see here and there an old soldier in long blue coat and peaked cap creeping about and bending among his flowers and vegetables. Each follows his own fancies in the matter of gardening. One grows Peas or Beans, another Potatoes, a third Onions, a fourth Lettuces, a fifth Scarlet Runners, for staple; but few are so prosaic as to have no flowers, while many others make these their

chief boast. There is nothing that a horticulturist would deign to notice. The old-fashioned cottage blooms and pot-herbs, with their fragrance of long-gone springs and summers, are still the sole favourites here—Sweet William, Snapdragon, double Pinks, Lilies, dwarf Roses, Larkspur, Wallflower, Gillyflower, Bachelor's Buttons, Gentian, Musk, Thrift, Lupin, Columbine, London Pride; green Rosemary, Rue, and Southerwood; the lofty Hollyhock, and the lowly Heartsease. Some of the old gardeners have architectural whims; one man has erected a castle of pebbles, five feet high, on whose top-most tower flies the Union Jack, another a kind of sentry-box encrusted with clam-shells, and two or three have with better taste twisted up little arbours. The few oddities are not enough to disfigure, only serve to accentuate the impression of a variety of individual tastes at work, which gives a peculiar interest to this composite garden, made up of ninety-two pieces; and the general result has sufficient unity of effect, helped by the broad public walk which goes round the four sides of the whole space and binds it together. A little westward from Chelsea Hospital is one of the oldest gardens in London, that of the Apothecaries' Company, made between 1673 and 1686, the latter year being probably the date of the wall, as inscribed thereon at the east gate. The freehold of the ground was given them by Sir Hans Sloane, in 1721. It looks, if you peep through the iron gate, just as a "Physic Garden" ought to look, dingy and formal, and as though laid out for growing Senna and Squills; in fact, its chief crop seems to consist of labels. The few trees, too, are mostly of a sombre and funereal aspect, one black Cedar, some Holm-Oaks, and a couple of specimens of Chinese Arbor Vitæ, which resemble gigantic bearse-plumes. Vegetable Porcupines, of the Cactus tribe, present their usual uncompromising aspect here and there; and a statue of Sir Hans, bewigged and grimy, stands in the centre. Battersea, the last made of the metropolitan breathing spaces, is a very promising young park indeed, with its pretty boating lake and sub-tropical gardens, its lawns for cricket and football, shrubberies, and, above all, its long terrace on the Thames, which forms its northern boundary. The ragged and marshy Battersea Fields, with their Willowy ditches and scraps of Cabbage garden, were raised into this new and noble condition under the care of Mr. Gibson. The only trees of any height in Battersea Park are some Willows and Poplars, the oldest inhabitants of the region. That tall group which decorates the west-end of the really charming island, with its bays of Reeds and water Lilies, is the haunt in autumn of numerous starlings, and any fine evening you may see and hear a flock of them wheeling with multitudinous twitter above the foliage ere they settle for the night. In St. James's Park, too, the Willows and Poplars are the chief ornament, especially those on the island facing the new India Office. The old Elms that remain are much in want of looking after. The best trees of the Green Park are all in that dell facing Engine Street, Piccadilly, some large Horse Chestnuts the most notable; but the ground beneath, which might be made remarkably pleasant, is needlessly abandoned to be trampled into dust and mud. Hyde Park has not many great trees. Its chief charm is the wide airy upland (permit the word) between the Marble Arch and the Serpentine, but there are trees in Hyde Park. The south side of the Serpentine is well wooded, and on the north side stand some sturdy Elms, thick of bole, with pleasant seats from which to look on the gliding toy ships, the pleasure boats, and the water-fowl that whiten with their dropt feathers that new-created Island. The most rural part of Hyde Park, is round the Deputy Ranger's lodge, a viritable grange, with its home trees, garden and paddock. And (London being packed full of contrasts) near this peaceful scene, but just a little farther east is "The Reformers' Tree," a good-sized Elm some 10 feet in girth, the outside one of a row of eleven, two being stumps. Taking the path from this noble tree—the future goal perhaps of admiring pilgrims—towards the Serpentine Bridge, we pass a Birchen grove, and a few sturdy Oaks. At the north-east corner of the bridge are four noticeable trees with light-coloured stems (Canadian or Cotton Poplars), their twigs in March thickly hung with long catkins. And so we come again to Kensington Gardens, the place in all London for the lover of trees, when he has no time for the outlying shades of Richmond or Greenwich. Just inside the gate, behind the powder magazine, look at this group of Pollard Chestnuts, about twelve in number, the oldest trees, probably, in the gardens; this one is the biggest—broad, squat, grotesque. Another, you see, though still full of life and budding twigs, is half stript of its bark, and the denuded wood is full of cracks, which call for some kindly surgery. "Bo sure," says Evelyn ("Sylva," Bk. III. ch. ii), "to emplaster great wounds to keep out the wet." On the other side of the pathway stands an old Pollard Oak, a wound in his veteran side, which the rain falls into, and idle fingers enlarge. See those freshly broken bits of wood lying on the Grass. So we enter on the slope east of the Serpentine, a fine country-like space of

Grass, bordered with trees, which form a grove on the side next the water. Here are large Elms (two especially grand), Horse Chestnuts, and a few tolerable Beeches. Passing the ugly fountain-plateau, which needs entire remodelling, and the majestic Elm by the water-side, already mentioned, we see about a dozen stumps of various heights of wind-wrecked Elms, still living and sprouting, but the broken boles not protected in any way from the weather. Keeping near the Bayswater boundary, on our westward way, we note near Lancaster Gate some great Horse Chestnuts (which want looking after), four or five Beeches, and then a picturesque grove of Scotch Firs, their tall bare stems and flat heads looking like those of so many Stone Pines. They are about twenty-one in number, but six are dead, and six more are in a bad way. The bark is coming off in patches, and from the holes in the wood it is evident that some insect is at work. Can anything be done to save the sound trees? The dead ones might be polled and made props for Ivy to climb upon. The adjacent Linden grove looks very spindly, and in need of thinning. Now we cross the great Elm Avenue from Kensington to Bayswater, unrivalled of its kind in all the parks, even including Richmond and Greenwich, and pass into a singular and delightful region in the westward part of the gardens, behind Wren's conservatory, with a Platanian grove of Yews, and three tall Cedars lifting still blacker heads high above theirs. Some good-sized Hollies fringe the outer limit, and that bowery Holm-Oak shelters a seat, seldom unoccupied; a pleasant place in March, the sun shining over the low hedge bordering our westward walk, nest-building rooks hovering and cawing round the tall Elm-tops, and a blackbird haranguing the woods and sky, as though London were fifty miles away.—*Fraser's Magazine*.

WORK FOR THE WEEK.

Flower-garden and Shrubbery.

EVERGREEN trees and shrubs may still be transplanted, mulching the roots with litter or leaves, over which an inch or so of soil should be placed. From Conifers all contending leaders should be removed, leaving only the most promising; where there is a deficiency of vigour in the leader, it should be encouraged by judiciously removing the points of the side branches, or, if necessary, thinning them. Hardy Ferns wintered in pots may now be planted in Ferneries out of doors, or in other shady spots. Annuals, such as Mignonette, Saponaria, and Candytuft, should be sown out of doors, where they are to bloom. American Aloes may be planted or plunged outside in beds, or placed on rock-work, or in vases where they are to remain during summer; in case of frost, a mat may be thrown over them. Edgings of the hardier succulents around flower-beds and borders may be made. Hollyhocks, the better kinds of Foxglove, Sweet Williams, and Rockets, may be planted out where they are to remain. Gladioli should be planted, Box edgings pruned, and Ivy clipped. The latter should be cut close in to the wall, even though it should be rendered leafless; in a short time it will be covered with the most beautiful bright green young foliage imaginable. Broad Grass walks may now be trimmed and swept, and lawns regularly mown and rolled.

Stoves and Greenhouses.

Plants of young and tender growth should be protected from bright sunshine, especially when the leaves are damp. Put a few neat stakes amongst the leaves of the earliest started Caladiums, so as to keep them from being broken. Place the young stock of Palms, Cycads, Dracænas, Ixoras, Crotons, Pavettas, &c., in a warm moist temperature; and if a brisk bottom-heat can be given, so much the better for them, as, in that case, the plants start freely into growth, and develop their foliage in greater perfection. Re-pot the stock of Alocasias. Plants belonging to the macrorhiza section of that genus are partial to a good substantial loamy compost; whereas, those belonging to the *metallica* delight in an open turfy soil. They like plenty of water, both at the root and in the atmosphere; indeed, *A. metallica* and *Marantas* would thrive set on inverted pots in an aquarium—i.e., if the bases of the pots were just above the water. *Cyanophyllums*, *Spharogynes*, and *Medinillas* also enjoy a similar position, and the large and magnificent foliage they produce under such circumstances amply repays any attention they may receive in that way. Put some *Tradescantias* of the *discolor* section in 4 and 6-inch pots, and keep them for a time in a brisk moist temperature, when they will make excellent flowering plants. Start *Clerodendrons* of the *fallax*, *fragrans*, and *Kempferi* section, and give climbing ones plenty of string to support their growing shoots. As soon as *Crinums* have done flowering, re-pot them in good substantial loam mixed with some well-decomposed manure. They may be bloomed in the same pot for two or three years in succession, if the specimens are large, in which case manure-water should be given them. *Centradenias*

make useful winter plants, if propagated from cuttings now and well attended to during the summer. Free *Brexias* from scale and *Ixoras* from mealy bug. *Allamandas*, amongst the best of which are *A. nobilis*, *grandiflora*, *Hendersonii*, *cathartica*, *Schottii*, and *Anblettii*, should now be kept in active growth. *Marcgravia dabia* is a useful plant, which will cover a stone or brick wall, grow on the wooden rafters on the north side of a stove, or make a nice covering for the stamps of Tree-Ferns; indeed, the *Marcgravia*, dwarf-climbing *Ficus*es, *Æschynanthuses*, and similar plants, thrive admirably in such situations. Cut back plants of *Scutellaria Mocciniana*, and pot and start them into growth. *Cissas discolor* (a plant which well deserves every encouragement) enjoys heat and moisture when growing, and is rather partial to a slightly shaded nook; cut back old plants close to the main trunks or shoots so as to induce them to start afresh; the divisions of the cut-away shoots will then strike freely, and form nice little plants for either suspended baskets or for pot trellises. *Torenia asiatica*, various sorts of *Æschynanthus*, *Coccothymus discolor*, *Panicum variegatum*, *Hoyas*, *Selaginellas*, some Ferns, and *Dracænas* for centre-pieces, are also suitable for basket-work; but, if a little extra shade can be afforded, many other plants, such as the beautifully-leaved *Philodendron Lindenii*, *Pothos argyrea*, different kinds of *Cissus* and *Pitcher* plants, may be effectively employed for the same purpose. In conservatories, *Camellias* done flowering, and other evergreens not in blossom, should receive copious syringings on bright mornings; air should be freely admitted, and a slight shading afforded during bright sunshine. Tying, thinning, staking, and keeping the plants free from insects, should receive daily attention. Plants that have been forced may now be put into pits or frames, and gradually exposed to the air.

Pits and Frames.

Continue to propagate bedding plants, and such as are rooted should be potted or pricked into boxes; those a little established should be gradually inured to the air, and strong well-hardened plants fully exposed, and shut up at night. *Pyrethrums*, variegated Grasses, *Sedums*, &c., should be placed outside on wall-sheltered borders, where mats can be thrown over them if necessary. Stocks, *Asters*, and *Marigolds* may now be sown on slight hot-beds; and, as soon as up, they should be gradually inured to the air. Those up and fit to handle are pricked off into boxes and pans, and kept near the glass. *Auriculas* require plenty of water at the root; but great care should be taken to prevent water or drip from coming in contact with their flowers and foliage. *Carnations* should now be shifted into their flowering pots, and those for outdoor decoration turned into beds or borders. *Heartsease* may be sown, and established plants planted out. Balbs done blooming should be placed in frames, where they can be kept rather dry so as to induce them to ripen.

Market Gardens.

The genial weather of the past fortnight has been instrumental in forwarding all sorts of vegetables. Winter spinach is now pushing up strong fleshy leaves, therefore have the beds cleaned and hoed. Hoe and clean Parsley beds after the leaves have been picked for market, and, if not already done, sow some seeds for autumn and winter bearing; March, however, is the best month for this operation. During the last three weeks there has been plenty of *Seakale* obtained from the open fields, in which it is cut as soon as the tops are discerned making their way through the earthed-up soil. Finish the earthing-up of *Asparagus* ridges. Parsnips are now beginning to appear; therefore, where *Lettuces* are planted between the lines, they should have the earth about them loosened with a short hoe, and the alleys between, i.e., where the Parsnips were sown, raked smoothly, but not deeply, with a foot-wide iron-toothed rake, so as to break the surface and to facilitate the egress of the seedlings through the soil. Earth up Beans and draw the rake over the soil where they have not yet germinated. Beans are generally planted in rows 2½ feet apart, with a line of Cabbages between them, the latter being removed before the former require the space. Radishes will now grow quite freely without coverings of litter—i.e., if the weather keeps fine and birds are kept off them. Therefore, remove such protection, which should be placed in the bottom of the manure heap to soak and rot. Still, however, keep litter on *Rhubarb*, for under it the leafstalks always come cleaner and crisper than when grown uncovered. Plum trees are in full flower, Pear trees are extremely promising, as are also *Cherries*; indeed, the fruit harvest, if uninjured by frosts and dry easterly winds, bids fair to be a good one. Cucumbers should now be planted out in frames, and well covered at night with litter. Keep the frames close for some time after they have been planted out. Those who grow Melons should now plant them in the frames in which they are intended to be grown.

ROYAL BOTANIC SOCIETY.

APRIL 22.

THE most notable plants exhibited on this occasion were Azaleas, Roses, Orchids, and Dielytras, together with Clematis, spring-blooming decorative plants, and florist's flowers, all of which were well represented, and the gardens themselves never looked fresher, cleaner, or better, than they do at the present time.

Stove and Greenhouse Plants.—Of these, Mr. Ward, of Leyton, staged a dozen nice little specimens, among which were *Erica profusa*, well-flowered, two plants of *Lycaste Skinneri*, *Cypripedium villosum*, *Odontoglossum Pescatorei*, three nicely bloomed Azaleas, and other plants. Mr. Wheeler, Regent's Park, also had a nice group, including *Franciscea calycina*, an old and valuable exhibition plant, Azaleas, *Erica Cavendishi*, and *Lycaste Skinneri*. Dielytras were very fine, Messrs. J. Veitch & Sons being first with plants a yard through, fresh in aspect and profusely flowered. Mr. Wheeler had smaller plants trained in rather too stiffly, owing to which they lost much of their natural gracefulness; while Mr. Reeves had still smaller plants, also impaired in appearance by being trained in too formal a manner. In the class for six stove plants, Mr. Ward staged a large spathed form of *Anthurium Scherzerianum*, *Rhynchospermum jasmynoides*, nicely bloomed, and a well flowered plant of *Franciscea calycina*. Mr. Wheeler, also, had a neat group of smaller plants. Messrs. Lane & Sons contributed a pretty group of twelve *Rhododendrons*, the varieties, and, in some cases, the plants, being the same as those shown last week at South Kensington. Messrs. Jackman, of Woking, again staged a beautiful group of Clematis, well-grown and profusely bloomed; Cape Heaths in good condition came from Mr. Ward, who had fine plants of *E. depressa multiflora*, *elegans*, *mirabilis*, *aristata major*, *tricolor*, *Eppsi*, and *Cavendishi*. Mr. Wheeler had a smaller group rather past their best. Messrs. Low & Co., of Clapton, staged six plants of *E. Lowii*, a fine variety of the *aristata* group, having large inflated crimson flowers, slightly glutinous; it appears to be robust in habit, and will prove a fine exhibition variety of this useful genus.

Azaleas.—Messrs. Lane of Berkhamstead had some examples of what are called half-specimens, remarkably well bloomed, including Flag of Truce, a fine semi-double white; and Comet, a brilliant scarlet, suffused with metallic purple. Mr. Wheeler's collection consisted of smaller plants, the best of which were Model, a fine flat flower, of a delicate rosy-lilac; and Stella, one of the best, resembling Comet, but not quite so brilliant. Mr. James's group consisted of still smaller plants, but, so far as cultivation went, they were nearly perfect, the plants being trained in a natural manner, and well bloomed. Of these the best were Criterion, a fine rosy-lilac variety, edged with white, the top petals spotted with deep rosy-crimson; Duc de Nassau, a rich lilac purple, with a very large semi-double flower, each segment being beautifully crisped round its margin. In the Amateurs' Class, Mr. Marcham also furnished six large plants very well flowered.

Roses in Pots.—Of these some fine examples were furnished by Messrs. Veitch & Sons, whose plants were perfect pictures of health and vigour. Among them were Paul Verdier, a well-known old rosy-crimson variety; Centifolia rosea, another fine well-known Rose, and one of the best for pot culture; Charles Lawson, a fine deep rosy-tinted variety; and John Hopper, a deep rosy-purple, with silvery-lilac backs to its beautifully incurved petals. The best Tea-scented varieties in this group were President, a profuse-blooming variety, with well-formed salmon-tinted flowers, and Madame Willermoz, a good white-tinted kind with delicate flesh. Mr. W. Paul, of Waltham Cross, staged a larger collection of smaller well-bloomed plants, among which we noted the new Tea-scented variety called Madame François Janin, a beautiful buff kind, with fine bright wax-like foliage; Catherine Mermet, another excellent variety of a delicate flesh colour of fine form, but, in this instance, a little past its best; Perfection de Montplaisir, a fine sulphur-tinted flower, belonging to the same group. Among the hybrid perpetuals we noticed Princess Beatrice, a very round and full-flowered variety of a delicate rosy-lilac colour; St. George, a new variety with large smooth petals, rather rough at the edges, and of a deep velvety-crimson; Etienne Levet, a fine deep rosy flower, with large smooth petals; this was introduced a few years ago, and is a good addition to Roses suitable for pot culture. Mr. Paul also showed two other new seedlings, Perle des Blanchés, a paper-white variety, the flowers being borne in clusters of four to seven at the end of each branch, it will be useful for pot culture or for cutting; the other, Mlle. Marie Arnaud, is a sulphur-coloured Tea-scented kind, and, as shown on this occasion, promises to be useful for furnishing cut flowers, the buds being nearly perfect, although not so compact as those of Madame François Janin, to which we have already alluded. Cut Roses were shown in fine condition by Mr. Walker, nurseryman, of Thame, near Oxford, two boxes of Maréchal Niel were perfect and very richly coloured. In another stand were blooms of Adam, a fine fresh coloured Tea, Duchess de Caylus, Charles Lefebvre, Souvenir de la Malmaison, Gloire de Dijon, and other well-known favourites.

Florists' Flowers.—Among these, Cinerarias were shown in good condition by Mr. Marcham, who had bushy plants of Her Majesty, a fine purple flower with a white centre; John Mitchell, a deep purple self; and Duc de Magenta, a deep crimson self. Mr. Waters, gardener to A. Mongredien, Esq., Forest Hill, contributed some pretty plants, including Purple Prince, a deep purple-rayed variety with a white eye; and Clara Oswald, a fine blue flower. Blue flowering plants, always scarce during the spring months, are likely to be substantially reinforced by means of blue-flowered Cinerarias, now so extremely popular in Covent Garden and elsewhere. Mr. James, Isleworth, also showed a collection of dwarf, well grown, and profusely flowered plants, and also

staged a nice collection of fancy and Alpine Auriculas. Some fine blooms of Pansies, in good condition, were furnished by Mr. Hooper, nurseryman, Bath; and the same exhibitor had a large box of a black and white bedding Pansy, named Mrs. Felton.

Miscellaneous Plants.—Of these Messrs. Veitch had an effective group, including most of the novelties alluded to by us last week. The collection included half-a-dozen choice Orchids—viz., *Oncidium fuscum*, *O. concolor*, *Epidendrum bicoloratum* (with two spikes), *Masdevallia Lindenii*, *Cattleya gigas*, and *C. Mendelii*. *Dracaena Hendersonii* is a finely-marbled variety, and colours well in a young state. The group included some of the elegant cut-leaved bronze-tinted Maples, and a fine basket of the hardy spring-blooming Azalea mollis. Two pans of *Drosera* were very interesting; and the same firm sent a plant of *Agave Leopoldii*, a stout form something in the way of a dwarf *A. Verschaffeltii*, but with stout dark brown wavy spines at the apices of its fleshy leaves. *Amaryllis*—Half-a-dozen fine plants were staged by Mr. Harborough, gardener to C. Kaiser, Esq.; and a new garden hybrid, of a bright crimson colour, named *A. Mooreana*, was staged by Mr. B. S. Williams, of Holloway. Mr. B. S. Williams staged a very effective collection, the most notable plants being *Dendrobium nobile*, alluded to in our last week's issue; *Imantophyllum miniatum*, with fine trusses of orange-scarlet flowers; *Dendrobium infundibulum*, *Aërides Fieldingii*, and *Odontoglossum Pescatorei*; besides numerous choice Palms, Ferns, Bromeliads, and greenhouse plants. The same exhibitor also staged new plants, including *Apheleandra fascinator*, with dark silvery-veined foliage (this has recently been figured in the new *L'Illustration Horticole*); *Ceterach aureum*, *Sempervivum triste*, *Hebeveria pachyphytoidea*, *Carludovicia plicata*, and others. Mr. Wheeler had a group of ordinary decorative plants, including a good specimen of *Eriostemon intermedium*, *Asplenium* (Veitchii) *Belangeri*, *Adiantum trapeziforme*; besides Orchids, Ferns, Palms, and flowering shrubs. Mr. W. Paul had a collection of Clematis in pots, and also a group of gold, silver, and bronze Zonal Pelargoniums in good condition; but these plants are evidently fast going out of popular favour. Mr. Wheeler had a miscellaneous group of hardy herbaceous plants; and Mr. Needle sent a beautiful and interesting collection of terrestrial orchids from Twickenham. Auriculas.—Of these, some nicely grown examples were staged. In the class for six show varieties Mr. J. Douglas, of Loxford Hall, Ilford, was first with fine specimens, amongst which we noted the following: Colonel Champneys (Turner), a fine grey edged variety of a rich purple; Meteor Flag, a rich purple self; Formosa, blue self; Conqueror (Popplewell), a fine white edged variety, good truss; Competitor (Turner), a fine dark grey edged variety. Second, Mr. James, Isleworth, with smaller plants. Third, the Rev. H. H. Dombrain. In the class for one green-edged variety, Rev. H. H. Dombrain was first, with Lancashire Hero. Second, Mr. James, with Lovely Ann. Third, Mr. Douglas, with Apollo. Grey edge: First, Mr. J. Douglas, with a fine truss of Robert Trail (Lightbody). Second, Rev. H. H. Dombrain, with Rob Headly (Lightbody). Third, Mr. James, of Isleworth, with Turner's Competitor. In the class for self, Mr. J. Douglas was first with Turner's Master Hole, a fine black. Second, Mr. James, with Charles Perry, a rich bluish-purple. Third, Rev. H. H. Dombrain, with Spalding's Metropolitan, a fine purple, with coarsely serrate foliage. Rev. H. Dombrain was first in the white edged class with Taylor's Glory. Second, Mr. James, with Highland Queen.

Botanical Certificates were awarded to the following:—

- Ficus Parvifolia* (Veitch). Alluded to last week.
 - Dracaena Hendersonii* (Veitch). A free-growing variety, beautifully marbled with red and creamy white, quite distinct and very attractive.
 - Croton ovalifolium* (Veitch). A short blunt leaved form, coloured something like *C. variegatum*, but distinct from any other species, and well worth growing for variety.
 - Abutilon Solowianum marmoratum* (Veitch). A large leaved golden blotched variety, well worth culture as a half-hardy foliage plant of vigorous habit.
 - Agave Leopoldii* (Veitch). A fine form, alluded to above.
 - Cattleya gigas* (Veitch). A large-flowered form; one of the most attractive plants in the genus.
 - Drosera capensis* (Veitch). A spatulate-leaved species. Interesting as a botanical curiosity.
 - Acer vitifolium* (Veitch). A bright green-leaved species of a novel and interesting group.
 - Acer faveosum* (Veitch). Beautiful yellow foliage most delicately netted with green. One of the prettiest of the whole group.
 - Hypolepis Bergiana* (Rollisson). A beautiful finely-cut species, with bright green hairy fronds 1 to 2 feet long. It does not, at present, show the creeping habit of its congeners.
 - Gymnogramma triangularis* (Williams). A delicate little Fern, not unlike *Cheilanthes* in habit, having triangular bright green fronds slightly powdered with gold beneath.
 - Ceterach aureum* (Williams). Alluded to last week.
 - Betula alba purpurea* (W. Paul). A purple-leaved form of the common Birch, likely to be a useful addition to hardy-ornamental trees.
- Floral Certificates** were given to the following:—
- Azalea Duke of Edinburgh (Parsons). A very large-flowered variety, the segments being flat and of good substance; colour, deep rosy-scarlet.
 - Amaryllis Mooreana* (Williams). A very rich crimson-flowered variety.
 - Clematis Marikata Oké* (Jackman). A delicate lilac form, with fine wax-like foliage, the petals very broad.
 - Clematis* Duchess of Edinburgh (Jackman). A fine semi-double white variety, having remarkably fresh and handsome bright-green foliage.
 - Clematis* Sir Garnet Wolseley (Jackman). A fine bluish-purple variety, and a decided acquisition.
 - H. P. Rose* Perle des Blanchés (Paul). A beautiful flower of papery or snowy whiteness, blooming in clusters like a *Noisette*.
 - H. P. Rose* St. George (Paul). A deep and vivid crimson flower of good form.
 - Tea Rose* Madame Marie Arnaud (Paul). A delicate sulphur fine in bud.
 - Tea Rose* Madame Jules Margottin (Paul). A fine robust grower, with fine wax-like foliage and delicate salmon-tinted flowers.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE INFLICTIONS OF FASHION.

By T. BAINES, Southgate.

THE higher the point of civilisation at which a country arrives the more its inhabitants become the votaries of fashion; and that we, in this country, enjoy no immunity from this infliction, is everywhere evident. If this did not extend beyond an indulgence in the luxuries of everyday life it would be a matter of less consequence; but, when the infliction spreads to matters of such importance as horticulture and arboriculture, it behoves those who take an interest in these pursuits to look the matter fully in the face. It may be said that gardening, as it exists at the present day, is a luxury, and that, consequently, it must be governed by such fanciful laws as rule matters of a kindred character; this, it must be admitted, is correct, so far as it relates to the purely decorative element, but here it does not stop. The introduction of a new genus of plants, or the resuscitation of an old, and, in many cases, an undeservedly neglected one, appears to be the signal for a universal mania in favour of the favourite of the hour to the comparative neglect of other things. When a useful plant makes its appearance, such as a Tricolor Geranium, Mrs. Pollock, for instance; why should we for years run mad after Tricolors by the hundred, that have barely an infinitesimal difference from each other? In the matter of new Roses there might be some excuse; for any improvement relating to the queen of flowers is sure to be hailed with delight. But may I ask how often in these are our expectations realised in proportion to the disappointments we experience? The time has come, I think, when there is little necessity for deriving our supplies of new Roses from the Continent. The Roses of recent years, raised by English growers, are sufficient evidence of this, and in the case of these we at least have a better opportunity of ascertaining something of their general character, previous to purchasing, than we have in the case of those of foreign origin. At present it would appear that we are on the verge of a Lily fever. This, if not carried too far, may be looked upon as simply the *amende honorable* for the neglect into which this flower has been allowed to fall. Thus far have we been dealing with what may be termed the elegancies of horticulture. But now come matters connected with the more essential and indispensable branch of gardening. First, let us take the ever-recurring rage for new Peas, nine-tenths of which are deficient in general properties compared with others they are intended to supplant. Then, as to new Potatoes, they make their appearance by the hundred. In this, too, we are aided by growers across the Atlantic, whose timely assistance we should receive with gratitude were it not that, when their varieties are proved, they are found inferior to our own, to say nothing of the exorbitant prices asked for them. Let us now advert to new fruits, more especially Grapes. How much disappointment has there been experienced by those who have supplanted old and well-tried varieties largely with new ones, which, after trial, have, in many instances, either been rooted out altogether or have had their heads cut off, and been made to do duty as stocks. These are a few of the positive inflictions which fashion imposes upon us in matters horticultural. Those of a negative character are also equally baneful. What have we to compensate us for the neglect into which numbers of old and tried friends amongst herbaceous plants have been allowed to fall? Nothing, except blazing stripes and circles of red, yellow, and blue, the glare of which is, fortunately, short-lived, for their repetition becomes a positive infliction on the eye. Let us not be misunderstood; no one would discountenance healthy progress in anything appertaining to horticulture, for in it, as in other matters, it is human to require novelty and change. But the evil is, that whatever becomes fashionable, either in any particular family of plants, or in the manner in which we employ them, we for a time lose sight of others of far greater importance. Again, if we look to arboriculture,

we find that fashion has inflicted something more serious than a passing disappointment. Both in the vicinity of the suburban villa and in that of the more extensive country mansion, it is desirable to get as much variety as possible; this no one will attempt to deny; but have our planting operations for the last thirty years been judicious? Have they not been governed, to too great an extent, by a rage for novelties in the shape of Coniferous plants, numbers of which are unsuited to the situations in which they have been planted, and are incapable of withstanding our occasionally recurring severe winters, leaving blanks that take years to fill up. Think of the numbers of grand deciduous trees and flowering shrubs that, comparatively, have been cast into the shade by these new comers. In this case, dear-bought experience would appear not to have had much salutary effect—that of the winter of 1860-61—when, in many a fine place, the destruction was such as one might have thought would have ensured caution in planting things that were evidently unable to withstand our severest winters. Let us go still further back and see what has been done as regards the planting of timber trees throughout the kingdom, for, say, these last eighty years. What gain to us have been the trees that we have substituted for the Oak, Ash, and Elm planted by our ancestors? Great things were expected from the Larch, but, unfortunately, it turns out to be worthless in many situations, so subject to decay is it at the core. The destruction of hedge-row trees, which high-farming entails, has so far lessened the supply of late years, and the great increase in the price of iron has caused so much greater demand for our old English Oak, as well as for Ash and Elm, that it is evident that none of the timber trees recently introduced are likely to supplant them in a national point of view.

MIXED PLANTING VERSUS GROUPED TREES.

THE editor's description of a garden at Verona in *THE GARDEN* of the 25th April, and of the Cypress grove therein, revives an oft-felt regret that the system of mixed planting has attained to such a degree that the home scenery of this country, beautiful as it is, is somewhat marred by a monotony which, by a more artistic treatment, might have been avoided. The art of forestry has always suffered under the sorrowful thought that the planter is preparing beauty which he will never be able to share with posterity. We plant our parks and gardens with a view to effects that we may never see, and it is fortunate if our successors understand and are willing to carry out our schemes. The following motives in managing ornamental woods may be worth consideration by those who are engaged in planting, or, as not unfrequently occurs, who succeed to long neglected and extensive woodlands. By mixed planting, we ascertain what trees thrive best in varying soils and exposures, and having practically acquired this knowledge it should be acted on intelligently and decisively. Given 100 acres of park with undulating varying soil, planted with mixed trees for shelter and ornament, probably the highest degree of beauty and character would ultimately be obtained in the following way. When the first thinning is undertaken, the designer should go all over the wood. He will find unmistakeable differences in the uses which the trees have made of the time since they were planted. Where the soil is deep and heavy, the Oaks will look unusually clean and healthy. He will not err if he sacrifices everything else to make this a grove of Oaks. Here, perhaps, is a bleak hill-side, exposed to prevailing winds, the soil light and shallow. In such a place, the most promising plants are probably Silver Fir, Pinus Pinaster, or P. austriaca. On the crown of the hill, the Scotch Firs will be masters of the situation. Let him look a hundred years a-head, and see here materials for a striking picture—gloomy depths of the heavy Pinasters; further on the stately Silvers, in rank after rank; and, on the height, a crest of the more lightsome Scotch Firs. Here, he will be encouraged to establish a dell of Beech trees; there, a company of Ashes. Then, some trees tend themselves to the formality of avenues; indeed, Lime trees, Yew, Beech, and Araucarias seem to attain their highest character when so employed. Thoughtful design will bring a higher reward than indiscriminate planting of any kind.

SALMONICEPS.

NOTES OF THE WEEK.

— WE are informed by Mr. Wills that in the decorations at the Mansion House last Wednesday upwards of two tons of Ivy were used in draping the pictures, mirrors, and walls, and that amongst the cut flowers were upwards of 2,000 blooms of *Maréchal Niel* Rose, and large quantities of *Stephanotis*, *Gardenias*, and other sweet-scented flowers, while among the plants employed were Palms, Pandanads, Marantas, Aralias, and Orchids.

— DURING the past week we have noticed one or two Horse Chestnuts in full bloom, more especially one opposite the Knights-bridge Barracks, in Hyde Park. The Horse Chestnut is one of the most distinct and ornamental of all round-headed trees, both in foliage and flower. As a town tree, it has one fault; its leaves die off very early. It is a pity one does not oftener see the rosy-flowered Pavias grouped with the Horse Chestnuts, for the sake of contrast.

— THE show of choice Orchids which has been so attractive to visitors at the Royal Exotic Nursery, Chelsea, for several months, is just now, if possible, more effective than ever. The cool Orchids are now well represented by dozens of the beautiful, but variable, *Odontoglossum Alexandræ*, one variety of which is by far the most richly-coloured of any we have yet seen. These are set off by the rich purple or puce-tinted *Masdevallia Harryana* and *M. Lindenii*, *Cattleya Mossiæ*, *C. Mendelii*, *Vandas*, and *Dendrobies*, completing one of the best displays of choice Orchids we have yet seen.

— A SCHEME is on foot for the establishment in Liverpool of a Crystal Palace, with winter gardens attached. It will be modelled on the plan of the Crystal Palace at Sydenham, and most of the features which have made that resort so famous will be here reproduced. It is intended to construct a large aquarium, and to have Zoological Gardens and spaces for out-door recreation attached to the palace. Several of the leading public men and merchants of the town have signified their approval of the scheme, and a proposal will, in a short time, be laid before the corporation for establishing the new institution within, or in connection with, one of the public parks.

— THE gardens at Alton Towers, which, through the liberality of Lord Shrewsbury, are thrown open to the public between May and July, are generally considerably damaged by the thousands who frequent them. On this account his lordship contemplated closing them this year; but has recently been induced to alter that determination. No excursion parties will, however, be admitted after the 31st July, though visitors by ordinary trains on Wednesdays and Fridays in each week, may inspect the gardens and grounds after that date, as heretofore. The restriction just alluded to is imposed on account of excursionists trampling on the edges and margins of the terraces, and scattering paper and bottles about the grounds, besides otherwise annoying Lord Shrewsbury and his family.

— WE must protest against the colour of the painting which is now disfiguring the fine stretch of iron railing which divides the Temple Gardens from the Thames Embankment. At first sight we thought it simply a preparatory coating of red lead laid on to protect the metal, but, on a nearer view, we found that several of the workmen were engaged in the final operation of gilding the rosettes. The selection of this colour (to whomsoever it is due) is particularly unfortunate, marring, as it does, all the fine effect of the greenery of the trees and shrubs now bursting into leaf in association with it. It also stands out in prominent contrast with the whiteness of the stonework which supports the railing. Passers-by, of all classes, pause to look at it, and are unanimous in their condemnation of the unhappy effect produced by it. We should have thought that some neutral tint would not only have harmonised better with the gardens of the Temple and their surroundings, but would have also formed a much better relief to the very expensive gilding, which, on its present ground-work, is to a very great extent thrown away.

— ONE of the permanent features most valued in connection with the Crystal Palace is its gardens. Since Sir Joseph Paxton first designed them, more than twenty years ago, the copses and trees have had time to become umbrageous; and at this season, when the spring flowering trees and shrubs are in perfection, there are few sights to be met with of such exceptional beauty as can be gained from the rockery, from all points of which Sir Joseph arranged real pictures in the way of landscape scenery. Near the rockery, now covered with Gorse, Broom, and Ferns, are numberless blossom-bearing trees and shrubs, among which the snowy *Mespilus*, flowering earlier than some others, double white Cherries, Lilacs, Laburnum, pink and white Thorns, scarlet and white Chestnuts, and *Maguolias* are grouped in profusion with trees of graceful foliage. On the rising ground, near the north end of the great fountain, is an interesting example of Weeping Beech. The shrubs around this

have lately been cleared, so that the clustering proportions of the tree may be better viewed. The Rosery, on the corresponding mound near the railway-station, has been re-arranged; as have also the *Rhododendrons* in the terrace beds and in other parts, and the improvement of other portions of the grounds has not been neglected.

— THE winter garden scheme at Bournemouth has met with the hearty concurrence of the authorities, and its erection is to be commenced forthwith.

— WE learn that a company is in process of formation for erecting a Winter Garden at Brighton. The land selected for the site was lately in the market for £30,000; but when the company offered to purchase it, the price suddenly rose to £45,000.

— A MARKET GARDENER living at Barking has been fined £4 and costs for offering for sale in London vegetables in a condition unfit for food. Doubts were also expressed as to whether he should not have been sent to prison without a fine.

— WE observe that the Royal Irish Academy has sanctioned, among other grants from the fund at its disposal for aiding scientific researches, £39 17s. 11d. to Dr. Moore of Glasnevin, for investigating and cataloguing the Irish Hepaticæ.

— MR. MICHOLS's fine collection of stove and greenhouse plants was sold by auction on Wednesday and Thursday last, and realised large prices. The first day's sale fetched about £1,100; one of the highest priced plants sold on that day being a noble *Anthurium Scherzerianum*, which fetched some £60. The result of the second day's sale will be given next week.

— THE French, Belgian, and Italian Railway Companies have made a reduction of 50 per cent. on the carriage of all articles sent to the approaching International Exhibition at Florence, which will be opened on the 11th of next month. The same reduction has been made by the Italian companies in the fares of visitors to the exhibition.

— A PARIS journal states that the annual cost of securing shade-trees, flowers, and rare plants for the parks and public walks is as follows:—"Bois de Bologne (keeping), 387,000 francs; Bois de Vincennes, 270,340 francs; squares, 545,220 francs; cost of plants, flowers, &c., 40,000 francs; expenses of the houses, 11,000 francs; total, 1,253,560 francs (£501,422)."

— THE Pharmaceutical Society have offered a silver medal for the best herbarium collected in any part of the United Kingdom between the first day of May 1874, and the first day of June 1875. The collections to consist of British flowering plants and Ferns, obtained in a wild state, and arranged according to the natural system, the collections to be accompanied by lists, arranged according to the same system, with the species numbered. No candidate will be allowed to compete, unless he be an associate, registered apprentice, or student of the society, or if his age exceed twenty-one years.

— A FINE plant of *Angræcum sesquipedale* has recently bloomed under Mr. Dunn's care at Dalkeith. The plant is about 2 feet high, and had five spikes bearing twenty-two very fine blooms with tails from 10 to 15 inches in length, and lasted six weeks in perfection. In the same collection there was in bloom a very fine plant of the Dalkeith variety of *Vanda tricolor*. It bore fifteen spikes having from nine to twelve flowers on each. There was also a plant of *Vanda suavis*—Veitch's variety—with sixteen blooms on one spike, which must be regarded as a very fine example of this fine Orchid. There were other two spikes on some plants of this variety with fifteen blossoms on each. *Vandas* may be regarded as among the very *élite* of Orchidaceous plants, and when not grown under too much shade, and with a liberal amount of air, they are seldom out of bloom.

— WITH reference to the subject of proxy voting at South Kensington, we have received the following from Mr. W. S. Cooper, Hillmorton Paddox, Rugby. Dr. Denny stated, he says, that, "If country friends made so much about the Society or thought so much about it, they could take the rail and come up to South Kensington to record their vote." Certainly, railway authorities will, doubtless, be good enough to issue us tickets, but naturally they will expect payment in return. May I, therefore, ask if Dr. Denny and the town-anti-country interest are prepared to pay the expenses of us rustics? I know not. They would, I think, rather keep us away and quietly pocket our subscriptions. Mr. Bateman hit the right nail on the head when he said "Fellows in the country were those who really cultivated horticulture." Formerly a circular was issued with the names of plants for distribution from the society; now, forsooth, we country members are invited to Chiswick to select for ourselves! More rail. Again there is to be no provincial show this year. Altogether, those who have opposed proxy voting may yet repent of their obstructive conduct.

THE INDOOR GARDEN.

CHAMÆROPS HUMILIS.

THIS is the only species of the Palm family indigenous to Europe, where it is found growing wild as far north as the latitude of Nice. It is common in Sicily and North Africa, especially in Algeria, where it is so abundant as, in some districts, to interfere seriously with ordinary cultivation, as it speedily fills the soil with a dense network of fibrous roots, which send up suckers and prove to the cultivators of that country a greater pest than the Conch Grass of our fields. The only effectual means of extirpating it, as recorded a few years since in the *Annales des Sciences naturelles*, is to lay the fields under water for a considerable length of time, when the roots become completely rotted and changed into vegetable mould. This remedy, however, can only be employed in the vicinity of streams, which, in Algeria, are "few and far between." This species of Palm is of dwarf stature, being seldom more than 3 or 4 feet in height, unless the suckers are cut away, when the trunk will sometimes rise as high as 20 or 30 feet. It forms a roundish and tolerably dense head of fan-shaped, plaited, deeply-divided leaves, springing from a mass of coarse fibrous matter, which gives the stem a somewhat club-shaped appearance. This, as well as the general aspect of the plant, is well shown in our illustration. In this country it is quite hardy, in sheltered positions, as far north as Yorkshire, where I have known some specimens of it, planted out at the foot of a south wall, to stand for years without any covering whatever in winter. These specimens were exceedingly ornamental, and required no more attention than any ordinary evergreen. The comparative hardiness of this Palm, and the very effective contrast which its habit and foliage present to the shrubs usually planted in our pleasure-grounds (to say nothing of its tropical aspect), should recommend it to more extensive cultivation than it at present receives. Throughout the greater part of England it will be found a very effective addition to the margins of shrubberies, if planted on the south side, or in any tolerably well-sheltered position, where it will not be exposed to icy blasts in winter, or, at any time of the year, to such high winds as would tear and bruise its spreading leaves. W. M.



Chamærops humilis.

BULBOUS PLANTS.

FEW classes of cultivated plants are so universally beautiful, or so much admired when in flower, as bulbs. They are, almost without exception, easily grown, and, when rationally treated, flower profusely; yet, we not infrequently hear complaints that some of the commonest of them are shy bloomers, a circumstance, doubtless, attributable to some inattention on the part of the cultivator, rather than to any inherent defect on the part of the plants themselves. Plants to bloom in perfection, must be well grown and well ripened, and this is especially necessary in the case of bulbs. Nevertheless, nothing is more common than to see pots containing this class of plants, thrown carelessly under stages, or crowded on a shelf, and left

without moisture for days together, as soon as ever their floral beauty is over. Where mal-treatment of this kind is practised—and it is unfortunately far from uncommon—we need not wonder at bulbous plants not blooming the following season. When the season of flowering is over, such plants require even redoubled attention, and, if they are grown in quantity, they should be all set together, either in a small compartment by themselves, or on a stage in a Vinery or plant-house, where they can be readily seen and carefully watered and syringed as required. Bulbs, with the exception of what are called Dutch Bulbs, are not fashionable just now in the majority of gardens, although, in one or two places which we could name, they are a speciality, and a most attractive one. At Meadowbank, Amaryllises and other choice bulbs used to receive nearly as much attention as the Orchids, for which that place has so long been justly celebrated, and most amply was the attention just

alluded to repaid; for nowhere else have we seen such a fine show of Amaryllidaceous plants as was to be found in the conservatories of that northern Eden. We know of no other class of plants that would better repay any painstaking cultivator for his trouble, than hardy, half-hardy, and tender bulbs, collected, weathered, and well grown. Only give them positions equal to those occupied by Orchids and Ferns, with half the amount of attention that is usually bestowed on these plants, and we would have a perpetual exhibition of the most gorgeously-tinted flowers. We frequently hear it said, that no plants rival Orchids in delicate-tinting and delightful fragrance; but even the graceful Butterfly plants (*Phalenopsis*) with all their wealth of snowy blossoms, are not more beautiful, or more deliciously fragrant, than the chaste and pearly blossomed *Eucharis*. Place a blooming plant of the glowing *Masdevallia ignea*, or *M. Veitchii*, side by side with *Hæmanthus coccineus*, and ask an ordinary observer which is the brightest, freshest, and most effective. Take a handful of *Ixias* or *Sparaxis* from a warm sheltered border, and carry them into the vapour bath of an East Indian house, and they will hold their own against the most rare and valuable of tropical epiphytes. Indeed, *Ixias*, *Sparaxis*, *Tritonias*, and *Babianias*, either as pot-plants or in borders, are invaluable, and furnish abundance of fine spikes for cutting and vase decoration. All they require is a rich sandy soil, in a sheltered sunny position, where their delicate flowers will not get damaged by high winds. Another bulb, worth growing by the dozen in every establishment where cut flowers or decorative plants are required, is the bright scarlet-flowered *Vallota purpurea*. This grows as freely as an *Amaryllis*, but differs from it in being evergreen; and not unfrequently inexperienced cultivators either ruin it entirely, or seriously injure it, by forcing it to rest for a portion of the year. This should never be done under any circumstances, or disappointment is sure to be the result. This *Vallota*, which is sometimes called the Scarborough Lily, is one of the finest of all bulbous plants for window culture in pots, lasting, as it does, a long time in bloom, and forming a very attractive ornament. Among the smaller bulbs adapted for general pot-culture may be named *Triteleias*, both white and blue forms; *Narcissi*, of all shades of

yellow and white; Crocuses; Snowdrops; and those most charming of all spring-flowering bulbs, viz., Squills (*Scillas*). We have seen some splendid pots of the golden-yellow Hooped-Petticoat Narcissus (*N. Bulbocodium*) this spring, and the tall blue *Scilla nutans*, growing side by side; and these, mixed with pots of Mignonette, Ferns, and other foliage plants, in a cool greenhouse, were strikingly effective. For autumn flowering, the Guernsey and Belladonna Lilies are invaluable, and their culture is as simple as that of the Hyacinth. Of these, well-developed bulbs showing flower-spikes may be bought for a few pence early in September, or as soon as they are imported by the nurserymen, and all they require is potting at once in any light sandy soil, and keeping them moist until their flowers expand; for window-culture, bulbs of this kind are specially adapted, and their delicately-tinted flowers shine and sparkle with crystalline brilliancy when placed under artificial light. For the decoration of the dinner-table, or for drawing-room vases, cut spikes or bulbs in small pots are specially adapted. During the coming season we hope to see both Guernsey and Belladonna Lilies imported in large quantities, and, as in the majority of cases, the flower-spikes are visible at the time during which the bulbs are offered for sale, their blossoming the same season may be relied on. As soon as the flowers are past, plant the bulbs in a warm sunny border, and, as a rule, they will again throw up their flowers the following year. The Belladonna Lily is specially adapted for outdoor or border culture; and treated in that way, it flowers freely every autumn; its delicate rosy-pink blossoms being borne on stout stalks 12 to 18 inches in height. Lilies are, fortunately, very popular just at present, and we hope they will long remain so, for as a class, no bulbous plants are more beautiful, either for pot-culture indoors, or for the decoration of beds and borders in the flower garden or pleasure grounds. B.

DENDROBIUM PIERARDI.

ALMOST everybody now-a-days who has the means—even where no special houses exist for their cultivation—is anxious to grow a few Orchids. Doubtless, the discovery that many of the most beautiful Orchids will flourish in a greenhouse temperature during a considerable portion of the year, and that they are not nearly so difficult to manage as was formerly supposed, has had much to do with their increasing popularity. Of course, comparatively few can afford to make a speciality of them, although, taking into consideration the high prices often realised at Orchid sales, they must, one would think, in many instances, prove a not unremunerative investment. For beginners, few families are more useful or beautiful than the Dendrobiums. D. Pierardi makes a beautiful basket plant, which may be had in good condition with as little trouble as many of the commoner creeping plants used for that purpose. We have a basketful of it literally covered with its soft velvety-looking flowers; it has been in this condition more than a month, and there are still many buds to open. Two years ago, when it was a very small plant on a block of wood, it was placed in a wire basket lined with Moss, and the interior of the basket was filled up with Moss interspersed with pieces of charcoal and two or three pieces of very fibry peat. The basket was hung up near the glass, and was well supplied with water during the growing season; afterwards it was rested by gradually withholding water and by exposure to the sunlight, not absolutely to dry it off so as to cause shrivelling. The great thing is to hang the plant near the glass, so as to get the growth well ripened. Where shall we find any stove or greenhouse plant that will yield as much floral beauty with so little trouble as the common but beautiful Dendrobium nobile? It may be had in flower at any season of the year where there are several plants in stock, by inducing them to make their growth at different periods; and, during their period of growth, heat and moisture are essential, accompanied by bottom-heat if possible. Much, however, of the success is due to the proper maturation of the pseudo-bulbs near the glass, altogether exposed to the sunlight, or at first with only the thinnest possible shade over them, to be removed altogether as soon as the plants get injured to the sun. I think this class of plants are often too heavily shaded, and, as a consequence, they do not flower so well. For the purpose of experiment, I placed a large plant of Dendrobium nobile, early in August, out in the open air at the foot of a south wall. My object was to see if exposure alone, even in a warm spot, without the aid of glass, would mature the pseudo-bulbs so as to produce a good bloom. The experiment, however, was a

failure, for the flowers are few and far between; whilst other plants placed on a greenhouse stage near the glass have flowered well. It appears that a plant that requires an Indian summer to mature its growth must in England have the aid of glass; but I know that many stove plants will flower all the better for being placed in the open air, in a warm sheltered place, for a month or so, to complete the maturation of their growth. E. HOBDAV.

Salvias.—When large conservatories and plant-houses are required to be kept gay during the dull dark months of the year, scarcely any subjects are more effective for mixing with the permanent inmates of these structures than these brilliant and free-flowering plants. There is a great variety of sorts, but, as so many of them are merely different shades of scarlet, I have selected a few kinds that will form a succession of bloom. I think I may, with certainty, select *S. splendens* as the best of all as regards freedom of bloom and intensity of colour. In these respects it is unexcelled by any plant with which I am acquainted, and from September to Christmas is its best season—although it may easily be had in bloom earlier and prolonged later if wanted. I also find *S. Itead* a very distinct and good sort to succeed splendens, as its crimson flowers with white throat are very pretty. *S. gesnerifolia* comes in well in spring, and several other varieties; but, of course, the winter bloomers are the most serviceable. We always grow fresh plants every year, as they may be grown to any size in one season, and are particularly clean plants if kept growing freely with plenty of root-room and moisture. They are all best grown out of doors during summer, and removed under glass as soon as the nights get cold; for, although considered by some as old-fashioned flowers, they well repay all the care bestowed on them.—J. G.

Euphorbia jacquiniæflora.—During the past winter few plants in our stove have attracted so much attention as this. Three years ago I planted out a small pot specimen, and trained it along the back wall, along with the elegant *Ficus stipulata*. The plant took kindly to its position and grew very rapidly, making much stronger shoots than it ever does when cramped in pots; indeed, so robust were its growths that I almost despaired of their ever flowering. It did bloom, however; the tips of its shoots being glowing masses of bright scarlet, its colour being intensified by the fresh green *Ficus* behind. I prune them back close every spring, and this year the whole back wall has been one mass of scarlet and green. Some of the strongest shoots had flowers at their tips for 15 inches, forming the most charmingly natural of all floral wreaths, and these came in very handy for the drawing-room vases; and the smallest were occasionally used by the ladies, as a relief from Camellias and Eucharis, for their hair. The brightest arrangement I ever saw in a drawing-room vase consisted of two spikes of this plant, a spike of Eucharis bearing five open flowers and two pearly buds, this trio being further set off by just three fresh well-developed fronds of *Pteris tremula*. Nothing could be simpler or more striking than this, the whole being contained in one of the elegant trumpet-shaped vases recommended by your correspondent Mr. W. Thomson, at whose suggestion I purchased mine, and must say that it has saved the gardener many a pang of regret at the loss of his favourite flowers, since so few sprays suffice to fill them tastefully.—J. H., Sydenham.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Urceolina pendula.—This grows freely in my little plant stove and blooms freely every year. The only drawback connected with it is that it blooms after the leaves are withered, or just before they again appear, and this gives the plant a naked aspect. Judicious grouping along with Ferns and other foliage plants, however, to some extent obviates this defect.—J. M.

Camellia reticulata.—I am sorry to say that the fine specimen of this Camellia to which you allude (see p. 344) has been going back for these last few years. This season I have removed all the bloom-buds, and have also paid great attention to the nourishment of the roots; a course of treatment under which it is making some strong shoots, and has the appearance of regaining lost vigour.—C. A., Bank Grove, Kingston-on-Thames.

Fuchsia Insects.—I have sent you two insects which have been attacking a batch of young Fuchsias, and especially Avalanche. They eat the bark off nearly all round, just under the soil. What are they?—J. C., Pain's Hill, [Olorhynchus sulcatus. Familiar to most gardeners, being very destructive to Ferns in pots, eating the neck of the roots away under ground. They also attack Strawberries, Cinerarias, Saxifrages, and many plants with similar roots, and amongst others, the Fuchsias.—A. M.]

Lagerstromia indica.—This is one of the chief ornaments of the garden and shrubbery in India, where it blossoms profusely, and where it is familiarly known as the Lace Flower, in allusion to the crisp wavy edges of the blossoms. Four varieties of Lagerstromia are known to me, differing from each other only in their colours, viz., the rosy (as described in the *Revue Horticole*), a pure white, a fine lavender, and a deep purple, all kinds which group very effectively. Another species, *L. regina*, is a very handsome flowering tree, common in Bengal. Its flowers are similar in shape to those of *L. indica*, but about double the size.—SAMUEL JENNINGS, 53, Granville Park.

THE PROPAGATOR.

HOW TO MULTIPLY MAIDEN-HAIR FERNS.

ANYONE having a plant of Maiden-hair Fern, may increase it in numbers in a variety of ways. First, it may be increased by division—that is, by taking it out of the pot and breaking it up with the finger and thumb into several pieces, and planting each piece in a pot in peat earth, sand, and little boulders. Thus treated and placed in a warm greenhouse, the plants will grow away freely. Now is the time for such work, as the fronds are in a partially quiescent state, and many of the young ones are showing signs of growth. In this way anyone may triple their stock by the end of the season, and the plants will not be much less in size than if the original one had been undisturbed. Another way of increasing these Ferns is by means of seed or spores. If any have been disappointed with the result of sowing the spores, the better way now to do is to have a few broken bricks, and some peat and sand sparsely introduced among them on the beds or tables upon which the plants stand. Allow the fronds to distribute their own seed; do not disturb the surface immediately around them, and there will spring up dozens of plants. Success may thus be counted upon, not only in the case of Maiden-hairs, but, also, in that of almost every description of Fern.—*Farmer.*

Rooting Cuttings in Coke Dust.—I have often proved that cuttings of soft-wooded plants that are very liable to damp off may be struck with greater certainty in charcoal or coke dust than in the usual way in sand. It imparts a greater porosity to the soil, damp cannot lie about the base of the cuttings, and there is less danger if an inexperienced hand does the watering. Amongst other things we have this year struck our spring stock of Tricolor Geraniums in coke dust, and we have certainly never had more success. It is not a bad substitute for sand, for covering very small seeds in spring of tender annuals that are usually sown in pots, pans, or boxes, especially if there are any snails or slugs in the immediate neighbourhood as they will not travel over it. I should explain that what I mean by coke-dust is simply the dust taken from the coke heap, and which is afterwards passed through a very fine sieve to free it from all coarse particles.—*E. HOBDAV.*

Layering Magnolias.—In nurseries, Magnolias of all kinds are commonly propagated by means of layering. This operation is commonly done in September and the first part of October. Bushes planted in the open garden, or at the foot of walls, may all be treated alike. Before commencing to layer the shoots, cut out any that are not required, or are in any way so deformed as to prevent their being layered successfully; never leave a single shoot above 15 inches in length unlayered in open borders, but those at the foot of walls may be allowed to retain a few shoots nailed thereto, but none hanging loosely about. The ground should also be loosened, and a little prepared soil got in readiness, which may consist of any old potting-soil mixed with a little peat and sand; but a good fresh loam, mixed with silver-sand and peat, is the best. Bring this with you in a basket or barrow, also some good strong wooden hooked pegs, to the plants to be layered. Bring down the longest and strongest plants first, and a little nearer the apex than the base of the shoot—say, two-thirds of the length from the root—remove the lower leaves, and make an incision under an eye to half through the stem, and cut upwards to a little above the eye, so that the longitudinal cut may be an inch or an inch-and-a-quarter in length. Without drawing out the knife, give the end portion a slight twist at the incision, so that it may assume an upright position when layered. Then, having made a cleft in the soil about three or four inches in depth, place therein the layered shoot, and around the cut a handful or two of the prepared soil should be placed, and the whole made firm and level. The shoots must be fixed in this position by strong pegs, which should be placed near the base of each shoot, as the greatest pressure is near the parent root. The point of this shoot should then be cut off, and the several small side branches layered in the same way. The next strong branch should be taken down and layered in the same way until the whole are gone over. The smaller ones are then layered, as are also all the side branches of the main shoots. Sometimes there is a general overcrowding, but a judicious workman could avoid all this, and fill up all empty spaces neatly and quickly. Two workmen, acting together, go over a much larger space in proportion, and perform their task better and more satisfactorily than one. Only the stronger points of the shoots should be cut off. The plants are allowed to remain in this position for two years before they are disturbed. They are then lifted, planted into nursery lines, or else potted. In some instances, wooden skeleton frames are placed over the Magnolias after they are layered, by which means, and a few mats, they are partially saved from the winter's severity.—*WM. FALCONER.*

THE FLOWER GARDEN.

DAHLIA CULTURE.

DAHLIAS may be propagated by means of cuttings, layers, root-divisions, or seeds; the latter being only used where new varieties are a desideratum. Cuttings are, undoubtedly, the best means by which Dahlias may be increased, and by these they may be multiplied to any extent; division of the roots is very commonly practised, but cuttings are, as I have said, best. When propagated by division, the tuber or tubers left, if they survive the summer, generally decay when stored, and communicate disease to the young plants. When cuttings are used, each has its own self-formed tubers, and they are, on that account, less liable to rot during the winter. If started in February, in a temperature of 65° or 70°, each crown will produce three or four cuttings every two or three days; which may be taken off even as early as March, removing them close to the crown, but taking care not to injure it, as others will come up at the base of those removed. It is, also, necessary for the growth of good plants, not to let the cuttings become too long before taking them off the parent tubers, as they are more apt to lag, need more room, and are not so convenient to plant out as short cuttings. When the crowns have supplied all the cuttings that can be got from them, they may then be divided, if required; consequently nothing is lost. To propagate from layers, the lowest branches of the plant must be taken as early as possible, and should be pegged down in the soil, in which, if of a sandy nature, they will root freely; in the absence of sandy soil, a quantity of leaf-mould, with a good admixture of sand, may be laid down for them to root in. Pure white sand alone I find to be best suited for striking them in, and a mixture of leaf-mould and sand is very good for starting the crowns in. Cuttings may be successfully struck during the summer months; but this is seldom done, except in the case of choice varieties. Three-inch pots are well adapted for putting the cuttings into, six cuttings being put in each pot, which should be plunged in a brisk bottom-heat, covered with hand-glasses, and shaded from bright sunshine; in less than a fortnight they will all be rooted, and may be potted off singly into large 60-sized pots, which may be put into lower temperatures gradually, until, say, the 1st of May, when they may be put out of doors until required for planting. It is necessary for Dahlias, as well as for other tender bedding-plants, to have them in a situation where they may be easily protected in case of frost, as, in the event of the thermometer getting as low as the freezing point, they would be greatly injured, if not killed outright. Dahlias are seen to most advantage when planted in masses in large beds. For this purpose the tallest should be collected for the centre or background, as it may be, mixing the colours as well as possible. They should be planted 3 or 4 feet apart, and, as they advance in growth, all the lower branches cut off about a foot from the ground. When a shrubbery is in any way unsightly, and has a border in front, a row of Dahlias often sets it off to advantage; and I have also seen a ribbon-border backed by Dahlias with good effect. Staking and tying out the shoots must be particularly attended to, as the stems are very brittle, and break under the least wind-pressure. Earwigs are great enemies to Dahlias, but they may be trapped by using small round troughs, which may be procured at any pottery. They may also be caught in pieces of Hemlock stems, 6 inches long, leaving a joint on one end, and sticking the pieces here and there through the Dahlias. Small pots, with a little bit of dry Sphagnum Moss inside, inverted on the tops of stakes, likewise form good traps. As regards stimulants, manure-water of the strongest character may be safely used after the plants show flower, provided it be administered in the evening. Some Dahlias will produce all their flowers, or nearly so, perfect; others require their shoots to be well thinned, and all blooms, except three or four, to be cut off in order to be eligible for show purposes; but, as a general rule, all may be more or less thinned. Dahlia roots have kept well, and flowered for years in succession, in dry soils especially, when the plants have been cut down to the ground, and covered with any material that will protect them from frost.

JAMES MORRISON.

Wotton Gardens, Aylesbury.

SAXIFRAGES.

By J. C. NIVEN, Botanic Gardens, Hull.

The Mossy Group.

S. perdurans Kitaibeli.—For many years, in fact, almost as long as I can remember, a Saxifrage of distinct habit and appearance has been in cultivation under the specific title of *pulchella*, not unfrequently also named *controversa*; the latter, however, is evidently a misnomer, as the plant bearing that name belongs to the small group of annual Saxifrages, with one of which, *S. tridactylites*, many will be familiar as growing on the top of old walls, the former name I can find no authority for whatever, and, after a careful examination of the plant, I find it answers the description given by Engler of *S. perdurans* in everything, except one trifling omission, namely, the slender ciliated hairs that occur on the foot-stalk of each leaf, and which I think it highly probable would vanish in the process of drying; under this name, therefore, I propose describing it. In general appearance the plant is dwarf and caespitose in habit; the rosettes, medium-sized, of a beautiful dark shining green, remarkably equal and regular in development; the leaves, individually, are thick and fleshy, five-cleft, the divisions tolerably equal and rounded at the points; the petiole is dilated and margined with long slender ciliæ, except which, the surface is perfectly glabrous; the flowers are large, pure white, supported in pairs, or, sometimes, solitary, on peduncles about 3 to 5 inches long; the bracts are foliaceous, either three-notched or entire; the calyx lobes are obtuse, and the petals broadly obovate. As a species it is perfectly distinct, and retains its character true from seed; it is of free growth, thriving well either under pot-culture or in the rockery. Its native habitat is limited to Croatia and the Carpathian Mountains. *S. Wahlenbergii* of Ball, which, I believe, I have met with in some collections, is synonymous with the above.

S. pubescens of De Candolle is a dwarf-growing trailing species, deriving its well-marked specific title from the fact that the whole plant is suffused with a short pubescence that gives it a greyish-green aspect. Its leaves are generally more or less entire, lanceolate, slightly incurved at the point, concave above and sessile; the margins also entire, with a few short hairs; the points of the leaves are acute but not mucronate; the flowers are produced in twos or threes on a foot-stalk about 3 inches high, they are comparatively small, of a creamy-white colour. A native of the Pyrenees, and considered by some authors as a variety of *exarata*, from which it differs decidedly in its creeping habit, besides other particulars.

S. trifida of Haworth is looked upon by Engler as a synonym for one of the many varieties of *decipiens*; but, as I take the latter species as including only those in which the five or seven-cleft arrangement of the leaves predominates, if, in fact, it be not an absolutely essential character, whereas, in this species, as its name indicates, the leaves are always trifid, hence, I deem it desirable to retain Haworth's original name. This, I am the more disposed to do, seeing that it has held its distinctive character under cultivation extending through a long series of years. It is of a creeping habit, though by no means so much so as in the *hypnoides* group, which will immediately follow. The leaves are distinctly divided into three short lobes, well defined and separate from each other, acutely pointed, but not mucronate. Each leaf is supported on a foot-stalk nearly twice the length of the blade, with a few scattered marginal hairs. The flowers are small and somewhat pendent. It is a native of the Vosges and the Pyrenees.

The Hypnoides Group.

S. hypnoides is the typical species under which are grouped all the forms and varieties of our British Saxifrages whose leaf divisions do not exceed three in number. It grows abundantly in most of our mountain districts; and, setting aside those variations induced by peculiar circumstances of soil, exposure, and locality—which, however marked they may be at the time of collecting, are apt to disappear during the second season of garden culture—I say, setting aside these which lack permanency, there are many forms which years of culture have failed to alter, and which we must consider as well-established varieties. Before dealing with them, I must add a few words of description as regards the type itself. It is a procumbent trailing plant, generally speaking, of lax growth; its radical leaves are all distinctly three-cleft, each division terminated with a bristly point. The foot-stalk is longer than the divided blade of the leaf, and is fringed with hairs, which assume, towards the base, a long slender cobwebby appearance. The flowering branches are slender, each supporting three to five white erect flowers; the floral leaves are linear, and not unfrequently entire. It is an old garden favourite, where it forms great cushion-like masses, fringed around with its trailing stems, growing freely and flowering abundantly.

S. hypnoides var. densa, an exceedingly diminutive form, dense and compact in growth; the leaves as frequently linear as

trifid, the segments very narrow, and the flower-stems rarely exceeding 2 inches in height. Cultivated, to my knowledge, for a quarter of a century, and still the same.

S. hypnoides var. Whitlavii.—Equally diminutive as the above; leaves always trifid, rarely producing flowers at all; its growth is perfectly flat, forming a lovely light green carpet, and hence admirably adapted for an edging plant, to back up a stone or terra-cotta margin to a flower-bed. We have used it here for that purpose for years; the absence of flowers renders it so much the more valuable. In spring gardening, it forms a beautiful emerald ground-work for dwarf Tulips, and other bulbs, retaining its bright green colour through the winter. This identical variety I picked up, when a lad, on one of my very first botanical excursions on the Mourne Mountains in the north of Ireland, and named it after Mr. Whitlaw, the then president of the Botanic Gardens at Belfast. I may, therefore, state that its constancy has been tested through a long series of years, and under diverse circumstances, without indicating the slightest variability.

S. hypnoides vars. leptophylla, lanceolata, and flavescens, are three very slender-growing forms, viewed by some authors as distinct species. *Lanceolata* I found on the Pentland Hills, and it still retains its original character—namely, the undivided leaves; but seedlings raised from it do not. In *flavescens*, the flowers are solitary, on short foot-stalks, and have a slight tinge of yellow; hence the name. I might incidentally remark that all these varieties are slightly affected by that midsummer hybernatory character that we shall presently find in most of the species that affect the south of Spain.

S. hypnoides vars. arranensis, atrovirens, and elegans.—These varieties are distinguished from the previous group by a much denser habit of growth, and general tufty, not trailing, character; so much so that, were it not for the constancy of the trifid character of leaf, I should be disposed to have referred them to the *caespitosa* group. The first variety was picked up in the Island of Arran by a non-botanical friend, who admired it for its dense dark green appearance, which it retains unchanged. The same remark applies to *atrovirens*, as the name indicates; but the leaf divisions are narrower than in the first variety. The last in this group has long slender foliage, which gives it a markedly elegant appearance; hence the name.

S. hypnoides vars. recurva, hirta, incurvifolia, and elongella.—These four varieties, may, I think, be considered to complete the goodly number of variations that are of a sufficiently constant character as to require chronicling at my hands. *Recurva*, as might be inferred from the name, has all its leaves, as they occur in the rosettes, slightly bent backwards; their segments are very slender, and its lateral extension is confined to very short stems. On the other hand, *hirta* and *incurvifolia* are remarkable for their rosettes of incurved leaves, more obtuse at the points than is usual in the *hypnoides* section, and occasionally diverging therefrom in the five-cleft character of the leaf. Neither of these varieties are trailing, and I have had great difficulty in determining in my own mind as to whether they are correctly classed under the present group, occupying, as they do, a sort of intermediate position between this and the next. The same remark applies to *elongella*, but in a less degree, as in it we have the mucronate terminations to each of the leaf divisions, which are, if not altogether absent, at least considerably modified in the two previous varieties.

S. caespitosa of Koch I take as the representative type of several so-called distinct species, which I purpose considering as varieties. Engler, I see, merges this specific title into a synonym for *decipiens*. It appears to me, however, that all the variations which he enumerates, naturally group themselves under two heads. I purpose, therefore, considering these two species as distinct, and grouping the variations, according to their respective affinities, under either one or the other. This species is chiefly distinguished from *hypnoides* in the fact that the leaves are either five or seven-cleft, each division being broader and more or less blunt at the apex. The foot-stalks of the leaves are shorter, and the marginal hairs thereon stiffer and more erect. The growth is, to some extent, procumbent; the sterile stems soon, however, forming largish rosettes. The flowers are arranged in lax cymes, numbering five to eight in each inflorescence. Geographically speaking, both *caespitosa* and *decipiens* appear to claim a home in the northern regions of Europe and America; rarely are they met with south of the mountainous districts of central Germany. Some of the forms are found in Ireland and Scotland. They, however, occur most abundantly in Iceland, Greenland, and even as far north as Spitzbergen.

S. caespitosa vars. laxa and groenlandica.—The former, as the name indicates, is remarkable for the lax or scattered arrangement of its flowers, the foot-stalks being long, also for a remarkable

breadth in the divisions of its leaves; more especially is this noticeable in the caulinary bracts: the latter is a dense-growing compact form, presenting in its appearance all the stunted characteristics that one might expect as coming from such an inhospitable climate as "Greenland's Icy Mountains" are likely to offer. In this form the flowers are usually produced singly on short foot-stalks, and the whole plant is less hairy than in the former variety.

S. cæspitosa vars. **platypetala** and **Stansfieldii**.—Both these are British varieties; in the first the numerous short procumbent stems give it a very distinct character, added to which we have larger flowers and broader petals, as the name indicates. In the second the general growth is more truly caespitose, the flowers smaller, with dark-coloured sepals supported on short peduncles; the whole plant has a dark green colour, whereas **platypetala** is light green.

S. decipiens of Ehrhart may, in general terms, be said to include a number of hairy forms, in which the procumbent character is altogether absent. The leaf divisions in the early stages of development, present the three-cleft arrangement, but, as the rosettes reach maturity, they assume their true character, and become five- or even, sometimes, seven-cleft, by a further sub-division of each of the lobes.

S. decipiens vars. **major**, **Webbiana**, and **villosa**.—The first of these varieties is a very distinct plant which I got from the Continent many years ago under the name of **hypnoides**, collected in one of the islands in the Baltic; it is however, evidently nothing more than a large and hairy form of **decipiens**. The other two varieties are less hairy than the typical plant; the leaf divisions are also narrower, and, in the last variety, more compact in their arrangement in the rosettes.

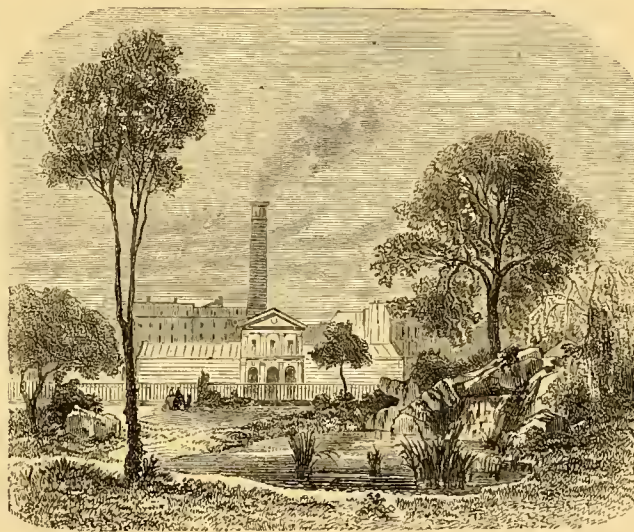
S. decipiens vars. **sponhemica**, **Sternbergi**, and **pedata**.—Of these three varieties—in the first, the leaf divisions are almost linear, the flowers are smaller, and the whole plant less hairy than in the other two; these are very closely related, but, in **pedata**, the leaf divisions are short and blunt at the point; the petals of the flowers are also narrower than in **Sternbergi**, and very distinctly three-nerved.

S. palmata of Panzani, though looked upon by Engler as a mere variety of **decipiens**, has, I think, an unquestionable claim to specific distinction. It possesses a singularly diffuse habit of growth, forming very large rosettes of somewhat fleshy, obtuse, nearly glabrous leaves; its flower-stems are perfectly smooth, each carrying from five to eight blooms; individually, they are fully twice the size of any of the preceding species; the petals being broad, rounded at the point, and tapering so slightly that they overlap one another, thus giving the flower a perfectly cup-shaped appearance; of pure white, in the bud, the sepals are tinted with a shade of chocolate-brown, and, in that state, the petals also are suffused with a tinge of pink towards the tips, giving the buds somewhat the appearance of the unexpanded flower of the Daisy. As a species, this is perfectly distinct from the **palmata** of Smith, found in the south of Ireland, and referable to that form of **decipiens** known as **Sternbergi**. I am not aware that there is any record of a native habitat for this plant, but those who cultivate it will fully endorse my remark, when I say, that it is one of the showiest and most distinct in this section, and well worthy of receiving its true status as a distinct species.

MANUFACTORIES MADE PICTURESQUE.

WHEREVER trees will grow—and there are few places where they will not—an agreeable landscape may be produced, even in conjunction with the most unpromising kind of architectural features. In the present example, something in that way, as will be seen, has been attempted; but enough has not been done to ensure success. The building is an important one as regards dimensions, and the architecture is far from mean in character; but, what with the tall chimney, and the masses of

workshops in the rear, a far greater amount of partial concealment is rendered desirable, if it is hoped to render the building and its surroundings picturesque. There is a tolerably well-shaped pond with nice tufts of Sedges, which, as they extend, will break the hardness of the outline, and render it a good feature; and the mass of rock-work which rises from one side of the water is not of the usual patchy kind, but massive, well designed, and of considerable extent. The failure consists in the paucity of trees. There are only two of any considerable size, and they prove quite insufficient to break up the monotony of the obtrusive lines of the building, or to conceal the ugly chimney. More trees near the tall one to the left, and two or three others near the palisades, would so veil the comparative ugliness of the building with the beauties of foliage, that the glimpses of some of its best features, which would necessarily still remain visible, would be of positive advantage to the aspect of the garden landscape that might be thus obtained. Horizontal lines are always pleasing when seen among the irregularities of natural forms. This principle is well understood in France, where many large industrial establishments, such as the great cotton factories in the neighbourhood of Rouen, are made very attractive by means of trees, and by well-designed approaches, in which they play a principal part; while the additional attraction of flower-beds is in many cases superadded with excellent results, in imparting to



Trees as a means of improving the aspect of a manufactory.

many of these palaces of labour a fresh, healthy, and cheering character. If we ornament triumphant toil with fair surroundings, it only receives the embellishment which it naturally calls for; while vast industrial structures, without such care, cast, as it were, a shadow of depression, which is not in accordance with the character of well-paid and productive labour. The surroundings of many of our own largest and most important industrial establishments are not only little cared for in this respect, but any attempt to beautify them is scarcely thought of; and, so far from being picturesque, in the very mildest sense of the term, they are too often absolutely squalid in their aspect, and convey the idea of prison-houses of compulsory toil, rather than, as they should do, grand centres of free and remunerative labour willingly undertaken, and in which the honest pride of success would be far more enjoyable if the arena of its development were rendered more attractive. Of course, this is not always practicable; but, whenever the artisan can be enabled to proceed to his workshop along a pathway decorated by flower-beds, or beneath an avenue of handsome trees, these agreeable adjuncts ought to be provided, as certain to produce a pleasant, cheering, and refining impression, and enable him to go to his work in a better and happier frame of mind. The beautiful task of the horticulturist is only beginning. It has, as yet, been confined in its labours to the homes of the rich. It has yet to embellish and render attractive the great structures devoted to labour throughout the land; and is as imperatively called upon to impart a pleasing aspect to the homes of our workers, as our builders and architects are to render them healthy by good ventilation and efficient drainage. H. N. H.

CHINA ASTERS.

Of these, we have two main divisions, the German and the French. We apply the definition German to the Quilled varieties, i.e., to those having tubular or quilled florets, though this is somewhat restrictive in its application, as the German growers have, of late years, done much in the way of improv-

ing the flat-petalled varieties also. The French Asters, which have large flat florets, are so named because French florists took them in hand some years ago, and effected in them a great and marked improvement. Taking the Quilled type as representing German Asters, it must be stated that, notwithstanding that the Germans have grouped them into many assumed types, yet but few of them are worthy of cultivation. What are termed Hedgehog, Porcupine, and other Quilled forms, are of a poor and worthless character. A really good strain of Quilled Asters furnishes very beautiful flowers; the form of the flower is half a ball of quilled petals, and many charming hues of colour are found among them. Of imported Asters the best types are the German Quilled and Reid's Quilled. Fine strains of Asters are also grown in England; and it is not too much to state that these, when well-grown and selected, are better than imported German ones. German Quilled Asters require special treatment to bring out their full beauty. A fine strain, if subjected to ordinary border treatment, will prove disappointing. They are, therefore, less valuable for ordinary border purposes than the flat-petalled types; still, neither Reid's nor the German Quilled should be cultivated in pots, as they have a somewhat lanky growth, and especially as there are dwarf-growing varieties of the flat-petalled section much better adapted for the purpose. If it is required to have a few fine Quilled Asters for show purposes, a well-manured bed should be specially prepared for them. A few plants taken from the seed-beds should be grown on in pots in some light rich soil, and planted out in lines towards the end of May, if possible, after a genial rain. They should be watered in dry weather, and encouraged in every way to make strong growth; the soil about them should be occasionally stirred, and it should also be mulched with some decayed manure from a spent hot-bed that will readily crumble to pieces, or which has been lying aside for use for months. In order to get fine flowers, all, except four or six buds, should be removed in order to induce fine development; and, as the day for showing draws nigh, some protection from sun, wind, and rain must be given to the flowers, or they will be wanting in that fresh clean appearance that so readily strikes a judge's eye. In all gardens where cut flowers are in demand, a bed of Quilled Asters should be grown to cut from. Only let the soil be rich, and the plants may be allowed to carry all their flowers. Such a bed of Asters will yield a large quantity of blooms for many weeks. A few for decorative purposes should also be planted about the mixed border, or any suitable spot where they can be seen to advantage.

Passing now to the flat-petalled or French section, it may be stated at the outset that its varieties are legion, but that a large proportion of them are worthless. One of the best forms of French Aster is Truffaut's Pæony-flowered Perfection, which bears noble incurved vari-coloured flowers. This is the French Aster *par excellence*, and though it is now offered by Continental growers in a bewildering multitude of varieties, the type I have named will give most satisfaction. Its flowers are large, full, with petals folding inwards—incurved, as it is termed. My next favourite type is the Victoria. This is of shorter and rather more upright rigid growth than Truffaut's Pæony-flowered, and has very large, full, flat-petalled flowers, but the petals lie outwards, or are reflexed. This is a magnificent Aster, with splendid full flowers like half a ball, and they assume a fine variety of colours. If any evidence were wanting of the popularity of this type, it may be found in the fact that it is fast taking the place of Truffaut's for show purposes. There is one good quality common to both these types, and that is, under ordinary border treatment, they will produce good flowers. They deserve, however, to be well treated; and, if planted in rich ground, and given a little manure-water at the blooming season, splendid blooms will reward the cultivator. If required for exhibition, there must be some disbudding in order to get increased size and fullness. The dwarf Chrysanthemum-flowered is a somewhat peculiar type, producing large blooms like those of a reflexed Chrysanthemum, and flowering later than the two before-mentioned types. Having a very dwarf free-branching habit, it is well adapted for flowering in pots, or for use as an edging to a bed of taller-growing kinds. The flowers of this type may be used for show

purposes, but they cannot be compared as regards quality, with those of the Victoria Aster. It should be stated that there are many varieties of the above type offered as novelties, as cellular, quilled, and porcupine. To these names are appended the new Humboldt, the newest Bismarck, the newest Shakespeare, &c.; but they are all of an inferior character. The Crown-flowered or Cocardean Aster represents a very distinct and charming type, and is so named because of the flowers having a central disc of white, with a margin of blue, lilac, carmine, crimson, and other shades. This is a selection from the Pæony-flowered Aster; the florets are reflexed, but the flowers are not so large and full as those of the Victoria. There are yet two pretty dwarf forms of Aster that I especially commend for pot-culture and for small gardens. They are the Dwarf Pyramidal and Boltze's Dwarf Bouquet. There is not a great deal of difference between them, but still enough to make the cultivation of both desirable. Very dwarf in growth, and very free in flower, they produce a profusion of nice flat-petalled, vari-coloured blossoms, and are unequalled to cut from. They are well adapted for indoor decoration before the Asters grown in the open ground come into flower. There is no difficulty in raising Asters, provided the seed be good; at the same time, Aster seeds are somewhat fickle in the matter of germination. They may be sown in pans or pots, or in shallow boxes, in a rich light soil, and placed on a warm shelf in a greenhouse and kept moist; or they may be sown on a soil-bed in a conservatory; or in pots placed in gentle heat in a Cucumber frame. As soon as they are large enough to handle, prick them off into other pots or boxes, and encourage them to grow fast and vigorously. Asters should be treated well—i.e., they should have rich soil and adequate moisture—and they will yield an abundant supply of flowers. The seed may be sown now.

R. D.

Plants now in Bloom on the Root-work at Weybridge.

—Your engravings of the root-work plants have been much admired; and, let me tell the talented artist that his hints on grouping plants, blooming at the same time, with a view to pictorial effect, have not been lost sight of. Among the beauties now out are *Æthionema coridifolium*, *Dianthus glacialis*, *Gentiana verna*, *Narcissus juncifolius*, *Scilla italica*, *S. amoena*, *Uvularia grandiflora*, *Trillium grandiflorum*, and *Epimedium rubrum*. This season, frost has spared *Dielytra spectabilis*. Among the strong-growing carpeting plants, we find most useful the old *Lithospermum prostratum*, *Achillea Ptarmica*, *Waldsteinia trifoliata* and *geoides*. These are now out. *Gaultheria procumbens*, with its beautiful red berries, grows best among roots. It makes its way between the bark and the wood in the wildest, prettiest manner. Among Saxifrages, most of them with their white flowers, are *S. cymbalaria*, with its yellow, and the mossy *S. atropurpurea*, with its pink blossoms, both of which have a very good effect.—GEORGE F. WILSON, *Heatherbank, Weybridge Heath*.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Anemone Robinsonii.—Three years ago I got a beautiful *Anemone* under this name. It resembles a large wood *Anemone*; the sepals are a delicate lavender, the anthers golden. It is a very free bloomer. Can any of your readers say what its origin is, or whether it is a species or a variety? It is one of the best of its class.—SALMONICERS.

Doronicum austriacum.—Is this only another name for *D. caucasicum*? The latter is now finely in flower; it has a dry habit and is a free bloomer.—OBSERVER. [The plant alluded to by us (see p. 322), as *D. austriacum* is usually known by that name; it differs from *caucasicum* in being a stronger grower, and in its flowers, which are nearly twice the size of those of *caucasicum*.—ED.]

Doronicum Clusii.—I grow upwards of a thousand hardy plants in my garden; and, at the present moment, this *Doronicum* is pre-eminently the showy. It grows about a foot high, and a plant of it (not a very large one) has on it twenty-seven large golden flowers, and many more have yet to open, making it altogether a very desirable plant. The little *D. caucasicum* is, of course, over. What a lovely little thing this is for early spring, even before flowering! The tufts of its leaves alone are remarkably handsome.—THOMAS WILLIAMS.

Orobis vernus.—This is now flowering freely, both in the open border and also in pots in the greenhouse, in which it forms an attractive object associated with *Narcissus*, *Muscari*, *Primroses*, *Squills*, and other spring flowers. How is it we so seldom see *O. luteus*, another free-blooming plant, which bears blossoms as large as those of *O. vernus*, but of a rich orange-yellow colour, in cultivation? Both are readily propagated, either by means of division or seed.—B.

Santolina incana.—This is one of the neatest and prettiest of all silvery plants for edgings or carpet beds. I have a quantity of it in a frame in shallow pans, and I find that it may be increased freely from cuttings taken off like those of *Cerastium tomentosum*, and struck in sandy earth. I had at first only a small pot-ful of it, but I have now at least 500 pretty little plants of it in thumb-pots, which will be ready for planting outside in May or June. It contrasts well with dwarf blue *Lobelia*, or crimson *Alternantheras*.—J. M.

THE FRUIT GARDEN.

GRAPES IN WATER BOTTLES.

THOSE who a few years ago, when this system was first promulgated, were so loud in their denunciation of it, must be surprised when they find that at the last meeting of the Royal Horticultural Society old Grapes of Lady Downe's were considered superior to new ones of the Black Hamburgh. I give no opinion on this matter, but as one who does not think very highly of Lady Downe's, except for its keeping qualities, I should have thought that equal first prizes, or a division of the first and second in equal proportions, would have met the exigencies of the case in a more equitable manner. Be that as it may, there can no longer be any dispute that we have Grapes, which, under proper treatment, will keep for an almost indefinite period. Calling the other day at Sherborne Castle, I saw in the fruit room there some scores of bunches of Lady Downe's, as fresh, crisp, juicy, and free from shrivelling, as if only just cut from the Vine. These were removed in October, have been kept in water since, and promise to remain in their present plump condition until midsummer, if not longer. Until within the last two years, Mr. Pragnall, the enthusiastic gardener there, used to leave the Grapes upon the Vines until the new year, but he found so much inconvenience from the Vines bleeding, and they became so weakened in consequence, that he was obliged to abandon the practice, and is now reaping the benefit of the change. In addition to Lady Downe's, Mr. Pragnall grows for keeping purposes a house of White Muscat, and another of Black or Mrs. Pince. Both these keep admirably in water, but are not quite so free from shrivelling as Lady Downe's. There are several other Grapes quite as good in their keeping qualities as Lady Downe's, as, for example, Oldacre's, West's St. Peter's, Gros Colman (the largest and handsomest of all the late Grapes), the Syrian and the White Nice, both remarkable for size of bunch, and, when properly grown, exquisite in flavour, but, to secure that end, it is necessary that they should be grown in a Muscat temperature. Give them that advantage, and you will have no cause to complain of deficiency of flavour. The coming Grape for early spring work will probably be Pearson's Golden Queen, which, with a handsome bunch, brilliant orange berry, and delicious flavour, promises to be the Grape of the period. I trust, also, that having a dash of the Strawberry Grape in it, it will be found constitutionally better suited to our climate than some of its more recent rivals.

A.

FRENCH MODE OF GROWING MELONS.

THE cultivation of Melons is one of the most profitable to market-gardeners, and, consequently, demands very great attention. The varieties grown are the white-bottomed Cantaloup Prescott, the orange or black Cantaloup des Carmes for the early crops, and for the succeeding ones, the dark grey, the scabby, or the large-ribbed, as may be found most suitable. As heat is necessary for growing Melons, it is generally furnished by manure. The few market-gardeners who have a hot-water apparatus, succeed equally well in that way, but it is far more expensive. The earliest Melons are sown in January in a very warm hot-bed under a frame. Three weeks after sowing, fresh beds are made in the same manner, and covered with frames and lights. In these the Melon plants are transplanted, 120 to 130 under each light. They should be well covered at night, and the frames should be lined with warm manure when necessary.

In May, fresh hot-beds are made in trenches, 4 feet 4 inches wide; the alleys are made wider than in the other beds, and are filled with a mixture of new and old manure, to which new manure should be added whenever the temperature requires to be raised. On these beds is placed a layer of soil, from 6 to 8 inches deep; this layer is to be level in the beds, but, in the trenches, raised in the middle. If the manure is dry, it should be previously watered and trampled. The frames and lights are then placed in position, and, when the bed heats, the plants are put in, either without breaking the

balls or otherwise. The latter method, carefully done, is the best in our opinion. The plants root sooner after a slight pressure of the earth around the roots, followed by a gentle watering. The fibres of the roots develop themselves at once after this treatment, while they remain dormant for some time if the ball be unbroken. Both methods, however, have their advantages. The young plants should be kept in the shade, and not planted too deep; an inch or two of the stem being left between the surface and the two shoots. The lights should be covered with mats at night, and also shaded during the day. A week after planting, the alleys are furnished with manure, which should be turned over at the end of a fortnight, and fresh manure added, if the temperature requires it. The plants should be pinched back to two buds; these will form two shoots or branches. After a fortnight, the frames are examined one by one, and the cotyledons and bad leaves are removed. Another inspection is made a week after, when the two branches are spread out, and the shoots, which are directed against the sides of the frames, are cut off. After another week, a third inspection is made, and superfluous shoots removed. At this time the plant should have filled its light, be in full flower, and even show some fruit; the shoots should now be pinched back so as to leave only one or two buds beyond each fruit. At the fourth inspection, which is made in another week, everything should be cut away beyond what serves to furnish the light, including those fruit which are not intended to be kept. The fruit that are retained should be shaded by the leaves, and placed in such a position as not to rest too much on the bed, but, as much as possible, on the stem. Only one Melon should be left on each plant. Air should be given, sometimes at one side and sometimes at the other, and gentle waterings whenever necessary. At the fifth inspection, any fruit that requires to be removed should be cut away, and all the shoots pinched back to two buds. The little Melons, which, if left, would spoil the fruit selected to remain, are not lost by being cut away. They are in great demand with the pickle-makers, having a much finer flavour than Gherkins. When the fruit at first selected to remain turns out badly-shaped, it is wise to cut it away, and allow one of the younger fruit to grow in its stead. It sometimes happens that a young fruit will grow unperceived, notwithstanding so many inspections; if, when it is discovered, the principal fruit is three-fourths grown, the other may be left untouched, as it will then do no harm. The Melon is known to be nearly ripe when it gives out a peculiar odour, when the rind assumes a yellow tint, and when the stalk curls. The crop is ready for market, according to the temperature, &c., in the end of May and the first fortnight in June. The greatest care, however, will not always succeed in bringing in a crop as early as desired. Market-gardeners do not gather their Melons when quite ripe. As soon as the fruit present the marks of incipient maturity which we have just mentioned, they are cut and placed in a cellar to retard their ripening. If this were not done, the Melons brought to market the day after being gathered would be already stale.

The Melons of the second season are sown in February, transplanted in the beginning of March, and planted out in the early part of April, just in the same manner as those of the first season. At this period, instead of raised hot-beds, trenches are made, not more than $3\frac{1}{2}$ feet, nor less than $2\frac{1}{2}$ feet wide, and 1 foot deep; these are filled with a mixture of new and old manure, well trampled and watered, and covered with a layer of soil 8 or 10 inches thick. The kinds grown at this time are the White-bottomed and Grey-bottomed varieties. The pinching, watering, and other treatment, are the same as before, subject to the difference in temperature. The crop comes in in June and July.

The Melons of the third season are sown in March, transplanted at the end of the month, and planted out in the end of April. The crop comes in about the end of July. The treatment is the same as before.

The sowings for the fourth season are made in the end of March, the seedlings are transplanted from the 8th to the 20th of April, and planted out from the 1st of May to the 10th of June. The greater part of the Melons of this last season are planted out on old hot-beds, in which Carrots have been grown. These beds are turned over and some fresh manure added. The added

manure must be watered, if dry. The crop comes in from the end of August to the beginning of September. Melons, at all seasons, require frequent gentle waterings before planting out, and the surface of the soil should be mulched. In the last season, the plants are grown under cloches. The kinds then grown are the Scabby or Wrinkled varieties.

In growing the first season's Melons, those frames are used which have previously served for Lettuces. In the second season, we use the frames which have been removed from Carrots in the beginning of April. In the third, those from Lettuces in cold beds and late Carrots. In the fourth, we employ the cloches which had been over Cos and Cabbage Lettuces. The trenches are made beforehand. The soil taken from the first trench is carried to the place where the last is to be made. When the trenches are made, the manure is brought and worked as already described, and then covered with a layer of soil. After this the frames are placed, and the first plantation made. The others are treated in the same manner in succession. In this way no time is lost, as the first plants are growing while the work is going on. A trench of the first season should be 4 feet 4 inches wide by 1 foot or 14 inches deep; one of the second season, $3\frac{1}{2}$ feet wide by 10 inches or 12 inches deep; and one of the third, $2\frac{1}{2}$ feet or 2 feet 8 inches wide by 8 inches or 10 inches deep. The same remarks apply to trenches for cloches. Immediately after planting, the cloches should be covered with manure, which is to be removed when the plants have rooted, and air should then be given at once. As the season advances, gentle waterings should be given more frequently. The seeds of the best-formed and finest fruit should be preserved, having been previously dried. In drying, care should be taken not to handle them too much before they are completely dried. The seed keeps good for five years. It is impossible to cultivate the Melon in the open air in the climate of Paris. Very hot seasons may ripen a few fruit without the aid of artificial heat, but these cases are exceptions. In damp cold years, Melons are subject to a disease which manifests itself by the appearance of immense numbers of insects, which, in forty-eight hours destroy all hope of a crop. I. P.

Grapes in Bottles.—I find (says Mr. Tillery, of Welbeck, in the *Florist*) that I can keep ripe Grapes best and longest in bottles of water, by hanging them in a late Vinery, where plenty of ventilation can be given, as well as a little artificial heat in damp cold weather, some shading being likewise required on bright sunny days in April and May. Three years ago, I had a dark room fitted up with shelves to suspend the bottled Grapes on, and, although the room was well ventilated, the Grapes damped, and did not keep so well as in the late Vinery. When they are kept in such a Vinery, the growing Vines in the house begin to get into full foliage by the middle of May, when all the Grapes then left in bottles may be removed and put into a fruit-room, where they will keep the supply up for a few weeks longer, should they be required to do so. To have Muscat Grapes well coloured and finished for late keeping, they ought to be forced in January or the beginning of February, for I find the best ripened bunches always keep the best. No varieties of Grapes require more time for ripening than the Muscat, even where there is a good command of artificial heat; and, to have them very fine, the best time to start them is about Christmas.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Nespras nepolica.—This is not *Achras*, but *Loquat* (*Eriobotrya japonica*), at least, that is now being sold in the streets under the above name.—JAMES BARTREX. [The paragraph was communicated, we did not see the fruit.—ED.]

Wiring Garden Walls.—Your correspondent Mr. Grieve, of Culford Gardens, in his quiet unobtrusive way, approving of the communication of "One who Practically Knows," appears in favourable contrast last week to Mr. Baines, of Southgate, on this subject. Like Mr. Grieve, I am desirous, however, to learn the results of fair and unprejudiced trials of the new French system of wiring walls. Mr. Baines has certainly not yet given one single valid argument against it.—FAIR PLAY.

Origin of the Green Gage Plum.—The origin of the name, says *Notes and Queries*, is simply that the Plum was brought into England about the middle of the last century, by the Rev. John Gage, who was in some way connected with a monastery or conventional establishment in France. He lived much abroad, but frequently visited his brother at Hengrave Hall, near Coldham, in Suffolk. In one of these visits he brought over from the garden of the monastery grafts of this excellent fruit tree, which were cultivated in the garden at Hengrave Hall, and soon were spread throughout England.

A HOLIDAY TOUR.

By THE EDITOR.

(Conclusion.)

Of Italian Gardens Generally.

As Italian gardens have very much influenced the gardens of other countries, and, for the most part, unfavourably, it may not be amiss to say something here of their origin and character. As to their origin, a glance at almost any part of Italy explains that. The Romans did not make terraces, because they admired them for their own sakes, but because the nature of the ground absolutely required them. For purposes of cultivation the hills are terraced in many parts like steps of stairs. The Italians did not build so that there was "a hill behind"

To shelter their devotion from the wind.

To avoid the malaria of the valleys and for purposes of defence, the towns crest the hills as the head of the young Mushroom does its stalk. When gardens were made in such positions, terraces to support the soil and form level walks were as necessary as earth and water. At Rome, where the immediate environs, unlike those of Naples, Genoa, and many other cities, are not hilly, the fashionable resorts, such as Tivoli and Frascati, were of a character to necessitate the terrace also; what was needed in most cases became the mode everywhere; the rude stone wall of the cultivator supporting a narrow slip of soil for his Olive trees or Vines became, in the ornamental garden of the wealthy Roman, an architectural feature, varied by vases, statues, &c. As regards the essential elements of Italian gardens, they are simple, and there is no need to go to Italy to understand them. The spirit of their design we have in many geometrical gardens in England; their sources of beauty, we have in England, too, everywhere the Cypress or the Pine flourishes; it is mainly owing to a few coniferous and evergreen trees, notably the Cypress and the Stone Pine, and, in a lesser degree, to Agaves, Prickly Pears, and Palms. In the exact ratio, in which these prevail over and veil the architectural and other artificial features, are the gardens beautiful. In the abundance of its vegetation we find the source of the charm of the Pamphili Gardens at Rome, a garden which is well shown in our page illustration. The sparseness of the vegetation explains the stony and distressing aspect of not a few gardens laid out in this style at home and abroad. It is, however, only just, as we find it illustrated in Italy, to say that there, as a rule, vegetation is more paramount than in many gardens in other countries. Elsewhere it is not unusual to see the terrace bare of anything beyond a few low shrubs and bedding plants; while, as to placing imposing plants at frequent intervals on the walls, as in the Pamphili Gardens, it is never thought of with us. It is essential to bear in mind that the beauty of an Italian or geometrical garden of any kind will depend on the predominance of vegetation over the merely artificial. This may be said to be true of all gardens, and so it is, no doubt; but it applies to the Italian more than to any other, inasmuch as it is in that style in which artificial features predominate most. Italian gardens, allowing of an endless variety of architectural work, apart from that of the house, they have naturally been much in favour with architects and artists, who have taken up the profession of landscape-gardener. The landscape-gardener proper, so to say, impressed by orthodox custom, and not attempting to think for himself, chimes in with the popular notion that every house, in no matter what position, should be fortified by terraces, and is busy forming terrace gardens, usually on level ground, which is unsuitable for them. Hence it comes that vast sums, ostensibly devoted to gardening, are spent on water-works, fountains, vases, statues, balustrades, walls, and stucco work. By the extensive use of such materials many a noble lawn is cut up; and, sometimes, as at Witley Court, the architectural gardening is pushed so far into the park as absolutely to curtail and injure the prospect—that is, if the prospect of a noble well-wooded park or arboretum is better than that of a posing-ground for the objects above enumerated. Many of the houses before which we see these formidable arrays would themselves seem to require much further embellishment from the hand of the artist architect. Indeed, if the cost of the stone and stucco ornament lavished on



THE PANPHILI GARDENS AT ROME.

the garden, in many cases, were spent on its legitimate object—the house, it could not fail to be a change for the better, for architecture as well as gardening. The fact is, the style is only worthy of serious adoption with us when the ground favours it, as, to name an English example, at Shrubland. There it is used, with a very pleasing effect, to lead from the house down a steep bank to the pleasure-grounds below. Nothing can be more pernicious for gardens than the too popular notion that the right plan is to place an Italian garden on the best front of the house, no matter what the nature of the ground; the fact being, where the ground is level, a finer effect results from allowing the turf to roll up to the walk in front of the house than from an elaborate terrace, as may be seen on the north side of Holland House, and at Cambridge House, and in such Gardens as Oak Lodge, where there is a very narrow terrace. There is, of course, in many cases, need for a formal walk, raised or otherwise, and, it may be, for a small terrace—points which will be governed in each case by the position, and by the house itself in various cases; but, where the ground, as in most English gardens, is level, there is no occasion for more. Such a foreground leaves us free to adopt everywhere a purely artistic and natural style of gardening. The needlessness of terrace-gardens in every position we have long shown in *THE GARDEN*; and so good a landscape gardener as Mr. McNab, of the Royal Botanic Gardens, Edinburgh, has recently declared his opinion to the same effect. In level town gardens, where the excuse of formal surroundings is used to justify a stony style, it is also a mistake. The highest effect is to be obtained, not by carrying numerous architectural details into the usually small town or city garden, but, by securing an absolute contrast between the garden vegetation and its unavoidable formal surroundings. And this end should be secured in such cases, not by aiming at the sham picturesque with rocks, cascades, and undulations of the ground, which would be too obviously artificial in such a case, but mainly by the simple majesty of trees and the charm of level turf. Thus it has been affirmed that none but an Italian garden would have suited South Kensington. Well, we had an elaborate garden designed there, and skilfully designed in its way. The plan was carried out with the greatest care; the planting, &c., was done by experienced gardeners, yet the result, as everybody knows, was unsatisfactory in the highest degree. There are many private gardens in European cities, of a more limited extent and with more formal surroundings, which are beautiful in the highest sense, and as devoid of the aspects that offend many in such a garden as Kensington, as if they were in some happy valley far away from the city. One feature of Italian gardens deserving of especial comment is the statuary. It is important, even with us, who are never likely to possess such a plethora of it as Italy. There, what it is capable of doing for gardens may be judged of everywhere, even unimportant palace gardens having frequently scores of statues and busts. Notwithstanding the wealth of art thus bestowed, it is rare, indeed, that a good effect is seen. On the contrary, the result is often spotty and objectionable, as in the Pincio, at Rome, where there is quite a regiment of new busts; and at Caserta, where the clipped masses have statues laid against them at regular intervals. In the distance, that is to say, in the landscape, such spotting about of statues and busts is exceedingly offensive, because it prevents the vegetation from expressing itself, so to speak. At a distance of a few hundred yards or feet, the varied forms and hues of a variety of trees and shrubs may be full of attraction, but a line of statues or busts and pedestals ranged along its face, as not unfrequently occurs in Italy, neutralises the effect of the vegetation. Then, again, in a real garden, there are, or there ought to be, many living objects to attract the attention which a number of statues or other artificial objects may distract. In the very multitude of statues and busts in an Italian garden, there is weariness. One or two fine works, isolated near some mass or grove of evergreens, might be introduced happily—the more so if the statue had any associations connecting them with the place; but it is doubtful if it would not be better to have such works under cover. No one who witnesses the disfigurement and decay of statues in the open air, here and elsewhere, can doubt, that, for mere safety's sake,

all works of any value from an artistic point of view should be under cover. If the works are of no such merit, it is not wise to so place them that they continually interfere with the pleasant impressions one receives in a fair garden. And if these things be true of the green tree what shall we say of the dry? How is it when Venus is leprous with Lichen, when Mars is armless, and when the lion has lost his tail? In Italy, in the open air, statuary is distinguished mainly by mouldiness. It is not only the moist climates of the north and west that favour the small spreading growths which so disfigure the forms wrought in marble. Everywhere in Italy, from Genoa to Caserta, the statues that have been more than a year or two in the open air are half-covered with a dirty blackish mould-like Lichen, which adheres to them as closely as if it grew with the marble itself. The result is grotesque effects in nearly every garden where statues or busts are seen; the expression of the face is distorted, or the form itself robbed of its expression, from half of its surface being obscured by an offensive blackish Lichen. If this would only grow equally over the whole surface, the statues might be mistaken for those of a curious hybrid race, with Greek and Roman heads on negro bodies. But it persists in growing in great flakes, now throwing a mantle over one side of Apollo, and now bestowing on Psyche one blackish cheek and a discoloured nose. All these facts being considered, it will probably be admitted that marble statues are best under cover; and that, in any case, a garden is not the place for them. Another error worth noting is that of placing large groups of sculpture in central positions, in gardens such as those shown in the illustration of the Doria Gardens at Genoa. In the engraving (see p. 379) the artist has, by the introduction of touches which suggest the grace of vegetation, managed to produce a pleasing effect, whereas the actual effect is miserably poor—at least to anyone who seeks for natural beauty in a garden. In this case, all the objections urged against statues hold good; but here they are more offensive, inasmuch as they occupy the best positions, and frequently destroy the precious quality known as “repose” in landscape-gardening.

THE GARDEN IN THE HOUSE.

WINDOW GARDENING IN SPRING.

My windows, being south-east, catch the morning sun, which I consider most fortunate, for my garden never looks better than in the early morning, just after sunrise; and I may as well add, that most of my window gardening is done between five and seven o'clock in the morning, since my employment calls me out from seven a.m. until five p.m.; yet that does not detract much from the pleasure I obtain from my plants; indeed, I often think that working men derive more real enjoyment from the cultivation of a few common flowers than professional horticulturists, who are continually brought in contact with the choicest exotics. Before relating my gardening operations, I will give an account of the cost of boxes, seeds, roots, and other appliances. This information is as much to be desired as cultural experiences, yet we rarely see it given in horticultural papers.

COST OF APPLIANCES.		£	s.	d.
2 Window-boxes, @ 3s. 6d. each	...	...	0	7 0
4 Brackets, for safely fixing same, @ 4d. each	...	...	0	1 4
1 Bushel of soil	...	...	0	1 6
50 Crocus bulbs (mixed)	...	...	0	1 6
12 Hyacinths	...	...	0	2 0
12 Narcissus	...	...	0	1 6
12 Packets of mixed flower seeds	...	...	0	1 6
12 Flower-pots	...	...	0	1 6
Miscellaneous plants	...	...	0	5 0
Water-can	...	...	0	1 6
6 Hyacinth glasses, @ 4d. each	...	...	0	2 0

£1 6 4

The above may seem to be a large sum at first sight to spend on the embellishment of the sitting-room windows, but a little consideration will show it to be otherwise. Before I commenced, I went to the florists and inquired the price of common wooden window boxes, and found that I could not get these

under eighteenpence or two shillings per foot run, so I at once determined to get a jobbing carpenter to make mine to order. I soon found an industrious man who offered to make them for 3s. 6d. each, of well-seasoned deal, $\frac{3}{4}$ -inch stuff, and the whole well painted (two coats) inside and out. Now, my boxes will last me at least five years, and, probably, much longer, as they will not have to be removed, so that the annual cost amounts to a mere trifle. To have bought these at the shops would have cost me at least double what I paid for them, and the chances are they would not have been so useful and substantial, although rather better finished. The pots and water-can will last for years with care, while many of my plants are of permanent interest; so, that if we reckon the average cost of my little garden for five years, the annual expense will not be nearly so much as it would appear from the account given above. And now a word or two about my plants. The first plant that bloomed with me was *Eranthis hyemalis*, which opened its yellow flowers and unfolded its bright green foliage early in February. This is a very common plant, that grows abundantly in many shrubby borders, but it is never seen to better advantage than when planted in a pot or window-box so that it is near the eye of the observer, for, when seen by the thousand in borders outside, it always seems to me to have a weedy appearance. After the *Eranthis* came *Crocuses*, both purple, yellow, and white, and these made my boxes gay for a month at least, or until the middle of March, at which time the *Hyacinths* commenced to bloom. The varieties of the latter were all single kinds; half of them I grew in water and the others in pots, and as far as my own experience goes, the latter did much the best, and produced by far the finest heads of flowers. Of those grown in glasses, two rotted away entirely, and I attribute this to my having allowed too much of the bulb to dip into the water; the other four did produce a few flowers, but nothing worth mention. For the future I shall grow all my *Hyacinths* in pots of rich sandy earth in the same way as the nurserymen and florists who grow for market. I have just now a fine show of *Narcissus*, great clusters of pure paper-white flowers, with deep orange cups, and their foliage is of a very delicate bluish wax-like green colour quite distinct from anything else I grow; these have been much admired by everyone in the neighbourhood. Along with these I have two plants of the common orange-flowered *Wallflower*, a couple of dwarf purple *Iris*, which are blooming very freely, but their richly-tinted flowers do not last well. A young and healthy *Virginian Creeper* in a pot at one of the windows is just putting out its green foliage from its delicate pink shoots, and, I have no doubt, this will form a striking feature in my arrangements for the summer and autumn. One of the freshest of all my *Creepers* is, however, a plant of *German Ivy*, which I hear is much used in America, but not as yet common in this country. This grows very quickly, and bears very bright shining leaves, something like those of the common *Ivy* in form, but of a much more pleasing green tint. My other plants consist of *Echeverias*, *Mammillarias*, and *Sempervivums*, and, as central plants for little stands in front of each window, I have an *India-rubber plant* on one side and a fresh feathery *Acacia* on the other. These are both green and healthy, and form very interesting objects, that I would not be without on any account, as the former was a present and the latter a seedling raised four years ago, and it gets more beautiful every season, and is always attractive. I purchased two tufts of *Creeping Jenny*, a week or two ago, and these have grown amazingly and will form nice fresh little plants; I intend to suspend them from wires, so that their leafy shoots can hang down gracefully all round the pot sides. My plants are all healthy, and I attribute this to their being frequently sprinkled overhead and occasionally sponged with clean soft water to clear them of the fine dust that so soon accumulates on house plants in the smoky town. In addition to the above, I have a plant of common *Ivy* in one of the boxes, and this is growing freely, so I shall train it over a hoop so as to form a graceful arch over the box. In pots, I have seedlings of *Ten-week Stocks*, *Asters*, *Convolvulus major*, *C. minor*, *Nemophila insignis*, *Mignonette*, and *Canary Creeper*. These are coming on nicely, and as soon as the *Narcissus*, *Wallflowers*, and *Iris*, have done blooming, I shall empty out my boxes and fill them again. W.

PLANTS SUITABLE FOR TABLE DECORATIONS.

In all countries and ages flowers appear to have been intimately associated with the customs and ceremonies of mankind. They have been adopted as the emblems or badges of nations and races—as the Rose of England, and the Lily, or Flower de Lys, of France—and the Red and the White Roses of the rival houses of York and Lancaster, are in the recollection of everybody; and flowers of various kinds have, from time immemorial, found a welcome in the palaces of the rich and the cottages of the poor. It has long been the custom to place vases or glasses of cut flowers upon the dinner-table, and it has, also, of late years, become the fashion to associate with these flowers, growing plants of various sorts; but all, of course, adapted to this purpose on account of the beauty of their flowers or their foliage, the pots, too, in which such plants are growing are generally concealed by some skilful device when placed upon the table, or they are placed in vases of china, silver, or similar material; and, on this account, it is desirable to have plants intended to be used for this purpose, growing in comparatively small pots. The classes of plants suited to the purpose are, of course, various, comprising varieties hardy as well as tender; but, as a rule, plants with ornamental foliage, and berry-bearing plants, are generally to be preferred; not that there can be any objections to the use of flowering plants for this purpose, but, as such plants are generally associated, when placed upon the table, more or less, with vases or glasses of cut-flowers, which will generally sufficiently represent the floral element, while the ornamental foliage, or the fruit of growing plants, constitutes a pleasing variety. The heated atmosphere of the apartment is, moreover, not unlikely to cause some delicate-flowering plants to drop their blooms, even before the close of the first evening of their doing duty in such positions. The following notes only apply to a few varieties of table plants, most of which have been found to be well suited for this purpose, and in all cases it will be understood that it is necessary that the plants should, in most instances, be growing in pots not exceeding 6 inches in diameter.

Several of the *Bromeliads* prove useful plants for table decorations, such as the *Æchmea fulgens*, when it has thrown up its graceful spike of coral-like flowers; then it is a very suitable object to place upon the dinner-table, and, when about to be used for that purpose, it should be held in an inverted position for a short time, in order to allow the water which may be lodged in the axils of the leaves to run out. It is easily increased by means of suckers, which are produced around the neck of the plants, when they are about to flower; these should be cut off, and potted singly into 3-inch pots, and placed in a stove temperature, where they will soon root, and should afterwards be shifted into larger pots when required. Young and well-formed plants of the *Bonapartea juncea* also form graceful objects for table decorations, as do also the *Beaucarnea glauca* and *recurvata*. They are by no means particular as to soil, and will generally succeed well in a compost of moderately rich turfy loam and peat. Many of the *Palms* and *Cycads*, when in a young state, form elegant and appropriate objects for the centres of dinner-tables; and a selection of the most suitable sorts should be kept growing in 6-inch pots for that purpose. They can be propagated from suckers or truncheons produced upon the stems of old plants, or they may be raised from seeds, and will succeed in any moderately rich light soil. Succulent plants, although generally somewhat grotesque in appearance, may, nevertheless, be occasionally used for table-decorations, more particularly when associated with cut-flowers and flowering plants of other species; they may consist of well-formed plants of such species as *Pachyphium bracteosum*, *Rochea falcata*, *Echeveria metallica*, *Sempervivum arboreum*, as well as of grafted specimens of *Epiphyllum truncatum* and its varieties, when in bloom. But, when plants in the form of standards are used for this purpose, it is desirable that the stems should be of sufficient length to elevate the heads of the plants, so as not to obstruct the view across the table.

Many Ferns are exceedingly well suited for table decoration, particularly the *Adiantums*, or Maiden-hair Ferns; among the most beautiful of which is *A. Farleyense*. The *Athyrium Filix-fœmina*, or Lady Fern, is a hardy and beautiful variety, well suited to this purpose; as is also the *Cheil-*

anthes elegans, together with *Gymnogramma chrysophylla* and *Massonii* among the golden sorts; and *G. calomelanes*, *tartarea*, and *Peruviana argyrophylla* among silver varieties. The *Lomaria gibba*, *Neottopteris australasia*, and *Nidus*, the Bird's-nest Ferns, young plants of all of which make very suitable objects for table decoration; as does also the *Nephrolepis exaltata*, and many of the tree varieties in a young condition. These are all increased by means of seeds, or by division. Some of the *Begonias* are also suitable plants for table decoration, although the majority of the ornamental-foliaged section is too spreading in habit for the purpose. A very beautiful dark-foliaged upright-growing kind, named *B. subpeltata erecta multiflora*, is, however, an exception, as are all the *Boliviensis* or tuberous-rooted sorts; and they may all be freely increased by cuttings put in during early spring. They will succeed in a soil consisting of turfy loam and peat, with the addition of a portion of silver-sand, and require to be grown in a stove or warm greenhouse. The delicately-beautiful foliage of the *Caladium argyrites* renders this plant also suitable for table decoration; although, on account of its dwarf habit of growth, it may not be well adapted for a central position. The bulbs should be started early in March in 3-inch pots, which, when well filled with roots, should be shifted into pots some 5 or 6 inches in diameter. The soil used should be turfy loam, peat, and leaf-mould, with a portion of silver-sand; and, like all the *Caladiums*, it requires a stove temperature. Nearly all the varieties of *Croton* may likewise be made useful for table decoration; and, on this account, it is advisable to strike a few plants of each sort from cuttings every season, which may be inserted either in autumn or early in spring. The soil they require is a mixture of peat, loam, and silver-sand; and they require a stove temperature. Probably, the best varieties for the purpose are *angustifolium* and *variegatum*. *Coleus Verschaffeltii*, and its congeners, make excellent table ornaments. They are all of easy culture, but in order to bring out the brilliant tints of their exceedingly ornamental foliage to the greatest advantage, it is necessary to grow them in a stove temperature, although they will all succeed tolerably well in a warm greenhouse. They are by no means particular as to soil, but a suitable compost for them may be formed of loam, leaf-mould, or well-rotted manure, with a little sand. In order to have plants of the desirable size, it is necessary to strike a few plants from cuttings several times during the season, and they will generally be found to naturally assume the pyramidal form, which is that most desirable for plants required for table ornaments; and this can also be induced, or assisted, if necessary, by judicious pinching. *Cyperus alternifolius variegatus* is a very elegant and suitable plant for table decoration, its paper-white leaf-stalks and striped foliage having a very remarkable and pleasing effect. It is easily increased by division, and the only difficulty regarding its culture is that of preventing the production of green leaves.

The genus *Dracæna* furnishes many plants whose brilliant-coloured foliage and graceful habit render them all that can be desired for table decoration, and they will generally succeed well when grown in soil consisting principally of turfy loam, with a portion of peat, leaf-mould, and sand. They may, also, be rapidly increased by means of cuttings, or eyes; as the tops of over tall specimens may be cut off and potted in sandy soil, in 3 or 4-inch pots, and placed under a hand-glass in a stove, where they will root in a fortnight or three weeks. Large plants, too, cut down to nearly the surface of the soil will soon produce several young shoots, that can be formed into cuttings, which soon take root, and the stems of plants so cut down may be split down the centre, when each division, cut into pieces of about an inch in length, containing an eye, or undeveloped bud, will strike if gently pressed into pots or seed-pans filled with a compost formed of sifted leaf-soil and sand plunged in a mild bottom-heat, and covered with a hand-glass. Some few of the species will succeed in a greenhouse temperature, but the sorts best adapted to table ornament, such as *D. Cooperii*, *rubra*, *terminalis*, *gracilis*, and others, require a stove.

Among ornamental-fruited or berry-bearing plants the most useful for table decoration are the various varieties of *Solanum Capsicastrum*, which naturally form themselves into compact bushy or pyramidal plants of about a foot or 18 inches in

height, and, when properly managed, bear a profusion of shining orange-coloured berries, or bright crimson cherry-like fruits, which last in perfection during many months. These *Solanums* may either be raised from seed sown in March, or they may be propagated by means of cuttings inserted about the same time; when fairly rooted they should be potted singly and grown in a genial temperature until about the end of May or beginning of June, when they should be planted out in a warm situation, fully exposed to the sun, where they will flower freely, and, if well attended to with water, should the weather prove dry, they will be sure to set abundance of fruit. The plants should be carefully lifted and potted in moderately rich light soil, in pots some 6 inches in diameter, during the early part of September, when they should be placed for a short time under a wall, or in some similar position, so as to be sheltered from the mid-day sun. They should, also, be frequently sprinkled with water, until they are fairly established in their pots, and in due time they should be placed on a shelf near the glass in the greenhouse, where the fruit will soon become finely coloured, and the plants will altogether be found to be exceedingly ornamental throughout the entire winter. If it be desired to keep the plants for another season in order to have fine large specimens, they should be cut in, or pruned back, about the end of April, and planted out, as before directed, about the end of the following May, and again re-potted in September in pots proportioned to their increased dimensions. Healthy well-formed young plants of the *Ardisia crenulata*, when well furnished with scarlet fruit, are also suitable as table plants during winter; they are of easy culture and require a stove temperature; as does also *Rivina humilis*, which, when clothed with its long pendulous racemes of bright scarlet berries, likewise forms an interesting object upon the dinner-table.

Skimmia japonica (a dwarf hardy berry-bearing shrub, of slow growth) is also very suitable for table ornaments, when kept in pots, as are likewise many of the ornamental fruited *Capsicums*, bearing, as they generally do, an abundant crop of highly-polished fruit, of a bright yellow or scarlet colour. They are all half-hardy annuals, and require to be sown in a hot-bed during March.

Among that class of plants known as tender annuals, some of the *Amaranthuses* and *Celosias*, especially the latter, are exceedingly useful for table decoration during the autumn and winter months. They must all be raised from seed, which should be sown in a hot-bed about the middle or end of March. They require a rich light soil, and when fairly established in 6-inch pots, they may be successfully grown in a warm greenhouse temperature. Among the best varieties are *Celosia pyramidalis*; *C. plumosa aurantiaca*, a kind which produces large terminal plum-like racemes of rich chrome-yellow flowers, *C. aurantiaca nana*, a variety with fine orange-coloured feathery plumes; *C. plumosa ignea*, with fine crimson plumes; and *C. Huttonii*, a very ornamental dark-foliaged sort.

Among hardy herbaceous plants, which may be found useful for table decoration are the graceful *Dielytra spectabilis*, and its white-flowered variety, neatly formed flowering plants of which, established in 6-inch pots, are found to be exceedingly effective; as are also plants in bloom of the *Hoteia* or *Spirea japonica*, more particularly its variegated form, viz., *S. japonica aureo-variegata*, which forms one of the most decorative and graceful of table plants. Its fine glossy ornamental foliage is traced throughout with bright gold-coloured veins, while its snowy-white erect feathery flowers are produced in great abundance. It is equally as hardy as its green-leaved congener, and will thrive in almost any soil, but in dry seasons it should be abundantly supplied with water; it is easily increased by division.

It has already been said that when plants in pots are placed upon the dinner-table the pots should, if possible, be concealed in some way. An ingenious contrivance, recently introduced, named the "Postulata," effects this desideratum perfectly. It is formed of strong cardboard, of various sizes and in different styles, elegantly ornamented. It also contains a concealed zinc pan, which effectually prevents the transmission of damp or moisture to the tables, and all so contrived as to be readily folded up and put away when not in use.

P. GRIEVE.

Culford, Bury St. Edmunds.

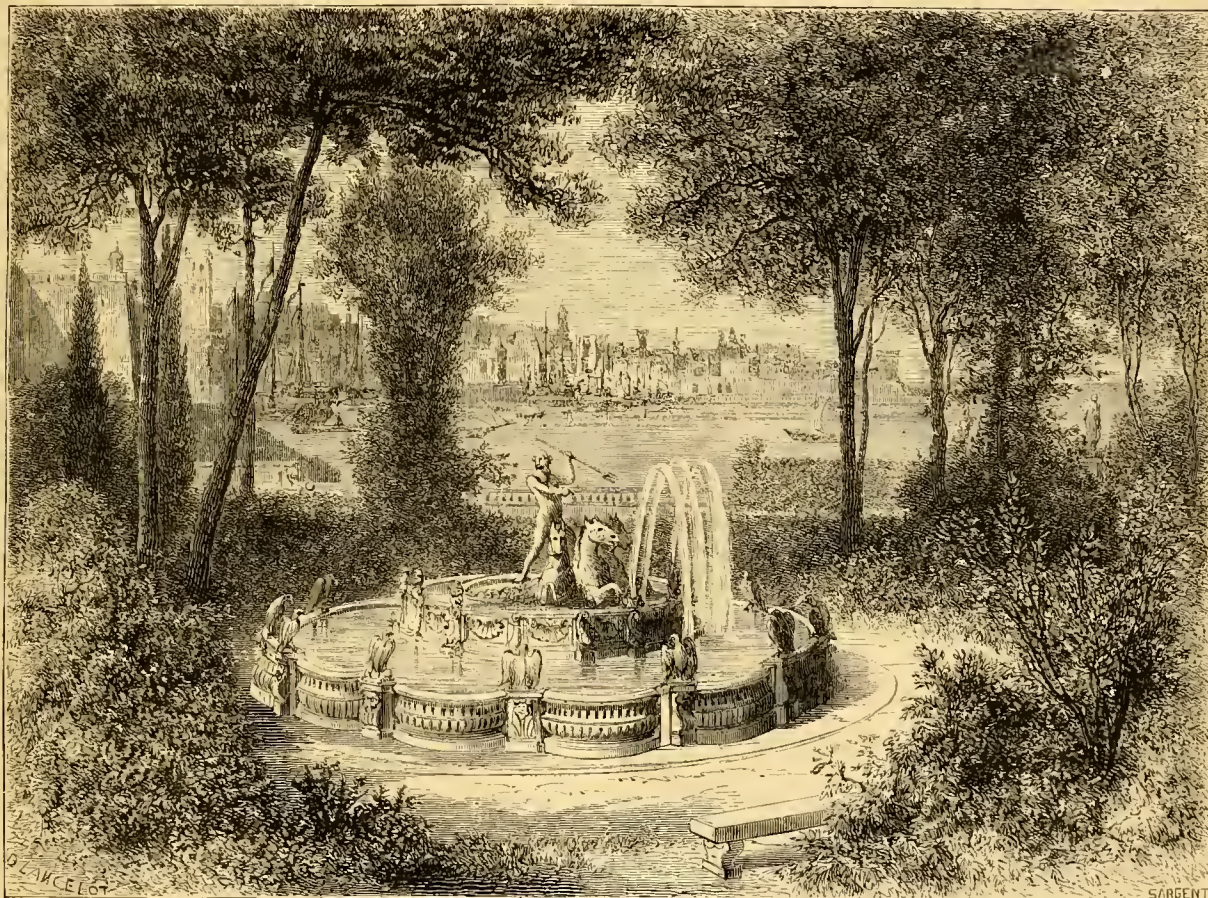
THE ARBORETUM.

ORNAMENTAL PLANTING.

By CHRISTOPHER YOUNG MICHIE, Callen House.

THERE is no branch of forestry which so much demands sound judgment, refined taste, and correct ideas, as that which treats of landscape or ornamental planting. It is not enough that we can admire and appreciate a well-defined and harmoniously coloured landscape, or be able to judge correctly of its merits or defects. Our province as planters is to select the materials, and so dispose and arrange them as to produce an effect at once the most powerful, agreeable, and perfect, that they are capable of doing. To attain this end—the proper arrangement and distribution of trees in a demesne or landscape—the planter requires an amount of skill and knowledge only attainable by perseverance, investigation, and study. To plant with any degree of certainty as to future results,

crooked, twisted and contorted, become pendent and drooping at the extremities; its leaves also become darker in colour. At that season of the year, when Nature, stripped of her leafy honours, has sunk into repose, and the eye is fatigued with gazing on the dull and naked landscape, joyous relief is afforded by the glossy green of the Scotch Pine, which, in winter, is arrayed in richest emerald. In sheltered situations it attains the height of 100 feet, grows to an immense size, and survives several centuries. The Silver Fir (*Picea pectinata*), on account of its hardiness and accommodating qualities, is entitled to a conspicuous place in the landscape. Its form does not much change with years, being the same in its mature growth as when a young tree, namely of a pyramidal or conical form. There is an irregularity and stiffness in its appearance, which renders it a conspicuous object when viewed among the other trees of the forest, generally towering from 10 to 20 feet above the highest in cold and exposed districts. It retains at all seasons a deep olive-green, its leaves underneath having white streaks, which, when upturned by



Central group in the Doria Gardens, Genoa (see page 376).

it is necessary to know not only the history, nature, and habits of every tree planted as correctly as the artist does the colours he uses, but also the properties and peculiarities of the various soils in which he plants, the aspects and position of the ground to be planted, the effects of the elements at every season of the year, as they act upon the plant in its various parts, more especially the buds, foliage, and fruit. As introductory to our subject, we shall at first indicate and describe some of the leading peculiarities and characteristics of our common forest trees, after which we shall the better know how and where to dispose of them to the greatest possible effect in the landscape. The Scotch Pine (*Pinus sylvestris*), is pre-eminently the tree of the mountain; it is never so much at home or so suitably placed as when it crowns the mountain-ridge, clothes the precipitous hill, adorns the projecting cliff or hoary rock, or guards the rugged pass at the entrance of a Highland loch. No tree in the forest undergoes so great a change in form and colour as the Scotch Pine. When young, its shape is conical, and its leaves of a lightish green; when aged, its top spreads out—its lofty branches,

the wind, present a shining silvery appearance—whence the name. It requires a pure clean soil, with moisture, and free exposure. It attains an immense height, with proportionate girth of stem, and survives 200 years. The Larch (*Larix*) is esteemed more for its utility and profit than its beauty in the landscape. Its principal merits in the latter respect are its sweet fragrance in early summer, its soft green appearance, contrasted with other trees at its early period of foliage, its often pendulous form vying with the Birch in gracefulness, and the beauty it so quickly imparts to the landscape after being planted, not to speak of its adaptation to the climate and soil. It attains the age of 200 years, and becomes a very large tree. The Spruce (*Abies*) has all the disadvantages of the Larch in point of beauty, while it is destitute of its merits. In any part of the landscape where Spruce would grow, other and superior trees might be substituted. There are, however, certain places, such as soft meadow ground, where the Spruce, at least for the sake of variety, may very properly be planted. Its recommendation for such situations are, endurance of frost when once a few feet high,

and tendency to absorb moisture from the ground, and ameliorate the climate. By the latter means its period of existence is greatly protracted, although its existence seldom exceeds 150 years. The Oak (*Quercus*) is a general favourite, seldom regarded as either out of place or keeping with the general landscape. The highest praises have been bestowed upon the Oak in all ages. It has been called "monarch of the wood," "king of the forest." It is probably the greatest favourite of all our hard-wood trees, being alike esteemed when a sapling as when a centenarian. Apart from poetical or historical associations, the Oak is deservedly a most interesting as well as valuable tree. It survives several centuries, attains over 100 feet in height, throws out magnificent wide-spreading branches, and contains occasionally 1,000 cubic feet of timber. The Beech (*Fagus*) is a noble tree, and well adapted to a great variety of situations, provided only the soil be moderately dry. The colour of its foliage changes considerably during the year, being of a very light green at first, which gradually becomes darker as the season advances, till the autumn tints appear, when its beauty still seems to improve, and it finally assumes a warm russet-brown or orange colour. It attains an immense size, and survives several centuries. One variety of the Beech, *Fagus purpurea* (the purple-coloured), merits an important place in the landscape. Though generally considered deficient in size as compared with the common Beech, yet, on account of its rare, rich, dark, glossy foliage, it is singularly desirable. It attains a good size, and survives to a considerable age. The Sycamore (*Acer Pseudo-Platanus*) when all its merits are justly weighed, stands in the first-class of forest trees. It is well adapted to stand either as a single tree upon the lawn, or to form groups in other situations. Its foliage being darker than that of most other deciduous forest trees, and its leaves large and rich in texture, it is a great favourite near the mansion. In autumn, the foliage generally retains its dark olive colour, when it suddenly changes, although upon southern exposures it sometimes changes into a light olive, but seldom assumes a high-toned colour. Its trunk attains an immense size, frequently 30 feet in girth, while its far-spreading arms describe a wide circle, supporting leaf-covered branches, which rise in cloudy masses one above the other to a great height. It also survives to a long age. The English Elm (*Ulmus campestris*) bears in its outline a striking contrast to many other trees, being of considerable upright habit of growth. Upon good dry loam and in a sheltered situation, it attains to a large size, and survives to a considerable age. The Scotch Elm (*Ulmus montana*) has many recommendations as a landscape tree, whether viewed standing alone, forming avenues, or in groups. It is a bold-spreading tree, of great size, and attains a great age, provided the soil be dry and rather rich, with an open loose sub-soil. The Norway Maple (*Acer platanoides*) possesses rare qualities as an ornamental tree. Its appearance upon the lawn is imposing, its beauty of foliage equally charming, whether viewed close at hand or seen at a distance. It is equally pleasing at all seasons. In summer, its fully-expanded leaves are most beautiful; in autumn, its colours, red, brown, orange, and yellow, impart to it a gorgeous lustre; in winter, too, when snow is on the ground, the buds and newly-formed twigs, which are of bright red, show to good advantage. Its scaly trunk resembles more a column of stone than wood; and whether supporting a canopy of green or golden foliage or leafless branches, is an interesting object in the landscape. The Ash (*Fraxinus*) whether as regards its form or the freshness of its emerald green is a noble and beautiful object. Its massive fluted or cylindrical trunk, its swelling majestic arms and pendent branches, together with its broad expansive top, render the Ash a first-class tree; while its long soft Grass-like foliage pre-eminently qualifies it for select spots in the landscape, such as the central part of a large group of dark-foliaged trees where the surface of the ground forms a concavity, or the lower part of a wide glen; in either situation it is an appropriate and lovely object, imparting during summer a beauty to the sylvan scene such as no other tree can, except the Walnut. Its size is immense; age, from 100 to 200 years. The Lime (*Tilia*) possesses many qualities to recommend it as an ornamental or landscape tree—its magnificent fluted trunk, wide-sweeping limbs, dense cloudy top, so rich in summer foliage, and the sweet fragrance of its flowers, so attractive of myriads of honey-gatherers busily humming around it. In forming avenues, shady walks, and covered drives, no tree is so suitable as the Lime. In the south of England or elsewhere, there are carriage drives of considerable length entirely overshadowed by magnificent canopies of Lime, appearing like immense arcades supported on rows of magnificent sylvan columns. It attains a large size, and survives to an old age. The Horse Chestnut (*Esculus Hippocastanum*) is of exquisite symmetry, and one of the loveliest trees in the wood; it is adorned with great beauty of foliage and flower. Its tender massive foliage is, however, easily injured by severe weather, and its wood being soft and brittle, is not suited for

an exposed situation. In a sheltered spot, however, with a moderately good and dry soil, it becomes a large and handsome tree, but, unless under very favourable circumstances, does not remain handsome or attain a great age. The Sweet Chestnut (*Castanea vesca*) well deserves a place in the landscape, both on account of its symmetry and beauty of foliage, flowers, and fruit. It becomes a large tree, and survives, under favourable circumstances, to an old age. Owing, however, to its tendency to become ring-shaken, which deteriorates much the value of its wood, and shortens its existence, it is often preferable to plant Elm in its stead. The wild Cherry (*Cerasus sylvestris*) is suitable for many parts of the sylvan landscape. It thrives under extremes of climate and in any soil, but does not well sustain the rigour of the sea breezes. It is also desirable on account of its profusion of white blossom in spring, rich foliage in summer, and variegated shades in autumn. In favourable situations it becomes a tolerably large tree, and often attains a great age. The Willow (*Salix*) is well entitled to a place in the landscape, where its graceful slender form presents a pleasing object to view. The situation to which it is best adapted is by the margin of a lake or river side, where it harmonises well with the wave or ripple of the water. The Huntingdon and Bedford Willows are the best for effect in the landscape; the former being of a light green, appearing, in connection with other trees, as if nearly white, demands special attention in point of arrangement, seeing that the contrast is so striking, it is equally liable to mar as to improve the effect. When planting Willows, it should be observed to plant them a few feet above the water-table, otherwise the roots suffer, and consequently the top dies at an early age, hence the necessity for pruning. The Aspen Poplar (*Populus tremula*) is highly commendable as an ornamental or landscape tree. Its outline in the mature state is handsome and beautiful. Its summer foliage is profusely rich and sweet, and even musical or poetical in the gush of sound among its tremulous leaves—ever moving, never at rest, now greatly agitated, now vibrating gently, ever whispering sweet sounds to the sighing breezes. In suitable dry soil, though poor, it attains a fair size, and survives many years; although upon rich soil it attains a large size, it does not live longer. The Lombardy Poplar (*Populus fastigiata*) is a tree desirable for the landscape, more on account of its tall peculiar spiry habit of growth, rendering it a conspicuous and picturesque object, than on account of its beauty. It is nowhere more suitable than in the neighbourhood of a town or country village, where it produces much the same effect as architectural embellishments. As the roots strike deep into the soil, it can only be planted with advantage where the soil is deep and moderately dry. The roots readily decay when surrounded with stagnant water, and hence the trees sometimes are overturned by a storm, not without danger and occasionally accident. The foregoing list of trees comprises those chiefly esteemed by the writer as the most important for forming a first-class landscape. In point of healthy growth, size, adaptation to soil and climate, symmetry, beauty, and general appearance, they are the best, and when properly distributed in a landscape they possess a pleasing variety in respect of shade and colour. Differing from those who affirm that certain trees are void of beauty, we regard every tree as possessing beauties of its own. One tree, however, is admired for one property, another for another, hence the necessity for planting them in natural situations, where they may harmonise with each other and with the landscape in general. For example, a Willow on a dry mountain top, and a Scotch Fir on a fertile river bank, could never please a cultivated and refined taste. In making the foregoing selection, a view has been had to the character of the country where they are planted—bold, hardy, majestic trees for more mountainous districts, and lofty, graceful, slender ones for the more level and sheltered grounds. Where two varieties have stood in competition, as with the Poplars, preference has been given to those possessing the greatest number of good qualities.

Let us now describe a landscape planted with a select number of the trees mentioned in the preceding list, viz., those suitable for an upland district, having an altitude of 1,000 feet to 1,500 feet above the sea, and exposed on all sides, soil poor and barren, sub-soil gravel or rock. Assuming that the mansion is situated in a central part of the estate, near the base of a hill, with a level fertile plain stretching in front. The mansion in such a case is the principal object in the landscape; all the surroundings should harmonise with it. Thus trees of the most symmetrical form and beauty should be artfully arranged nearest the mansion; but, although artfully arranged, art should be so concealed that they should still appear as of natural growth. In the mansion, art should be displayed, in the woods it should be concealed. The highest and most distant part of the landscape may be clothed exclusively with Scotch Pine, for the following reasons: first, on account of the upland soil being better adapted to grow this, and bring it to perfection, than any other tree;

second, because the top of the hill being the most distant part of the landscape, and forming, as it were, the background of the picture, should be planted with Pines of the darkest hue, in order to impart the impression of vastness and extent. About two-thirds of the distance from the summit of the hill to the front of the woodland should be planted with Pine; there the soil becomes better, and the situation more sheltered. A rich herbage clothes the ground, which now assumes a gentle slope instead of the extreme steepness of the mountain top, all which shows that a different class of trees is now required, and suggests, as successor to the Pine, the Birch, also a native of the mountain, and a tree which naturally harmonises and associates with the former. Viewed in connection with the Scotch Pine, the Birch is soft, rich, and warm. It imparts a beauty to the summer landscape, while in autumn it assumes a golden tinge, which gradually deepens into orange, yellow, or red, until the whole has the same array of gay and gorgeous drapery. The manner in which Birch and Pine should be planted, so that their varied foliage may be intermingled, can best and only be decided by the natural surface of the ground. Where it undulates, the Birch extends and occupies the hollow ground; the Pines occupy the higher ridges, and should rarely appear lower down upon the hill in detachments; a detached portion of Birch may appear, however, in a ravine amongst the Pines. In either case great nicety is required in mixing the two sorts, so that their marginal lines may blend softly together. The Birch has recommendations for such a situation because of its certainty to thrive, become a fair sized tree, and survive to considerable age. The Aspen Poplar should succeed the Birch, and join with it in the same manner as described for the Birch with the Pine—the Birch occupying the lower ground, and the Aspen the ridges and more elevated parts. The reason for this is, that while the latter is equally hardy with the former, and thrives in as poor a soil as the Birch, its branches are holder, somewhat resembling the Ash or Oak, its top lofty, broad, and cloudy, while its foliage is richer and brighter. Thus it is superior to the Birch for a prominent and conspicuous situation; further, its foliage bears exposure better than any other deciduous tree in the forest, being found fresh and uninjured by high winds, when even the Birch, growing by its side, has sustained much injury; and not only are its leaves beautifully formed and of a rich colour at all seasons, but the slightest breath of air elicits from them streams of sweetest music. Besides these advantages, it well befits the landscape of an upland district, from its deep-toned golden hue in autumn. To complete the background of the landscape, we have now to indicate the trees suitable for the base of the hill and around the mansion. It is important to select a variety of trees fitted to adorn this situation. Trees of large size, with healthy, rich foliage, and such as attain old age, bold and noble in outline, pleasant in summer, gorgeous in autumn, and beautiful at all seasons, are those which are required. The Beech has many of these qualities, and is well suited for such a situation as that under consideration. The warm tints of its autumnal foliage, and pleasing colour at all seasons, constitute important merits of the Beech as a landscape tree, to which may be added its noble spreading branches, gigantic cylindrical trunk, lofty spreading top, and majestic appearance. The background, or part behind the mansion, on the exposed side, is finished by introducing a few groups of other trees, as suggested by the nature of the soil or diversity of the surface, such as the Wild Cherry, Common Ash, or Scotch Elm. Our next consideration is, what trees should stand singly in the park and around the lawn, forming the foreground of the picture, the altitude being 1,000 feet above the sea, and at such a height, inland, and beyond the influence of the sea air? The following we should recommend:—the Sycamore, as being hardy, of noble appearance and luxuriant foliage, shady in summer, and ornamental in winter:—the Oak, its merits being hardiness, noble growth, large size, beauty of foliage, and great age:—the Scotch Elm, with noble spreading top, sweep of branches, rich foliage, large size, old age:—the Beech, as alike suitable for the park as for forming a background; its merits have been already noticed. The Common Ash is a notable headed tree of great size. It grows upon poor soil, is beautiful in summer, and picturesque in winter.

Having described the arrangement of trees in a landscape at as high an altitude as trees grow properly in Scotland, we shall now consider what is required for a landscape in a fertile part of the country, with a situation variously sheltered and exposed, altitude from 300 to 600 feet. In this case, unlike the preceding one, a great variety of first-class trees can appropriately be introduced, on account of the better quality of soil, greater diversity of surface, and lower altitude. Taking our stand point of observation to the south-west front of the well-known Floors Castle, in Roxburghshire, where an extensive district appears before us stretching far in the distance, comprising an area of many miles, comprehending almost every variety of soil, and with great diversity of surface, we shall give an arrangement of trees suited to such a district. Assuming that the

whole surface of the district is destitute of trees, and that it is resolved to plant so as to cover the ground with the noblest trees the soil is capable of sustaining and bringing to perfection, and in such an arrangement as to gratify the taste, and please the eye, beginning with the background, which rises in the distance to a height of, say 600 feet, this we would plant with Scotch Pine, as being darkest in colour, and having a gloomy aspect in the distance. Its great size, bold and rugged appearance, also recommend it for such a situation. A second hill, less elevated than the former, and which stands in the same line, but at considerable distance towards the foreground, we would plant with Sycamore, on account of its large spreading top, dark massive foliage, and the old age which it attains, together with its other merits as a landscape tree. The next elevated ground in the same line as the two preceding hills, but a little less elevated and reaching still nearer the foreground, we would plant with Norway Maple, for the following reasons:—First, on account of its importance as a magnificent timber tree, picturesque and romantic appearance, and the great age it attains; second, on account of its light showy green appearance in relief against the darker heavier foliage of the Sycamore, which only changes its colour before dropping off on the first approach of winter. Towards the front of the last mentioned knoll, the ground generally inclines for some distance. The sloping ground we would plant with Oak, for the following reasons:—For its magnificence and its unequalled majesty. Its trunk, limbs, branch and foliage are all magnificent. Its autumnal effect is less striking than that of the Maple behind it; but, at the same time, it is more diversified. In a healthy Maple plantation, the colour of the autumnal leaves is nearly uniform, viewing the whole surface, while that of the Oak greatly differs, even in the branches of a single tree. The Maple, therefore, forms a fitting contrast and suitable background to the Oak. Having described the background, which consists of four successive ridges or zones, one rising above the other as they recede in the distance, we turn next to the left hand view, as seen from the castle. This is an extensive plain, sloping gently, and of a more uniform surface. The most distinct view here is only about half that of the preceding one. To begin with the most distant view, and upon which the sun shines in early morning, we would plant this with Sycamore, for the following reasons:—On account of the general merits of the tree, which we have already described; in consideration of its heavy dark foliage floating on the top of the hill, or descending its slope. The Sycamore being dark, heavy, and ponderous in outline, conveys not only an impression of weight and importance, but also of distance. Next to the Sycamore should succeed Beech, the former forming a background to the latter, not only suitable in summer, but equally so in autumn, retaining as it does, its dense dark foliage, while the Beech in front of it has changed into a warm russet brown. The loose airy irregularity of the Beech, too, contrasts well with the Sycamore, which is stiff, round, and cloudy in outline. Next to the Beech should follow the Lime tree, which has a close compact outline, widely differing from the Beech in summer, while late in autumn it maintains its summer greenness till the leaves suddenly fall off. In this position, the Lime forms an excellent contrast with the preceding and succeeding zones or belts of trees. In front of the Lime we would again plant Norway Maple. The former being darker in foliage than the latter, forms to it a proper background. In autumn, too, while the Lime is yet green, the Maple is of a bright shining yellow, or orange colour. Assuming that we have now reached nearly the base of the hill, and come upon level ground, and that a terraced appearance can no longer be produced, Art must accomplish what Nature further denies. We would, now that we have reached the base of the hill, introduce a zone of common Ash. First, on account of its partial obscurity when stripped of its leaves in early autumn, or when yet naked late in the spring; second, in consideration of its soft, long, grass-green foliage during summer, which no tree in the forest, save the Walnut, equally possesses. For the base of the hill, the bottom of a glen, or centre of a concavity, no tree is so well adapted. The Ash should be planted in a narrow irregular belt, its extreme margin mixing gradually with the Maple in the background. The English Elm we would next plant, on account of its towering height, which only admits of a partially concealed view of the Ash, and its foliage, which remains unchanged in colour for a considerable time after the Ash has shed its leaves. Next we would interpose a zone of Scotch Elm. It is less spiry, not so tall, more spreading, and altogether softer in outline than the English Elm. In autumn, upon dry ground, freely exposed, the Scotch Elm assumes bright shades, though not of a warm tint. In front of the Elm we would plant Oak, which forms an excellent foreground, and contrasts well with the Elm, thus the general favourite is again brought prominently into view. The whole of this latter arrangement has been made with a view rather to produce contrast and variety, both in form of trees and colour of foliage, than for the purpose of harmoniously blending shade with shade. The latter object is, with the present limited

knowledge of the laws of vegetation, beyond the power of man to accomplish satisfactorily, owing to the foliage changing so much at various stages of growth, and being influenced by their state of health and vigour of growth.

The next view of the landscape is upon the right, taking it from the front of the mansion, as previously. In the distance, the ruins of an ancient castle are assumed resembling that lately erected on Minto Crags, situated upon a peak in the skyline. (If it has historical associations so much the better.) In connection with this relic of warfare, we would plant the extreme height with Silver Firs. The reasons for doing so are because of the hardness of the tree to endure exposure; even the strongest sea breeze affects it less than any other evergreen with which the winter is acquainted. Also, because a skyline studded with Silver Firs has at all times and seasons of the year, when viewed with a hazy atmosphere, a little after dawn, or during the murky twilight, a strange and awe-inspiring appearance, especially if in the vicinity of a fortress or other building susceptible of awakening such emotions. The extreme top of the hill, only at the top of the ravine, is planted with Silver Firs, the part of the hill both behind and in front of the "Silvers" being planted with Scotch Pines, which gradually mix with the former. The castle is embosomed in a mass of Pine, against which it shows in grand relief; its Moss-grown weather-beaten walls show to a great advantage against the dark foliage of the Pine. No Silvers are planted close upon the castle, as this would render the outline of the building too complex and undefined. Next to the Scotch Pine, with advantage, might be introduced a zone of Aspen Poplars, taking care not to mix the trees where the two classes join, but to carry a distinct but irregular line between them, so that the Pine may appear to come down abruptly upon and overhang the Aspen. Upon this, in a great measure, depends the effect of the landscape. We would next introduce a zone of Sycamore. This is intended as a background to the succeeding belt, and to form a rising clondy mass representing an elevation in the ground, though none naturally exists. Care and skill are necessary herein the blending of the margins of the different classes of trees. The recommendations of the Sycamore for such situations are its magnificence, both in respect of trunk and top, its dark, shady foliage in summer, and slight tinge of greenish-yellow in autumn. The next zone is Beech, which forms an excellent contrast to the Sycamore behind it. In outline, being more loose and airy, its summer foliage of a lighter and softer green, and in autumn of a brilliant colour, it shows conspicuously against the dull background of the Sycamore. The next zone is Lime, which is of a stiffer outline than the Beech, of a dull green in summer, and in autumn changing but slightly. It forms an excellent contrast with several other trees, especially the Norway Maple which succeeds and forms the next zone. The merits of the Norway Maple as a landscape tree having already been described, need not here be repeated, except to remind the planter of its beautiful summer green and incomparable rich yellow in autumn. It, therefore, gives a striking effect with the Lime forming its background. The next zone is English Elm, which, from its towering character and different colour, both in summer and autumn, forms an excellent contrast to the Norway Maple, which should rise in a high mass behind it. The next and last succeeding zone is Oak, of whose merits nothing need further be stated beyond what has already been done. This again brings us to the foreground.—*Transactions of the Scottish Arboricultural Society.*

CLADRASTIS LUTEA.

THIS forms a tree which grows from 20 to 30 feet in height and bears a profusion of pure white flowers in July or August. The flowers are arranged in elegant drooping panicles, and contrast forcibly with the finely-cut pinnate foliage. Its thin

seed-pods, though rarely seen in this country, are borne on short stalks. It is frequently known as *Virgilia lutea* or *V. tinctoria*, the latter being perhaps the name under which it is best known in gardens and nurseries. When covered with its panicles of snowy flowers, it forms a noble ornament on lawns or in pleasure-grounds. It requires a dry warm soil and a sunny situation—conditions under which the wood becomes thoroughly well ripened, and the flowers are more freely produced the following year. It is also very effective in autumn, as its foliage assumes a brilliant golden tint previous to its falling off. Planted near a Purple Beech it would be very effective. It is a native of N. America. ARBOR.

THE LIBRARY.

CONTRIBUTIONS TO THE FLORA OF MENTONE.*

THOUGH late in reviewing this volume, we, nevertheless, feel bound to do so, as it is of peculiar interest from a horticultural point of view. The district to which it relates is one of the richest in Europe as regards its winter flora. When, in spring, the fields and copses of the more southern Italy are only whitened by the Daisy and the Sloe, many of the beautiful flowers of the Riviera have passed out of bloom. This arises from the peculiarly favourable position of the country. All the district is favourable to vegetation, but Mentone may be described as situated at the "foot of a south wall." The Alps come down here to sun themselves by the sea, and, in doing so, keep away the bitter winds of the north and east. Hence we find the Lemon thriving better than in South Italy; the *Wigandia* in superb bloom in the gardens in spring, and the Castor-oil plant living well through the winter. The Olive is not here the poor over-worked and over-pruned tree it looks in many parts of Italy, but always a fine and picturesque tree, and often a stately one; and, beneath the Olives and Lemons, on those Myrtle and Rosemary-clad headlands that run into the many-hued sea, and on the hills above the Vine and Wheat terraces, and on the crags and Alps behind them and in the mountain valleys and high pastures, grow the many flowers, the most interesting and rare amongst which are figured and described in Mr. Moggridge's book. Among these are not a few plants well worthy of culture for their beauty, as, for example, the scarlet *Anemone fulgens*; *Lavatera maritima*, with its delicately tinted flowers; *Pæonia peregrina*; the beautiful *Primulas Allioni* and *latifolia*; *Crocus medius*, a fine kind; *Leucojum hyemale*; *Campanula macrorhiza*, *Allium neapolitanum*, as valuable as any Daffodil; many kinds of *Ophrys*; *Cytisus Ardoini*; *Potentilla Saxifraga*, a handsome dwarf species whose pure white petals are prettily relieved by a central tuft of crimson anthers; *Leucojum nicaense*, a graceful little plant peculiar to this district, with smaller flowers, and more slender leaves than those of the common *Snowdrop*; *Globularia alypum*, a rare plant, with exquisitely beautiful blue flowers; the singular-looking *Fritillaria montana*; five species of *Serapias*; not to name other equally beautiful plants better known in our gardens. These, and many other plants, are well figured by Mr. Moggridge himself, and his book forms a collection of plates of much interest to horticulturists, as well as to the many who resort to the fair climate of Mentone in winter and spring. It is an illustrated local flora of the highest merit, and such a one as may form a model for other districts, possessing botanical wealth and an intelligent population to take an interest in it.

* "Contributions to the Flora of Mentone, and to a Winter Flora of the Riviera." By J. Traherne Moggridge, F.L.S. London: Lovell, Reeve & Co.



Cladrasia lutea.

WORK FOR THE WEEK.

The Flower Garden.

ALTHOUGH our springs of late years have rendered early bedding-out undesirable, it is not too early to decide how the garden shall be planted, and to make arrangements accordingly. What may be termed the massing system has had its day, and it is evident that something fresh must soon be introduced. We would have masses of colour in suitable situations, but we would have them subdued and tastefully toned down by means of foliage, so as to form a rich, quiet, and harmonious whole. Even ribbons, if a mere repetition of the same plant *ad infinitum*, cease to charm; and the same holds good in the case of panelling and carpet-bedding, where gaudy colours are employed. The secret of gardening decoration does not consist in crowding hundreds or thousands of plants, however scarce or valuable, into a given space. No; it lies more in the judicious use of appropriate plants, and in so lighting them up by means of colour, that each shall enhance the beauty of the other. For this purpose expensive materials are unnecessary; it is the arrangement rather than the plants individually which charms. One man with a handful of flowers from the hedgerow will often produce an exquisite bouquet; while another, with flowers however choice, might fail. Tasteful application of the material which may be at command is what is wanted. Spring-flowering plants, although now doing good service, will soon require to be removed to the reserve garden, the ground in which should be put in order to receive them; add to it a little thoroughly-decomposed manure, leaf-soil, or peat, as the case may be. Before re-planting, divide into small portions such plants as Aubrietias, Arabis, and Daisies, &c., allowing sufficient space between the plants for proper development, without crowding. Bulbs must be removed in as perfect a manner as possible, being careful not to bruise the leaves in the operation, and on no account remove the flower-stems, as they greatly assist the maturation of the roots. Water freely, and protect from sunshine for a few days with evergreen branches. Plant out spring-struck Hollyhocks, and divide and re-plant Neapolitan and late-flowering Violets. Centaureas should be plunged in the beds in pots, as they grow more compactly, colour better, and are more manageable in winter. Clip Box-edgings, and everywhere maintain perfect neatness and order.

Greenhouse.

In order to prolong the flowering season of such plants as are in bloom under glass, it will now be necessary to attend carefully to shading during the middle of the day in sunny weather. Scrim, a fabric made of flax, is much the best and cheapest shading material in the end. The finest quality of it will break the sun's rays without excluding too much light. Roof climbers will now require regular attention to keep them from becoming an entangled mass. The system of allowing the whole roof to become covered, as is frequently done, is objectionable. It excludes too much light from the plants underneath, especially in dull weather; it also spoils the general effect, which is much enhanced by confining climbers to something like one-fourth of the roof space, and leaving them to hang down gracefully at intervals; yet in this too much uniformity should be avoided, by allowing some to hang lower than others. Let every means be employed to keep them free from insects, more especially scale. Azaleas that are brought into bloom in other structures for removal to the greenhouse or conservatory, will be benefited by sprinklings overhead with the syringe every afternoon until their flowers are fully expanded; they should also be shaded, especially the high-coloured varieties. They must, likewise, be well attended to with water, as, during the development of their flowers, there is a much greater drain upon the roots than at any other time, and if allowed to become dry the flowers suffer as well as the growth for the ensuing year. Geraniums and Calceolarias that are throwing up flower-trusses should be encouraged by means of liquid-manure, not too strong, especially in the case of Geraniums, or it causes them to run too much to leaf. Fumigate regularly, and not too severely. Fuchsias stake, stop, and tie. Closely examine them to see that they do not suffer from aphides or red spider, as either quickly spoils them. Cockscobs, Balsams, Achimenes, and Hydrangeas should be well attended to, as these, with the plants previously mentioned, will be the principal things to be depended on during the following two months, when there is a much greater scarcity of flowering-plants than during early spring. Chrysanthemums that have filled the small pots they at present occupy, should be at once potted into their flowering-pots; from 8 to 12-inch pots, according to the sizes the plants are required, will be found large enough for general use. If fine flowers are wanted, stop the shoots during this month, but not later. A dozen really good blooms on a plant of the large-flowered varieties are preferable to three times the number of starvelings often met with. Plunge them at once in their summer quarters in ashes, which will prevent worms from getting into the pots, and will

keep their roots at a much more equable temperature than when not plunged. The effect of rapid change in the temperature of the soil in an ordinary plant-pot when not plunged is not sufficiently considered; during bright weather the effect of the sun's rays acting upon the pot raises the earth heat in an unnatural degree, and therefore the cold chill of even our summer nights causes a corresponding reaction. The first batch of Primulas and Cinerarias will now require potting into thumb-pots, using good loam, well enriched with rotten dung and leaf-mould, for the purpose, mixed with a little clean sand; place the plants in a somewhat close pit or frame; shade them from bright sun, and attend to them well with water. Pot off all cuttings struck of Enphorbias, Hydrangeas, and Poinsettias, placing them in a growing temperature near the glass, so as to ensure short stont growth. Rhynchospermum jasminoides is a useful conservatory plant, its fragrant white flowers rendering it a general favourite. It is a plant of easy management, requiring the temperature of a Vinery, or intermediate house, during its growing season. The different varieties of Kalosanthes will now be fast showing flower, and will be benefited by weak manure-water. Get them properly tied before the shoots get too heavy. They are useful decorative plants for summer. Now is a good time to propagate them; they strike freely in loam or peat, with an admixture of a little sand, giving very little water until they are rooted. Tie out Achimenes, as they advance in growth, giving them all the light possible, so as to induce a stout blooming habit. A good number of the oldest plants of scarlet and pink Geraniums should be selected for keeping up the conservatory display during the summer and autumn; and a batch of the scarlet Pelargonium Vesuvius should be potted into 6-inch pots and turned out of doors, where they will be fully exposed during the summer to the full sun. With these it is not size that is required; but a thoroughly matured growth, that will ensure their flowering freely when subjected to heat for winter decoration.

Fern House.

Plants that have not been re-potted for some time, and where it is not deemed advisable to give them more root room, may be assisted by the application of manure-water; but, in all cases, see that the drainage is effective, otherwise its application will only aggravate the evil. If any plants are out-growing their bounds, either in pots or planted out, it is an easy matter to reduce this over-luxuriance by cutting away, more or less, according to circumstances, their oldest fronds whilst in a green lying state; this will be found to reduce the size of the fronds made afterwards, in proportion to the extent it has been carried out. The different kinds of Dicksonia, Lomaria, Cyathea, &c., that throw up their young fronds in a batch may have, when these are fully developed, the oldest fronds, if unsightly, cut away.

Hard-wooded Plants.

Azaleas will now be coming into flower without the assistance of fire heat, and although with the increased temperature of the season they will not last in bloom so long as those that have been forced, yet the much brighter colours which they acquire under more natural conditions will compensate for their shorter duration. The house they occupy whilst in bloom should be well shaded, in order to prolong their flowering as long as possible. Remove all seed pods from such as have done flowering; after which allow them a fortnight or three weeks to recruit their energies previous to re-potting. Use in the operation good fibrous peat broken into pieces proportionate to the size of the plants; add nothing except as much silver-sand as will not only ensure porosity; but also maintain a sweet healthy condition of the soil for years; for Azaleas, with anything like fair treatment, are not short lived. After potting keep them in a closer atmosphere than they have been in for a few weeks, and shade during bright sunny weather. Admit no side air during such time, but give sufficient at top to keep the temperature from getting too high; 80° or 85° with air, shade and moisture will do no harm; on the contrary, Azaleas enjoy it. Plants that are vigorous and that push some of their shoots very strong will be benefited by having the points of such shoots nipped out, as soon as they show a disposition to outgrow their neighbours; if done whilst the growth is soft the plants will push several shoots, which will set blooms with the rest of the plant. Attend as heretofore to the general stock of hard-wooded plants, and by close attention encourage early and vigorous growth.

Indoor Fruit Department.

Pines should receive plenty of water and heat, the fruit being neatly tied to stakes, and where size is required, all suckers, as they appear, may be removed. Keep the atmosphere rather drier than ordinary for Grapes that are colouring. Thinning, stopping, and tying of Vine shoots must be attended to, and inside borders should be particularly guarded against getting too dry. Give abundance of water to Figs that are swelling. Peaches that are past the stoning

period should be thinned to the required distances apart. Ripening Strawberries should be kept somewhat dry; those that are swelling require a little manure-water, and pass the hand gently over those that are in flower, in order to assist fertilisation. As soon as the soil of the Melon beds is filled with roots, they should be top-dressed, packing the soil firmly, and placing over it an inch of loose mould. Overcrowding shoots or foliage should be prevented, and single flowers not allowed to set; on the contrary, all should be removed until a fair crop can be set at once. Cucumbers must not be permitted to bear too heavy a crop at one time; thinning and surfacing, as for Melons, should be carried into effect, except that the compost used should not be so firmly packed, and should be of a richer and more open character than that used for Melons. Sow Vegetable Marrows, and transplant those that are ready. Continue to pot and harden off Tomatoes.

Hardy Fruit and Kitchen Garden Department.

In cases where the disbudding of Peach, Nectarine, and Apricot trees has commenced, protection from frosts cannot yet be dispensed with, and great care should be exercised to guard against strong sunshine in the mornings after frost, as much damage is sometimes done by brisk sunshine at that time. As a protection against the attacks of green fly, the trees should be frequently syringed with tobacco-water. Double-bearing Raspberries should be cut down to within a few inches of the ground, to encourage autumn fruitfulness. Asparagus beds, for the present, should have all their produce cut, *i.e.*, none should be allowed to run up, except, perhaps, here and there a stem or two for seed. Full sowings must now be made of Salsafy, Scorzonera, and Skirret, in lines a foot apart. A few seeds of White Dutch, and of Red and White Stone Turnips should now be sown. Sow round-leaved Spinach between lines of Peas and in open spaces amongst other crops; also, a late crop of Carrots in deeply-worked sandy loam, not too rich. Celery plants should be pricked out and freely exposed. Sow Peas for succession; those up should have a little earth drawn up to them, and be staked; the latter practice also applies to Beans. Sow the main crop of Beet and French Beans in warm situations. Cauliflower, for late cropping, should be pricked out, and Cabbages, of which another small sowing should also be made.

THE KITCHEN GARDEN.

EARLY AND LATE PEAS.

THE number of varieties of early and late Peas now in seedsmen's lists is so great, that it is puzzling to know how to make a selection. The following sorts were grown and proved by me last year; and I can recommend them as being the best, either for large growers, or for amateurs with only a limited space for their cultivation. In the earliest section, the Ringleader, or First Crop, is still the first fit for use; followed by Sangster's No. 1, Taber's Perfection, Emerald Gem, and Kentish Invicta; but the earliness of some of these varieties does not compensate for their small pods, lack of flavour, and poor cropping qualities. Some, however, prefer their flavour to the richer Marrow flavour of the following early new sorts—namely, Laxton's William the First, Alpha; and, in the older dwarf Marrows, Little Gem and Multum in Parvo. If sown at the same time as Ringleader, all these sorts are only a very few days after that variety in coming in for use, and have far larger pods and better flavour. For forcing early in pots, both Little Gem and Multum in Parvo are exceedingly well adapted; and I have had them ready for gathering in the beginning of May in some low pits built on purpose for growing early vegetables. Maclean's Blue Peter is a new dwarf variety, and is likewise said to be very early and prolific for growing in pots. In the second-early section, Maclean's Advancer is a wrinkled Marrow of excellent flavour, and an abundant cropper. Laxton's Fillbasket, Quality, and Maclean's Best of All are likewise very excellent Peas, with a Marrow flavour. For the general crop, G. F. Wilson is also one of the very best new Peas lately sent out, both for flavour and productiveness. Laxton's Superlative is everything described about it as regards its large pods; but they fill very unevenly, and the Peas are not of first-rate flavour; yet it is worthy of growing as a show sort. The old favourites, Veitch's Perfection and Ne Plus Ultra, are standard varieties for late sowing, and will keep the supply up till the frost in autumn cuts them down. Where accommodation can be found for very tall-growing kinds, Williams's

Emperor of the Marrows is a very productive late sort, of the British Queen section. Magnum Bonum, another new tall late kind, is highly recommended as the largest and best flavoured Pea grown; and Laxton's Omega as the very latest that can be grown. To cultivate late Peas successfully on dry soils, they should be sown in drills which have been prepared as for Celery trenches, namely, with plenty of rotten manure dug into the bottom of them, to at least 18 inches deep. The Peas ought to be sown 6 inches lower than the surface of the ground, to allow for earthing them up, and to retain the waterings which must be given them in dry warm autumns, or the mildew will appear, and soon render the crop unproductive.

WILLIAM TILLERY.

HISTORICAL NOTES ON VEGETABLES.

Maize or Indian Corn (*Zea Mays*) now so widely spread over the South of Europe, does not appear to have been introduced from America till nearly a century after the discovery of that Continent, though mentioned as a valuable article of trade in the West Indies by several travellers of the sixteenth century; it is shown to have been still unknown in Spain at the close of that period, and it was not until after the year 1610 that it found its way through Spain and Sicily into Italy. Professor Targioni-Tozzetti satisfactorily shows that all supposed mention of this grain by earlier writers before the discovery of America referred to other kinds of grain, though under some of the names since given to the Maize.

Rice was, in the year 1400, still only known in Italy as an article of import from the East. Its cultivation was introduced into Piedmont and Lombardy in the end of the fifteenth or commencement of the sixteenth century, either directly from India by the Portuguese, or through Spain and Naples by the Spaniards. Some of the varieties now grown in India appear to be but little removed from their wild prototype.

The Sugar-Cane is merely alluded to because its cultivation was attempted in Tuscany in the sixteenth century, but found totally unsuited to the climate. Of Asiatic origin, while the wild type is not uncommon, it was carried to the West Indies, and thence introduced into Sicily in the time of the Saracens. It was also, perhaps, for a short time, cultivated in Calabria, a point which has been much disputed, although of no importance, as no success attended the experiment if made.

Leguminous Plants.—The cultivation of these dates from a period of very remote antiquity, for Professor Targioni finds them mentioned by nearly all the ancient Greek and Latin writers on Georgics, and their origin is difficult to trace.

Haricots or French Beans.—These came from the East Indies, where the kinds are said to be numerous. The species, however, are not nearly so numerous as is generally supposed; thus, the *Phaseolus vulgaris* includes at least eight of the commonly adopted species of modern botanists, the *P. lunatus* four, the *P. Max* or *Mungo* (which is either dwarf or climbing, like the *P. vulgaris*) five or six, the *P. Truxillensis* three or four, *Dolichos* (or rather *Vigna*) *sinensis* four or five, *Lablab vulgaris* at least as many, *Canavalia gladiata* two or three, and so on. This multiplication of species has not been owing entirely to the considering as botanical species what are mere varieties of cultivation, but in several instances it has arisen from the same varieties having been received from Asia, Africa, and America, and separately described without adverting to their common origin.

The Common Bean (*Vicia Faba*) has been vainly sought for in a wild state. The vague indication of supposed habitats in Persia, or on the shores of the Caspian, have not been confirmed by modern researches. May it not, however, had its origin in the *Vicia narbonensis*? a species not uncommon in the Mediterranean region from Spain to the Caucasus, and very much resembling the Bean in every respect, except in the thinness of the pod and the smallness of the seeds.

The Tomato.—This, if ever found wild in the Eastern Archipelago, has only spread from cultivation, for it is now ascertained to be exclusively of Peruvian origin, and was not known in Europe until after the discovery of America. It appears, however, to have preceded the more useful Maize and Potato, for Matthioli mentions its introduction in his days, that is, in the commencement of the sixteenth century. It was first cultivated rather for ornament than for food, which may, perhaps, explain its more rapid introduction.

The Capsicum.—There is great uncertainty as to the real native country of the Capsicum or Hot-pepper (*Capsicum annum*, Peperoni of the Italians, Piment of the French), now so universally spread over all tropical countries. Although long known under the name of Indian Pepper, it appears not to be indigenous in Asia, and

there is no authentic record of its cultivation in Europe before the discovery of America. It is said to be really wild in that Continent, and Cæsalpin and Clusius, late in the sixteenth century, both speak of it as introduced from thence. Yet, in the time of Matthioli, early in the same century, and, consequently, at a period when very few of the natural productions of the New World had been transplanted to the Old, we find, at least, three varieties well-established and abundantly cultivated in Italy, under the name of Indian Pepper, which is hardly probable if it had been really introduced from America, then so recently discovered. A curious instance of the slowness with which the use of culinary vegetables is spread, is afforded by the large green mild variety of Capsicum, which is so much eaten over a great part of Spain and some of the adjoining French departments. It was carried by the Spaniards into Naples during their dominion in the sixteenth and seventeenth centuries, and has ever since remained in common use there, without spreading further. It makes an excellent salad, having all the flavour of the Capsicum without the slightest pungency.

The Sweet Potato or Batata (*Ipomœa Batatas* or *Batatas edulis*).—This is one of those maritime plants which are spread over the shores of both the New and the Old World, within or near the tropics, but its cultivation appears to have originated with the Americans. It was, evidently, unknown to the ancients, and the first mention of it on record, is by Pigafetta, who found it used as an article of food in Brazil, where he landed in 1519. Its first introduction into Europe was, probably, by Oviedo, after whose return to Spain, in 1526, it was cultivated at Malaga, and from thence sent out to different parts of Europe.

Lettuces, Chicory, and Endive, appear all to have been in cultivation ever since the time of the ancient Greeks and Romans, without any record of their first introduction. The numerous varieties of the Lettuce have been referred by modern botanists to three supposed species (*Lactuca sativa*, *L. capitata*, and *L. crispa*), and, as no plants so characterised are now to be found wild in our own quarter of the globe, their origin is vaguely assigned, as usual, to East India. That country may, however, be well ransacked before Cabbage or Cos Lettuces are met with growing wild in the mountains. Their prototypes may be sought for, with much better chance of success, amongst the common wild Lactuces of the Mediterranean region, but can only be determined with any degree of probability by a more correct knowledge of the changes produced by luxuriant cultivation on their foliage than we now possess. The cultivated Chicory is universally acknowledged to be but a slightly altered variety of the wild plant (*Cichorium Intybus*) so common over a great part of Europe; the Endive, on the contrary, is always enumerated as a distinct species (*Cichorium Endivia*) of unknown origin, unless it be "East India." We fear it must share the fate of the Lettuces, be erased from the list of botanical species, and reduced to the rank of a cultivated variety of the Chicory.

Professor Targioni's researches convince him that the **Carrot** and **Parsnip** were both known to, and cultivated by, the ancient Greeks and Romans; but that, until the middle ages, as far as can be traced from the vague descriptions of early writers, the Parsnip was very much more general than the Carrot, although, since then, the proportions have been everywhere reversed. The Carrot, indeed, appears much more susceptible of improvement under the enlightened cultivation of modern days, and the readers of our "Horticultural Transactions" will recollect, in the second volume of the second series, a paper of Vilmorin-Andrieux's, in which he gives an account of the manner in which he succeeded, in the course of a very few years, in converting the thin, wiry, useless white roots of the wild Carrot into a crop of fine, well-shaped, rich-coloured roots, equal to our best garden varieties.

The Finocchio, so highly prized by the Italians, especially in the southern portion of the peninsula, is comparatively a modern vegetable. It has, however, produced several marked races or permanent varieties, amongst which the principal are the *Finocchio forte*, but little removed from the common Wild Fennel, the *Finocchio dolce* or Sweet Fennel, and the *Finocchio di Bologna* or *Finocchione*, with the lower part of the stem (or head) much enlarged and succulent. These three varieties are considered by modern Italian botanists as so many distinct species, the two last stated to be of unknown, but probably of "Grecian or Syrian," origin. But Professor Targioni admits that they are not mentioned by any Greek writers, and that the *Finocchio di Bologna* was a new vegetable brought to Florence from Bologna in the middle of the sixteenth century. They are surely all cultivated varieties or races of the common Fennel, which is truly wild in most parts of Mediterranean Europe.

Beet.—The cultivated Beets are referred by Italian botanists to two species, of which one only, *Beta Cicla*, is admitted to be of native origin, whilst the true *Beta vulgaris* is stated to be indigenous to Central Asia, Egypt, and the shores of the Mediterranean, to the

exclusion of Italy. Moquin-Tandon has, however, more correctly reunited the whole under the Linnean name of *Beta vulgaris*, of which he reduces the numerous forms to three principal races—First, the Wild Beet, with a slender hard root, sparingly introduced into kitchen-gardens for the foliage, occasionally cooked with sorrel to diminish the acidity of the latter. Second, the White Beet, *poirée* or *poirée-carde* of the French, with a thicker, but still hard root, with enlarged leaves, and a great tendency to succulence in the petioles, which are blanched like Cardoons for culinary purposes. This vegetable is frequently mentioned by ancient Greek and Roman writers. Third, the Beet-root, *barbabetola* of Italian gardens, *betterave* of the French, so well known for its sweet and succulent root, was first introduced into Italy in the sixteenth century, from Germany, where it was probably first produced. A sub-variety of the Beet-root, with a somewhat coarser and larger root, now become so important an article in agriculture, was originally put forward under the name of root of scarcity, *racine de disette* in French, or Mangel Wurzel in German.

Spinach (*Spinacia oleracea*) was unknown to the ancient Greeks and Romans, but appears to have been early used by the Arabs, transferred to their gardens from the plains and lower hills of Western Asia, where it is now found wild. The Moors carried it with them into Spain, from whence it gradually spread, in the middle ages, over the rest of Europe. It has now generally replaced the Orache (*Atriplex hortensis*), a plant also of Eastern origin, but of much earlier introduction, as it appears to have been known to the ancient Greeks under the name of *Atraphaxis*, and to the Romans under that of *Atriplex*.

Asparagus (*A. officinalis*), indigenous to Italy, as well as other parts of Europe, is mentioned both by Cato and Pliny as carefully cultivated, and attaining a considerable thickness in their days, and has ever been a favourite vegetable among the Italians, who grow it to great perfection; they likewise eat the thin, almost thread-like shoots of the wild plant.—*Journal of the Royal Horticultural Society.*

The Colorado Potato Beetle.—Mr. Elliott, of St. Martin's, Stamford, has kindly furnished us with a specimen of the destructive beetle known as the Colorado Potato bug, collected in Illinois last year, the possible introduction of which into Europe has lately been the subject of some anxious speculation. According to M. Carrière, the accounts of this insect, which have lately appeared in several journals, have all erred in referring it to the genus *Doryphora*, from which it is sufficiently distinguished by the absence of the peculiar lance-like sub-sternal projection to which the genus *Doryphora* owes its name. The proper name of the Colorado beetle is *Chrysomela decemlineata*. It is a pretty little brownish beetle, scarcely half an inch long, marked on the back of the wing-cases with ten strong longitudinal black lines. In this respect, and also in the absence of the lance-like projection, the specimen which we have received agrees exactly with the figure given by M. Carrière in the last number of the *Revue Horticole*. The *Doryphora*, which is also figured there, is nearly double the size of the *Chrysomela*, and has the wing-cases marked with numerous black dots instead of lines. Its true name is *D. multipunctata*. The confusion of the two insects appears to have been originally made in the American journals, from which the account was copied into our English papers. The *Chrysomela*, then, would seem to be the true Potato bug, of whose ravages we have heard so much; while the *Doryphora* does not specially confine itself to that plant, but also attacks Tomatoes, Egg plants, Winter Cherry, and, in some parts of Illinois and Wisconsin, has even established itself in Cabbage plantations.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Canadian Wonder Bean for Forcing.—We have never been one day without this Bean since last November. It is certainly the best forcer with which I am acquainted. It excels all others in its cropping qualities. It is, in short, first-rate in every respect, the individual Beans being nearly twice the size of those of other kinds—6 to 8 inches long, straight as gun barrels, tender and delicious.—R. GILBERT.

The Best Tomatoes.—Mr. F. R. Elliott, who has had a good deal of experience, gives the *Rural Home* some of his observations on some of the leading varieties of the Tomato. The early Hubbard is very early, but not profitable for market. The early Smooth Red, when genuine, is the earliest that is profitable. The General Grant closely resembles it. Hathaway's Excelsior is the best Tomato for the main or general crop.

Diseased Cucumbers.—I have a house, 54 feet long and 10 feet wide, filled with Rollison's Telegraph and Blue Gown Cucumbers. Of these, the first are just coming into full bearing; but, yesterday, when looking at them, I was surprised to find that gum was oozing from their sides, thereby completely spoiling them. Is there any remedy for this disease, or can any of your readers inform me of anything that will check its progress? Do plants inherit it from their parents that have been attacked, or are they individually liable to be attacked?—A CONSTANT READER.

THE FEVER GUM TREE.

(EUCALYPTUS GLOBULUS.)

THE following account of "the properties and uses" of this tree, is taken from a lecture lately delivered to the Royal Botanic Society, by Professor Bentley:—"The first and most important influence which this tree exerts, and that which has brought it more especially into notice, is its power of destroying the malarious agency which is supposed to cause fever in marshy districts; from which circumstance it has been called 'the fever-destroying tree.' It is in this respect commonly regarded as being serviceable in two ways—first, by the far-spreading roots of this gigantic tree acting like a sponge, as it were, and thus pumping up water and draining the ground; and, secondly, by emitting odorous antiseptic emanations from its leaves. Probably the influence of the latter is but small; although I am by no means of the opinion entertained by some writers, that these emanations are without effect. I do not certainly believe, as has been recently stated, that the branches of a solitary Eucalyptus tree can have had any effect in neutralising the malarious influence of a district previously constantly infected by fever; but I do think that the foliage of groves of Eucalyptus trees, by diffusing an agreeable, aromatic, camphoraceous, stimulating odour in the surrounding air, does have an appreciable influence in neutralising marshy miasmas, and thus improving the healthiness of the district. The great influence is, however, in my opinion, unquestionably produced by the power the roots possess of absorbing water from the soil. It is stated that a Eucalyptus tree absorbs as much as ten times its weight of water from the soil; and hence the enormous suction-power of masses of such trees may in some degree be judged of; so that, where thickly planted in marshy places, 'the sub-soil is drained in a little while as though by extensive piping.' That the main influence of Eucalyptus trees is thus due to the absorptive power of the roots is also borne out by the fact that other plants of rapid growth, when planted in marshy districts, have a sensible effect in diminishing their malarious influence. This is notably the case with the Sun-flower, which is grown for this purpose to a large extent in the swampy regions of the Punjab and other parts of the world; and the effect has been that districts which were previously remarkable for their insalubrity are now said to be entirely free from miasmatic fever. But whatever be the cause or causes which render a marshy district thus comparatively healthy to what it was before the introduction of the Eucalyptus trees into the neighbourhood, the fact is unquestionable, and is now testified to in various parts of the world. Thus at the Cape, in a very few years, the cultivation of the Eucalyptus has completely changed the climatic condition of the unhealthy parts of that colony; and in Algeria, where it has been tried on a large scale in a district previously noted for its pestilential air and consequent prevalence of fever, not a single case now occurs, although the trees are not more than 9 feet high; and in the neighbourhood of Constantia it is also stated that at another noted fever-spot covered with marsh-water both in winter and summer, in five years the whole district was dried up by 14,000 of these trees, and the inhabitants now enjoy excellent health. In Cuba, again, marsh-diseases are fast disappearing from the unhealthy districts where this tree has been introduced. In the Department of the Var it is also said that a station-house situated at one end of a railway viaduct, so pestilential that the officials could not be kept there longer than a year, is now as healthy as any other place on the line, in consequence of the planting of a few Eucalyptus trees. Numerous other instances might be cited to the same effect as having occurred in France, Spain, Italy, Germany, and other parts of the world; and we cannot doubt, therefore, that although the effects have been to some extent probably exaggerated, the statements are substantially correct, and that this tree does possess a most beneficial effect in neutralising and improving the malarious influence of marshy districts, and that attempts should be therefore made to introduce it into those regions where the climatic influences are favourable for its growth and development. Several of the districts into which it has been so introduced have been already noticed and others suggested, so that it is unnecessary to allude further to it here; but we now proceed to allude briefly to the other properties and uses of this tree and of other species of Eucalyptus. In the first place we may state that the timber of many species of Eucalyptus is of very great value, and is largely used throughout the Australian Colonies. The timber of several species is remarkable for its solidity, hardness, and durability, and from its power of resisting the attacks of insects and the teredo, as also the influence of moisture. Such qualities render it valuable for many useful purposes, as, for instance, railway sleepers and maritime works. Among the products obtainable from Eucalyptus wood we must not forget that of potash, more particularly as this alkali can be obtained without sacrifice of any valuable timber, and from localities not accessible to the wood trade. The richness in potash of this wood may be estimated from the fact that Baron von Mueller found that the ashes of these trees

'contained a larger proportion of potash than the Elm or Maple, which are the trees most esteemed for that purpose in America. The yield from the latter trees is estimated at 10 per cent. of the ashes, while that from the Eucalyptus is 21 per cent.' The barks of various species are also now used to some extent in paper-making; those of *E. rostrata*, *E. obliqua*, *E. corymbosa*, and *E. goniocalyx* are amongst those so employed. The barks of many species are also used extensively for tanning. They owe this property to the presence of constituents similar to those contained in Oak bark and other substances commonly employed in this country and elsewhere for a like purpose. A number of species of Eucalyptus also exude a very astringent substance, which, from its resemblance to the ordinary medicinal Kino both in appearance and properties, is commonly designated as Eucalyptus or Botany Bay Kino. This substance, which, when it first exudes, trickles like blood down the bark of the trees in a semi-fluid state, ultimately hardens into dark red shining masses, which have a very astringent taste. It is employed for similar medicinal purposes as our official Kino, and also for tanning and dyeing. Another substance, called Eucalyptus or Australian manna, is also yielded by *E. mannifera*, *E. viminalis*, and, probably, by other species. Two varieties of this manna have been distinguished. It occurs in small, rounded, opaque, whitish masses, with an agreeable sweet taste. It has a similar action to the ordinary manna in use in this country, and contains somewhat similar constituents. It exudes abundantly during the summer months through punctures or wounds made in the leaves and young bark. As it exudes it hardens, and drops from the leaves on to the ground in pieces sometimes as large as an almond. Another important produce of the Eucalypti is the essential oil. This oil is stored up in the pellucid glands already referred to as contained in the leaves, and readily observed when these are held up to the light by the semi-transparent appearance they then exhibit. These oils are prepared on a very large scale at Melbourne, and form an important article of commerce with this country and elsewhere. One manufacturer alone produces about 1,000 lbs. of Eucalyptus oils per month. These oils generally have a somewhat camphoraceous smell; but the odour differs in the various species, and the oil obtained from *E. citriodora* has a pleasant citron-like odour. Some of these oils have been employed, as Eucalyptus oleosa, as a solvent for resins in the preparation of varnishes; but they are of far more value for diluting the more delicate essential oils used in perfumery. The oils of *E. amygdalina*, *E. globulus*, and *E. citriodora*, are thus more especially employed. The oil chiefly consists of a substance called by its discoverer, M. Cloez (who made some interesting researches on the essential oil of *E. globulus*), eucalyptol, a liquid body, in chemical characters resembling camphor. Most of these Eucalyptus oils are of a yellowish colour, although some have a bluish tint; by re-distillation the oil may be obtained nearly colorless. From the quantity of oil contained in the leaves, they yield, when burned, a very large proportion of gas; and it is said that one of the towns in the gold-regions was for a long time lighted by gas extracted from this source. The gas thus obtained is stated to produce a very brilliant flame; and as much as 10,000 cubic feet have been obtained from one ton of leaves. But the expense of collecting these leaves in a country where labour is so costly appears to have been a barrier to its employment, except under exceptional circumstances.

"We have now, in conclusion, to allude very briefly to the medicinal properties of the Eucalyptus globulus. The febrifugal properties of the bark and leaves of this plant have been testified to by many practitioners. Probably some of the exaggerated statements that have been made in reference to the efficacy of Eucalyptus bark and leaves in fevers have arisen under the mistaken idea that the bark contained an alkaloid resembling, if not identical with, quinine, the well-known alkaloid of Cinchona-barks. But the experiments of Mr. Broughton, the government chemist of Ootacamund, entirely disprove this; for upon careful examination of the bark and leaves, Mr. Broughton states that neither quinine nor the other alkaloids of Cinchona-bark exist in the plant in any proportion. What properties the plant possesses would appear, therefore, so far as known at present, to be due essentially to the presence of eucalyptol, already noticed as the principal constituent of Eucalyptus oil. From the testimony of numerous medical practitioners in various parts of the world where the plant has been introduced, and from its popular reputation in fevers in Australia and other countries, we can scarcely doubt that it does possess anti-periodic properties, although these are far less important than those of Cinchona-bark. Cigarettes made of Eucalyptus leaves are reputed to be efficacious in bronchial and asthmatic affections, and in other ways; when, therefore, we regard the beauty of the different species of Eucalyptus, and the proved influence of *E. globulus* in improving the pestilential character of marshy districts, the genus must be regarded as one of the most important to man in the vegetable kingdom."

THE GARDEN.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

MANUFACTORIES MADE PICTURESQUE.

AFTER having visited hundreds of manufactories in the north of England, I can fully corroborate your correspondent's statement (see p. 371) that they are in many cases squalid and unattractive owing to the absence of vegetation. In some cases this is owing to the presence of free acids in the air, more especially in such places as Sheffield, Manchester, Halifax, Leeds, and Bradford, where there are many extensive chemical works engaged in the preparation of dyeing and bleaching material, and near such as these it is useless to plant any kind of vegetation whatever, since even the turf itself has a hard struggle for existence, and is not unfrequently beaten in the attempt. There are many thousands of outlying manufactories, however, around which trees, shrubs, and flowers would grow and flourish with all the luxuriance imaginable, and would not only beautify the exterior of these strongholds of labour, and thus, as has been stated, afford relief to busy workers, wearied at watching the noisy loom or whirling spindle, but modern scientific researches prove that the presence of fresh and vigorous vegetation, aromatic shrubs, and fragrant flowers, would exert a beneficial influence on health by reason of their purifying and deodorising influence. I have but little doubt that, if this subject was brought to the notice of manufacturers, they would adopt some course by which they could carry it out at once; especially as they, as a class, contribute largely towards the furtherance of horticulture, and often possess gardens and collections of choice exotics second to none in the country. In recommending this I should not overlook what has already been done in this direction, and, as a notable example, I may instance the pretty elastic web manufactory belonging to Mr. Turner, at Leicester. This is situated at the western extremity of that quaint old town, near the Bow Bridge on the Soar, over which King Richard III. rode on the morning of the battle of Bosworth, and over which his dead body was brought back at night. The factory itself is a conspicuous building, partly surrounded by a neatly kept lawn planted with choice shrubs, Conifers, and tufts of well-developed Pampas Grass, the latter being specially attractive in autumn. The manager's house, a pretty little Gothic building, which was formerly occupied by the proprietor himself, is nicely draped with climbers; while at the entrance gates is a pretty little lodge surrounded by flowers, and graceful creeping plants and shrubs. A few years ago, one of the finest collections of Orchids in this country was grown close under the walls of this factory; indeed, if I mistake not, the surplus steam from the boilers supplied the heat for it; and, on my first visit to the establishment, I was struck by the vigorous appearance of the plants, although some of them trembled at every revolution of the engines; it is, however, not often that one finds the most beautiful of Orchids so near the whirl and bustle of an extensive manufactory. These Orchids are now removed, but the general features of the place are little altered on that account. Some manufactories I have seen in Derbyshire and Yorkshire are naturally beautiful on account of the charming rocky or woodland scenery by which they are surrounded. Just opposite Shepley Glen, one of the most romantic of Yorkshire dales, are one or two little paper-mills, close by the River Aire. The machinery of these is turned by water-power, and it is hardly possible to conceive anything in the way of manufactory surroundings more picturesque. This was simply Nature's adornment, without the interference of art; but, where that does not exist, one cannot help thinking that workmen would be happier and more contented if their workshops and places of business were made artificially interesting, instead of the bare and, in many cases, repulsive places they too often are. I have seen ordinary artisans' shops made beautiful with Ivy and *Convolvulus*, and a village blacksmith's garden the best in the parish; while even the signalmen on our railways spend part of their leisure time in growing pot-plants, or hardy flowers. It is pleasant to

see working men bring the fresh sweetness of flowers near their dwellings, so as to make them a part of their every-day existence; and, happily, this taste is rapidly extending amongst all classes of society, both in town and country.

F. W. BURBIDGE.

FERNS FOR THE MARKET.

OF all Ferns cultivated for market purposes, the best is the common Maiden-hair, *Adiantum cuneatum*, which is of moderate growth, stands well in room windows, and is the best of all Ferns for bouquet and button-hole work, or for mixing with every description of cut flowers. Its pretty fronds excite more attention than those of any other variety, and, taking it altogether, it is a Fern with which it is scarcely possible to overstock the market. For these past few years, however, *Adiantum concinnum latum* has been held in considerable estimation in the market, and this has been so far fortunate for growers, as this kind can be raised to any extent by means of spores, the produce of which, in twelve months, may be grown into large and handsome specimens, well furnished with rosy-tinted young fronds. This variety of Fern is, however, too tender for general market work; it will not stand draughts nor any hardship, and the fronds, when cut, last but a very short time. For these reasons its market value has somewhat decreased. Of this sort thousands were grown two or three years ago by Mr. Herbst, of Richmond, but now he has scarcely a plant of it on his premises, simply because they have fallen in public estimation. *Adiantum decorum* still maintains a prominent position in the market; it is a fast grower and a pretty variety, not very unlike *A. cuneatum*. With some, *A. hispidulum* is a favourite, as are also *A. formosum*, and the strong-growing broad-leaved kinds, such as *A. trapeziforme*, *macrophyllum*, and *Catherinæ*; in fact, most of the Maiden-hairs, if grown into nice little specimens soon command purchasers, but many of them are too expensive and slow-growing to be remunerative. Next in demand to the Maiden-hairs are the different kinds of *Pteris*, of which *serrulata* and *tremula*, and their varieties, are most in request. The common *Pteris serrulata* is a graceful little Fern, but it takes a year or fifteen months to get a nice saleable specimen of it. It does not, however, require much pot room, and not only are plants of it useful in themselves, but the fronds stand well when cut, a property which constitutes one of its greatest advantages. Of this species there is a variety in cultivation under the name of *P. s. major*, which is one of the most graceful of Ferns when grown in pots. Its fronds are, sometimes, 3 feet in length, branched and beautifully arched, and a well-grown plant of it forms a grand object either for hall or table decoration. Of this sort it is impossible to get a sufficient stock, for the demand for it always exceeds the supply. It is somewhat difficult to increase; hence its scarcity. It produces an abundance of fertile fronds, but the spores never germinate with any kind of certainty; therefore, the only way in which it can be increased with satisfaction is by division, which is a slow process, especially for market purposes. Some cultivators have succeeded in getting a crested form of this Fern, quite as free-growing as the original, and, therefore, a better market plant. *Pteris umbrosa* is another good market Fern, and one much sought after on account of its ability to stand, uninjured, in heated rooms for a considerable length of time, and its robust deep green fronds clearly indicate this fact. It may be readily increased by means of spores. But of all Ferns propagated in that way, *Pteris tremula* stands, perhaps, in the foremost rank, and it is a variety which is, likewise, highly esteemed in the market. Under good cultivation, it makes excellent saleable plants at the end of twelve months, starting with the seedling stage; but it is frequently grown for six months longer. It is of little value for affording fronds for cutting, but it makes a very desirable pot plant. *Dicksonia antarctica* makes a fine market Fern, when in a young state; for this purpose, after the spores germinate, they should be pricked off into little clumps, and, as soon as a few small fronds have been formed, they should be potted off, placing two or three plants, without separation, in each pot. By this means nice bushy and effective specimens are obtained fit for sale.

NOTES OF THE WEEK.

— THE Rhododendrons in the conservatory at Enville have been very fine during the past spring. *R. Nuttallii* has borne flowers fully 7 inches across, and other varieties, such as *R. javanicum*, *R. Gibsoni*, and *R. Edgeworthii* have been remarkably floriferous. Few plants are more attractive in spring in cool conservatories than these Rhododendrons when well grown.

— ON Monday afternoon Weston Park, the first public recreation ground secured for Sheffield, was opened with some ceremony. The park was the property of Miss Harrison, and on her decease was purchased by the town for £15,000. The residence is being converted into a museum.

— AT the Hale Farm Nurseries, Tottenham, may now be seen in flower, the Yellow Pæony (*P. Wittemanniana*), the singular-looking *Iris Iberica*, and the delicate and showy *Iberis jucunda*, also a clump of *Gentiana verna*, with at least fifty fully expanded blossoms, *Pulmonaria daurica*, the curious *P. maritima*, *Rubus arcticus*, *Eritrichium nanum*, and *Erythronium giganteum*. Among *Primulaceæ* may be mentioned the six varieties of *Primula cortasoides amœna*, called, sometimes, *P. Veitchii*.

— ON Thursday next, the 14th inst., Mr. W. Bull intends offering part of his collection of Orchids for sale at Stevens's. The collection comprises some of the rarest species of *Cattleya*, *Vanda*, *Odontoglossum*, and *Phalenopsis*, including the hitherto rare and valuable *P. Lobbii*, besides other novelties, the plants being fully established, and in a state of perfect health and vigour. One of the lots will consist of the finest plant of *Masdevallia Lindeni* in cultivation; quite recently it bore eleven fine flowers, seven of which were fully expanded at the time.

— THE new arboretum at Walsall was opened the other day, the formal ceremony being performed by Lady Hatherton in the presence of several thousands of the inhabitants. The greater part of the site is the property of Lord Hatherton, who has contributed £500 towards the cost of the undertaking. The area of the arboretum is 18 acres, of which $7\frac{1}{2}$ acres are covered by ornamental waters. The grounds have been laid out with taste, and the whole enterprise will be a valuable acquisition to the inhabitants of the Black Country.

— THE glorious uncertainty and irregularity of our climate could scarcely be better illustrated than by the character of the weather during the last three weeks. On several occasions during last week the thermometer registered 5° of frost; fortunately everything was dry, and, therefore, little real damage was done. Of course, 5° of frost is nothing unusual in May, but, coming after the preceding hot weather, which had brought everything forward with a rush, its effect would have been disastrous, had not dry weather prevailed. There are, at present, prospects of a very good fruit crop.

— A MEMBER of the Pharmaceutical Society was preparing a lecture on edible and noxious Fungi, when he accidentally swallowed a quantity of spores of a large species of Puff-ball (*Lycoperdon giganteum*), and, within the space of an hour-and-a-half, was seized with severe illness, the most violent symptoms of which could not be subdued until nine days after the first attack. "So much," observed the sufferer, writing of his illness, "for eating 'a devil's snuff-box.'" The Giant Puff-ball, we need scarcely say, is edible in a young state, but its matured spores ought certainly to be avoided.

— THE collection of Economic Entomology at Bethnal Green has recently received an interesting addition in the shape of a few cases of exotic galls, some from the Himalayas, originally collected, we believe, by Dr. Hooker; and some from Utah, collected by Mr. Andrew Murray during his late visit to that country. Some of these are very curious, inasmuch as they show the extraordinary forms that vegetation assumes under the irritation of gall insects, and those belonging to the Oaks are interesting from their relation to the Oak-galls of our own country. The galls upon our native Oaks (possibly upon all Oaks) are produced by various species of a family of hymenopterous insects named Cynips, a black or brownish four-winged fly, and which have received various specific names, derived from the part of the Oak to which they are confined, or from some peculiarity in the form or appearance of the gall itself. They occur upon the leaf in various forms, on the leaf-stalk in various forms, on the flower-stalk, on the flower, on the acorn, on the buds, on the twigs, on the roots, and are all so like each other, differing chiefly in size and degree of colour and markings, that it is almost impossible for anyone to dispute the Darwinian origin of the whole from a common ancestor, whose descendants have been modified by their special predilection for, and adhesion to, some particular part of the plant. The species of gall which we have figured in another page of to-day's paper is produced by *Cynips lignicola*, or,

as it is sometimes called, *C. Quercus petioli*, and is generally known as the "marble gall," from its being of the size and shape of a boy's marble.

— A FERNERY has been purchased from Mr. Sam. Mendel, and offered to the Peel Park Committee of the Salford Corporation as a nucleus of a winter garden.

— MR. J. H. LEWIS, of Liverpool, proposes to issue twenty sets of British Rubi, if names of subscribers are to hand by June 1. Each set will contain examples of twenty forms. Each example will show two flowering-shoots—in flower and in fruit—and two pieces of barren shoot—young and old. In gathering, avoidance will be given to hedgerow-clipped plants, and preference shown, in this fasciculus, to those that exhibit characters corresponding to Professor Babington's species and varieties, as described in "British Rubi," 1869. If encouragement be given to this fasciculus, others will be issued having more regard to intermediate and dubious forms. The price will be £1 per set.

— AT a recent meeting of fruit-growers in Melbourne, Australia, the sparrow difficulty was the principal, although not the ostensible, subject of discussion. To such dimensions have the losses of stone and small fruits attained that the growers feel themselves face to face with the most serious obstacle they have ever had to encounter. By the introduction of the English sparrow the balance of Nature has been completely upset; the native birds which used to visit the gardens at certain seasons—many of them insect destroyers—have been driven away by the pugnacious strangers, to whose rapacity fruits, grain, and seeds are alike sacrificed.

— MR. BRIGGS, of Yuba City, California, has a solid block of fruit trees covering 210 acres. The soil is a light sandy loam, and is constantly cultivated with ploughs through the whole season. A correspondent of the *Marysville Appeal* writes, that it contains 8,000 Peach trees of sixteen varieties (4,000 being of one variety, the Red May); 3,000 Apricot trees of twelve varieties; 4,000 Cherry trees of twelve varieties; 7,000 Plum trees of fifteen sorts; 2,000 Apple trees of only eight varieties; 1,000 Pear trees, mostly Bartletts; 1,500 "Cherry Plum" (*P. myrobalana*) trees, and 150 June (Jaune Hâtive) Plum trees. There are also 1,500 Walnut trees (*Juglans regia*) of three sorts. The cost of the land was about 17,000 dollars (£3,400); total cost for orchards, land and all, is less than 30,000 dollars (£6,000), and the estimated value is 50,000 dollars (£10,000).

— THE following are a few of the prices realised at Mr. Micholls's sale, to which allusion was briefly made in last week's number of THE GARDEN (see p. 366):—*Azalea Stella* (5 ft. by 4 ft.), £10 10s.; *A. Chelsoni* (5 ft. 2 in. by $4\frac{1}{2}$ ft.), £11; *Erica Cavendishii* (4 ft. by 4 ft.), £9; *E. Shanonii* (4 ft. by 3 ft.), £9 10s.; *Aphelaxis macrantha purpurea* (5 ft. by 3 ft.), £11 11s.; *Phenocoma Barnesii* (5 ft. by 3 ft.), £12 12s.; *Hedera tulipiferum* ($4\frac{1}{2}$ ft. by 4 ft.), £16; *Dasylirois acrotrichum*, £12 12s.; *Gleichenia rupestris* (7 ft. by 5 ft.), £19 19s.; *Nepenthes Hookeri*, £26 5s.; *N. sanguinea*, £14 3s. 6d.; *Cocos Weddelliana* (8 ft. by 7 ft.), £29; *Anthurium Scherzerianum*, "one of the original plants, and the finest specimen, with the highest-coloured flowers in existence," £66. The total sum realised for 639 lots amounted to £1,614 17s.

— THE number of the *Florist* for May contains an excellent coloured illustration of a new hybrid perpetual Rose, raised by Mr. William Paul, and named by him Peach Blossom, the tint being that of a delicate peach-blossom, a colour hitherto unknown amongst hybrid Perpetual Roses. The same number also contains figures of two new dessert Gooseberries, one of which, named Catherine, is a hairy yellow of great size (nearly an inch-and-three-quarters in diameter), and is said to be of good flavour. The other, Benson's Seedling, is a hairy red of tolerably large size, and said to be of exceedingly good quality. It has been awarded a first-class certificate by the Royal Horticultural Society, and is described as a chance seedling, originally taken from a hedge in the neighbourhood of Peterborough.

— IN reference to Mr. Darwin's note on the destruction of Primroses by birds, apparently for the purpose of obtaining the nectar, *Nature* published the other day letters on the subject from various parts of England. At Plymouth, birds are in the habit of thus cutting the flowers of the *Polyanthus* and *Primrose*, and in Hampshire the same flowers are attacked by blackbirds, it seems. Dr. Gladstone notices that both *Primroses* and *Crocuses* are thus bitten off by sparrows in London gardens, and others remark the habitual destruction of the *Crocus* in the neighbourhood of Hamersmith by the same birds. On the other hand, persons writing from Hertford and Torquay have examined large beds of *Primroses* which have not been attacked in this manner. It has been suggested, with some probability, that the birds may be in search of small insects which infest the flowers, and this should apply more forcibly in the case of the *Crocus*, the nectar-bearing portion of the flower of which is almost buried in the earth.

THE FLOWER GARDEN.

A CYCLAMEN NOOK.

THIS elegant and exotic-looking flower is seldom made to play the conspicuous part it ought to do among the earliest of the spring flowers of the open garden. The Persian species, *C. persicum*, found also in the Greek islands, has become a great favourite among our early-blooming greenhouse plants, and it well deserves the prominence to which it has been promoted. The extreme elegance of its flower-forms, its graceful growth, and the many exquisite varieties which have recently been obtained by careful culture, have secured for it a leading place among the most popular flowers of the day. But its pretty congeners, *C. coïm*, *C. europæum*, and their varieties, have not as yet received the same amount of attention as flowers of the

display of rich rosy-tinted flowers, among snow and icicles, could consist of a fair sisterhood of Cyclamens. I had known these prettiest of wild flowers in sheltered nooks among the rocks of the Alps, and nestled between the tufts of April turf in the Roman Campagna, and the green slopes of the Villa Borghese; but it required a few moments' reflection to realise the fact that those pretty porcelain-like creations, whose acquaintance I had first made in Italy, were actually the flowers then seen braving the frosts and snows of ungenial Britain, before the end of January; nevertheless it was so, and they seemed to enjoy their defiance of the northern climate.

The same Cyclamen nook has, however, been seen to far greater advantage in the present season; the winter had been so mild that the Mosses and tender herbage amongst which they grow had already formed a soft green carpeting for them to spread their finely marked leaves upon, and make a rich



A Cyclamen Nook at Heatherbank, Weybridge.

open garden, though they are nearly as beautiful and perfectly hardy; the latter, indeed, being probably a native British plant, or, at all events, occasionally found in a wild state at the present day, in many favourable spots throughout the country, though possibly introduced from the Continent at some remote period.

In the earliest days of the spring of 1873 (indeed, towards the end of January of that year), I saw, for the first time, in a nook prepared for them at Weybridge, a large patch of hardy Cyclamens, of several varieties, flowering as freely as Snowdrops in the midst of frost and snow. Their delicate blossoms were of various colours; some white, tipped with carmine; some crimson, tipped with deepest purple-red; and some of a rich blush tone, deepening at the point to glowing crimson. For a moment, one could scarcely believe that this

dark background of many-tinted brown, green, and orange tones, well calculated to set off and contrast with the roseate colouring of the flowers. Great care was taken to prepare the nook, in the first instance, in a situation well fitted for the purpose; with an aspect which the flowers delight in, and the kinds of soil most favourable to their growth. As will be seen by the illustration, the place especially selected for the purpose is partially covered by a canopy of Laurel, in the soft shadow of which flowers of the white variety, tipped with carmine, positively glisten like gems. In the front, to complete the desired degree of shelter, some large masses of rock have been placed, among which seeds have scattered themselves, from which some of the finest plants have sprung. The prevailing tones of the flowers of *C. coïm* are shades of full pearly blush, tipped with crimson. The variety known as *C. verum*

has flowers of delicate crimson, tipped with deepest carmine. This is the kind most commonly found in Italy, the foliage of which, though small, is very beautifully veined and marked. *C. ibericum*, a Spanish kind, might almost be considered a distinct species, the flowers being deep crimson, and the foliage of a dark green, almost without maculation. *C. coïum album*, the white variety, with its crimson tip, is, perhaps, the most attractive of all as to the flowers, but the foliage, like that of *C. ibericum*, is without variegation. The variety with the largest flowers, and tallest flower-stalks, is undoubtedly *C. Atkinsii*, a hybrid obtained from *C. album* and *C. persicum*. Although one of the parents (*persicum*) is too tender to bear our winters in the open air, the descendant is perfectly hardy, and its brilliant white and crimson flowers figure conspicuously in the accompanying illustration on the right side of the little picture, in the deep shadow cast by the massive foliage of a protecting Laurel.

This "Cyclamen nook" has been quite the pet of the whole surrounding neighbourhood. Friends stopped each other, defying wintry winds, to ask about its progress—were the Cyclamens in bud? were they in flower? were they at their best? how did they bear the nipping of the cold east blasts? These, and a score of other questions were anxiously asked. "The nook" was a novelty most keenly appreciated; those red-stemmed sturdy little beauties, recklessly coming into full bloom almost as early as the Snowdrops, and long before the Crocuses, enlisted the sympathies of every garden lover for miles round; and preparations will be rife next autumn in many a garden thereabouts to prepare rival "nooks;" questions without end having already been asked, and as freely answered, as to how to plant? the best soil for the purpose? and the best aspect? Many flower-lovers, who are not botanists, will be glad to know that they may have an autumnal as well as a spring nook of Cyclamens; the *C. hederæfolium* being a September-flowering kind. This plant—the Ivy-leaved, as its name implies—is a native of the mountains of the Austrian Tyrol, and many varieties will doubtless be obtained from it if there should be a demand for autumnal-flowering kinds. It is a very handsome plant, the leaves being more finely shaped, and also more beautifully marked, than those of any other species. The pretty-sounding name, Cyclamen, is formed of the Greek word *κύκλος* (cyclos), a circle, in allusion to the numerous circular coils of the fruit-stalk. When the flowers fade, the pedicels twist up like a screw, enclosing the germen in the centre, and, lying close to the ground among the leaves, remain in that position till the seeds ripen.

H. N. H.

BEDDING PLANTS.

WITH an outdoor temperature equal to that of an ice-house at night, and somewhat like a Turkish bath in the day-time, I envy not the cultivator who has the care of a large collection of bedding plants in small pots. The mere labour of watering in such weather is very great. The plants would do far better, and not require a fourth of the labour, if they were turned out of the pots into some structure of a temporary character, where the necessary protection could be easily applied. Of course, although we are now getting fine weather in the daytime, which is pushing forward vegetation to some extent, it is too soon yet to think of bedding-out; for the chances are that the early part of this month will continue to be cold, and the nights frosty. There are various ways of providing cheap temporary places for saving labour in the management of bedding plants; and, in fact, almost anything is better than keeping them baking in small pots. In some places this accommodation is provided by opening trenches 4 or 5 feet wide where the ground is vacant in the vegetable quarters. I, however, object, for various reasons, to thus using ground intended hereafter for vegetables, because, in the first place, the ground in the immediate neighbourhood gets trampled so much as to render it unfit for cropping for some time; secondly, I am in favour of a hard surface for standing the plants on when turned out of the pots, with just sufficient soil placed firmly between and over the balls to induce them to make a host of fibrous roots,

but not deep enough to encourage too much growth; and thirdly, it is always desirable to economise labour by placing those extemporised nurseries as near the water supply as possible. Having, therefore, selected a suitable spot in a sheltered position, the next consideration is the arrangement of the surface into handy-sized beds to facilitate the necessary watering and covering. The former will be reduced to a minimum, but the coverings will probably require to be placed on every evening. In nearly all gardens there is, or ought to be, a number of stout boards or planks for the convenience of carrying out any necessary alterations in winter cleanly and expeditiously; and with those, and some short stakes driven in alternately on each side to keep the planks firmly on the edge in the required position, a number of temporary wooden frames will be formed in a very short time. Stout laths or Holly-hock stakes may be laid across, at intervals of 3 feet, to support the mats or other protecting materials used, and a nail may be driven through the ends to keep them in their proper places. About 6 feet is a very convenient width for watering or covering. I have sometimes, when short of planks, used bundles of Pea stakes laid end to end for forming the outside of temporary bedding-plant protectors, and, with an extra band round them to keep the sprays close together, they form no bad substitute for planks. However, anyone with a little ingenuity will always discover something near at hand suitable for the purpose. I may say also that much may be done to facilitate arrangements of this kind in winter, when there is not so much pressure upon any department. Assuming that the surface of the ground is level and perfectly hard, about 4 inches of soil may be placed in the frame, and the plants at once planted out almost closely together, and the soil packed in firmly round the balls. Tricolor, Bicolor, and all other Geraniums that are grown in pots for bedding, may be turned out, and the pots used again for potting off Coleus, Iresines, Fuchsias, &c. In this way our pots do duty sometimes two or three times during the spring. Verbenas, Petunias, Ageratums, Perillas, &c., are better pricked off into boxes, and the growth duly pinched in to keep them sturdy and dwarf. When the planting season arrives, the plants may easily be lifted and the balls divided without any serious check being felt. In fact, this turning out into a cool open air structure a month or so before finally planting out is a decided advantage, even to the plants, without taking into consideration the important saving of labour.

E. HOBDAV.

THE WALLFLOWER.

IS not this valuable spring-blooming plant worthy of much wider cultivation, and a more careful degree of selection, than it at present receives? I regard the Wallflower as the most pleasing of all hardy early-blooming biennials, as, in addition to rich hues of colour, it also possesses the most delightful of perfumes. I have seen the single Blood Red growing by the acre in market-gardens about here; but, as the flowers are cut as fast as they are ready for bunching, the effect of a grand mass of rich colour is never seen. How is it that our fine London Market variety is so little met with in country districts? I often ask myself the question; but the reason is clear and simple. No spring flower is so eagerly sought after by bees; and, as they continually flit hither and thither from plant to plant, and from garden to garden, it is obvious that they must be continually fertilising the flowers of one plant with the pollen of others of a different hue of colour, and, under these circumstances, it would be impossible to maintain pure a strain of the Wallflower, let the colour be ever so good. At least, it could not be maintained so by seed, but it might be done by the propagation of anything specially good by cuttings. There is but one other resource for the amateur or gardener who wishes to annually possess pure strains of the Wallflower, and that is, to purchase seed from some reliable source, where one colour only is grown, except at remote distances from any other. I have, of late, become so conscious of the great beauty and fine quality of some of our single kinds, that I have this spring made a selection of certain forms and colours for naming, and to be propagated by cuttings, so that their fine features may be truthfully maintained. Thus, of these, I have selected six as

possessing notable merits. Warrior has a fine pip of good form and substance, well expanded, and in colour intense rich crimson. It grows to an average height of 18 inches when the plants are strong, and is most effective when in full bloom. Giant Red partakes somewhat of the robust habit of growth peculiar to the strain known as Young's Blood Red, but has a more compact growth, and is about 14 inches in height; the pip is of great size and substance, and fully expands without curling; the colour is bright crimson-red, and the variety is one of the finest I have ever seen. The Dwarf, compact red, presents a form that must become most valuable for spring bedding purposes, its height being about 9 inches, whilst it also possesses a close branching habit. It blooms early and freely, and is also of a deep crimson-red hue of colour; it will make a capital companion variety to the Belvoir Castle Yellow. We have at times obtained from the Continent novel coloured strains of the Wallflower, but they are remarkable for their straggling habit of growth and looseness of the flowers. Of these I have made a selection of a variety that has purplish plum-coloured flowers of fair quality, and the habit of the plant is better than that of Wallflowers generally, being about 15 inches in height, and even more. I call this kind Plumripe. Good yellow Wallflowers, when pure in colour, and of an even habit of growth, make very effective spring beds. This is especially the case with a good strain of the Belvoir Castle Yellow, a variety that has several synonyms, but its large use by Mr. Ingram, at Belvoir, ere it was commonly known elsewhere, justifies the general use of the designation I have given it. Its merits are a very dwarf compact branching habit; early blooming; colour, pure orange-yellow, and a most effective bedder. For a fine border kind, however, I must give the palm to Cloth of Gold, a clear golden-yellow flower, large, flat, and rounded, and very handsome. It grows to a height of 16 inches, and blooms for a long period. The latest novelty in single Wallflowers is a variegated kind, the leaves being edged and flaked with yellow, and the flowers striped yellow and crimson. It is quite hardy, and will make a pretty pot plant for a cool house. Seed of the single Wallflower should be sown in the three first months of the year to secure strong plants, and an early bloom for the next spring. Our market-gardeners sow their seed usually on a fine day in January, and are oftentimes enabled to cut flowers at the ensuing Christmas. Of the double kind little is now seen except the yellow, which is common, and makes a very attractive border plant. It is a great favourite with cottagers, as plants, if carefully looked after, will continue to grow and flower for several years. There is also sometimes to be met with a fine double chocolate-brown kind that is equally early and vigorous, but the least known and most richly coloured of all is the deep crimson, a fine and distinct variety. It is in all respects, except colour, an exact duplicate of the yellow, but I have not seen it for many years. These double kinds are easily propagated by cuttings taken off after the plant has flowered, as the young shoots are then firm and able to resist damp. A shady place, sharp sandy soil, and a handlight are all the remaining requisites to ensure a good stock of plants. I have seen the exhibits in the class for six double Wallflowers, staged at the spring show at South Kensington, for several years past, but the yellow kind only has been staged. If the class is to be continued, I hope to see more variety in future.

A. D.

STOCKS.

ONE of the most common, and, at the same time, one of the sweetest of garden flowers, is the Ten-week Stock, popularly known under the homely name of Gilliflower—a summer-blooming plant as indispensable to our gardens as the Rose. It is said to have come to us from the shores of the Mediterranean; and if the original form, as introduced, could now be compared with the finest types in cultivation, we should be much surprised at the extent of improvement which has been effected in it. As in the case of the Aster, German cultivators have done much in the way of developing finer characteristics than occur in the original species, and hence it has come to be known as the German Ten-week Stock. This Stock is that which is most generally cultivated for summer-bloom-

ing, and it is the invariable rule to import its seeds from Germany, where they are saved from plants carefully cultivated in pots; therefore, as a general rule, sixty to seventy per cent. of the plants produce double flowers. In some cases, however, the chances of double flowers are very precarious. It is said that such seed plants as have more than the usual number of petals, that is, six or seven instead of four, generally produce double flowers when the seed is again sown. This may be true; but it is no less certain that four-petalled flowers will also produce a large percentage of double blossoms. Still, it would always be well for the cultivator who may be bent on improving a particular kind of Stock to mark plants showing a redundancy of petals, and sow the seed separately with the view of testing the truth of the theory. It is by no means generally known that double Stocks do not produce seed, and that it is obtained only from single flowers, a fact also true with respect to the Chinese Primrose. In a perfectly double Stock there are no such things as stamens or anthers, consequently no pollen, but all flowers on single plants that have five, six, or seven petals, will furnish seeds that produce eighty per cent. of double flowers. The finest strain of this Stock is that known as the large-flowering Pyramidal Ten-week. I have seen magnificent varieties of this come from imported seed—large vigorous-growing plants, branching freely, and producing a huge main spike of double flowers, with numerous branching spikes in succession. Where cut flowers are in request, a bed of these Stocks should be grown to assist in supplying them during the summer. The seed may be sown at any time from the middle of March onward; but it is always well to get Stocks from the seed early, so that plants may be ready for bedding. The seed can be sown thinly in pans or shallow boxes, in a gentle heat, and, as soon as the plants can be handled without injury, they should be transplanted into other pans or boxes, and grown on quickly, at the same time taking care not to draw them so as to make them weak and lanky. There are many places in gardens where a bed or line of Stocks might be grown with advantage; only give them a good rich soil to grow in, and they will amply reward the cultivator. The German growers have a formidable list of kinds, many of which are more curious than showy. There are, however, sure to be sufficient leading colours among them, such as crimson, rose, purple, violet, and white, to yield distinct and pleasing hues. There is a strain of English selected Stocks known as Pyramidal, which are of tall growth, and remarkable for the large pyramids of fine flowers which they produce; but they are by no means so generally cultivated as they deserve to be. There is a very distinct type of Stocks known as Wallflower-leaved, which were introduced many years ago from the Grecian Archipelago, and which have shining deep-green leaves, not unlike those of a Wallflower. In all other respects the Wallflower-leaved type is like the ordinary German Stock. One of the finest varieties of this type, and at the same time one of the most beautiful Stocks in cultivation, bears the name of Mauve Beauty, a kind remarkable for its huge compact heads of pale lustrous mauve-coloured flowers. The same treatment as that recommended for the Ten-week Stock will answer for this type of Stock.

The Intermediate Stock, as it is termed, though only a later-flowering selection from or variety of the German Ten-week, may be set down as a distinct type. It is used for pot-culture, to flower in early spring, the seed being sown in July and August. In growth it is dwarf and bushy, and, being very free-blooming, it is well adapted for cultivation in pots. As striking colours are best adapted for this purpose, the varieties may be said to be confined to scarlet, purple, and white. There is a fine strain of this type grown in Scotland, under the name of the East Lothian Intermediate Stock, where it is much used for beds and borders, the cool moist climate of that country appearing to suit it exactly. Instead of sowing Intermediate Stocks at the end of the summer, they should be sown about the end of March in a cold frame, and in May they should be transplanted to the open ground, in which they will flower freely through August, September, and October. In November the double flowers should be all lifted and potted, as it is unsafe to expose them to the risk of wintering in the open ground, and they continue to bloom more or less during the winter in a cold frame or cool house. They should be again

planted out in March, when they will make fresh growth and flower all the summer. The single varieties are also lifted in November, and either potted or planted by the side of a south wall, where they are wintered, and flower and ripen their seed the following summer. They too require a rich light soil, in which they root freely.

There are yet the Brompton Stock and the Queen Stock. The latter differs from the ordinary annual Ten-week Stock in being somewhat shrubby, of larger size, and of perennial duration. The principal varieties are the purple, scarlet, and white—the former being most generally grown. It is a great favourite in cottage gardens round London; and, at this time of the year, dense bushes of it may be met with—a mass of fine double purple blossoms. By some the Brompton Stock is thought to be only a variety of the Queen Stock; and certainly there are many points of resemblance between them, though the latter has a stronger, taller, and less branched growth. There are the crimson, white, and purple varieties. In some country districts, there is a fine form of the crimson or scarlet to be met with in cottage gardens, with long stems of great size and remarkably full double flowers; and there is also a very fine form of the white Brompton in cultivation. The seed should be sown in April and May, either in a gentle heat or on a warm border in the open air; the plants should be pricked out into beds and grown on during the summer, and in August and September planted out where they are to flower. They frequently suffer during the winter from hard weather; and, it is not a little remarkable, that these biennial Stocks appear to have suffered more during the past dry winter than they did during the very wet winter of 1872-73. An old authority states that the true Queen Stock is rough on the under part of the leaf, and woolly. The Brompton Stock has leaves that are smooth on both sides. The seed of the white Brompton Stock is of a pale brown colour; that of the white Queen of quite a dark tint. A great deal of confusion is caused by one being frequently sold for the other. Quo.

NEW VARIETIES OF CHRISTMAS ROSE.

(HELLEBORUS.)

The following remarks on this subject, by M. E. Rodigas, appear in the last number of the *Bulletin d'Arboriculture*:—Among those varieties of Helleborus which are considered to be true species, several possess a really ornamental character, and deserve to be better known. Such are *H. niger*, with its large-flowered variety, *H. n. maximus*; *H. purpureus*, which has flowers of a fine velvety purple; and especially *H. abchasicus* A. Br. (mentioned in Booth's catalogue of 1851, and two years later in the seed catalogue of the Botanic Garden at Berlin), and *H. olympicus* Bot. Reg., the flowers of which are larger and more rosy, and which is, probably, only a more perfect form of *H. atrorubens* Wald. The discovery of the last-named species dates back to 1822. It is a native of Hungary, while *H. abchasicus* was first found, fifteen years since, on the slopes of the Caucasus facing the Black Sea. Seeing these plants in flower, side by side, we have often doubted their specific difference, and a personal experience of them fully confirms this view. In fact, repeated sowings which we have made of seeds of *H. abchasicus* fertilised with *H. olympicus*, and *vice versa*, have produced forms possessing, in turns, all the characteristics of several species admitted by authors, so that *H. abchasicus*, A. Br., *H. atrorubens* Wald., *H. purpurascens* Wald., and *H. olympicus* Bot. Reg., might well be reduced to a single type, of which (following the recognised laws of priority in botanical nomenclature) the name should properly be *H. atrorubens* Wald. Whatever opinion may be formed of this scientific question, at which we merely glance here, the plants possess a twofold value for gardens on account of their early flowering and their handsome foliage. Not only do their flowers withstand all the rigours of wintry frost and snow, but the verdure and vigorous growth of their leaves distinguish these plants throughout the whole year. In the course of the sowings to which we have made allusion, M. le Dr. Rodigas has obtained, in his gardens at Saint Trond, several varieties, which add to the other good qualities of the type the additional merit of new tints of colour in the flowers

Of these varieties the following are among the most remarkable:—

H. ABCHASICUS VAR. *FLORE ROSEO* (Rod.), distinguished by a rosy tint, which, in fine lines or streaks, suffuses the pale ground of the flower.

H. A. VAR. *FL. PURPUREO-LEVIGATO* (Rod.), remarkable for the round form and reddish-purple colour of its flowers.

H. A. VAR. *FL. ALBO* (Rod.) is, perhaps, the most remarkable of these varieties, its pure white flowers, slightly tinted on the margin with rose, presenting a marked contrast to the flowers of the other kinds.

H. A. VAR. *FL. PURPUREO* (Rod.), in its foliage and the colour of its flowers, resembles *H. purpurascens*, Wald., although it is certainly a seedling from *H. abchasicus*. Its flowers are not so large as those of the parent, but they are perfect in form, and their purplish tint is very striking.

H. A. VAR. *FL. LUTEOLO* (Rod.).—This variety is remarkable both for the large size of its flowers, and for the yellowish tinge which suffuses their green ground-colour.

All these varieties are well adapted for the embellishment of the flower garden, and, if re-potted in autumn, may be kept a long while in bloom as window plants. Their culture is exceedingly simple. Ordinary garden-soil, half-sandy and half-clay, provided it be not too poor, suits them admirably. In dry and very sandy soil, they should receive occasional waterings during the summer, or there is a risk of their not blooming well in the following spring. The plants are multiplied by division of the stools in spring or autumn.

Peculiar Sport from Pelargonium Mrs. Pollock.—I have sent you a truss of bloom cut from a green sport of Mrs. Pollock, in which you will find a considerable amount of the Nosegay element. The colour too, is different from that of Mrs. Pollock. Have you seen anything like it?—J. MITCHELL. [On submitting this to Mr. Peter Grieve, he favoured us with the following reply:—"I should hardly have thought it possible that a sport from Mrs. Pollock could have produced the truss of bloom you have sent me, as the flowers are not of the same colour as the blooms of that variety. I have always found that the blooms of green sports from variegated varieties retained the same shade of colour as that of the plants from which they had sported, although, generally, of increased vigour. Moreover, neither of the parents of Mrs. Pollock were of the Nosegay section. The family of the modern Zonal Pelargonium is, however, somewhat analogous to the great Anglo-Saxon race, viz., composed of various elements; and, this circumstance may to some extent, account for the extraordinary sport in question. If your correspondent will refer to 'Grieve's History of the Variegated Zonal Pelargonium,' he will find at page 21, the following pedigree of Mrs. Pollock:—"In the summer of 1855, I fertilised blooms of the old variety named Cottage Maid with pollen taken from Golden Chain, and the result of this cross was two distinct varieties, both of them improvements upon their pollen parent. They were named respectively Golden Tom Thumb and Golden Cerise Unique. During the following summer, blooms of the Emperor of the French were fertilised by the pollen of Golden Tom Thumb, and this produced a variety which was named Gold Pheasant, a decided improvement upon its pollen parent, and inferior only to Mrs. Pollock, which last, together with Sunset, were the produce of the two following years, and were obtained between Emperor of the French and Gold Pheasant, making the latter the pollen parent.'"]

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Heather-thatched Summer-houses.—Can any of your correspondents tell me how to thatch a summer-house with Heather? The roof is dome-shaped and supported on wooden piers.—M.

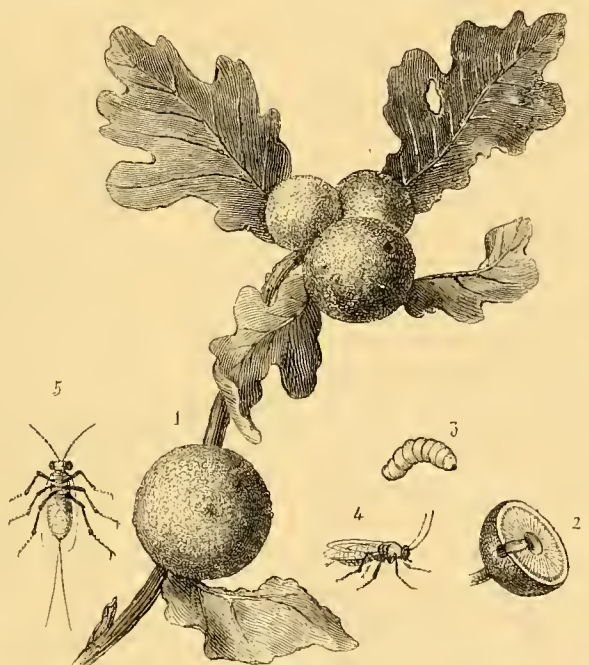
Iris tomiolopha.—This showy species is now in bloom in Mr. Bull's establishment at Chelsea. Its foliage is about a foot in height, and the scape, which is about as long as the foliage, bears a large lilac flower with purple spots. It is a native of China, and has been fully described in the *Journal of Botany*. It does admirably as a pot plant in a cool house or pit, although a warm sheltered border is the place for it when established.—B.

Alyssum saxatile.—From the middle of April to the middle of May, there is no more showy or beautiful plant in the spring garden than this Alyssum; its bright golden colour being the most pleasing of all yellows. Three years ago I planted out a row of nine strong plants, which have been allowed to remain untouched, and now they make a solid mass of colour, 9 feet long and 2 feet in width. These plants consist of the compact-growing variety of this Alyssum, and were originally raised from seed, from which plants may be obtained as readily as Wallflowers, and, if it be sown now, strong blooming plants next spring should be the result. Propagation by means of cuttings is also a good mode of increasing the stock; which should be put in under hand-lights as early in summer as good firm wood can be had.—BENFORD.

GARDEN DESTROYERS.

OAK-APPLES OR GALLS.

THESE are produced by an insect known to entomologists under the name of *Cynips Quercus-petiolii*, which deposits its eggs in the tender bark of the young twigs of the Oak. Soon afterwards the portion of the bark in which an egg has been deposited begins to swell, and ultimately forms a rounded tumour or excrescence, sometimes over an inch in diameter. "On cutting into these galls," says Dr. Fitch, "the small limb on which they grow is found to have its wood thickened or swollen, and, over it, forming the chief bulk of the tumour, is a corky substance of a yellowish-brown or snuff colour, between which and the wood are several small hard grains (resembling seeds, each having a cavity in its centre), in which, doubled together, lies a soft, white, footless worm or maggot. This, on completing its growth, changes to a pupa in the same cell, and, subsequently, into a fly; whereupon, to escape from its confinement, it gnaws through the corky substance and the external bark, thus producing those small perforations like pin-holes, which are always seen in these tumours after the insects have made their exit therefrom." Fig. 2 in our illustration represents a section of one of these galls cut through the middle, and showing the central cavity in which the grub grew to maturity, prior to eating its way to the outside, through the channel which is also shown. The injury done to Oak plantations by these insects is sometimes very great. A few years since they appeared in such numbers in the counties of Devon, Cornwall, Dorset, and Somerset, as to create quite a panic among the landowners, who were threatened with the entire loss of their Oak plantations. Some of the trees withered and died, others had their leading shoots killed, while the younger trees were seriously checked in their growth. A remarkable effect which these galls produced on the larger trees is thus recorded by a gentleman, writing at the time from the neighbourhood of Worcester:—"The mischief is that the Oaks are certainly rendered barren by these hard gall-nuts, and, wherever they occur on the larger trees, there are no Acorns at all produced." There is another species of *Cynips* which deposits its eggs in the same manner in the leaves of the Oak, causing them to swell similarly. The tumours, however, produced by this insect are soft and much smaller than the bark-galls. In both cases it is probable that the parent insect, when depositing her eggs, injects with each a small quantity of some acrid secretion which has a specific effect in so irritating the tissues of the bark or leaf that they at once commence to swell and produce the spherical induration which forms the *nidus* of the future larva. W. M.



1, Oak-gall (full size); 2, section; 3, larva; 4, female, and 5, male *Cynips*.

Mountain Ash tree Insects.—What is the name of the enclosed insects which are destroying small Mountain Ash trees?—M. W. W. [They are a species of *Phyllobius*, named *P. mali*. They usually attack the Apple and Pear and other allied species of the same family as the Mountain Ash. We know of no remedy.—A. M.]

Insects and Flower Fertilisation.—According to Dr. Müller, of Lippstadt, who has recently published an exhaustive treatise on the fertilisation of flowers by insects, it appears that insects are not impelled by their instinct to frequent particular species of plants. This may occur, but it is only in isolated cases, of which he is able to cite only two. In general, insects roam at random over the fields, and light indifferently on any flowers that attract their attention, and it is not uncommon to find them making fruitless search in flowers that contain no honey. This important fact has been generally overlooked by former observers.

THE GARDEN IN THE HOUSE.

BALCONY GARDENING.

WITH very little outlay or trouble, a balcony may be made a mass of bloom during a great part of the season, and its decoration affords pleasant occupation. If it be covered, I would suggest, first, that Virginian Creeper be trained over the roof, as nothing with which I am acquainted grows faster, and its colour, in summer, is a bright green, while in autumn it becomes a mass of glowing red. It should be planted in a tub or box, placed at the end of the balcony, along the front of which should be trained Creepers, such as Clematises, and these should also be planted in pots or boxes at each end of the balcony. If the latter be very long, however, some may be placed in the centre as well. On the pillars or supports, Honeysuckle, Passion-flower, and Jasmine might be trained with advantage, and neat baskets suspended between the pillars have a fine effect, filled, say, one with a fine-leaved Coleus, surrounded with blue *Convolvulus* to hang down all round it. Another might contain a white and pink *Fuchsia*, surrounded by blue *Lobelia*; a third might be furnished with

a handsome *Calceolaria* in the middle, and scarlet *Tropæolum* to hang round it; and a fourth might consist of a plant of *Centaurea*, surrounded by *Rollison's Unique Geranium*. Then, standing at equal distances in pots along the front, might be placed either handsome-flowering plants or shrubs. All the plants which I have mentioned might remain out of doors all the year round, except those in the baskets, some of which may be saved in a small greenhouse if such a convenience be at hand. The cost, however, of filling them afresh every season is but trifling. In autumn I would advise their being filled with variegated *Ivies*, many of which look lovely drooping down round the edges, and in their centres should be placed *Hyalanthus*, *Tulips*, *Squills*, or any spring-blooming bulbs. In the case of balconies which have no roof, but which merely consist of an ornamental railing, arches of iron rods should be placed along the front, lengthways, and covered with creepers, consisting of the varieties above-named, a

basket being suspended from the centre of each arch. An arrangement of this kind has a very good effect. Instead of having large plants along the front, a box, made either of wood or tiles of whatever width is desirable, to run the entire length, might be used filled with bedding plants during the summer months, and in autumn with bulbs and spring-flowering varieties. When purchasing baskets, I should always advise well shaped, but not ornamental worked patterns to be selected, as those with ornamental work on them are much more expensive, and when the plants are in them, little of the ornamental part can be seen.

A. HASSARD.

Upper Norwood.

Cobæa scandens.—This and its beautiful variegated form are tolerably well known as conservatory climbers of quick and graceful growth, but it is not so well known, that the green-leaved or typical form is one of the best of all climbers for window or balcony culture. If grown in pots and trained inside the window, it flowers earlier and more profusely than when planted outside, but in either position it is a valuable decorative plant, and one well worth general culture as above indicated. It is a native of mountain ranges in Mexico, and bears large bell-shaped flowers of a greenish-purple, with bright golden stamens. The variegated form is rather more tender than its green-leaved kind.—J. L. McFARLANE.

THE ARBORETUM.

OUR PARKS AND WOODLANDS IN SPRING.

SPRING—the season when Nature puts forth her first promise of the glory that shall follow in the leafy days of summer—comes, I fear, to the pent-up multitudes in great cities only with its lengthened days and warm blinks of sunshine. How little do the vast majority of townspeople know or see of the beauty of our English woodlands, lanes, and parks at this enchanting season? Nevertheless, there is in the heart of most townsmen a deeply ingrained love of a garden and its belongings, and it is a hopeful sign of the times in which we live that we have amongst us men with means and sufficient generosity to part with their money to purchase that most elevating and rational of all enjoyments, namely, a public park or garden. Although such places may be wanting in some of the bright features and surroundings of the fine English parks far away in the country, yet they are, to the artisan and toil-worn multitudes that frequent them, a very paradise; and not alone to them, but, to the children of the rising generation in our towns, what the lanes and woodland-meadows are to our country children, a place of healthful resort, where they become acquainted with Nature and her wonderful productions. Many of us can trace our love of flowers to the days of childhood, when we gathered Daisies and Buttercups with other “wildings of Nature,” to be carried home in triumph to deck the cottage window-sill. Nothing has a more humanising effect upon the young than flowers, and those who set apart either a park or garden for the use of their toiling brethren deserve the best thanks of every man who wishes well to his country. Even to those whose lives are spent in the country, spring is peculiarly interesting. The Pine copse, on which, during the short and stormy days of winter, the eye delighted to rest, becomes comparatively dark and sombre when the Larch puts forth its exquisite green and lovely rose-coloured catkins. Than the Plane, too, no tree in our English woodlands or parks is, at this season, more ornamental, its varied tints being most remarkable; some trees look as if clothed in dark bronze, others in the deepest olive-green. The perfect symmetry of outline of the Plane, too, makes it one of the most striking objects in our landscapes. The Gean and double-blossomed Cherry are likewise lovely objects, perfect in outline, and being covered, as it were, with a sheet of purest snow, contrast strikingly with their green surroundings. It is a matter of regret that the Birch does not occupy a more prominent place than it does in our parks. All who have seen it in its natural habitat, on mountain passes and wild gorges, will, I feel sure, like Sir Walter Scott, term it the “lady of the woods.” Even in winter, we have no native tree to equal it in gracefulness, and, when clothed with young leaves, the perfume which they exhale when refreshed by evening dew or a passing shower, is most delightful. Of the tree “with boughs that quake at every breath, we can hardly have too many,” says Sir Walter Scott; and he planted about 100,000 Birches round Abbotsford. The Hawthorn is so indispensable that few parks or woodlands are without it; next to the Yew and the Oak, it is the most durable and long-lived of our native trees, and, perhaps, more historical and poetical associations cluster around it than surround all our other trees put together. About the durability of our native Hawthorn there can be no doubt; Scott set the age of the “Whitehope tree” at 300 years; it had ceased in his time to put forth leaves, and it stood long afterwards a leafless trunk, giving character to the landscape around it. In early spring as well as in the months of autumn, colours blend most harmoniously; yet, each tree may be known in the distant landscape by its outline. Distinctness of form as well as of colour is, therefore, a point worth the attention of planters. In many of our English counties, the leafy grandeur of our woods and parks is eclipsed at this season by the floral beauty of the Apple and Cherry orchards that surround our rustic homesteads. He would be a dull observer, indeed, who could pass them by without feeling some emotion at a sight so beautiful, while, beneath their shed blooms may often be found a host of our sweetest spring flowers. What a wreath of floral beauty “blooms all

unseen” in the unfrequented glades and recesses of our woodlands; the quantity of wild Primroses in this county (Northumberland) alone is something remarkable. Indeed, many of our woodlands are literally carpeted with them, relieved by the Violet and Wood Anemone, &c. I have not seen the Lily of the Valley growing wild in any of the woods in this county, although it grows plentifully in the highlands of Yorkshire, in a wood near Grassington. J. T.

TRANSPLANTING EVERGREENS.

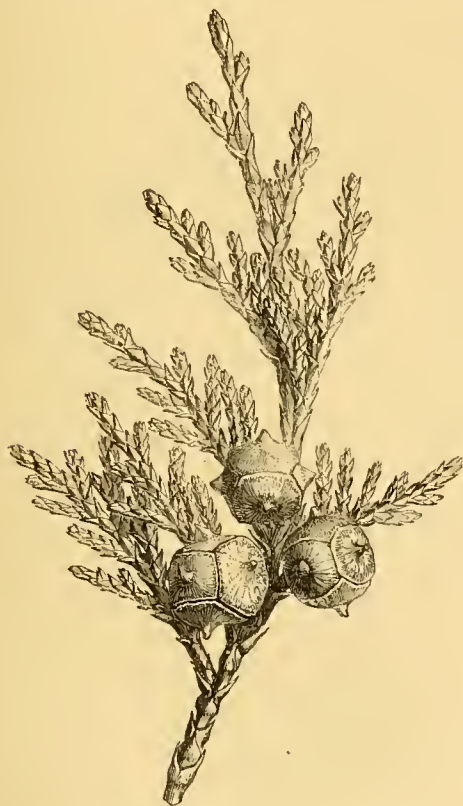
CULTIVATORS, both those who write on the subject and those who practice planting trees and shrubs, are not agreed as to which is the best season of the year for planting evergreen trees and shrubs. Some plant in the autumn, others in the spring—any time from February till the end of May—and all hold that their own practice is best. As in every disputed or debateable matter, so in this question a good deal may be said with some show of force on both sides. The advocates of autumn planting say, that an evergreen transplanted at that season has the remainder of the autumn before it to establish itself before winter comes on with its nipping frosts and cutting winds, and before the soil becomes water-logged and chilled down to its minimum temperature. But those who stand by the practice of spring planting maintain, that they altogether avoid the evils implied in the recognised necessity for planting early in autumn, because winter being gone before they begin, their plants have the whole summer before them in which to recover from injuries which are unavoidable in even the most carefully conducted planting. Our own experience and reason are decidedly in favour of spring planting of all kinds of evergreens, about the transplanting of which there is any difficulty or risk. Many things may be planted at almost any season without risk, while others are particularly unmanageable, except at the most favourable season, and this we have proved—to our own satisfaction at least—is the period at which the particular sorts begin to grow. At that time life is fresh and buoyant, therefore any check administered is comparatively easily overcome. The influences of genial sunshine, gradually increasing in power, along with gentle showers, carrying warmth and nutriment into the earth, alike sustain and accelerate the process of healing the wounds inflicted on the roots. And this is the first process to be accomplished before any progress can be made by the plant in re-establishing itself in its new position. Circumstances are all in favour of this in spring, but the reverse is the case in autumn. Winter is coming on, indeed, is very near before it is generally practicable to engage in planting in the autumn; consequently, the chances of plants recovering from injuries, before they are forced to rest by the increasing cold and decrease of light, are very small indeed. Such are some of the reasons in favour of spring planting, in so far as evergreen trees and shrubs are concerned, and the experience of all who have tried it, with the exception of those who have to deal with light dry soils, which are liable to be dried up with the first spring drought. In such soils, no doubt autumn planting is best, but they are the exceptions which, to our minds, prove the soundness of the rule. The particular period in spring in which the various classes of evergreens, shrubs, and trees may be planted with the greatest safety varies very much; but a good rule to go by is the period at which the particular kinds begin to grow. If the rule is rightly observed, it will be found that ample time may be had for carrying on very extensive operations, and that there is no cause to hasten the work unnecessarily. From the middle of April to the end of May is a pretty long period, considering the length of the day as compared with that of late autumn, and also the ease with which such work may be done owing to the soil being drier and in a more workable condition than in autumn. All tender shrubs and trees may be transplanted in April and May with more safety than in any of the autumn months, and the result at the end of the first twelve months in many cases will be found as two to one in favour of spring planting. This is particularly the case with many of the choice Conifers, such as Deodars, Wellingtonias, and many others, which should never be transplanted, except they are to

be moved many miles, till they have fairly started to grow and made some progress. No one need be afraid of the young growth suffering because of the check. We have lifted many sorts of Coniferæ of considerable size late in May, after some progress in growth had been made, and though the leading shoots which had grown 6 or 9 inches or more, at mid-day leaned to one side, quite alarmingly in appearance, for some days after planting, yet every morning they stood as erect and firm as if nothing had happened to them, and in a few days they started growing, and continued to do so at a pace quite equal to the progress made by them in former seasons.

N. B. A.

CUPRESSUS NUTKAENSIS.

THE north-western shores of North America, especially in the vicinity of Nootka Sound, Observatory Inlet, and the Island of Sitcha (places familiar to the reader of "Cook's Voyages"), are the exclusive habitat of this remarkable species of Cypress.



Cones and leaves of Cupressus Nutkaensis.

When the late Dr. Fischer first saw it, he noted it down as a *Thujaopsis*, so much does it resemble that genus in habit and foliage. Later authors, however, prominent among whom is Mr. Gordon, have determined that the tree is most properly classed amongst the Cupressineæ, in the sub-order Chamæcyparidæ, which is distinguished from *Cupressus* proper, by having only two seeds under each scale of the cone, whereas, the true *Cupressus* has several. The subject of our notice was first introduced into England in 1851, and the specimens which were then received were kindly supplied by the director of the Botanic Gardens, St. Petersburg, where the young plants were raised in the open air—a sufficient indication of their hardiness. Under favourable conditions, the tree attains in its native habitats a height of 80 to 100 feet, with a bole of over 4 feet in diameter, perfectly straight, and covered with a smooth, soft, dark-coloured bark. The branches spread very much, and are sub-divided into a vast number of smaller pendent ramifications, which in old trees are thickly covered with a highly aromatic resinous exudation. The leaves, in shape, ar-

angement, and colour, bear a remarkable resemblance to those of *Thujaopsis*, being a little brighter, perhaps, and with somewhat less of bluish reflexion. The cones (of which we give an illustration) are solitary, almost sessile, or borne on very short stalks, and are covered with a glaucous pubescence; they are about the size of large Peas. If a twig or branch of this tree is broken or bruised, it exhales a very powerful balsamic odour, and the wood, which produces white and soft timber, also yields in great abundance a very aromatic gum, which, in its appearance and scent, has a strong resemblance to Canada Balsam. The tree is, on account of this property, known on the Continent as the *Sapin aromatique*. Possessing, as it does, the desirable qualities of beauty, hardiness, and much indifference as to the soil in which it may be planted, we need hardly add another word in commendation of one of our finest evergreens.

W. M.

Value of Pinus Pinaster for Sea-side Planting.—Having, in a recent number of THE GARDEN, had occasion to recommend the *Pinus Pinaster* for sea-side planting, I now take the liberty of sending a sketch of one of many trees of this kind which grow here. The tree from which the sketch is taken grows within a mile of an exposed sea-coast. It measures 10 feet in circumference at a height of 4 feet from the ground, and is probably from 70 to 80 feet in height. Although these dimensions may be nothing unusual, it is an encouraging fact that timber of this size and beauty can be grown even in a stormy exposure like this.—HERBERT MAXWELL, *Monreith, Port William*. [The sketch in question is a representation of a fine tree with a bare trunk, many feet in height, surmounted by a noble head of healthy foliage.—ED.]

Dry Rot in Timber.—A remedy has been discovered, by the use of which this destructive enemy to the woodwork of a house may be destroyed or arrested. What is known as "dry rot" is caused by the spores of a species of Fungus (the *Merulius lacrymans*), which, though they are sometimes carried by currents of air to the scene of their future devastations, are more frequently present in the soil upon which the house is built at the time of erection, and are brought into near contact with the woodwork in the filling up between the joists, or sometimes even in the mortar. Notwithstanding its name, dry rot does not act upon perfectly dry timber, but begins its ravages whenever the wood is in the necessary state of humidity. It may be prevented by mixing with the rubbish used for filling in the floors, tho' "tank-waste" from alkali works, or the same substance will completely check it if already developed. Tank-waste is of no commercial value, and may be had at alkali works for fetching; it wholly destroys this species of vegetable life, and generates no bad smell whatever.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Daphne pontica.—There is a remarkably fine specimen of this charming sweet-scented shrub growing on the north side of Mr. Goodwyn's residence, at Bedford, where it has been for several weeks literally a mass of bloom. This plant is about 4 feet through one way, and 3 feet the other, and is in the most robust health.—D.

Wistaria frutescens.—Can any of your readers tell me anything about this plant, long since introduced into our gardens, but now evidently either lost entirely or very rare? It is figured in Sweet's "Flower Garden" (1831), p. 104, and is described as being superior to *W. sinensis*. It has purple flowers and blooms later than *W. sinensis*, climbs to a great height, and, according to Sweet, is easily propagated by means of cuttings of the young wood placed under a bell glass.—B.

The Wild Cherry.—Allow me to direct the attention of planters to the Wild Cherry or Gean (*Prunus avium*), as a most desirable tree both for spring and autumn ornamentation. One on which I am now looking has a head like a spreading Oak, is about 40 feet high, and as much in diameter, and one complete mass of beautiful white flowers. While again in autumn it is equally conspicuous on account of its richly tinted foliage. It is a tree well worth planting.—OBSERVER.

How Do Trees Grow?—About twenty-five years ago, new wooden railings were fixed on a garden wall in front of a house in the neighbourhood where I reside. The carpenter, to fasten them more firmly, drove an iron stay into a Sycamore tree which stood in the garden, and fastened the other end to the rails. Assuming that the stay was placed level, I find that it is so at present, and a large excrescence has grown over and around that part of the iron stay which joins the tree. This is one proof that a tree is not "elevated bodily by the development of the roots."—H. AEWIN.

Early Leafing of Trees.—At page 344, you notice the early leafing of trees in London and its neighbourhood. Down here (Cornwall), the flow of sap is three weeks earlier than usual. Riding Oaks has been going on here for a week or more, and we might have begun a week sooner if we had had the least idea of their fitness. Last year we could not get a tree to "run" until the middle of May. Hawthorn (May) has been in bloom a week. The Man Orchis and the spotted one, mixed with Blue Bells, all of which are in full flower, were found under trees with foliage quite out on April 25th. Ferns have made new fronds, and the appearance of the woods and hedges makes one think that May is near its close.—H. M.

THE COOMBE WOOD NURSERIES.

By NOEL HUMPHREYS.

LEAVING the rail at the Coombe and Malden station, the walk to these nurseries is one of the pleasantest within ten miles of London. Spring aspects of herb, and tree, and flower, have come on very early and very suddenly this season; and, consequently, the woods and fields, even on May day, were rich with gloriously bright tufts of delicate green, and blossoms of many colours. Along the road leading up to that portion of Coombe Wood, known as the Warren, the villa gardens, which here and there vary the regular line of the hedgerows, were literally ablaze with a profuse gush of floral beauty. The White Broom, the double Golden Furze, the double-flowering Cherry, the Laburnum, the Lilacs, and the pink and white Hawthorn flowers, as the bright May sun shone full upon them, and among the loftier Horse Chestnuts, magnificent with grand spikes of flower, both of the red and the white kinds—were really dazzling in their luxuriance. The upper branches of the broad-leaved Lilac were so heavy with their load of bloom that they lolled lazily for support on the tops of the walls or palings, revelling in their beauty. Yet, in the midst of all this luxuriance, the recent frosty nights and keen east winds had not failed to commit some little havoc. The precocious young shoots of the Laurels were nipped and blackened to such an extent that they will not recover during the present season, as were also the tender leaf-buds of the Robinia, just bursting into the graceful pinnate foliage which makes the early spring aspect of that elegant tree more attractive than even when covered with its masses of flowers, white and delicate as flakes of purest snow. The cruel winds had done little mischief among the herbaceous plants, lying lower, as they do, in the sheltered beds and borders of the pretty gardens, where sweet Wallflowers—among them the double yellow and double maroon varieties, and great golden masses of yellow Alyssum were defiantly splendid. It should be noted that a fine contrast in colour to the bright Alyssum is found in *Lunaria biennis*, known by the homely name of "Honesty" in cottage gardens; its subdued, but rich, purple being at once the contrast, and the precisely complementary colour—these respective tones, when closely opposed, making each other look both clearer and brighter. This should be attended to in preparing for the best early spring effects producible in our flower gardens, for a very glorious effect of colour may be produced by the close juxtaposition of masses of these two free-growing hardy plants, though the chance of such an effect is generally frittered away by a hap-hazard spottiness of arrangement. Ten-week Stocks, of several hues of red and purple, white Arabis, and lavender-toned Aubrietia, had also just become rife with abundant flowers in place of the Daffodils, Crocuses, Snowdrops, and Hepaticas.

Entering the Warren by a road which, while only a foot-path to the general public, is a carriage-way to the handsome residences and grounds which have been leased from portions of the ancient wood, the character of the scene suddenly changes. These residences and their grounds are, fortunately, out of sight among their own shrubberies and plantations; and, therefore, one passes through what appears a centenarian wood, dotted here and there with noble Oaks, whose foliage on the 1st of May was just beginning to unfold itself in various tones of rich olive, contrasting exquisitely with the dove-grey trunks and branches and with the vivid greens of the young foliage of other trees. There were, also, grand old dark-green Hollies, thickly beaded with tightly closed buds of a lighter hue, destined to supply scarlet fruit at Christmastide, but at present so tightly shut, as to comfort us with convincing proof that Christmas is a long way off. Old Hawthorns, too, there were, with rugged twisted trunks and fantastically gnarled branches only half hid by their annual suit of bright green; which was, in its turn, more than half concealed by clusters of buds, like pearly pellets set in clips of green, and by expanded white-petalled, pink-anthered flowers, whose perfumed breath filled the air with delicious sweetness. However, I pushed forward to the main object of my day's excursion, Messrs. Veitch's nursery; and, after reaching another turnpike-road at the end of the Warren, a turn to the right soon brought me to the gates.

Nothing can well be finer in the way of horticultural effect

than the grand avenue which forms the chief entrance to these interesting grounds. Our photographer, from whose reflex of the scene the accompanying engraving was taken, selected his point of view somewhat too near the commencement of the avenue, and so lost the glimpses of exquisite distance formed by the magnificently-foliaged slopes of those portions of Coombe Wood which are still unencroached upon by leasing and building. Also, by taking up his position too much in the very centre of the broad pathway, he was not able to display clearly the plan upon which the avenue has been planted, though the view gives the general aspect of the combination with good effect. Each side of this magnificent avenue consists of two distinct parts or ranges; the external line is formed by finely-grown trees of *Araucaria imbricata* and *Wellingtonias*, planted alternately. Each of these fine specimen trees is between 25 and 30 feet in height, and each is perfect to the very ground. This is very remarkable in regard to the *Araucarias*, which are so sensitive to our alternately damp and sharp frosty nights; and yet there is not a single defective branch in the whole length of this noble line of trees. The *Wellingtonias*, as we know, are entirely hardy, and quite defiant of the rigours of our climate up to a certain period of their growth; but whether they will ever become forest trees with us, rising some 100 or 150 feet high in our treacherous atmosphere, is still a moot question. However that may be, the *Araucarias* and *Wellingtonias* of Messrs. Veitch's avenue certainly look very promising. In front of this line of larger trees is an interesting series of smaller specimens of *Coniferae* of various kinds, carefully selected as to size, in order to render their own line symmetrical, and at the same time not to conceal even the lower portion of the grand *Araucarias* and *Wellingtonias*. Between each of these younger *Conifers* is a fine plant of *Yucca recurva*, which affords a charming variation of foliage very pleasing to the eye. Each plant in this inner line, both *Yucca* and *Conifer*, is encircled by a low evergreen bordering, the space within being filled with hardy Heaths, each circle being furnished with a different kind. These Heaths, rich at the present season with flowers of many tones of colour, impart a sober and subdued richness to the general composition which serves to heighten the effect very agreeably. Among the beautiful young *Coniferae* forming the inner lines of the avenue are, *Retinospora plumosa*; *Cupressus Lawsoniana*; *Cryptomeria elegans*; the foliage of which is of a soft bloomy purple in winter, changing to green in summer; *Retinospora filifera*, with its threadlike pendulous branchlets; *Retinospora aurea gracilis*; *Thujaopsis dolabrata*, the Fern-like *Retinospora* (*R. filicoides*); *Abies polita*; a beautiful Japan Spruce, perfectly hardy; *Retinospora aurea*, conspicuous even at a distance, by the bright golden touches of colour at the extremities of the younger branches; a new *Cryptomeria*, softer and more delicate in foliage than *C. elegans*; *Juniperus rigida*, a beautiful Juniper of unusual character, injudiciously termed rigid, inasmuch as its chief feature of attraction is the graceful drooping of its young branchlets. There are also pretty young plants of the Umbrella Pine, which the next generation will see in its splendor, as a tree of 70 or 80 feet high. In short, there is a display of rare and beautiful *Coniferae* in this noble avenue, which is worthy of the spirited introducers of the *Wellingtonia*, and so many other splendid novelties.

The other parts of the nursery which, with a neighbouring plot of land, occupy some forty acres or, perhaps, more, present many features of interest fully equal to those of the grand avenue. There are broad winding roadways leading to the lower grounds, which are bordered with choice shrubs of endless variety, and of the greatest interest to all lovers of horticulture; and, from the higher parts of these roadways, the general view over the lower portions of the nursery is really beautiful, as well as interesting. There are wide expanses of the beautiful *Daphne Cneorum*, a neat little dwarf shrub covered with great trusses of bloom of a soft tender pink; stretches of lemon and orange-flowered *Azaleas*; slopes, purple with the rich hues of *Cryptomeria elegans*, and endless stripes and patches of variously tinted foliage, appearing, as they are spread out far below the eye, like a magnificent carpet of a hundred colours, softened and blended by distance, the whole being backed by the grand banks and slopes of foliage

VIEW IN THE COOMBE WOOD NURSERIES.



of the ancient woods beyond. Descending any one of the broad winding roads just alluded to, the visitor is arrested at every turn by the beauty and interest of the shrubs on either side of him, and by the fine landscape effects produced by both form and colour. On one side, perhaps, is a white-flowering Broom, every drooping branch heavy with its snowy burden; next to it is a golden bush of Spanish Gorse, very distinct in character from our fine native species; then comes one of the new Maples, which, as belonging to a family of plants yielding exquisitely tinted foliage, are one of the most valuable additions recently added to our previously rich list of horticultural material—it is *Acer sanguineum*, a graceful tree with crimson-purple foliage; and the next attractive object is a clump of many bushes of the elegant narrow-leaved *Berberis*, *B. stenophylla*, covered with their curious orange-coloured flowers. Next comes a group of variegated Hollies, followed by *Genista daurica*, a perfect blaze of yellow, reflected, as it might seem, farther on, by a great bush of double-flowering Furze. Then comes the purple-leaved Nut, forming such an excellent substitute for the Copper Beech wherever a mass of moderate size, and never greatly-increasing dimensions is required. Next appears a new evergreen Oak, not yet “published,” with leaves as large and solid as those of a Portugal Laurel. Following on, come noble plants of the Lindley and Charles X. Lilacs, profuse in flower as the common Persian kind, and much grander both in the size of the trusses and in the individual flowers. The Lindley variety is of a rich lilac, verging to deep rose, and the Charles X. a light azurean lilac, with the charming addition of a lovely scent.

Descending to the lower grounds, many objects present themselves. There is, for instance, an extensive “rootery,” combined with a pond for the display of aquatic plants, which will form a conspicuous feature in the course of the coming summer; and there are noble hedges formed by fine plants of *Cedrus Deodara* clipped into form, which are certainly interesting features, especially the one which shuts off the Japanese garden, planted some years ago by Mr. James Veitch, and which will be described on a future occasion. There is also a noble display of standard Portugal Laurels, both of the Myrtle-leaved and the ordinary kind, which only require to have a sprinkling of real Oranges artificially attached to their branches to make one fancy himself among the Orange groves of Nice or Cintra. Next comes the grand feature of acres of the newest and choicest Rhododendrons, both standard and bush, which will, in about a fortnight's time, form a very sea of floral beauty to gaze over. Farther on are choice masses of Azalea; some new varieties of *A. mollis* not yet named, having flowers as large, with petals as broad, as those of the grandest Rhododendron blooms. Farther on are long stretches of hardy Heaths; *Erica vulgaris*, *E. mediterranea* alba, *Ledum* intermedium, and others. After these, one comes upon whole acres of golden Hollies, said to be the finest and most extensive collection in England. Another Deodar hedge encloses and shelters the “stoolery,” where layering, and all other kinds of propagating are going on. Among the plants, of which large stocks are being raised in this sheltered portion of the nursery, are a new white *Wistaria* (imported direct from Japan), with larger flowers and finer foliage than any other known kind; having also the advantage of the foliage being much more advanced at the blooming time than the old varieties. There is also a new lilac kind, somewhat finer flowered than the old variety. Among the new *Acers*, which are being rapidly produced in numbers, are *A. palmatifidum*, with naturally spreading Palm-like top and deep purple foliage; *A. dissectum*, with leaves which divide themselves almost into filaments, a species which will be much used in bouquet-making instead of Ferns, as it lasts in perfection much longer; *A. pulchrum*, with pinkish-purple leaves as large as those of the common Plane, and very much resembling them in form; *A. roseo-marginatum*, with exquisitely variegated foliage, exhibiting four distinct colours—pale ochre, white, delicate pink, and green. There is also a very small leaved kind, variegated with pink and white, which is not yet named, and is likely to be very attractive.

Among shrubs suited for training against walls are several kinds trained for display against the sides and banks of the conservatories. Among these are three kinds of blue *Ceano-*

thus, all profusely bloomed; in fact, entirely covered with their neat bunches of deep-toned azure flowers, which, as Byron sang of the Mediterranean Sea, are indeed “darkly, deeply, beautifully blue.” It has been an unusually fine season for the *Ceanothus*; and the hue of its flowers, so unusual in plants suitable for training, has made many a wall glorious with bright azure this season; especially that of a lodge which I passed on my way to the nursery, and which many May-day rambles, like myself, crossed the road to look at more closely. There was also a white kind, with much larger foliage, *C. velutinus*, which, for the sake of variety, should not be overlooked. A new *Escallonia* was also pointed out, with blood-red flowers, larger and more profuse than those of *macrantha*. One of the new *Viburnums* is shown to be a very desirable plant for wall-training, its profuse semi-spheroids of snowy florets and its curiously-plaited foliage being remarkably attractive in character. There were many novelties, also, in herbaceous plants inviting attention; but I have only space to mention two excessively pretty *Primulas*, *P. cortusoides amœna*, with soft lilac flowers; and *P. cortusoides alba*, with deeply-ent petals like those of a *Clarkia*. I was, also, specially attracted by a new double white Daisy, a variety just imported from Germany, much whiter and fuller than any of our own kinds. There was also, in one of the glass houses, another novelty which I cannot forget—a pretty Tea Rose, of deep rich damask tone, which has just been named after the Duchess of Edinburgh.

My excursion to these nurseries was a very pleasant one; and I recommend all who can appreciate the charms of exceptionally fine country scenery, and a noble collection of trees and flowers, to visit the Coombe Wood Nurseries before the glorious music of the nightingale is over.

OXTON HALL.

THIS, the seat of Alfred Harris, Esq., is pleasantly situated on rising ground, about half-way between the village of Oxtou and Tadcaster. The gardens though not extensive, are by no means without interest. The flower-garden is situated on three sides of the hall—east, south, and west. From the east side, which is the carriage entrance, there is an extensive view of the park, about 80 acres in extent, adorned with fine specimens of Oak, Beech, and Chestnut; there are, also, some large and ancient-looking Thorn trees, with flowers of various colours. Nearer the hall, on the Grass, are some large Yews; one, in particular, is about 20 feet high, and 50 feet in diameter, the lower branches resting on the ground. This, when looked at a short distance off, is a handsome object. On the south side is the spring-garden, in which are small geometrical beds, cut out of the Grass, and effectively edged with Golden-feather *Pyrethrum*, Golden Thyme, and red and white Daisies. Here, also, are fine specimens of Hollies; and a little to the west of the beds is a Cedar of Lebanon, the trunk of which is 8 feet in circumference at 4 feet from the ground, and about 50 feet high; and the lowest branches from point to point are 40 feet in diameter. Among the trees is a snowy *Mespilus* (*Amelanchier Botrypinum*), which, when in flower, is extremely effective. Beyond this there is a pair of unusually fine Turkey Oaks, and east of these are the summer flower-beds. In the conservatory—a lean-to house—there is generally a nice show of flowers, consisting of Azaleas, Camellias, *Deutzias*, *Cyclamens*, *Cinerarias*, *Primulas*, and similar plants, the *Cyclamens* being particularly fine during the early months. The kitchen garden is not extensive. It is surrounded by a brick wall 12 feet, and in some places 16 feet, high, well furnished with fruit-trees. On the north side of the garden is a Peach and Nectarine house and two Vineries, all lean-to houses. The centre house, which is the early Vinery, is 40 feet long, and is heated by means of hot-water pipes. The late Vinery is 90 feet long, and receives no artificial heat whatever; the Peach and Nectarine house is 60 feet long. The gardener, Mr. Croft, states that Peaches, weighing 9 ozs. each, had been gathered out of these houses. On the north side of the hall, at a little distance off, is a small stove, propagating, and greenhouse, near which is a small rock-garden, built of the Magnesian limestone, which is so abundant in the neighbourhood. One of the best features of this place is the numerous massive specimens of trees, especially the Beech and Chestnut. Some parts would be greatly improved if the bare spaces of ground under the trees were planted with *Priunroses*, *Anemones*, *Squills*, and other bulbs, or with patches of such things as *Omphalodes verna*, *Symphytum caucasicum*, &c., which would impart to the whole a much more cheerful appearance than it now has.

R. P.

THE INDOOR GARDEN.

CALATHEA (MARANTA) ZEBRINA.

FEW species of this ornamental genus, and indeed, few fine-foliaged stove-plants of any description, equal this, when well-grown, either in stately habit or in rich colouring. Like many other good and highly ornate plants, it has the fault of being common in our gardens; but, with those who appreciate a plant for its intrinsic beauty in spite of fashion, this is a subject which is sure to be a favourite. When liberally treated, it produces leaves fully 2 feet in length, of a rich bright green tint, heavily barred or striped with dark velvety-maroon, nearly approaching black. It is valuable alike for stove decoration and for purposes of exhibition. It is the most robust of all the Marantas, if we except *M. Veitchii*, and, as it is a rapid grower, a small plant of it soon develops itself into a good-sized specimen. A compost consisting of one-third fibrous loam, one-third peat, and one-third leaf-mould, with the addition of sufficient sand to keep the whole porous, suits it admirably. The pot in which it is grown should be well-drained, and, when growing, it likes a liberal supply of moisture at the root. Keep up the humidity of the atmosphere, and if syringing is occasionally resorted to, use pure water only, as the slightest amount of mineral or earthy matter held in solution, will spoil the rich freshness of its elegantly arched



Calathea (Maranta) Zebrina.

velvety foliage. During the past season we have had several new species of *Calathea* introduced, but none more effective than the plant now under notice. Q.

STEPHANOTIS FLORIBUNDA.

FEW white-flowered plants equal this in wax-like purity, gracefulness of form, and delicate perfume; and when blooms of this description are sent to market, they are sure to realise fair prices, even at a time when other flowers are plentiful. Like the *Eucharis amazonica*, flowers of the *Stephanotis* are everybody's favourites, and they will last fresh for several days after being cut—a valuable property in the case of flowers grown for market purposes. For button-hole bouquets, about three single flowers or buds, backed by a bit of Maiden-hair Fern or frond of a *Davallia*, look remarkably well. They are well adapted for bouquets, and are used largely along with Orange blossom in all bridal bouquets; while, as a wreath for ladies' hair, nothing can be prettier than a cluster or two of expanded blossoms and unopened buds of *Stephanotis*, backed by its own thick rich green leaves. In forming wreaths of this description, the old or well developed foliage only should be employed, as the fresh young leaves soon droop and wither after being cut from the plant. The *Stephanotis* is easily propagated by means of cuttings made of the young wood, leaving a heel of old wood at the base. These should be inserted in a prepared cutting-pot and covered with a bell-glass, placing the pot in a genial bottom-heat, either in a pit or propagating case; in the latter case the bell-glass may be dispensed with. Cuttings of *Stephanotis* root freely at this

season of the year in about a fortnight, but it is a saving of time to purchase plants that are established. These will grow freely if liberally treated, that is, if planted in good fibrous loam, crocks, and leaf-mould, to which sufficient coarse sandstone grit has been added to keep the whole fresh and open. In a compost of this kind the growth made is short-jointed and robust, and much more floriferous than coarser growth made by plants in well-manured composts. The *Stephanotis* likes a warm and genial temperature, the best positions being the roof of a plant-stove or Pine-pit, where it can be trained close to the glass and fully exposed to the sunlight. It grows freely trained on glass partitions or back walls, but rarely flowers so well as when fully exposed nearer the glass. Some growers for market cover the roofs of their forcing houses with this plant, and obtain crops of its pearly, deliciously scented, flowers, for nine or ten months out of the twelve. It grows well in pots, in which it forms a fine exhibition plant, and it is one of the most striking of all stove plants thus treated; but, where quantities of cut blooms are required, pot culture is too troublesome, and does not pay half so well as when the plants are planted out and trained on the roof. They should be pruned in rather closely about December or January, and they may be started into growth as required by means of a little extra heat and moisture. The *Stephanotis* is liable to become infested with mealy bug, which spoils the look of the foliage; and, if this proliferous pest is not kept in check, the clusters of flowers also become infested. The best means of obviating this state of things is extreme cleanliness, for mealy bug rarely appears unless a plant has been neglected or irregularly treated with regard to moisture. Frequent syringings with water at 80° to 100° I have found an excellent preventive of insect pests, and the plants seem to thoroughly enjoy this warm bath daily all through the summer; precautions being taken not to wet the fully-expanded flowers. This seldom happens where flowers are grown for market, every cluster being cut as soon as ever the buds show signs of opening, and the unopened buds are rather benefited by syringing than otherwise. There are but few flowers that pay better than this and *Eucharis amazonica*, and, in all large establishments where choice cut flowers are in demand, a low span-roofed house or large pit might be profitably devoted to the culture of these two plants alone, as they both thrive well under similar treatment and conditions. If it can be managed, this should be done in preference to growing the *Stephanotis* among other plants, especially Pines, since every cultivator who has once had his Pines covered with mealy bug is not likely to run the risk of their again becoming infested. A great deal depends on regular syringing as above directed, and occasional sponging over with soap and water (a very tedious process where the plant covers the roof of a plant-stove); but, if the plant is already infested, nothing is better than repeated doses of Stevenson's insecticide, made a little stronger than is directed in the printed directions, and with this the plant should be syringed at least twice a week. At the time the plants are cut back, they should be carefully cleaned throughout, every insect and speck of dirt being sponged or brushed off, using soft-soap and warm water, and syringing afterwards with clean soft water. C.

CULTURE OF SARRACENIAS.

IN nearly every good plant collection may be found plants whose chief value consists in their singularity of form or structure. An ordinary observer may go through a fine collection of stove and greenhouse plants and afterwards remember little about them; but if he sees a *Sarracenia*, a *Cypripedium*, or a *Nepenthes*, his attention will be at once arrested; he will closely examine them, and afterwards remember them with interest. *Sarracenias* have been in cultivation for many years, although, like other curiosities, they never seem to have been generally grown, a circumstance, perhaps, attributable to their constantly failing to grow in a hot and dry temperature, conditions under which the earlier cultivators placed nearly every exotic that chanced to fall into their hands. They are natives of North America and the United States, where they grow by the margins of streams, and in mossy bogs and swamps, and the only

reason why, with us, they are not quite hardy, is our variable climate and the absence of a thick warm covering of snow, which is one of the best of all protectors for tender herbaceous and Alpine plants. They will withstand any amount of cold, but not fluctuating dry winds, sharp black frosts, and drenching rains. One species, *S. purpurea*, or The Huntsman's Cup (once thought to be a specific against small pox), has grown tolerably well planted out on Messrs. Backhouse's rockery, at York, but with nothing like the vigour with which it grows in pots in a moist genial temperature. When well-grown, *Sarracenias* are valuable for exhibition purposes, as all who have seen Mr. Baines's splendid plants at Nottingham, Bath, Manchester, and elsewhere, can testify. The compost in which they grow best is one composed of fibrous peat pulled to pieces with the fingers and mixed with chopped living *Sphagnum* and broken well-washed crocks. The whole must be on a well-drained bottom; in this respect they are very much like Orchids, they cannot endure stagnant moisture; and, if they are well drained, so that all superfluous moisture passes away readily, it is then almost impossible to give them too much water at the root. In potting, it is best to elevate the crowns a little above the rim of the pot, packing the base of the stems with fibrous peat, and surfacing the whole with fresh living *Sphagnum*. They require about the same temperature as that of a greenhouse in summer, with a little extra heat in winter, and they grow best in the moistest corner of the house, as near the glass as possible, with plenty of air and shading when necessary. They enjoy a full share of light, but cannot endure bright sunshine. It should be borne in mind that all the *Sarracenias* are essentially bog-plants, and cannot endure anything like a hot dry atmosphere. I remember seeing some of these plants in a hot Orchid-house, where they refused to grow and gradually lost their foliage; after which they were placed in a cool airy pit to rest. This was in the summer time, and, instead of resting, the plants at once showed signs of renewed vigour, and commenced a most luxuriant growth. This fact taught me a lesson in growing these interesting plants that I shall not forget, for every pitcher developed under the above circumstances was larger, fresher, and better coloured than the preceding one, and the plants were much admired both by gardeners and visitors. The following descriptive list includes the species best worth growing, either as decorative plants or for exhibition purposes.

S. flava.—This is one of the freest and best of all, producing pale green pitchers varying from 12 inches to 2 feet in height, and much swollen or expanded like a clarion at the mouth. It is a very variable plant, both as regards the colour and size of its pitchers. One of the best varieties we have ever seen was that exhibited by Mr. Baines at our different metropolitan and provincial exhibitions, where it has been generally admired.

S. Drummondii.—This is one of the most robust of all, and one which makes a noble exhibition plant when well grown, being nearly a yard high and as much through. Its pitchers somewhat resemble those of the last, but are white at the mouth, beautifully netted with deep rosy-purple and green. Like the last, it sports into one or two other forms, of which the one named "*alba*" is the best. It bears great lurid purple flowers fully 3 inches across, generally in perfection in March and April, but the bloom-buds should be pinched out when good specimens are wanted, as they do not grow so vigorously if allowed to develop flowers.

S. rubra.—This is one of the rarest of all the species, and it does not grow so vigorously as most of the others. Its pitchers are erect and slender, of a cool green colour, finely netted with crimson veins towards their apices.

S. flavo-purpurea.—This is a singular form, possibly a natural hybrid between the last-named species and the richly-coloured *S. purpurea*. In habit it resembles *S. flava*, but is shorter in the pitcher and broader at the mouth, of a soft pale green veined with purple or purplish-crimson. We only know of one plant of this, which is in Mr. B. S. Williams's nursery, at Holloway, and is very distinct from any of the other species in colour.

S. purpurea.—This is one of the commonest of all, and, at the same time, a handsome decorative plant, of robust habit when grown under the above conditions. Mr. Baines and other cultivators have exhibited masses of this species fully a yard across, when it is a most curious and interesting object at our floral exhibitions. Last year I saw two great pans of this in the small but select collection of Sigismund Schloss, Esq., of Bowdon, Cheshire, and these were very richly coloured. I attribute this to their being grown close to the

glass in a north house, where they obtained a full supply of light and plenty of air. This is the first plant in the whole group that an amateur should attempt to grow; and, if he succeeds with this, the other rarer species may be added without much fear of failure. It is hardy in constitution, and I have seen it grow freely in a Wardian case at a north window. It was potted in a wide and shallow pot, the latter being plunged up to the rim in the open peaty compost of the plant-case, and the whole being neatly surfaced with living *Sphagnum* and *Selaginella*; the requisite moisture at the root, and in the atmosphere of the case, was easily obtained by occasional sprinklings with a syringe. As before stated, this species is perfectly hardy in sheltered situations, but it does not grow so vigorously when fully exposed as when protected in a frame or cold pit. The pitchers of this plant are 4 to 8 inches in length and much swollen, being of a reddish-purple tint when well grown.

S. minor.—This is the smallest of the whole group, bearing erect pitchers 4 to 8 inches high, and seldom more than half or three-quarters of an inch in diameter. They are nearly cylindrical, not dilated at the mouth, as in most of the other erect-growing species; and of a fresh green colour at the base, tinged with red or reddish-purple towards the apex. The flowers are borne on slender stalks about a foot high, and are remarkable for their small size, and dark purple, nearly black, petals. This kind has frequently been confounded with *S. variolaris*, from which, however, it may be readily distinguished by its smaller size. *S. variolaris*, moreover, is a green-flowered species, and the flowers are much larger than in the present plant. It is a pretty little species, well worth culture for variety, and makes rapid growth if kept cool, moist, and airy.

S. psittacina.—This is one of the most peculiar members of the genus, readily distinguished by its pitchers lying horizontally on the surface of the compost in a radiate manner, and in their having a curved hood, not unlike that of *Darlingtonia californica*, but minus the fish-tail-like appendages of the last-mentioned plant. It is one of the most ornamental plants of the whole group, and should be included in every select collection. This plant should be well elevated above the rim of the pot, so that its pitchers can recline in a natural manner on the mossy compost.

S. variolaris.—This is a free-growing erect plant, though not so attractive as some of the others; still, where a collection is grown, this should be included to complete the group. It has flowers of an apple-green tint, and grows well treated like its congeners.

Sarracenias are readily propagated by division, offsets being freely produced by well-established specimens. I have never seen seed produced in this country; but, if the flowers were fertilised, this might, in all probability, be obtained, and some fine varieties be the result, even if raising seedlings would not prove the quickest way of raising a stock. I have now *S. flava* and *S. Drummondii* in bud, and shall try the experiment of cross fertilising these as soon as their flowers are fully expanded. One of the most peculiar points about the flowers of these plants is the broad, disc-like stigma, in shape not unlike an umbrella when open. The pollen is powdery, and can readily be applied to the viscid stigmatic surface by means of a moist camel's-hair pencil. G. H.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

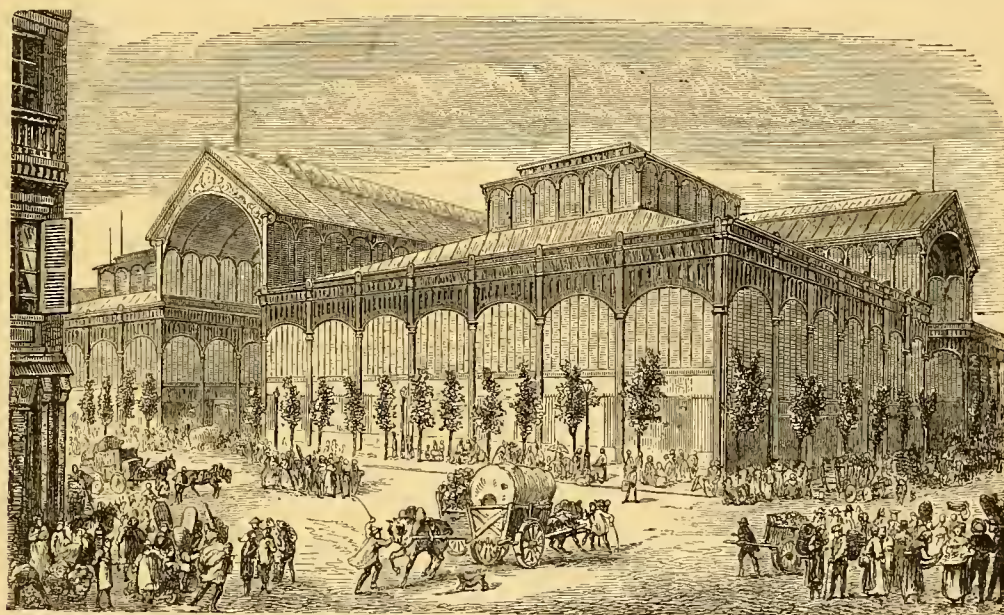
Regelia ciliata.—This pretty greenhouse plant, which belongs to the Myrtle family, is figured in the *Botanical Magazine* for this month. It is a native of south-western Australia, and forms a bush 3 to 5 feet high, with more or less pubescent or hirsute twigs and leaves; the branchlets are slender, strict, and densely clothed with leaves. Flower-heads globose, half to three-quarters of an inch in diameter, of a dull purplish-red colour, with numerous bundles of bright rose-coloured projecting stamens, which impart a pleasing feathery appearance. It flowers in September.

Dicliptera (Justicia) Twediana.—The current number of the *Revue Horticole* contains a coloured plate and a description of this handsome greenhouse plant, the seeds of which were sent by M. Lasseaux from Montevideo, to the Muséum, at Paris. It produces a number of flower-stems from 1 foot to 20 inches high, branching trichotomously, and bearing at the ends of the branches numerous flowers, of a bright orange-red colour, and arranged in close erect whorls. At Paris, it has been planted out in the open air in summer, and continued to flower all through the autumn until the appearance of the first frosts. It appears to be a most effective plant.

Variegated American Aloe.—Complaints are often made that the variegation of this plant does not colour well—a circumstance doubtless frequently owing to its being kept too moist at the roots. In the conservatory at Ealing Park are two very fine examples of this Aloe, in tubs, the variegation of which is most brilliant. Some time ago these two plants had a dull and unattractive appearance, which induced Mr. Cole, the gardener at Ealing Park, to re-tub them. On turning them out, it was found that the soil about the roots was of a cold, sticky, and retentive character. This was removed, and some light soil, plentifully mingled with rubble, was used in re-tubbing the plants; on the top, too, were laid pieces of white stone. The result was quite surprising; and, singular to state, water is never given to the roots. All the moisture they get is what falls from the creepers overhead when the house is syringed.—R. D.

TREES ABOUT MARKET PLACES.

WHEREVER London trees are now putting forth their tender leaves of most delicate green they seem to say, "Why not more of us? You evidently enjoy the fresh cheery aspect of our foliage, so why be so chary of planting many more?" When the little town princess was taken into the country and beheld the fields and trees she asked her governess why they did not build cities in the country; as the reply of the governess is not recorded it is to be presumed she was too much puzzled by the question to be enabled to answer it, and, doubtless, changed the conversation as promptly as possible. But may we not ask a question of a somewhat opposite character—and say, "why do they not bring some of the best features of the country into the cities?" Many of our wider streets might, as has been previously urged in this journal, be planted with border trees, and many open spaces be made green and pleasant by an annual supply of fresh country turf. Why "they" do not do it is one of the mysteries which no man, who is not a district-surveyor, or a vestryman, or a common councilman, can explain. The mysterious "they," meaning, of course, nobody in particular, is, at all events, a power which has been hitherto a very successful obstructive in this matter.



Trees about Market Places.

When the late Mr. London planted a beautiful tree in front of the house, which he built in Porchester Terrace, the mysterious "they" issued orders for it to be dug up and carted away at the planter's own expense. One not accustomed to the nature of the prompt and sweeping action of the mysterious "they," might imagine that the tree in question ought to have been accepted as a valuable hint to the effect that a whole avenue of such might be planted with pleasing effect along the entire length of the terrace; but "they" did not think so, and down it came.

The accompanying engraving represents the *Halles centrales* of Paris, round which, it will be perceived that young trees have been planted, which produce a very agreeable effect. Why, therefore, should not the projected new Covent Garden Market be enlivened by the refreshing verdure of growing trees? This is a question that it is much more easy to ask than to obtain an answer to. The mysterious "they" is a form of power not open to questioning of that kind; and, invariably, maintains a dignified silence. It may be that the Duke's architect would object to any of the lines of his structure being even partially concealed, from any possible point of view. It may be that his Grace's steward, if he happens to have thought about trees at all, may have calculated that the trunks of, say, forty trees, taking their average

diameter as likely to reach nearly a foot each in some thirty years' time, would occupy the place of twenty Cabbage-stands, which, at rentals of £10 each, would produce an income of £200 a-year, which, he might possibly say, "ought not to be muddled away for the sake of a few trees." That the assumption that the above-named actors in the matter, as material beings actually representing the mysterious and invisible "they," is altogether an imaginary one, need not be said; but, nevertheless, it is safe to assume that, by the assistance of an irresistible power of some kind or other, trees will not be permitted to put in an appearance in new Covent Garden Market.

Will the suggestion for planting trees about the New Cattle Market at Islington, and along the principal façades of the New Meat Market, be more successful? It is scarcely to be expected that it will. There is certainly ample room for their introduction at the Islington Market, and also in front of the new buildings of the Meat Market; the latter structure being so handsome, it is evident that with an appropriate *entourage* of that kind, it would form one of the most attractive objects in London. But "they" might object, and the "they" of the City of London is one of the most powerful and obstructive "theys" in the

world. It is but recently that, by the clearances effected for the line of the new Queen Victoria Street, a comparatively small triangular space was created on the western side of the Mansion House, which opened a fine view of its west front; and showed plainly how, by a little architectural modification, that side of the structure might be made to assume a very imposing aspect; and how a noble portico, beneath which carriages might be driven to set down visitors comfortably in any weather, might have been constructed, thus giving additional importance to the palace of our metropolitan magnate, the Lord Mayor. In addition to this advantage, the open space afforded an opportunity for a really handsome public fountain—a luxury and ornament which hundreds of even the petty towns on the Continent enjoy, but which London does not at present possess. The fountain might have been made the substructure of a splendid marble canopy (supported on decorative columns), beneath which suitable protection the bronze statue of the munificent merchant, Peabody, might have been placed within a fitting shelter from rain and sleet and snow, instead of being relegated to an inconspicuous corner, with no more attempt at suitable surroundings than when in the sculptor's studio; as though it had been shot down where it is, according to contract, and there left. Round about the proposed fountain and its crowning canopied statue, there might have been a space

of green turf, enclosed within a handsome balustrade of polished red granite and white Sicilian marble, both of which materials have been found to stand our climate without sustaining any injury from the severest winters. Within this enclosure, three trees might have been planted, with plenty of room for future growth, one to the west, one to the north, and one to the south, leaving the eastern side freely open, in order to afford an unimpeded view of the statue and fountain from the Mansion House. But this utilisation of the small triangle of open ground, the freehold property of the City of London "they," the undefinable "they," decided to Let or Sell for building purposes; and the consequence is that a towering building will arise that will so far shut out "light and air" from the west side of our City Palace, that an action for deprivation of those important necessities of life, would certainly have been forthwith commenced by any private proprietor, who had not himself committed the act of selling or letting his land, with the full knowledge that his "light and air" would necessarily be shut out by his own wilful "Act and Deed." The invisible, inscrutable, and undefinable "they" of the great city, will, of course, never condescend to state why they chose to let slip such an opportunity of embellishing their central seat of honour and power, and, at the same time, of doing something like decent justice to the memory of a great benefactor. As regards the planting of the three proposed trees, however, the inscrutable power might vouchsafe, through some unexpected channel, something of an answer, to the following effect—"Why more trees? is it not written, and has it not been written, over and over again, that there is not a single street in all the city of London from some part of which a tree may not be seen?" The obvious retort to this answer, intended to be crushing, is "why not trees?"

H. N. H.

THE FRUIT GARDEN.

WATERING PINES.

I HAVE long been of opinion, and I am daily becoming more convinced, that the giving of water to Pine plants, from the day they are put in as suckers until the fruit is matured, is by far the most important part of all their cultivation. Nothing is more antagonistic to the well-being of the Pine than excessive watering. No plant with which I am acquainted requires less water throughout the whole year; and no plant will exist and remain healthy for the same length of time, without water, as the Pine. I have put in suckers in September, watered them when rooted in October, and did not give them another drop for four months afterwards; and at the end of that period they were much healthier, and altogether in a much better condition than any which I have seen that were watered regularly every fortnight. The pale yellow sickly colour, which is too often observable amongst Pines is the indication of too much water at the root. In very many instances, Pine watering is done periodically, irrespective of all absorbing or evaporating agents; certain dates are put down and strictly adhered to, whether in the dull inactive winter months or in the scorching summer time. There are many considerations which must be kept in view in Pine watering; the first of these is bottom-heat—when this is strong they require water more frequently than those that are kept cool at the root. Another most particular thing to be observed is the state of the plunging material; if the tan-leaves, or whatever else may be used, are very damp when the Pines are plunged, or become damp at any time, water should be very sparingly given, and it will be found they only require it at long intervals, as the moisture they absorb through the pot is sufficient, but, under such a variety of circumstances, the times for watering cannot be given; their needs, or supposed needs, should never be judged from the last time they were watered, but from their actual requirements, which can be easily ascertained by feeling the balls with the hand. Pines, in fruit, generally require water oftener than those without it; but, even when in fruit, water should be applied with caution. When water is given, the balls should be thoroughly soaked. I fill the space between the soil and the rim of the pot two or three times when watering to ensure this. I am very much pleased to see that, in your well-written notes of "Work for the week," you recommend the withholding of water after the fruit begins to change colour. This, it will be remembered, is not in accordance with the instructions of J. S. W., at page 217, of *THE GARDEN*, where it is said, "if well swelled glistening fruit, with the juice almost oozing out of the pips, is desired, watering must never be discontinued, even when the fruit is quite ripe." Pines, which are watered after

colouring commences, are invariably found, when cut up, to be partly decomposed in the centre, and quite black at the core; therefore, all care should be taken to avoid watering at this important period. If Pines are well grown up to the time of colouring, water is quite unnecessary to promote further development, or to add more juice. Regarding syringing or damping overhead, this is very beneficial if judiciously done in the afternoons of very hot scorching days, but should never be too freely indulged in during dull sunless weather, or large crowns, sometimes twice the length of the fruit, are the unsightly result.

J. MUIR.

ON THE CULTIVATION OF ORCHARDS.

By F. FALKENER.

THERE are three principal circumstances which appear to influence the growth of Apple trees, and to determine their natural localities; namely, climate, soil, and aspect. Though Apple trees will endure a winter of greater severity than is generally experienced in any part of the British Islands, yet, to bring their fruit to maturity, requires a warm summer, and, therefore, the southern and western counties are more favourable to orchards than those of the north and east, and, accordingly they are more generally cultivated in the former than in the latter, even where the soils are of a similar character. Great light has been lately thrown upon the adaptation of soils to particular plants; and it is now easy to account for the predilection, so to speak, of the Apple tree for soils that abound in clays and marls. All deciduous trees require a considerable portion of potash for the elaboration of their juices in the leaves, and are prosperous or otherwise in proportion to the plentiful or scanty supply of that substance in the soil. Liebig has shown that the acids generated in plants are always in union with alkaline or earthy bases, and cannot be produced without their presence.* The most striking exemplification of this necessity is the Vine, the leaves, tendrils, and unripe fruit of which are remarkable for their acidity. It has been proved that Vineyards supplied with manure of a very forcing kind, but which contains no potash (horn-shavings, for instance), soon cease to be productive. Now the Apple tree, during its development, produces a great quantity of acid; and, therefore, in a corresponding degree, requires alkaline, and probably earthy bases also, as an indispensable condition to the existence of the fruit. Without such substances, therefore, in the soil, in adequate abundance, orchards cannot prosper; and it is morally certain that more accurate inquiry and observation will establish the fact, that, all other things being equal, they are productive or otherwise in proportion to the quantity, up to a certain limit, of these substances in the soil. It is known that all clays contain potash, and that marls consist of clay and carbonate of lime, and also contain potash, besides sulphate and phosphate of lime. The presence of alkaline and earthy bases, particularly potash and lime, affords a satisfactory solution of the adaptation of marly soils to the production of Apples, even without taking into account the part which phosphate and sulphate of lime play in their formation. These considerations are very interesting, as they are calculated to throw a valuable light upon an important branch of horticulture and rural economy, by pointing out the means of exercising an effectual influence upon soils in the production of Apples which are not naturally adapted to that purpose. Nor is the opinion above entertained mere speculation, for we have almost everywhere sufficient proof that soils not naturally adapted to the growth of Apples are, by the application of manure, made to produce them in great plenty and perfection. It cannot be denied that the ammonia, and also the humus of the decaying dung, must have some influence on the growth of the tree in such soils, and also on the development of the fruit;† but it is, at the same time, most certain that these alone would be perfectly inefficient for the production of the fruit without the co-operation of those bases which the manure also supplies, and which are naturally deficient in such soils as we are now speaking of. The size, and perhaps the flavour, of the fruit may be somewhat affected by the organic part of the manure, but its very existence depends upon the presence in the soil of a sufficient quantity of those inorganic or mineral substances which are indispensable to the formation of the acids. If further proof be wanting of the effect of potash upon the productiveness of fruit-bearing trees, it is to be found in the benefit derived from manuring Apple trees with leaves which contain it in considerable quantity. This effect is remarkably exemplified in the application of the cuttings of Vines to their roots, by which practice Vineyards are kept in full bearing for any number of years, without any other manure, and of which Professor Liebig, in his admirable work on agricultural chemistry, has cited two remarkable instances. With these views, it is reasonable to refer the

* "Chemistry of Agriculture and Physiology," p. 92.

† It is not probable that trees with large systems of leaves can be much indebted to the soil for those organic substances which the atmosphere so abundantly supplies.

more general cultivation and prevalence of orchards in the districts above named than in any other, principally to the greater abundance of that mineral food so essential to fruit-bearing trees, producing a large quantity of acid. We shall have occasion to revert to this subject in treating of the manuring of orchards. With regard to aspect, districts are favourable to orchards which have more or less an undulating surface (and, therefore, present numerous localities whose sheltered and, at the same time, sunny aspects are favourable both to the setting and ripening of the fruit), and often acclivities, which, though of excellent soil, are too steep either for cultivation or the pasture of heavy cattle. Very open or elevated and exposed situations, and the bottoms of deep-sunk valleys, are almost equally unfavourable: the first, from the violence of winds and low temperature, and the latter, from their liability to cold fogs and late frosts while the trees are in blossom, which often, in one fatal night, utterly destroy the hopes of the husbandman. In planting an orchard, therefore, the site should not be chosen "in lowly vale fast by a river's side," nor, on the contrary, at an elevation too much exposed, but on moderately sheltered southern slopes, and, when choice will farther permit, inclining rather to the east than to the west; for, although a slope inclined to the south-west is warmer than one to the south-east, it generally retains the fogs longer, and, therefore, is more dangerous to the fruit in the spring of the year. A situation much surrounded, or closely hemmed in by woods or plantations, is almost equally as objectionable as a close watery bottom, as woods exhale a vast quantity of moisture from their leaves, and the fogs produced over them dissipate much more slowly than those over open ground.

Raising Plants.

Apple trees are generally purchased from nurserymen, or persons who make a particular business of raising them, and who sell them at prices varying from 2s. to 5s., according to size and quality. They may, however, be raised with great facility by any intelligent cultivator; and where orchards are much cultivated, considerable profit might be made by selling them to others. At all events, a few young trees should be always coming forward in the provident cultivator's garden, for the purpose of filling up vacancies occasioned by accident or decay. It is a prevailing opinion that the hardiest and best stocks are those which are raised from the seeds of the wild Apple or Crab; and Mr. Knight recommends that the pips should be taken from the fruit before it is pressed, but the pommy (that is, the pulp after it has been pressed) will generally contain a great number of entire seeds. This pommy, or that from the Apples of healthy and vigorous trees, should be thickly laid and covered up in shallow trenches, about 18 inches apart, so as to admit of the young plants being well hoed and hand-weeded in the following summer. Immediately after the fall of the leaf in the ensuing autumn, the strongest plants might be drawn, and planted 18 inches apart in rows of the same distance from each other. The land should have been previously trenched, manured, and cultivated for garden produce. The remainder should be similarly managed in the following year. During their future growth, the ground should be kept perfectly clean by repeated hoeings; and the plants would be much benefited by a light forking between the rows. No knife should be allowed to approach them in this stage, unless it be to shorten a rampant-growing shoot, which may be making too strong a diversion from the stem, and not even then if it be more than a foot from the ground, at least when it is intended to graft the stem; for every twig and leaf contributes to the growth of the root and the stem, the only thing, at present, to be regarded. When the plants are more than half-an-inch in diameter, at a foot from the ground, or about two or three years' old, the head should be removed, and the stock grafted about 10 inches from the surface; and, at the same time, every sprig and bud of the stock should be carefully taken off, in order that the sap may be more vigorously determined towards the graft. The mode of grafting will be noted presently. When the graft has grown about 2 feet in height, the plants should be removed or planted out in land similarly prepared, in rows 4 feet asunder, with an equal interval between each plant, where they are to remain until finally removed to the orchard. Before the plants are removed from the grafting-site, no side-shoots should be cut off, except those below the graft. On their removal to open rows, any overgrown branch may be shortened, and two or three of the lowest removed close to the stem. After this, the stronger side-shoots only should be moderately shortened, in order to encourage the upright growth until a good head is formed about 6 or 7 feet from the ground. The side-shoots may then be removed, close to the stem, in two successive years, while the head is left to it unrestricted growth. It is a very common, and bad practice to cut off all the side-shoots early, leaving only two or three twigs at the top, by which means the plant is very much checked in its growth, and, instead of producing a firm and tapering stem, it becomes almost cylindrical, and tortuous, instead of upright. Those who treat plants in this way are, undoubtedly,

ignorant of the true nature of their growth, and the important office of leaves; and, therefore, in attempting to assist Nature in her operations. If such persons had equal facility of witnessing the growth of the roots, they would, no doubt, think it their duty to cut part of them away, with a view of promoting the growth of the stem—at least such a proceeding would be not less absurd. Every leaf is a feeder of the plant, no less than every rootlet; and no interference with the progress of the plant should be allowed, except for the purpose of preventing any side-branch becoming a rival to the head. When, however, the plant has attained the required height of stem, and the head has pushed forward strong shoots above that height, the whole of those on the stem may be finally cut away as before directed, the stem having by this time gained sufficient substance and strength to preserve its erect position, and to support the head. Apple trees are generally fit for planting out in the orchard at about seven years of age, at which time, if they have been well treated in the nursery, they will be about an inch and a half in diameter at the middle of the stem. The particular age, however, at which trees should be removed to their final destination, after they have formed a good head, is not very important, provided they do not very much exceed the above size; and the objection to a greater size is the difficulty of taking them up with a due proportion of roots, so as to prevent them receiving too great a check. It must be obvious from analogy that early transplanting is preferable to late, provided the trees be well and substantially fenced against injury from live stock of every kind—that is, with posts and rails, and with thorns immediately surrounding the body of the tree. The habit of keeping the trees in the nursery until they are what are called strong trees, can have arisen only from the feeble fencing they too generally receive by which the tree is often made the chief support of the protecting Thorns or Furze.

Selection of the Best Kinds.

The subject of grafting necessarily involves that of the selection of sorts. The best fruit, whether for cider-press or the table, are frequently not the most productive. Every individual seed produces a new variety, differing, more or less, from the parent tree; and all the best varieties we possess are derived from one common parent (the native Crab), and owe their excellence to selection and cultivation, in like manner as the most polished society of the present day is derived from a race originally rude and savage. Each particular variety of Apple has its period of vigour and decline, and its duration cannot be protracted by grafting beyond a certain limit; and it is very remarkable that within that natural limit, the grafts partake both of the vigour and the decrepitude of the parent tree or variety. The period of duration is not known with any precision, and, perhaps, is longer in some varieties than in others. It is generally supposed, however, that it never much exceeds two centuries. Mr. Knight, one of the most profound physiologists of this, or any other country, has observed that the disease called canker is always the consequence of grafting trees from very old sorts, and which are in their declining age; and that though the graft will often grow vigorously at first, it soon begins to exhibit symptoms of disease, which no management can avert. It seems probable that even the power of growing at all cannot be extended beyond the limit, harring accidents, which Nature has assigned to the existence of the original parent or patriarch of the family. Many kinds, once very celebrated, have long since disappeared from the catalogues of gardeners, and can now nowhere be found; while many other varieties, which were much esteemed in their palmy days of bearing, are fast approaching to extinction, and, at the present time, present only a few scattered and dwindling specimens, amongst which we regret to number the celebrated Cockagee cider Apple and some excellent Pippins. By the industry of horticulturists, however, a great number of new varieties of excellent quality have been raised to supply the place of those we have lost and are losing, in which there is more merit than would, at first thought, be supposed; for a good sort out of the number of seedlings raised is like a prize in a lottery, and it must be remembered that some years must elapse before the experimenter can draw his prize, if, indeed, there be one for him. Mr. Knight has been one of the greatest experimenters in this way, and has raised many good varieties. In the purchase of young trees or in grafting, in order to form a productive and profitable orchard, care must be taken to select good sorts, which are either new, or in the vigour of their bearing, whether for the cider-mill, the table, or the kitchen. Apples for these several purposes recommend themselves to our choice by very different qualities, though some few are almost equally well adapted to all purposes. In those for the table we require sweetness, with a subdued and pleasant acidity, and a delicate aromatic flavour. In the kitchen Apple, size, the quality of keeping, and considerable acidity, are the principal requisites; acidity is indispensable in Apples intended for boiling and making sauce. The best fruit for cider are those which yield the heaviest juice; and these are not,

generally speaking, agreeable to the palate. The celebrated Cockagee Apple is absolutely uneatable, though it is very fragrant and inviting to the eye. I was once told by a cultivator that he offered a boy a shilling if he would eat one in his presence. The attempt was made, but was soon abandoned, from the impossibility of getting it down. The red and yellow colour of the rind is considered, by cultivators in the Apple districts, as good indications of cider-fruit, and Apples of the various degrees of those colours are decidedly preferred to those of which the rind is green. Knight observes that those Apples only which are of a yellow colour, or a mixture of yellow and red, are proper for making the finest kind of cider; but the quality of all cider is very much influenced by the different processes practised in its manufacture, which will be treated of in due course. In order to ensure the obtaining the most desirable sorts by means of grafts, the orchard from which they are intended to be taken should be carefully inspected in the previous autumn, just as the fruit is arriving at perfection, and the proper trees marked. The grafts, which should be taken off in February, should be of the last year's shoot, and taken from the strong lateral branches of free and vigorous growth. The ends may be cut off, and the part reserved should be about 8 or 10 inches long. They should be kept covered up in dry earth until the middle of March, which is generally the best time for grafting, as the sap then begins to rise freely, and affords a better chance of a successful operation. The immediate object of this operation is to bring the bark and young wood, both of the stock and scion, into close and permanent contact, by which means the vessels of the one are enabled to communicate with those of the other. This is effected by several different methods, which have their various denominations; but that which appears to be most generally approved, in grafting young Apple stocks, is what is called saddle-grafting, as affording the best means of bringing into contact a larger surface both of the bark and wood, and thereby giving a better chance of success, and also of preserving the graft firmly in its place. Grafting upon old stocks and large trees is performed by the method called cleft-grafting. These operations, however, require great nicety, and are generally performed by professional gardeners; and, as they can be learned by inspection and practice only, it is needless to describe them here. The principle is the same in all cases, namely, to bring a clean recent oblique cut of the corresponding parts together, as mentioned above. They are then firmly fixed by a ligature of bast or garden-matting, and preserved from the air by a thick covering of a compound of clay, horse-dung, and chopped hay, previously well blended together. If the trees are to be purchased from a nursery, ready grafted, and the sorts cannot be relied upon, they should be inspected in the previous summer while in leaf; and those selected which give the greatest promise of making good and healthy trees, and the most likely to be good bearers. They should have full and flourishing heads, and broad roundish leaves, as such generally bear the largest fruit and the most abundant crop. In winter such trees will present a larger and fuller bud than those whose leaves are small and pointed; but, though these are favourable indications of the size of the fruit, and the productiveness of the tree, they are by no means so with regard to other qualities, as the trees may be early or late bearers, and the fruit red, yellow, or green; and whether they will produce either good cider Apples, or those better adapted to the table, can only be known when they produce their first fruit. If they then prove not such as are desired, or there is too great a proportion of one sort, grafting in the head should be had recourse to. This will, it is true, protract the time of bearing a year or two; but it is much better to submit to two, or even three, years' delay, than for a hundred years to have bad fruit.

Pears.

The Pear tree will grow, and produce great crops of fruit, on soils which are not favourable to Apple trees. For instance, on drier and lighter soils, consisting chiefly of sand. In Worcestershire, Herefordshire, and Gloucestershire, they are often planted in hedgerows; and from such trees the farmer frequently derives a large supply of excellent perry. The trees of the perry Pear are, some of them, so large that one will, in very favourable seasons, produce several hogsheads. There are, however, some objections to the practice of planting fruit trees in hedgerows; they shade the land, are exposed to depredation, and require the exclusion of cattle during a considerable portion of the autumn. But we ought to set against these objections two countervailing advantages; the ditches of a field receive a great deal of nourishing matter from the drainage of the land, which readily finds its way to the roots of the trees; and the sun has freer access to the trees so situated than when they are crowded together in orchards. Pears trees are but little cultivated in the counties of Somerset and Devon, at least for the making of perry, which is the more remarkable as the soils of both counties must be equally favourable to their growth; but as the Pear tree is many years before it

comes into bearing, this neglect may have arisen from the nature of tenures. A tree which requires twenty years to bring it into bearing should be planted by the person who is in possession of the fee of the land, or it is not likely to be planted at all. The best perry Pears are generally very harsh and disagreeable to the taste, and, indeed, may be considered uneatable, so that even hogs are said to reject them; and yet they produce, when ground, very sweet pulp and rich juice. The sweet eating Pears make a much inferior perry, which soon turns sour. The mode of raising Pear trees is precisely similar to that of Apples. Stocks may either be raised from the wild Pear or from the seed contained in the pulp after making perry; nor is there so much reason to prefer the wild kind to the perry Pear as the Crab-stock to that raised from the Apple seed. A repetition of the process is, therefore, needless, and particularly as they are most generally purchased from the nurserymen, to whose department the business of rearing more properly belongs, and by whom it can be better executed. It may be observed, however, that the Pear will succeed if grafted upon the Apple, Service, Medlar, or Quince stock. Some Pears are said to be improved by being grafted upon the latter, but the hard sorts are rendered gritty. The kinds of Pears cultivated in the counties of Hereford, Worcester, and Gloucester, for perry making, are, principally, the Longland, the Squash, the Oldfield, the Barland, the Sach Pear, and the Red Pear. Before we quit the subject of rearing plants, it may be well to observe that it is a common practice, after the plants have been removed to wide rows, to cover the interval thickly with Furze, when it is readily obtainable, which prevents the growth of weeds, keeps the ground moist, and, as it decays, yields manure to the trees. It would, perhaps, be a better practice to raise two or three successive crops of manured Potatoes.

Planting Out.

When the trees have shed their leaves is the most proper time for planting out. They should be taken up with their lateral roots at least 2 feet in length, and planted as soon after as possible. In planting orchards, the ground, for the space of at least 6 feet in diameter, should be trenched to the depth of 16 or 18 inches, and well broken by the spade or mattock, the turf being thrown to the bottom. It is of some importance that the tree, when planted in the orchard, should stand in the same position, with regard to the points of the compass, as that in which it grew in the nursery; and, in order to ensure this, the south or north side of the trees should be marked before they are removed from the nursery, and this might be done when trees are purchased at the time of selection. Care should be taken to surround the roots with the finest part of the mould, and to plant the trees at precisely the same depth as that at which they before grew. The ragged or lacerated ends of the roots should be taken off with the knife; and the hole, after being duly prepared as above, opened wide enough to admit the longest of them. If the ground at the time of planting be dry, and water can be conveniently procured, two or three bucketsful, applied to each of the trees, will be of essential service in securing its growth. The tree being placed in the hole, and temporarily fixed in its proper position by a single stake, the hole should be nearly filled with mould, and the water poured upon it. After a few hours, the remaining mould may be added, and well trodden down. The mode of fencing must be suited to the kind of stock kept in the orchard. If sheep only are depastured, the tree should be closely surrounded by strong thorns stuck into the ground, enclosed and sustained by thick stakes driven into the firm ground beneath, and reaching nearly to the forks of the tree, and these firmly held together by strong bands or withes. As a further precaution against damage from the gnawing of sheep at any exposed place, the trees should be washed or smeared with a mixture of creamy lime and cow-dung, which should be renewed from time to time as occasion may require. If it be indispensable to stock the orchard occasionally with large cattle, the tree must be fenced by two or three rough strong posts, fixed firmly in the ground, and united by strong battens or short rails nailed to each, and embracing thorns or furze closely surrounding the tree. It is a miserable economy to perform this part of the business of planting imperfectly or scantily, as many an orchard has been ruined by the neglect of proper and substantial fencing. In some situations, where flat slaty stones abound, the trees are sometimes surrounded by a circular wall. The trees should be planted at the distance of from 40 to 60 feet apart, according to the richness of the soil; for it should be always remembered that the roots extend far beyond the branches. At 42 feet distance, twenty-five trees will stand upon an acre, which may be generally considered the proper number. The rows should run north and south, in order that the trees may derive the greatest benefit from the sun. If, in the ensuing spring, a thick dressing of a well-mixed compost of lime and earth be laid over the whole space that has been opened round

the trees, and afterwards dog in, it will be highly beneficial to them; and digging or forking round the trees should be repeated every year, for three or four years. If the ground be wet it should be thoroughly drained by deep covered trenches between each row of trees; and if, besides this, the whole ground were trench-dug, and the turf replaced as the work proceeds, if Grass-land or trench-ploughed if arable, the expense would be well repaid by the rapid growth of the trees, and the improvement of the land.

Best Soils for Apple Trees.

It has been observed before that the extensive culture of Apple trees is chiefly confined to certain districts, which abound with marly and heavy calcareous soils; and the probable and principal cause of this partial distribution has also been noticed, namely, that such soils contain, in greater abundance, those mineral substances which are essential to the growth of the tree, and more especially to the formation of the juices of the fruit. It has likewise been observed that the natural impediments in other soils to the successful cultivation of the Apple are removed by a liberal supply of ordinary manure, but particularly the fallen leaves of trees, in all of which potash is very abundant. The soil of the London clay, though not naturally favourable to the growth of Apples, is, by trenching and manuring, made to produce not only plentiful crops of Apples, but also all other juicy fruits in great abundance and perfection; and this triumph of cultivation over the impediments of nature is manifested in the highest degree in the extensive gardens that surround and supply the Metropolis. The extensive system of leaves of all fruit-bearing trees is probably quite adequate to the supply of all the organic or gaseous substances which both the tree and the fruit require, and, therefore, it is in the mechanical state and to the inorganic constitution of the soil that we must look for those conditions which are either favourable or unfavourable to the growth and productiveness of such trees. It is not enough that the soil be neither too open nor too retentive for the supply of the due degree of moisture; it must also contain those inorganic or mineral substances which the tree and the fruit require. When the defects are known, the remedies are obvious. By draining and trenching only, a stiff soil may probably be rendered favourable to the production of fruit; and, if this mechanical operation (at all times beneficial in such soils) fails to produce the desired effect, it is evident that mineral manures are wanting, which may be supplied by heavy dressings of lime or peat-ashes, or both. If the soil be too porous, a heavy dressing of marl is the best remedy; and, when this cannot be procured, clay, with lime and peat or other ashes, will supply its place. There are but few situations, however, where it would answer, except on a very small scale, to render light those lands capable of bearing Apples. It has been observed, that marls, besides carbonate of lime, contain also potash and sulphate and phosphate of lime. Lime and peat-ashes generally contain more or less of the same substances, and, in applying them to soils which do not contain them, or in which they are defective in quantity, we only supply the deficiency of Nature. Every cultivator knows that no soil can be productive without a plentiful supply of water; but those principles or substances which water conveys to plants, and which are equally essential to their existence, have hitherto, for the most part, as separate substances, escaped his observation, obscured, as they are, in the general mass of manures which he conveys to his fields. The fertilising effect of certain salts, which constitute only a part of this manure, and which, till lately, were never thought of as forming a necessary part of the food of plants, has awakened that spirit of inquiry which promises to lead, at no distant time, to a knowledge not only to the cause of the fertility and barrenness of land, generally speaking, but also to a more exact knowledge of the peculiar adaptation of certain soils to particular plants; in other words, the true reason why any particular plant will thrive in one soil, and not in another. That most ingenious and thoroughly practical people, the Chinese, have long since experimentally discovered the means of adapting their soils to the plants they wish to cultivate upon them, and provide the proper manure for each particular plant. We have much, therefore, to learn in this particular, at least, from a people whom we have been accustomed to regard as semi-barbarians—as, indeed, in some respects they are. Science has recently opened to Europeans a shorter and surer way of gaining knowledge of this kind, or at least affords them a guiding light by which to conduct their experiments, in the exact analyses which may now be obtained of plants, and of the soils upon which they grow and prosper. These observations upon the artificial adaptation of the soils to the growth of Apple trees are merely thrown out as suggestions. When young trees have been carefully planted and well-fenced, they will require but little attention, except that of keeping up the fences and taking care that they be not shaken by the wind. To guard against the latter, the tree should be well armed with

a firm bandage of straw at the part where it rises above the top rail, and there confined between two cross-pieces, passing from one rail to the other, or else so firmly fixed by withe-bands as effectually to prevent any rubbing, and consequent injury to the bark.

Pruning.

The bearing capabilities of Apple trees of considerable age may be much improved by judicious pruning, in removing decayed branches and old unprofitable boughs, where the head is much crowded. These should, in all cases, be taken off by a clean cut close to the branch from which they are separated, or, at least, to a lateral shoot, so that the part may heal over as soon as possible. By pursuing such a course of pruning, and by keeping the body of the tree only just sufficiently open to permit the sun to penetrate, the weight of the fruit will be increased, and it will, at the same time, ripen more regularly. Mr. Knight recommends most attention to be paid to the lateral branches, which, if unchecked by occasional pruning, are apt to load the tree too much at the extremities. In damp situations trees are often covered with Moss, and thievish Mistletoe takes root in their branches, and robs them of their juices. These parasitical ornaments should be perseveringly removed from the trees, though they are often suffered to grow with their growth, and strengthen with their strength; or, it might be more properly said, at the expense of their growth and strength. Sometimes trees, which at first were good bearers, become stag-headed and unfruitful. It is more than probable that this condition is owing to some defect in the soil. The proper remedy to be resorted to in this case is what is called heading-down—that is removing all the branches to within a foot or two of the main forks or the stem of the tree, in order to encourage the formation of a healthy and vigorous head. This operation should be accompanied with a heavy dressing of compost, formed of lime, ashes, and earth, extending for a considerable distance round the tree, which should be dug in with the marled turf. If the land be wet, draining must be resorted to, as in that case other trees are, no doubt, suffering in some degree from the same cause. If the tree be infected with canker, the same treatment should be adopted; but in this case there is but little hope of success, for, according to Knight, that disease is symptomatic of the declining age of the species, which no treatment can effectually cure, except in the case of trees which have been grafted in the head. Fresh grafting, if the stocks be young, will remedy the evil. In otherwise hopeless cases, such treatment of stunted trees is deserving of trial; for, if it succeed, a large and full-bearing tree is soon obtained; whereas, if it be removed and a young tree planted in its place—even if it succeeds, which would be doubtful—it would be a long time before it came into bearing. When the fences are no longer deemed necessary for the support and protection of the young trees, it is still proper to guard against the injury from cattle, by smearing the stems with lime and cow-dung.

Apple Trees in Arable Land.

In Herefordshire it is very common to plant Apple trees in arable land—a practice, the policy of which is very doubtful; though there can be no doubt that the trees must derive great benefit from the tillage and manuring of the land. I am not aware that any comparison has been made between the profits of an orchard under tillage and another in pasture, on the same kind of land. Indeed, it is hardly likely that any trial of the kind has ever been instituted, or could be with any chance of a satisfactory result. It is highly probable, however, that many soils which are not naturally adapted to the growth of Apples are rendered productive of them by means of the tillage and appliances which corn-crops require, and especially by the application of lime. Trees will grow luxuriantly on certain soils without bearing Apples; on the deep gravels of the grauwacke slate, for instance. On such a soil I have seen an orchard planted upon pasture, the trees of which thrive well, but produced no fruit. There can be but little doubt that this orchard would have produced Apples under an ordinary course of tillage and manuring. It cannot be for want of humus that such orchards are unproductive, for that accumulates in Grass-growing orchards; not can it be owing to a deficiency of either carbon or ammonia, or the elements of water, for, of these, the atmosphere affords an inexhaustible supply to plants which have large volumes of leaves and extensive roots for their absorption, and this supply is renewed by every breath of wind and every shower of rain. It must, therefore, be owing to a deficiency of mineral substances in the soil, which, perhaps, the ordinary manuring and lining bestowed upon arable land would have supplied; for the constant barrenness of an orchard cannot be attributed to the effect of spring frosts. Other fruit trees, besides Apples and Pears, may find a suitable place in an orchard such as has been described. Plums and Cherries may find a place on its southern side; and Walnuts and Spanish Chestnuts serve as a protection to the north and east.

Cherries and Plums are far less choice than Apples, as to the soil upon which they grow. Productive orchards of the former are found upon the new red sandstone of Worcestershire, as well as upon the slate rubble of the valleys of Devonshire and Cornwall. In the vicinity of, or at a moderate distance from, large towns the produce of such trees often sells for a large sum of money.

Management of Store Fruit.

Apples and Pears, which are intended for keeping, should be hand-gathered when they are as ripe as they will hang on the tree. If they are taken much earlier they will shrivel, notwithstanding all the pains that may afterwards be taken to preserve their plumpness. The gathering should be conducted with great care, so as to prevent bruising, as the least injury of that kind produces decay and rotteness in the injured Apple, which soon communicates it to others. The fruit should be gathered in dry weather, and spread out singly in an open apartment for about a week, and then carefully put away in a tolerably airy place. If it be desired to keep them very long, and in high perfection, before being stored they should be carefully wiped, and each wrapped in thin paper, like that used for Oranges. Recesses, fitted with shelves so as to prevent their pressing too heavily, are the best adapted for their storage. By the latter means, Apples and Pears of the keeping kinds may be preserved quite fresh and plump until the return of fruit in the following summer.—*Journal of the Royal Agricultural Society.*

THE HOUSEHOLD.

IMPROVED COOKING APPARATUS.

Mrs. A. Lewis has delivered a lecture, at the Inventors' Institute, on improved cooking and heating apparatus, and offered some suggestions for food reform. The chair was occupied by Dr. Hardwicke. Mrs. Lewis went through all the mysteries of cooking a working-man's dinner. The stove she used was of a larger size than those with which she prepared a meal in public some time ago, but it nevertheless proved as efficient as one could possibly desire. The principle upon which her new receptacle for holding fuel is based is that of the brazier, one of the simplest, and, at the same time, most efficacious that has perhaps ever been adopted. Her description of a brazier is, by a simple mechanical contrivance, made to turn upon a pivot, the object of which is to regulate the draft, and consequently the expenditure of fuel. A "roaring" fire may be obtained by this means; or the coal or peat which is used—for it will burn either—can be reduced almost to a spark—a great desideratum, not only in warm weather for the well-to-do; but one which will, no doubt, be highly prized by the poor on account of the saving thereby attained. The remarkable thing about Mrs. Lewis's system is, that she does not allow any portion of the food, whether animal or vegetable, to be immersed in water, except in the form of steam, and in order to do this she has several very ingeniously, but at the same time very simply, constructed vessels. Another thing worthy of commendation is the rapidity with which the aqueous element is converted into what one of our cousins across the Atlantic called a state of "perspiration." From the time the match was applied to the fuel not more than three minutes elapsed before the kettle was "singing," and after two more had passed the pot, or rather cylinder, was boiling. This cylinder was about 2 feet high and something like a foot in diameter, and the interior of this vessel is fitted with shelves, the object of which is to support a description of tin colander, and these in turn hold the various vegetables. Three of these apparatuses were placed over the others in the steamer, the first containing a Cauliflower, the next some Potatoes, and the third Turnips. Then, again, in a second pan were placed some fish, all of which turned out admirably, under the superintendence of the distinguished chef. The Cauliflower was beautifully white and the Potatoes were like "balls of flower," but the most delicious of all were the Turnips. These latter, by the mode in which they were treated, were neither watery or spongy, but firm, and what is more important retained all their saccharine matter. It may be a fact worthy of note that the whole cost of keeping a coal fire going in one of these patent stoves from seven in the morning until eleven at night costs but 2½d. This fact alone ought to be sufficient, even if there were no other advantages to be obtained by them, to ensure their success. Mrs. Lewis commenced by deploring the dense ignorance of the working classes respecting all matters connected with cooking. What they wanted was cheaper food and less expensive means of preparing it than they possessed at present. She then went on to say that her stoves were not intended for the rich, although they might be made as ornamental as any, but

they were for the working classes, and especially for the labourer. The stoves were adapted for either peat or coal, either of which would burn equally well; but for cheapness and cleanliness she much preferred the former description of fuel. By using that particular sort of stove the room was warmed equally in all parts—a most essential thing to health—and persons were not frozen upon one side and scorched upon the other. Another, among many advantages which it possessed was that it emitted no smoke. People now put their vegetables, their meats, and their fish into water, and boiled or stewed them until most of the nutritive portions of them had been absorbed in that element. The same thing might be said with regard to roasting and baking. These processes were equally deleterious, for they only hardened the meat and destroyed its juices. The only mode of cooking properly so as to obtain every particle of nourishment the various edibles contained was either by steaming or allowing the live flame in a covered pan to get near them. What was required in order to bring about a better state of things was for the School Board to take the question up theoretically, and some other body practically. There was no good trying to cook properly without theory. Food and condiments from abroad she strongly set her face against, especially for ladies, as their use produced in many instances the number of pale faces they exhibited. Soup, too, taken before dinner was a barbarism that no enlightened person should be guilty of. In conclusion, she said that she had not so much to do with the higher classes as with the poor, although she had much to say to them. What she wanted to see was the working man's home made what it ought to be, comfortable, and she could assure all present that once such a stove as the one she had used that evening was introduced into a man's home, it became quite a different dwelling.

The Rose Harvest in Turkey.—The Adrianople Rose crop for 1873 is reported to have been on the whole a good one, and, consequently, the manufacture of attar of roses, for which this district is so celebrated, has been fairly remunerative. Distillation, however, owing to the excessively wet weather, being impeded, the produce was not of the best quality. About 938,000 oz. was the result, and as the price, which, of course, varies with the quality, ranges from 13s. 1d. to 16s. 10d. per oz., the whole is valued at about £700,000. The German merchants are the principal customers for this article of luxury, and annually purchase over 60,000 oz., the remainder generally going to the Eastern markets.

Vanilla Flavour obtained from Fir Trees.—There is, it appears, in the juice of Fir trees, between the wood and the bark, a crystalline substance called coniferin, a glucoside, as chemists call it, which, when acted upon by oxydising agencies, is easily converted to vanillin, the chemical principle of vanilla. As a few grains of this vanillin will flavour at least a dozen ice puddings, and the juice of an ordinary sized Fir tree contains enough coniferin to make five guinea's worth of vanillin, it is evident that Scotland can supply all our pastry-cooks with this article without greatly diminishing the forests of Fir now about to clothe her hills with the most delicate of vernal green.

Cucumber Pickles.—Many complain that they cannot pickle Cucumbers successfully. As I have preserved several barrels, perhaps I can assist others by furnishing them with my way. It is best to pick them every day. In picking them, they should not be pulled off, but the stems should be cut about half-way between the Cucumber and the main stalk. Be careful not to cut or bruise the Cucumbers, and, in washing them, rinse them carefully, rubbing them as little as possible. Do not rub off any more of the little black prickles than you can help, for, whatever causes the juice to run makes them incline to rot. Now put a layer of salt on the bottom of your barrel or jar, on this lay smoothly a layer of Cucumbers, and sprinkle on salt enough to cover them; then more Cucumbers, and so on. As soon as the salt melts into brine, which will be in a few days, the scum will begin to rise on it. Wherever this scum touches a pickle it causes it to rot; to prevent this, cover them with a cloth the size of the barrel, keeping it weighted down with stones. Every day, when you fill up with fresh Cucumbers, take off the cloth, and rinse the scum off from it in clear water. After your barrel is full, the cloth will need to be rinsed once in two or three days for several weeks. If you find scum on any of the pickles, rinse them too; and, if any of them are soft on one side, throw them away. Be sure that the cloth covers the pickles, and that it is kept under the surface of the brine. When wanted for use, soak them several days in cold or slightly warm water, changing the water once or twice a day. Then place them in a pan of water on the stove, and let them remain near the boiling point, but not quite boiling, for half a day. This makes them softer and more wholesome than when left without scalding. They are then ready for the vinegar.—*Hearth and Home.*

HINTS FOR AMATEURS.

THOSE who are fortunate enough to possess a little patch of garden in any suburban district should now be busy, morning and evening, sowing or planting. One of the most frequent of all questions asked by amateurs is, "How deep shall I sow my seed?" To this question we can only reply that it depends on the kind of seeds sown. The amateur must be guided, to some extent, by the size of his seeds; for example, Sunflowers, Sweet Peas, Convolvulus, and Nasturtiums, have large seeds, and these will find their way through nearly any depth of soil; but the best depth to sow these is, say, an inch to an inch-and-a-half deep. Now if we were to bury some of the smaller and more tender of flower-seeds an inch under the soil we should never see the young plants come through the surface, and it is possible that the seedsman would be blamed for supplying bad seeds, when in reality the fault was our own. All small dust-like seeds should be sown on the surface of finely raked ground, and then just enough finely-pulverised soil should be sprinkled over to cover them completely. Many seeds, as Mignonette, Larkspurs, Wall-flowers, and many annuals will grow well if simply thrown over the surface of newly-dug earth and then raked in with a small-toothed rake. The object in covering the seeds is two-fold, viz., to keep them moist and dark until germination takes place, and to hide them from the birds. Everywhere in Nature we see the seeds sown as soon as they are ripe, and the falling leaves cover them over and eventually supply the young plants with the best of all manure. For the generality of large seed half-an-inch deep is quite enough, and this depth is best for all except the smallest or dust-like seeds. If the flower garden and borders are to be gay with a variety of hardy annuals, now is the best time to sow them, and not a day must be lost. A dozen showy varieties will only cost a shilling, and these will add much interest to any little suburban or town garden, however small. Now it is, unfortunately, but too true that there are many amateurs who do not know the names of half the plants they admire in the market, or in the gardens of their neighbours, so we will just name a selection of plants which will bloom during the present summer if sown at the present time, and carefully watered every evening in dry weather. This latter operation will be an interesting one, as it will bring the amateur into close communion with his plants, and in this manner much will be learned as to their individual peculiarities and requirements. A garden is of little use to its possessor unless he takes a personal interest in its management, and in time this attention will grow into a pleasure, and no part of the day will be more pleasantly spent than an hour of two in the cool of the evening when, with a cigar in one hand and a watering-can in the other, the pet plants are duly attended to. One of the easiest of all plants to grow, and one of the most deliciously-fragrant of all plants, is the common Mignonette or "Little Darling," a name bestowed on it when first introduced into French gardens. We should like to see every bare inch of soil in all our parks, squares, and gardens covered with this "fragrant weed," and one way of obtaining this is to buy an ounce or two of seed at the cost of a few halfpence. This should be emptied into one of your pockets, and then, on passing any bare spot, a pinch of the seed might be sprinkled over it, and some are almost sure to grow, and they will perfume the evening air with their refreshing fragrance. Most people like flowers, but they neglect their culture for the want of definite information how to proceed. Sweet Peas are showy and fragrant, their flowers being borne on long slender stalks makes them suitable for cut flowers, and they, moreover, last remarkably well in water. Convolvulus major, or "Morning Glory," is a handsome and quick-growing climber, and a few seeds of this should be pricked in close to any bare wall or fence, as it makes an excellent trellis-plant, or it can be trained up strings beside the door or window—positions in which its rich ruby, or purple-tinted, flowers show to the best advantage. The common Canary Creeper is a general favourite, and grows well treated like the last. It has fresh green leaves, divided into about five lobes, its flowers being of a bright golden-yellow colour, not unlike little canary birds; hence its popular name. Growing up a string by the cottage porch, or scrambling over a low fence, this is one of the most beautiful of all climbing plants. Its botanical name is *Tropæolum peregrinum*, and it is nearly related to the common Nasturtium, another elegant and free-flowering climber, well known in nearly every cottage garden. Ten-week Stocks should now be sown in patches, and they will bloom in the course of a few months; while their flowers are nearly as sweet as Mignonette. Asters may be sown in the same manner, and hardly ever fail to produce their large richly-tinted double flowers. In addition to these, Larkspurs (purple and white), Soapdragons (*Antirrhinum*), Soapworts (*Saponaria*), and Clarkias should find a place along with *Collinsia bicolor*, *Love lies Bleeding* (*Amaranthus*), *Candytuft* (*Iberis*), *Eschscholtzia californica*, *Lupinus*, *Nemophila*, and the rosy cushion Pinks (*Silene pendula*). The

above will grow and flower freely in any ordinary garden soil, and are quite as well worth growing as Geraniums, and other summer bedding plants; though, if possible, include both in your arrangement. As to the question of expense, any of the above seeds can be bought at any seed-shop in penny or twopenny packets; so that the cost is no serious obstacle to their culture. B.

WORK FOR THE WEEK.

The Flower Garden.

THERE are several kinds of evergreens that may now be transplanted, when the sap is in motion, with the greatest certainty; and, amongst them, we would particularly mention the Cedar of Lebanon, the planting of which during winter is attended with great danger; whereas, if planted now, the chances of failure are reduced to a minimum. Careful removal is necessary, however; and it should be done speedily, so as to expose the roots to the drying influence of the weather as little as possible. When the tree is in position, cover the roots with the finer portions of the soil, and tread it solidly down, giving a thorough soaking of water, which must be allowed to subside previously to filling up the pit. Mulch the ground above the roots, and little after attention will be necessary. Hollies may also be transplanted at any time during the spring months—a point worth knowing, for the best gold and silver kinds are unsurpassed by any other subjects for summer embellishment. The same remarks are applicable to *Rhododendrons*, and many other evergreen shrubs. Recently-planted trees and shrubs must have timely attention, in order to prevent their suffering from want of water and from wind-waving. In the case of large trees, indeed, staking is an important point. Re-plant *Cerastium* and other hardy edging plants. Violets, as they cease flowering, should be lifted, parted, and re-planted in ground that is in good condition. Fresh turfy loam and dung, forked into the soil where they are to grow, will be found to suit them perfectly. They delight in a situation shaded from direct sunshine, such as the north side of a wall, or in the shade of trees; but avoid inducing them to become drawn, by planting them under the spread of the branches. The best varieties for garden display are the Czar, the finest of all single Russian kinds; and the white sort, called compacta. Pansies and Violas may now be planted out into beds that are well enriched with manure, and to which fresh soil has been added; bearing in mind that perfect success is only attained by promoting continuity of growth. Sow seeds of hardy annuals, biennials, and perennials, and plant out *Hollyhocks*. In the case of *Eurothera macrocarpa*, part the roots. This showy sort may be propagated in heat by means of the young shoots. Among *Oxalises*, which should now be divided, *corniculata rubra* is a very pretty variety for carpet-bedding. The Striped Grass, *Dactylis glomerata variegata*, should now be propagated by parting the roots. Of the *Pyrethrum* well known as Golden Feather, a sowing should be made at once, upon a warm sheltered border. It will come in well for panels, where the plants cannot well be too small when planted out. Unoccupied beds should be treated in accordance to the crop they are to carry. In the case of Geraniums, a dressing of fresh soil will be more conducive to effect than one of rich manure, as over-luxuriant production of foliage proportionately diminishes the amount of flower; while, on the other hand, if an exuberance of leafage is desired, an abundant supply of nourishment must be given. Deep cultivation is important; for, except that is secured, no after management will compensate for its loss. Leaf-mould and thoroughly decomposed manure only should be used, avoiding rank dung. General ground-work must be proceeded with, and arrears of every description pushed forward. Cut Box-edgings; and, if any remain to be relaid, they must now be seen to. Mowing, rolling, and clipping the edgings of walks will now demand attention. Weeds must be kept under, and perfect neatness and order must be everywhere maintained.

Pits and Frames.

The majority of bedding-plants now occupying these may be placed under temporary protection, preparatory to being planted out. Attend to the pricking off of tender annuals, and push forward what potting off may yet remain to be done. Abundance of space and air should be afforded to the more tender bedding-plants, so as to ensure sturdy well-matured growth. Continue to make sowings of tender annuals.

The Fruit Garden.

Disbudding the shoots of Peaches and Nectarines, by only taking off a few at a time, till all danger from the influence of cold weather is over, must now, or soon, be proceeded with; and, where this is properly done, it adds to the beauty and health of the trees. Where the fruit has set thickly, timely attention to thinning must be observed. Apricot trees are often much infested with a grub, that

curls their leaves up and eats the young fruit. As this pest is safe from syringings or dressings of any kind, it must be searched for and crushed with the finger and thumb; and the more effectually this is done, the fewer grubs will appear next year. Peach and Nectarine trees on the walls, if infested with aphides, must be syringed with tobacco-water; and this, if done in time, will prevent them from injuring the foliage. Attend to the stopping of all fore-right shoots on Pears, Plums, and Cherries on the walls. In true orchard-houses—that is, where no artificial heat is employed—the temperature must be ruled by the weather. It is advisable, therefore, on bright sunny days, to close the lights early in the afternoon, to secure a higher temperature for the night. Disbudding and pinching all strong shoots, and thinning the fruit where set too thickly, will be the routine for this month. Green fly and red spider must be eradicated by fumigation, or syringing with tobacco-water. The Vines in the early houses will now be ripening, and some air left on at night will assist the colouring process. In the succession-houses, when the Vines are in flower, good fires must be kept up, and plenty of air given when the weather permits. Thinning the berries as soon as they are fit, stopping the laterals at a leaf or two above the bunches, and removing all superfluous shoots, will be the main points now to attend to in the latest Vineries. The coverings may now be removed from all the outside borders, and some liquid-manure applied to them when watering is necessary. The fruit in the earliest Peach-house will now be at its second swelling, and the border must be examined to see that the moisture is sufficient, especially where the roots are all inside the house. Abundance of air must be given when the fruit is colouring, and the watering at the roots gradually discontinued. The trees in the late succession-houses must be syringed every afternoon, and a moist atmosphere kept up to prevent red spider from injuring the foliage. Soft water, at a temperature as high as that of the house, should be used for this purpose, for hard water stains the foliage and fruit with carbonate of lime, and spoils the bloom on the fruit when ripe. The thinning of the fruit must be attended to, and the quantity left on be regulated by the health of the trees. I find the best soil for Peach and Nectarine borders, where such can be procured, is the turfy loam from old pastures or the sides of roads, and no manure or compost of any kind added to it. Peach trees grown in such soils never make too gross or unhealthy wood, and they can always be kept up to the desired vigour by an addition of fresh soil to the roots and liquid-manure during the time the fruit is swelling. All leaf-mould, old tan, or any compost or soil that is likely to bring Funguses into Peach-tree borders, should be strictly avoided when making them, for, when Fungus fastens on the roots of Peach trees, it soon renders them unhealthy and unproductive. As the first crop of Figs will be about ripening, the supply of water to the roots must be diminished, and only sufficient given to prevent the second crop from dropping off. The trees grown on walls after the winter coverings are removed will want their wood thinned, and all the shoots left nailed or tied in. As soon as the fruit in the Cherry-house is all gathered, the trees must get all the air possible by taking the lights off or opening them to their fullest extent. When grown in tubs or pots, the trees can be placed in the open air in some sheltered situation, and not neglected for water in dry weather. Syringe with tobacco-water or fumigate should the black aphid make its appearance on the trees. In the case of Cucumbers and Melons, a steady bottom-heat will still want keeping up, and by attention to syringing and a moist atmosphere the foliage will appear clean and healthy. The fruits on both Melon and Cucumber plants often set too many at a time, and require thinning, so as not to weaken the plants too much. Put pieces of slate or glass under Melons grown in frames, to prevent the damp soil from rotting the young fruit. When Melons are grown in pits and the plants trained on wires or trellises, the fruit, when getting heavy, must be supported on a square piece of wood with a piece of string fastened to each corner tied to the wires, leaving plenty of room for the fruit to swell to their full size. Plants in frames will still want covering up with mats at night, and continued till all danger from cold weather is over. The ridge Cucumbers sown in May will want planting out by the end of the month, and a suitable ridge or bed made with hot dung will want preparing for their reception. Vegetable Marrows will likewise want planting out at the same time, and in the same way. When the fruit is all gathered from forced Strawberries, the plants are often huddled together in some exposed corner and neglected; but such plants, if taken care of and planted out, will furnish fine fruiting plants next year in the open air. Some varieties, likewise, when planted out early, produce a good crop in the autumn, and notably Sir Charles Napier for one. If the ground cannot be got ready for planting them out till other crops come off, and the pots are wanted, the plants may be shaken out and packed closely together with a little mould sprinkled amongst them, when they will be safe till planting-

time, if supplied with water in dry weather. Take advantage of favourable weather to clean between the plants, and to mulch them properly in good time. Where the soil is light and open, tread it firmly previous to mulching. To make Pines swell off freely, now that the days are long and light, ought to be no difficulty. All that is required is method in the way of applying necessities, such as tepid manure-water, charging the atmosphere with ammonia and humidity, kindly airings occasionally, and never shading if well-swelled finely-coloured fruit is aimed at. Succession plants in every stage of growth should now get their full share of heat, humidity, and air, with a warm humid atmosphere. Air freely night and day, in order to get strong robust plants.

The Kitchen Garden.

In order that vegetation may make proper progress, stir the surface of the soil frequently and well amongst growing crops, by means of the hand-scarifier, Dutch and draw hoes. Unctuous, stiff, wet soils must be methodically trenched, exposing as much of them as possible to the influence of sun and air, in a rough ridged state. Forking, scarifying, hoeing, and otherwise loosening the soil, at all seasons amongst crops is the main point in good cultivation, giving neither vermin nor weeds a chance of existence. Make up vacancies by transplanting, or you tolerate a loss; everything can be transplanted by means of a trowel in each hand, one to open the hole and the other to take up the plant with a ball of earth attached to it. After-thinnings, when the plants are established, are made with crane-necked hoes, one in each hand, sharply looked after. Make the last sowing of some late Broccoli; prick off all previously sown plants as soon as they can be handled; also, those of Savoy, Brussels Sprouts, Borecole, and other Kales. Plant Cauliflowers out in succession now, on the coldest, dampest situations you can select, and make small sowings for succession. Thin early Carrots, and sow other early kinds in small quantities, in order to have always a succession of young roots. Plant Beans on stiff cold ground, and pinch the tops out of such as are coming into bloom. French Beans, transplanted or up and growing, dredge with dry dust, to prevent shanking or canker; shelter, where not under hand-glasses, with boards or boughs. Of Scarlet Runners, and other Runner Beans, plant a fall crop, sheltering and dredging them as just recommended for French Beans. To early plants of Celery in frames give air freely, and water abundantly; earth carefully, remove the lights entirely now, and make use of them for sheltering and assisting the second crop for a short time, or for French Beans, Capsicums, Chillies, Sweet Basil, &c. Young Celery for succession, continue to prick out; never allow the plants to get large or drawn previously with large tap roots, if fine, crisp, and well-finished Celery is aimed at. The best situation for Celery at this season is in partial shade, that is, where tall late Peas have been sown in rows, 12 or 14 feet apart, as they always should be, in order to obtain a heavy, perfect crop, and where early crops of Spinach, Turnips, Cauliflowers, &c., have first been taken; between the Peas cast out a shallow trench, 6 feet wide, fork into it a good portion of good rotten manure, and plant seven or eight plants crossways in the trench, 18 inches apart. Thus treated, the result cannot fail to be a heavy crop of fine Celery, and that with less trouble, labour, and expense, than by any other method, and in this way all the winter crops can be conveniently sheltered and protected from severe frost. Sow Lettuces once a fortnight in drills, on well-prepared ground, to be thinned by hand or hoe; they will grow away much freer without "bolting" from seed, than when transplanted in hot dry weather. Of Peas continue to sow late varieties at good distances apart, in order to obtain good and perfect crops, and partial shade for intermediate cropping. Draw a ridge of earth up to within 9 or 10 inches of each side of all Peas up and ready for sticks, and place mulchings of decayed manure of some kind between the Peas, and the ridge on each side. It is astonishing how this benefits them by preventing evaporation, and it affords convenience for applications of water. Stop or pinch out the tops of all early-blooming Peas; and all late kinds and strong growers should be first stopped when 2 feet in height, and three or four times afterwards, in order to get heavy crops. Manure and fork the ground between crops of Seakale that have been cut; thin the crowns early to two or three shoots, according to strength, and apply dreggings of soot pretty freely in rainy, dark, cloudy weather. Seakale grows naturally in great abundance, and Asparagus may be found in many places on the Devonshire coast. Tomatoes should be planted out against walls, close fences, under hand-glasses at the bottom of steep sloping banks, or in warm valleys against stakes, &c.; they may be trained and led with one shoot up to any bare spots on walls between fruit trees, then stopped to fill up. The Tomato is a wholesome fruit not grown or made use of in this country to the extent it should be. Radishes, Mustard and Cress, Chervil, and other salading, sow little and often.

NOTES OF THE WEEK.

— THE bitterly cold weather has cut short the supply of Asparagus to Covent Garden market in a marked degree, and prices have run up considerably in consequence.

— THE bunches of Lily of the Valley, seen in such profusion in the London streets during the past week, come to us mainly from the neighbourhood of Toulouse. Many thousand large bunches were received in Covent Garden during the past week. These were sub-divided into the small bunches seen in the streets. These Lilies come packed in boxes, with abundance of their own leaves, and travel well.

— APRICOTS from Spain are now selling in Covent Garden; they are the variety known as the Kaisha, and come from Valencia. What a pity it is that wars and revolutions make progress in cultivation and fruit growing almost impossible in this fine country; whereas, in parts of America, not yet settled twenty years, these arts are in a highly advanced state. The South of France sends large supplies to our markets; whereas Spain, though possessing a more favourable climate for early crops, sends, as yet, very little.

— LEICESTER Square is nearly finished, and it is, we regret to say, a failure as regards design. All the prettiest and best designed squares we know of, have an open Grassy centre, and the walks not more conspicuous than is necessary. Leicester Square has a large fountain and basin in the centre, and this, with the very conspicuous walks, cuts up the surface so much, that a poor, confused, and altogether too gravelly and stony effect is the result. An imposing fountain in the centre of a small garden, or a fountain of any kind, is always a mistake, and particularly in our wet climate, to the charms of which a dripping fountain is no addition at most times.

— LOVERS of hardy herbaceous plants will find now, at Kew, various plants in bloom not generally to be seen in private collections. Among these may be named *Anthemis Aizoon*, a silver-leaved dwarf species, of which there is a nice tuft on the rock-work studded with showy white flowers; *Ranunculus illyricus*, a species somewhat resembling *R. gramineus*, but having glaucous leaves and larger flowers; a good tuft of *Anemone vernalis* nicely in bloom; also *Silene maritima* resea, a desirable variety of the well-known Sea Catchfly, with fleshy-rose-coloured flowers; several plants of *Viola palmata*; *Hedysarum obscurum*, with deep rose-coloured flowers; *Saxifraga corsicana*, a distinct kind of the mossy section of *Saxifraga*, studded with large white flowers; and the beautiful blue-flowered *Pulmonaria dahurica*. That beautiful shrub *Viburnum macrocephalum* is also just now producing large and fine heads of bloom in such abundance against a wall in the herbaceous department as to be conspicuous even at a distance.

— THE visit of the Emperor of Russia has led to the raking up of many anecdotes connected with the visits of former Russian potentates, the first having been Peter, the Isar of Moscow, afterwards known as Peter the Great. In the "Diary of Evelyn," which contains so many memoranda of interest to gardeners and lovers of horticulture, it appears that the Isar, in order to pursue his studies connected with shipbuilding, had taken up his quarters at Sayes Court, close to Deptford Dockyard. Mr. Evelyn's butler, it is recorded, wrote to his master a very disparaging account of the inhabitants of Sayes Court, consisting of the Isar and his Russian attendants, to the effect that the house was full of people "right nasty;" and that the Isar himself had, as a short cut to the dockyard, wheeled his barrow right through his master's (Mr. Evelyn's) quickset hedge. On being reminded that such conduct was a transgression of the law, the Isar retorted we had a great deal too much law, and that he had only two lawyers in the whole of his dominions, and intended to hang one of them immediately on his return.

— COMPLAINTS reach us from all sides as to the grievous damage done by recent frosts. In the London districts and the home counties the destruction is appalling, even to these well accustomed to our too-often severe springs. Fruit trees, Roses, Coniferous trees, Rhododendrons, and other "American plants," even the Ivy, and numbers of our hardiest herbaceous plants and commonest trees, such as the Oak, the Ash, and the Laburnum, have been very much injured—too often killed back to the old wood. The poor Lilac-blossoms, and other flowers of the spring-trees have been in many cases burnt up, as if with fire. Oddly enough, while the nights have been clear enough to permit of severe and prolonged frosts, the days have mostly been overcast, and with winds of unusual bitterness, which seem to have worked with the frosts in producing such unexampled destruction. The frost has also been severe in Nottingham and elsewhere in the Midland counties. At Retford, the thermometer indicated 11° of frost; in the gardens at Thoresby there were 10°; at Ollerton equal severity; but at Budley, three miles northwest of Ollerton, there were 12° of frost, the ice in the shade remaining till the afternoon. Vines have suffered considerably at Auxerre, Chalon-

sur-Saone, Dijon, Clermond-Ferrand, and in a portion of the Médoc district. In Jersey, Potato crops have been greatly injured, whole fields in some parts of the island having been destroyed.

— At the Royal Horticultural Society's meeting on Wednesday last, Mr. Terry of Peterborough House, Fulham, exhibited a specimen of *Medinilla magnifica*, bearing about eighty fine drooping spikes of bright rosy inflorescence.

— We have received from Messrs. Sutton & Sons, of Reading, specimens of their Late Queen Broccoli, a sulphur-coloured kind just now in perfection, the heads of which measure 27 inches in circumference. It is the latest Broccoli in Messrs. Sutton's trial grounds, and, owing to the size of the heads, their closeness, and fine form it promises to be a great acquisition to late Broccolies.

— We regret to announce the death of Mr. John Salter, the venerable and well-known Chrysanthemum grower, formerly of Versailles, and more recently of Hammersmith, which took place on the 18th inst., at the age of seventy-six. His nursery, one of the most interesting of those devoted to hardy plants in the neighbourhood of London, was broken up some years ago, in consequence of the District Railway requiring the grounds, since which time he has lived in retirement at Kensington.

— THE Board of Works have purchased the manorial interest in Clapham Common for £17,000; they do not, however, propose to make any alteration, but simply to secure it from the threatened innovations of speculating builders. Here, therefore, we shall have an open space "left to Nature," where the green hillock will be allowed to remain, and the Heather, Furze, and wild flowers allowed to grow undisturbed.

— We have received from Mr. Samuel Gale, of 320, Oxford Street, specimens of indelible stamped zinc garden labels, suitable for Roses or fruit trees. The zinc of which they are made is oxydised, thus making it easier to read than the bright glittering surface of quite new metal. The best method of attaching these labels, which are of various forms, is by means of a piece of tarred string. They are cheap, durable, and neat in appearance, and, evidently, an improvement on many of the kinds of labels now in use.

— WE learn that Messrs. Weeks's decorations on the occasion of the opening of the Thames Embankment were of a very effective kind. Spanning the entire front were three arches tastefully draped, while baskets of choice flowers depended from the front of the building. Among other plants employed, were *Dracæna anstralis* and *terminalis*, *Yuccas*, *Callas*, *Clematises*, and a large collection of *Pelargeniums* and other flowering plants, the whole making a display at once interesting and striking.

— AT Messrs. Webber's stand in Covent Garden may have been seen some of the finest Asparagus yet observed in London. It is of English growth, being from the market garden of Mr. Dancer, of Little Sutton, and is of as good quality as the best French growths. It has been grown on the usual French plan of leaving a considerable space between the plants. The variety grown by Mr. Dancer is one called Conover's Colossal, which he supposes to be distinct from the common Asparagus. The produce from the French gardens has been very fine this year, excellent specimens being now seen in Covent Garden, and the fruiterer's shops elsewhere.

— NOTWITHSTANDING exceedingly bad weather, the opening of the International Flower Show at Florence, on Monday last, passed off in a most satisfactory manner. The ceremony, which took place at twelve o'clock, was performed by King Victor Emmanuel. His Majesty was accompanied by several of the ministers and by the members of the corps diplomatique. Nearly 300 botanists from all parts of the world were present, besides a large number of foreign visitors. The show took place in the new market, a splendid building, the architectural features of which are very striking. Professor Ancona read a discourse in which he traced the history of horticulture in Florence. The king expressed his gratification with the exhibition, and spoke with several of the principal botanists present. The floral decorations were especially effective.

— AN American botanist, Dr. H. G. Farlow, has made an interesting discovery in the reproduction of Ferns. He has observed the development of true Fern plants directly from the substance of the leafy body produced by the germination of the spores of a Fern (*Pteris serrulata*), and quite independent of any reproductive organs, and he states that the plants thus produced were quite undistinguishable from those which arise in the regular way by way of fertilisation. A few nearly similar cases have been recorded in flowering plants, the seeds of some female flowers having proved to be fertile when there appeared to have been no possibility of their having received the influence the pollen, and this observation of Dr. Farlow's is of importance as tending to confirm these supposed cases of parthenogenesis, as it is called, in plants which have hitherto been regarded as not thoroughly well established.

THE GARDEN IN THE HOUSE.

ANEMONES AS WINDOW PLANTS.

ANEMONES are fine plants for culture in boxes on the balcony, or in the open border. These, and all other hardy plants cultivated in pots for window decoration, should be plunged (after flowering) in a bed of sifted coal-ashes, or Cocoa-nut refuse. This keeps their roots cool, and in an equable state as regards moisture. When they show flowers, the pots can be washed, and then removed to the drawing-room to expand their richly-tinted flowers. The common Hepatica (*A. hepatica*) is one of the most beautiful of all spring flowers, and may be used in balcony-boxes with excellent effect along with *Arabis alpina* and its variegated variety, *Aubrietia purpurea*, or *A. græca*. *Saxifraga umbrosa* (London Pride), *S. crustacea*, a small-growing species, the leaves of which look as if set with little pearls, and many others. Any of these may be used for edgings, and the centres filled in with Snowdrops, Crocus, Tulips, Hyacinths, Winter Aconites, Scillas (Squills), *Bellis aneubæfolia* (Red Daisy), any or all the numerous beautiful varieties of the common hardy Primrose, white Lilac, red, crimson, and purple; and last, but not least, scatter a few seeds of *Myosotis dissitiflora*, over the boxes in the autumn, or prick in a few plants, and your window-boxes will be a treat, both to yourself and neighbours, during the warm sunny days of spring. Anemone roots may be bought in the market any time during the autumn, and should be planted forthwith. The roots of some Anemones will grow after being stored in a dry place for two or three years, still they are considerably weakened thereby. The popular name Wind Flowers, also belongs to the genus *Zephyranthes*. *Anemone japonica*, *A. japonica alba*, *A. hortensis fulgens*, and *A. vitifolia*, make fine specimens, plunged in pots ready for removal to the window or balcony in autumn, when their flowers expand. All hardy plants should be kept cool, and have abundance of fresh air whilst flowering, after which they should be again plunged outside. *Anemone japonica*, and its varieties, is one of our best autumn-flowering hardy herbaceous plants, and its large pure white flowers are very useful in a cut state. When taken up out of the ground and potted, it is also very serviceable in the conservatory or window-garden. For this purpose it wants a good soaking of water, and should be put in the shade for a few days until thoroughly established. B.

ROOM PLANTS AND INSECTS.

THERE are insects that multiply by hundreds, and destroy the labour of months in a very short time, as we know they have often done in many places. Those who have glass-houses can control the various insects which destroy foliage and prevent plants from flowering, for they have only to close the sashes and doors, and to light a pile of tobacco refuse, and the insects forthwith depart. Ladies, however, who keep plants in windows during winter, and on balconies in summer, are not able to do this; but if they possess a tobacco-loving biped, they might devote his admiration at the shrine of tobacco to some practical purpose, by requesting him to so arrange his morning and evening devotions, that the smoke of his burnt-offerings might mingle with the leaves of their pet plants, and thus keep their branches and foliage free from those pests—green fly and red spider. If, however, their possessions do not include this species of humanity, they can brush away the aphid with a feather, by placing the pot upon paper, on a stand, and afterwards burning the paper. Red spider is not easily diverted from his destructive course; so it is often needful to immerse the whole plant in strong tobacco liquor for ten or fifteen minutes, to dislodge him from his winter and summer quarters. This minute insect is one of the most detestable pests which infest house plants, and many a stand of plants is ruined through his agency. His presence is known by plants not having a healthy appearance—when their leaves curl up, and their bright green hue is gradually assuming a dingy look; under such circumstances apply the smallest of microscopes to the under surface of the worst looking leaves, and the disastrous effects will soon be perceived. The leaf will be found covered with red tiny mites, sucking out its strength and vigour. Roses, Carnations, Geraniums, Heliotropes, Fuchsias, and similar plants, are the favourite haunts of these red marauders, and often they take up their abode in foliage for summer and winter, unmolested, because the owner of the plants know not of their peculiar habits. The flowers are not produced, but the reason is unknown. If badly infested, tie something over the top of the pot to keep the earth from falling out, and then immerse the whole plant in soap suds or tobacco-liquid. Then take it out and dip it into pure water, to rinse off the suds or tobacco thoroughly. Perhaps the tenderest shoots may be injured, but that is no matter, because the plants generally

need pruning to recover their vigour after having been the abiding place of insects. Ivies are often infested with slugs, which live on the under sides of the leaves, and cause white spots to appear upon the upper side. A sponge dipped in carbolic acid, soap-suds, or tobacco-water, and wiped over every leaf thus affected, will usually cause them to disappear. Pure water must be used to wash off the suds; make the latter quite strong. The tiny white worms which sometimes appear in the soil of house plants, and which feed upon their roots, are also most inimical to their health. Roses, Carnations, and Geraniums have been injured by scattering salt over the surface; but red pepper will destroy them, and yet will not injure the growth of the plant. Brown scale, when it occurs, must be picked off with the fingers, or brushed away with an old tooth-brush. This insect is very pernicious to all woody plants, as it clings to their stems and sucks the life-blood out of them. Repeated washings and showerings will not dislodge it, but a touch of the finger-nail will destroy it, and often a warm bath of tobacco liquor will make it loosen its hold. The effect of the tobacco liquor and other liquid destroyers should be tried first upon some plant of little value before such are more costly are subjected to its influence. Plants infested with insects can never present a pleasing appearance, and if the bark and leaves be covered with dust and impurities, their peculiar functions are nearly destroyed, as the leaves are the lungs of plants; and, if the tubes be closed, the plant barely lives, and cannot blossom. DAISY EYEBRIGHT.

Dielytra spectabilis as an Indoor Plant.—The late frosts have in most places spoilt the beauty of this charming plant. It would be interesting to learn how much frost it will bear with impunity. I find from experience that it is safe with 5° of frost, but that 7° or 9° take nearly all the colour out of the flowers and leaves, while from 10° to 12° cripples it utterly. Pity it could not be induced to flower later, so as to be out of the reach of frost; most seasons of late years have been hard on this plant, marring, if not utterly ruining its beauty when in its prime. It is well worth a place in the conservatory, and in hanging baskets scarcely any plant has more grace and beauty. It is also well suited for a vase or stand, or for a window rest on a staircase. The white variety, too seldom seen, is also very beautiful when associated with the pink kind.—D. T. F.

NOTES AND QUESTIONS ON THE GARDEN IN THE HOUSE.

Dwarf China Rose.—I have had a plant of this Rose in my window for the past month, and it is still flowering freely and most deliciously scented. I consider it one of the prettiest of all spring-flowering kinds for pot-culture.—Q.

Italians and Perfumes.—The modern Italians, especially those of the more southern parts of Italy have a peculiar horror of perfumes. They consider them remarkably unwholesome, and the Roman or Neapolitan lady requests her visitors not to use them. What is very strange, the nostril so susceptible to a perfume, is wonderfully obtuse to its reverse.—LOAN LITTLE.

Mesembryanthemums the best Window Plants.—Few can know the value of this genus without seeing the plants growing in the open air, in a warm country, such as the South of Europe, where they fall down the walls and rocks in graceful curtains, and are now dotted over with rose and crimson stars. The important fact for the window-gardener to bear in mind is, that all *Mesembryanthemums* grown freely in sunny windows, and allowed to trail down from the pots, are, when in blossom, the most beautiful of window plants.—W. R.

German Ivy as a House Plant (*Senecio mikanooides*).—This is a rapid-growing Composite plant, and one of the best of all quick-growing climbers for window-culture. It strikes freely from cuttings, or it may be layered, as it roots freely from every joint, and plants so obtained soon develop themselves, and, if potted in a rich compost and liberally supplied with moisture at the root, run round a window-trellis in a few weeks. It has bright shining leaves, somewhat resembling those of Ivy, but it is a much quicker-growing plant than Ivy. It is grown by the thousand on the Continent as a window plant, but as yet it is rare in this country.—B. F.

The Lily of the Nile as a House Plant (*Richardia æthiopica*).—This does remarkably well in a room window. A plant which I have of it has bloomed every spring for those last five years, but this year better than I ever saw it, having on it four fully-developed flowers. I think this is owing to my having given it a liberal shift, potting it in a rich compost of fibrous loam and well-decayed manure in equal proportions. I keep up abundance of moisture at the root; indeed, the saucer in which the pot stands is generally half-full of water, and this the plant seems to enjoy, as it grows vigorously, each succeeding leaf being large and taller than its predecessor.—J. BAIGES, *Belgrave, Leicester*.

Virginian Creeper as a Town Plant.—This is peculiarly a town plant, growing, as it does everywhere, either in shade or in sunshine, and it is, moreover, by no means particular as to soil. For hiding bare walls, or for covering trellises, porches, or arbours speedily, it is one of the best of all climbers. Now is the time to plant it, and it should be regularly watered until it has become established. No plant looks prettier than this during the summer, when its green leaves and ruby-tinted shoots droop gracefully over a balcony, or trail round a window-trellis; while, in autumn, its gorgeous crimson colours last good for several weeks. If contrasted with other climbing plants, as Ivy or Wistaria, so much the better.—W.

THE INDOOR GARDEN.

JUBÆA SPECTABILIS.

THIS very handsome Palm, known, also, as the Coqnito Palm of Chili, is the only species of the genus, and is one of the most southern of American Palms. It has a stout trunk, swollen in the middle, which, in its native country, sometimes attains a height of nearly 40 feet. The summit is surmounted by a crown of large, spreading, pinnate leaves, of a full deep green colour, and from 6 to 12 feet long, the leaflets being from 1 to 1½ feet long, and about an inch wide, springing in pairs from nearly the same spot, and standing out in different directions. The leaf-stalks are very thick at the base, where they are enclosed in a dense mass of rough brown fibres, which grow upon their lower edges. In the account of the Royal Gardens, at Lisbon, given at p. 292, Vol. IV., of THE GARDEN, mention is made of a specimen growing there in the open air, which has attained a height of 32 feet, and the trunk of which measures 13 feet 8 inches in circumference at its base. "In Chili," says the "Treasury of Botany," "a sweet syrup, called Miel de Palma, or Palm-honey, is prepared by boiling the sap of this tree to the consistence of treacle, and it forms a considerable article of trade, being much esteemed for domestic use as sugar. The sap is obtained by the very wasteful method of felling the trees, and cutting off the crown of leaves, when it immediately begins to flow, and continues to do so for several months, until the tree is exhausted, providing a thin slice is shaved off the top every morning, each tree yielding about 90 gallons. The nuts are used by the Chilean confectioners in the preparation of sweet-meats, and by the boys as marbles. A quantity of them was brought to this country a few years ago, and sold under the name of Little Coker-nuts." The soil for this plant should be a mixture of one-half rich loam, and one-half a compost of peat, leaf-mould, and sand. It withstands our winters in the open air near London, in a poor condition, but, if grown in tubs in the conservatory in winter, and placed in the open air in summer, it will prove an excellent subject for association with the hardier Palms.



Jubæa spectabilis.

TREE-FERNS.

(SUB-ARBORESCENT SPECIES.)

OWING to the differences of opinion which often exist as to what is or is not a tree-Fern in certain stages of growth, I have been induced to separate a number of species from my enumeration of tree-Ferns, and to include them in a section which I shall term sub-arborescent kinds. These, while they represent to a certain extent the noble character of the Tree-Ferns proper, are specially suitable to cultivators who have small houses.

Brainea.

This is rather an anomalous genus, which is characterised by an erect caudex; the fronds are pinnate, veins "flabellately forked; the lower venules angularly anastomosing, forming a costal row of oblique cuneiform areoles. Sporangia produced on the transverse-curved veins and bases of the free venules, constituting a broad continuous or sub-interrupted transverse naked sorus."

B. insignis.—This is the only species belonging to this genus hitherto discovered, and no other known Fern can be added to the genus on account of the great peculiarity of its habit, its venation, and its manner of fructification. It produces a stout stem, which is said to attain a height of 4 feet, the largest I have seen being about 2 feet, and this was evidently of considerable age. The fronds are pinnate, and from 1 to 3 feet or more in length; upper side light green, almost glaucous beneath, base of the stipes and crown of the plant furnished with light brown chaffy scales; habit very graceful, rendering the plant worthy of a place in every Fernery. It enjoys a liberal supply of water at its roots, but I have always found drip or sprinklings from the syringe to turn the fronds brown; therefore, this should be avoided. It is usually considered a stove species, but it thrives admirably in an intermediate house. The only recorded localities for this plant are Hong Kong and one place in Khasia.

Didymochlæna.

This genus consists of only one species. It is characterised by having both pinna and pinnules jointed with the rachis or main stem, and by its terminal, oblong, punctiform sori, and oblong hippocrepiform indusium.

D. lunulata.—The stem of this distinct and handsome Fern is erect, stout, and sub-arborescent; the fronds are erect, from 3 to 6 feet long, bipinnate, and broadly lanceolate in shape; pinnules nearly an inch long, obliquely rhomboid, sub-sessile and articulated with the rachis; they are dark heavy green in colour when mature, but,

when young, tinged with dull reddish-brown. The stipes and rachis are densely clothed with large brown chaffy scales. This is a superb stove Fern, and is admirably adapted for planting near the margin of water in a Fernery arranged on the natural system; indeed, when this plant fails, the evil is chiefly owing to want of attention in keeping it duly supplied with water. I have already remarked that the pinnae and pinnules are articulated with the rachis, and, if the plant is allowed to become dry, these fall out at the joints, leaving nothing but bare stems in place of broad rich deep green fronds. It should be potted in equal parts of loam and peat, with the addition of a small portion of sharp sand. As before remarked, keep it well supplied with water, and place it in the shade, when it will not fail to be a source of pleasure and attraction to all beholders. It seems to be widely distributed through tropical America, as well as South and Western Africa, and several of the East Indian islands.

Lomaria.

This genus contains many species and varieties, but only those which form an erect caudex will occupy attention in this place; they have distinct, dimorphous, barren, and fertile fronds; in the former the veins are forked and free, but, in the latter, there is a continuous line, running transversely with the veins upon which it is situated, and, in general, in such abundance as to spread over and entirely conceal the whole under-side of the contracted fertile pinnae. They are mostly strong-growing plants, or, at least, plants of a robust constitution, and should be potted in two parts loam, one of peat, and sufficient sand should be added to make the whole feel gritty when taken in the hand.

L. gibba.—No more useful Fern is in cultivation for general purposes of decoration than this species, and, therefore, I place it at the head of the list. When well-grown, and with all its fronds perfect, it has a rounded vase-like appearance, which is truly beautiful. The fronds upon old specimens attain a length of from 18 inches to 2 feet; they are broadest at the upper end, spreading, deeply pinnatifid, and shining bright green in colour. At first, the plant does not form an erect stem, but has a tufted appearance; with age, however, it builds up a trunk some 2 or 3 feet high, which varies considerably in stoutness in different individuals. It grows naturally by the margins of streams, which is a sufficient indication that it enjoys an abundant supply of water. It grows most luxuriantly in the stove, but stands uninjured in the cool-house, and, whilst young, may be used with much effect for the decoration of apartments, the dinner-table, &c. Native of New Caledonia.

L. magellanica.—This species rejoices in upwards of a dozen synonyms, the true form, I believe, not being very plentiful in cultivation. The stem is stout, attaining a height of from 1 to 2 feet, the crown and stipes being clothed with a dense mass of long, narrow, dark brown bristle-like scales; the fronds are from 1 to 2 feet long, pinnate, the pinnae being very coriaceous in texture, entire, linear-oblong, and obtuse, dark green on the upper side, inclining to rusty-brown below. It is a splendid cool-house Fern. Native of the Straits of Magellan, Falkland Islands, Chili, &c.

L. cycadifolia.—This, although distinct-looking, cannot, perhaps, claim specific rank, and will have to be looked upon as a variety of the preceding. The stem is stout and massive, attaining a height of 3 and 4 feet; the fronds are from 2 to 4 feet long, pinnate, the pinnae being dark green above, inclining to bright tawny beneath, whilst the stipes and crown of the plant retain the peculiar narrow dark brown bristle-like scales of the species just described. It is a superb species for the cool-house, and will be found sufficiently hardy to stand in the entrance hall, or similar situations, without injury, when not in a growing state. Native of Brazil, Chili, &c.

L. discolor.—This fine species is a native of New Zealand, a country so rich in Ferns of distinct character and pleasing effect; the stem is stout, attaining a height of from 2 to 3 feet with age, the fronds are from 1 to 3 feet in length, coriaceous in texture, deeply pinnatifid, the pinnae are variable in size, linear-oblong, dark shining green above, paler below, sometimes approaching to reddish-brown; the stipes are dark-coloured, and, together with the crown of the plant, furnished with dark reddish-brown hairs. It is an extremely handsome and desirable species for the cool Fernery.

L. L'Herminieri.—This is a miniature tree; indeed, we have never seen a stem more than 6 inches high, but it is, nevertheless, a stem, its size and peculiar beauty rendering it a veritable gem for the Wardian case. The fronds are from 6 to 10 inches in length, widest in the upper part, deeply indented at the edges, but more pinnatisect than pinnatifid; in a young state they are of a brilliant crimson, which changes with age to deep green. Native of Brazil, Caraccas, &c.

L. Fraseri.—A rare but most elegant species, rising upon a slender stem to the height of 2 and 3 feet, or even more. The crown of the plant is furnished with short brown scales; fronds from 1 to 2 and

even 3 feet in length, they are deeply and finely pinnatifid, brilliant shining green on the upper side. It is, undoubtedly, one of the most elegant cool-house Ferns in cultivation. Native of New Zealand.

L. cycadoides.—With this noble species (which has been introduced to commerce during the present season by Mr. Williams, of the Victoria Nursery) I shall conclude my enumeration of this genus; it is a bold-growing, handsome, and very distinct Fern; the stem is stout, both crown and stipes being densely clothed with very large and broad, almost black, chaffy scales; fronds, pinnate, very thick and leathery in texture, dark green above, pale below. Native of South Africa.

Blechnum.

There is really very little difference between this genus and the preceding, the shape of the indusium, and the fact that the fertile fronds are never contracted, forming the chief distinguishing characters. The general treatment necessary for the species here introduced is the same as before named for the various kinds of Lomaria.

B. brasiliense.—Stem from 1 to 2 feet high, stout, the crown of plant and base of stipes clothed with numerous long, black, and glossy chaffy scales; the fronds are supported upon very short stipes, they are somewhat erect in habit, from 2 to 4 or 5 feet long, and about 18 inches broad, deeply pinnatifid, and bright green in colour; when young the fronds are beautifully tinged with rosy-pink. It is usually considered a stove species, but when not growing, it will stand uninjured in the cool house. Native of Brazil.

B. orientale.—This is still a rare species; stem stout, base of stipes and crown of plant clothed with long, shining, chaffy scales; fronds from 1 to 3 feet long, ovate-lanceolate in shape, pinnate and coriaceous in texture; pinnae linear-lanceolate, from 3 to 6 or 9 inches in length, and pale green in colour. It is a beautiful stove species from the East Indies.

Leptopteris.

The species here described are usually known as Todeas, but as some authorities have separated them from that genus, on account of their thin and membranaceous fronds, I have here followed their example; at the same time, I am not satisfied that it is a sufficiently good case for generic distinction. The kinds here enumerated are all greenhouse or cool-house kinds, which require a close moist atmosphere to keep their fronds perfect. We have before alluded to these plants in our remarks upon Filmy Ferns, and recommended them to the notice of our readers as gems for the Wardian case; and, as young plants, for this purpose, they are certainly unequalled; during the past year or two, however, importations which have reached this country have revealed to us the fact that with age they build up stout and massive stems, and they must therefore also take their place amongst the sub-arborescent kinds.

L. Wilkesiana.—This species is apparently a plant of slow growth, and it must take a long time to attain to a height of 4 to 6 feet, which travellers and collectors assure us it does in its native habitats. The stem is slender, seldom much exceeding the dimensions of an ordinary walking-stick; the fronds vary from 1 to 2 or more feet in length, according to the age of the plant; they are broadly lanceolate, the pinnules being oblong-obtuse, dark green, and pellucid, yet not to the extent of the other species. It is a truly beautiful plant. Native of the Fiji Islands.

L. superba.—The stems of this plant are stout, the tallest we have seen being about 20 inches in height, bearing upon its summit a lovely crown of ovate-lanceolate fronds, which are of a brilliant sea-green, with the edges beautifully curled up. It enjoys plenty of shade and a close moist atmosphere. Native of New Zealand.

L. hymenophylloides.—The fronds of this species are more triangular in outline than those of the last-named plant; but, like it, the stems are very stout; fronds, pellucid and deep green, but devoid of the peculiar and distinctive character of *L. superba*, viz., the curled and crisp appearance of the segments. Native of New Zealand.

L. intermedia, as its name implies, is intermediate in appearance between *L. superba* and *L. hymenophylloides*; for, whilst retaining the ovate-lanceolate-shaped fronds of the former, the texture of the pinnae is that of the latter; it also builds up a stout stem with age, but hitherto very few examples have been introduced. Native of New Zealand.

Diplazium.

One species only of this genus can be admitted into this enumeration, but it is a very handsome bold-growing plant. As a genus, Diplazium has very little to distinguish it from Asplenium, the chief character being the double sori, which are placed back to back upon the veins; but this is not always constant; they are all, however, well deserving attention at the hands of Fern lovers, especially the species here named.

D. arborescens, is a massive bold-growing plant, attaining a height of about 4 feet in old and well-grown examples; fronds, broad,

dark green, bipinnatifid with finely divided pinnæ, the stipes and crown being abundantly furnished with large chaffy scales, rendering it very effective. It should be grown in equal parts peat and loam with some sand added; it enjoys an abundant supply of water, and thrives admirably in the cool Fernery. Native of St. Helena.

Angiopteris.

Although the plants belonging to this genus and *Marattia* are not considered true Ferns, they, nevertheless, are sufficiently akin to be introduced into this enumeration. They are characterised by their gigantic rachises, which rise from between two thick fleshy appendages, and which ultimately build up a short stout and fleshy sub-arborescent caudex; the veins are simple or forked, and free. Sporangia biserial, sessile, opening by a slit on the inner side. They, are for the most part, native of swampy places in the Islands of the Indian Archipelago, although some have been found upon the mainland. For compost, use good rich loam and sharp river-sand, drain the pots well, and supply water abundantly; where sufficient space can be given to *Angiopteris*, they form gigantic specimens, and produce a truly tropical appearance.

A. evecta.—The fronds of this species we have seen nearly 18 feet in length, but it assumes all its proportions and beauty when they are about 2 or 3 feet in length; they are bipinnate; the pinnules of a lively bright shining green in colour. For planting on the border, or upon an island in the stove Fernery, it is admirably adapted. Native of many of the East Indian and Pacific Islands.

A. assamica.—Whilst resembling the preceding in general appearance, it is narrower and smaller in all its proportions, and does not so rapidly attain a gigantic size, which will render it more suitable for the majority of amateurs. Native of Assam.

A. pruinosa.—A noble growing plant, resembling *A. evecta* generally, but differing in having the under-side of the pinnules beautifully glaucous. Native of Java.

A. Teysmanniana.—This is also a very handsome plant; when mature, it reaches 20 feet in the length of its fronds; as a young specimen, however, it forms a beautiful object in the Fernery on account of the vivid green of the pinnules. Native of Java. Of this genus we have other forms, but they are not specially amateur's Ferns, and, therefore, we imagine the above will be quite sufficient to introduce in this enumeration.

Marattia.

These are closely allied to the preceding, and indeed resemble them in general appearance, but are more adapted to the wants of Fern growers generally, inasmuch as they never assume such giant proportions, and, consequently do not require so much space. Soil and treatment should be the same as recommended above for *Angiopteris*.

M. laxa.—In this we have a large bold-growing kind, which will thrive in a warm greenhouse. The fronds attain a height of some 5 or 6 feet; they are bipinnate, having broadly-lanceolate, dark green pinnules. Native of temperate regions of Mexico.

M. elegans.—An extremely fine ornamental species, having bi-tripinnate fronds, which attain a height of some 5 or 6 feet, the pinnules are rich deep-green in colour. Native of New Zealand.

M. alata.—With this species I shall bid adieu to this genus. There is no question that it is the handsomest of all as yet introduced to our collections. The fronds are bi-tripinnate, the pinnules small, the rachis, in addition, being beautifully winged, and the colour a soft pale green. It succeeds admirably in the cool-house when not in a growing state. When the young fronds are about to unfold, however, I have found it much benefited by a little extra warmth. Native of the West Indies.

Eupodium.

One species only represents this genus amongst cultivated Ferns, and it is very rare. As a genus, it differs only in having its clusters of exannulate Sporangia (synangia) set upon little stems or foot-stalks. Treatment same as for *Marattia*, but it must be kept in a warm house.

E. Kaufussii.—This plant attains a height of several feet, and, saving in the peculiarity of its fructification, it very much resembles *Marattia alata*. It is an exceedingly handsome plant, and those who love the curious forms of the order, will reap much pleasure from it. Native of Brazil. G.

Evergreen Walls for Moist Stoves.—The back walls of these structures, whether lean-to or half-span, often present a very unsightly appearance from the great amount of moisture in the atmosphere rendering it impossible to keep any sort of wall clean, for any length of time. Even the usual plan of covering with

creepers is not always effective. The mode of furnishing which we adopt is both simple and effective, and gives us at all seasons plenty of Fern fronds for cutting; the only preparation required is to have the wall "wired" over as if for training trees on, except that the staples for holding the wire should be fixed so that there is a clear space of about 3 inches, which should be firmly filled with partly decayed turf and peat. Into this compost we insert any spare roots of Ferns suitable for cutting, especially Maiden-hairs and the *Pteris* tribe, with a few *Fittonias*, *Isolepis*, *Foliage Begonias*, &c., finishing off with little patches of *Lycopodium denticulatum*, about 6 inches apart, to form a ground-work. Keep the soil constantly moist by syringing, and in about six weeks there will be a wall of living green on which the eye will never weary in dwelling, and a most agreeable contrast to the bright foliage and flowers usually found in houses of this description.—JAMES GROOM, *Henham Gardens*.

HOYAS AS BASKET PLANTS.

Hoyas generally, that is the free-flowering kinds, make interesting pot plants, and they are also useful for training along the back walls of stoves, but, as regards the smaller growing species I know of no position in which they show themselves off to better advantage than when planted in hanging baskets. For this purpose, one of the prettiest of all is *H. bella*, a dwarf-growing plant of shrubby habit, having short thick oblong leaves about half an inch in length, and clusters of pure whistler-like flowers with purple five-lobed centres, set, as it were, in frosted silver. These clusters of blossoms suspended, as they are, from slender branches are best seen when looked at from below. *H. Paxtonii* somewhat resembles the last, but has longer leaves drawn out to a point at the ends, and somewhat wavy at their margins. This species also flowers freely and makes a nice ornamental-basket plant. *H. longifolia* is another species that answers well for this purpose, and even the Wax Plant, *H. carnosa* and its golden-variegated variety may be grown in large baskets and trained around their sides. A stove temperature suits them best, and frequent syringings with tepid water aids them in making robust growth. B.

ORCHIDS IN FLOWER AT KEW.

THIS collection is now very interesting, the following, amongst others, being in flower:—*Sobralia macrantha* is bearing seven or eight of its great lilac flowers at the apices of reed-like stems 2 to 3 feet high; this is a good variety with a deep purple lip, and has the additional advantage of flowering on stems about half the usual length. A healthy plant of the true *Odontoglossum* have bears a fine branched spike, but the flowers are not yet fully expanded; this plant is quite distinct from *O. Reichenheimii*, to which, however, it is closely related. A plant of *Dendrobium Dalhousianum* bears a small spike of flowers on a pseudo-bulb only about 18 inches in length; this is one of the finest and strongest growers of the entire genus, often producing growths from 4 to 6 feet in length, and it flowers from the last year's, or old, growth; this is the largest-flowered of all the *Dendrobies*, and is one of the most striking of all Orchids when in flower, each being nearly 4 inches across, the broad segments being of a cream-colour suffused with rose, while the great concave lip is hairy on the disc and blotched with blackish-purple. A plant of *D. Farmerii* bears several spikes of pearly-white flowers, the lip having a blotch of yellow at the base; this is a free-flowering and very variable plant both in habit and flowers; a specimen which bloomed in Messrs. Veitch's collection a week or two ago had a dense spike of bright rosy flowers, with an orange blotch on the lip, and the flowers were much larger than in the Kew specimen. There is one plant always in bloom at Kew—we might instance several—but the one we now allude to is *Epidendrum cochleatum*, the shell-lipped *Epidendrum*, and one of the first of Orchidaceous epiphytes, introduced to the Royal gardens. It is a variable plant, but some of its varieties are well worth growing, if only for its ever-flowering character. Its sepals and petals are of a pea-green colour, the concave lip being striped or shaded with dark purple or chocolate colour, and this is of remarkable richness when seen between the eye and the sunlight. *Cologyne ocellata*, one of the prettiest species in the genus, is blooming freely, bearing spikes of white flowers an inch or an inch-and-a-half across, and having a large blotch of lemon-yellow on its tri-lobed lip. This blotch of yellow is margined with a red or vermilion-coloured line, and the flowers

themselves are delicately scented. The large-flowered form of *Phalenopsis grandiflora* is still in bloom, as is also *P. rosea*, a plant rarely out of flower wherever it is grown. *Odontoglossum Alexandræ*, *O. Pescatorei*, and *O. nebulosum* are in flower, as are also several species of *Lady's-Slipper* (*Cypripedium*), besides many curious small-flowered species of terrestrial habit, no less interesting to the botanist than the showy kinds, while the entire collection never looked in better condition than it does at the present time, notwithstanding the many drawbacks a cultivator has to contend with in a public establishment, where visitors are continually opening the doors, thus causing the cold or chilly draughts so detrimental to this class of plants. B.

DIEFFENBACHIA BOWMANI.

This beautiful tropical Aroid is a native of South Brazil, whence it was introduced by Messrs. Veitch & Sons, of Chelsea, who named it, in compliment to its discoverer, the late Mr. Bowman. It is one of the finest *Dieffenbachias* in cultivation, having leaves about 2½ feet long and a foot wide, blotched and spotted with very dark green on a pale green ground. The value of this class of plants is very great; for, wherever a stove temperature can be commanded, they may be grown with the greatest facility. Any damp corner will do for them; but, in order to have the varied colours of the leaves well brought out, they should be kept near the glass. A good fibrous loam and some peat, enriched with decayed manure or leaf-soil, makes a good compost for them; and it should be open and spongy, for *Dieffenbachias* like plenty of water; but stagnant moisture is ruinous to them. They also enjoy a moist atmosphere while growing, and free use should be made of the syringe at that season. If they grow lanky, as they are sometimes apt to do, the remedy consists in decapitating them and using the heads as cuttings, still retaining the stumps in the pots, and plunging them in bottom heat. Under this treatment, every dormant eye will start into growth, the one nearest the summit taking the lead; all the shoots in their turn may be removed with a small heel and used as cuttings. No one, therefore, having the convenience of a stove, need be without plants of *Dieffenbachias*, all the varieties of which are useful, and very ornamental when intermixed with flowering plants, or others having brilliant leaves. For window-gardening and table-decoration, this class of plants is sometimes used with good effect; but their durability under such circumstances is so brief, that, after all, they are, perhaps, best when kept in the stove. W. F.

Agave Elmeetiana.—This smooth-leaved, or unarmed species, belonging to the spicate group, is just now bearing a stout spike of greenish-yellow flowers in the succulent house at Kew. The spike is fully 5 feet high, and very thick in proportion, while the flowers are the smallest we have seen on any species of this genus, the anthers being, on the contrary, very large in proportion to the size of the flowers. The flowers are geminate, or borne in pairs, and at the base of each pair is a long narrow, almost hair-like, bract. The spike on the large plant of *A. americana* close beside it, has pushed its stout spike several feet above the roof of the house. When first produced, this spike lengthened at the rate of about 3 inches per day, but the growth now is less rapid, seldom exceeding an inch.—B. F.

Showy Cactuses.—These old-fashioned plants are too often neglected; still, they are well worth general culture, either as greenhouse or window plants. They are easily propagated by means of cuttings, a piece of a plant placed in a well-drained pot of sandy earth, and not over-watered, being sure to grow; and, when in flower, there are few other plants that can rival them in brilliancy of colouring. It is almost impossible to kill them by any amount of ill-treatment, unless they are over-watered during the dull cold days of winter, at which period they should be dust-dry, as they are apt to rot off at the crown. They are properly named *Phyllocactus*, or *Leafy Cactus*, in contradistinction to *Echinocactus*, *Hedgehog*, or *Globe Cactus*, and other globular or cylindrical species. When not in bloom, they can be stored away on any shelf near the glass, where they should be duly attended to throughout the summer, so far as watering is concerned. As window plants they have few equals, and are very generally employed for that purpose in country districts.

The following are distinct and beautiful:—*P. Corderoyanus*.—A fine scarlet or crimson, suffused with bright metallic-purple. The flower is 4 or 5 inches across, and is one of the most striking of the scarlet varieties. *P. Jenkinsonii*.—This bears a smaller flower than the last, of a bright scarlet colour, and not fully expanded. *P. Gordonianus*.—A large variety, with bright rosy or flesh-tinted flowers. *P. crenatus*.—This is a creamy-white variety, with large flowers, and contrasts well with the other deeper-tinted varieties.—J. P.

Pachypodium succulentum.—This, one of the most interesting of all ornamental plants, is now blooming in the succulent house at Kew. It has a swollen or gouty stem, not unlike a Swedish Turnip in external appearance, and from this spring, numerous horizontal or deflexed spinose branches, varying in length from 18 inches to 2 feet. These are again divided into little branchlets, at the apex of each of which is a tuft of narrow glaucous leaves and a cluster of pearly-white star-shaped flowers, each about three-quarters of an inch in diameter. These, being borne very profusely, are very ornamental, apart from the singular habit of the plant. It is a native of the Cape of Good Hope.—Hortus.

Ipomœa (Quamoclit) coccinea.—It may interest some of your readers to know that this plant is now growing freely as a climber in one of the plant-stoves at Kew. It has slender twining stems, set rather closely with elegant pinnate leaves of a dark green colour, the divisions reminding one of the teeth of a fine comb. It bears a vivid scarlet flower, and is very ornamental either with or without flowers. It does not require any great heat, indeed, it is almost sure to be attacked by red spider when grown in a high temperature. In America it is extensively used as a window plant, and deserves a fair trial for similar purposes in this country during the summer months.—B.

Clerodendron Thomsonæ.—This, one of the showiest of all stove climbers, is now in flower; we have it here trained up the rafters, where it forms massive wreaths of deep green foliage and clusters of white crimson-tipped flowers. It likes a rich, open, and well-drained soil, and should be regularly syringed every day when making its growth. Unless duly attended to every day with regard to moisture both overhead and at the root, it is liable to become infested with nearly all the noxious insects that plants generally are heir to, notably to mealy bugs and thrips. If these should put in an appearance show them no mercy, but syringe at once with strong tobacco-water or Fowler's Insecticide nearly double the strength recommended on the printed directions. Give them two or three doses a week until they are *non est*, as they soon spoil the appearance of foliage and flowers alike. If there is no room to plant it out, it readily accommodates itself to pot culture, and soon makes a fine exhibition specimen if liberally treated. Occasional doses of clear liquid-manure are beneficial when the pot becomes filled with roots, and the plant should be neatly twined round a globe or balloon-shaped trellis so as to show off its clusters of flowers to the best advantage. I can scarcely conclude without alluding to another member of the genus, *C. fallax*, an old crimson-scarlet variety, which blooms the first year from cuttings. This should find a place in every plant-stove, however small.—J. H., Sydenham.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Convolvulus Cneorum.—This is a dwarf shrubby free-flowering species, well worth more general culture than it receives as a pot-plant, either for greenhouse or for window decoration. Its foliage is of a silvery or glaucous tint, and the flowers are each the size of half-a-crown, of pearly whiteness, with a pale lemon centre.—J. H. S.

Philodendron crinipes.—This species is admirably adapted either for covering rockwork in a tropical conservatory, or for training over the moist back wall of a warm plant-stove. It is a quick grower, having dark glossy lacinate foliage a foot-and-a-half long by a foot or more broad, borne on long stout petioles of a reddish-purple colour. The most peculiar part about this plant is the slender filiferous appendages (like those of a Moss Rose bud) by which these petioles are thickly covered, giving them just the same appearance as if covered with fresh green Moss.—C. H.

Arctotis grandiflora.—This is not so often seen in cultivation as it deserves to be, especially as it may be readily propagated, and grows freely, either in a cool greenhouse, or when treated as a window-plant. It is of a shrubby habit, about a foot or 18 inches high, and has silvery grey or glaucous-tinted pinnatifid foliage, and rich orange flowers, which are not unlike those of *Gazania splendens*, or the rare *Mutisia decurrens*. It is a native of the Cape of Good Hope, and is one of the most showy Composites we have, each flower being about 3 inches high, and nearly as much across, when fully expanded.—A. S.

Sarsaparilla.—The plant from which this well-known medicine is prepared, is, in itself, one of the finest of all climbers for a plant-stove or warm tropical conservatory. Its leaves are of a deep glossy green colour, with irregular silvery blotches or markings. Each leaf is 9 to 15 inches long, by about 8 to 10 inches wide, broadly heart-shaped in form, and they have a fine effect when the rambling shoots are trained up the rafters or tied to trellis work. There are several other species of *Smilax* very ornamental, but the present species (*S. officinalis*) is by far the finest I have yet seen. It is now growing vigorously in one of the stoves at Kew.—D. R.

THE FLOWER GARDEN.

AUBRIETIAS AND OTHER SPRING-BEDDING PLANTS.

THE floral display in the spring flower garden is seldom very effective, nor is the garden itself very enjoyable during most seasons until after the middle of the month of March, so that its season is necessarily of comparatively short duration, and the period is already rapidly approaching when the present occupants of the flower beds must give place to their summer successors. This season, up to the present time, on account of its great drought, can hardly be considered as having been favourable to the development of spring flowers. The rainfall of the month of March was little more than an inch, while that of April was considerably less (viz., 0.69 inch). The

producing a display at a distance than any of the *Myosotis* family, whose great beauty can be best appreciated on a closer inspection. *Aubrietia Campbellii* may be readily increased by cuttings; and *Græca*, *purpurea*, &c., by divisions or by seed, which should be sown under glass about the middle of March or beginning of April, and afterwards pricked out in beds in the open air about the middle of May, when they will be in a fit state to be planted in the beds of the parterre as soon as the summer bedders are removed. Marginal lines of *Echeveria secunda glauca* have suffered very considerably during the last winter, and can hardly be depended upon for spring bedding. Many succulents, however, are all that can be desired for this purpose, such as *Sempervivum californicum* or *calcaratum*, together with *S. globiferum*, *S. rubicundum*, &c., and the beautiful *Sedum acre aureum*, *elegans*, *Sieboldii*, &c.; also the well-known *Cerastium tomentosum*, *Santolina incana*, and



Dieffenbachia Bowmanni (see p. 414).

water-springs are now exceedingly low, and water, in many parts, is becoming scarce. During the last fortnight cold east winds have prevailed, accompanied by hot sunshine, which has caused the early Tulips, &c., to go out of flower earlier than usual, and has much impaired the beauty of beds of Pansies, Primroses, Polyanthus, Violas, Wallflowers, &c.; and a severe frost on the night of April 29th—amounting to 8°—sadly blackened and nearly destroyed fine beds of the beautiful *Myosotis dissitiflora*, &c., as well as killing all the young shoots on Walnut trees, and severely injuring many early crops of culinary vegetables. Most of the varieties of Aubrietias, however, appear to have the power of resisting cold as well as drought in a great degree, and beds of such species as *Græca* and *Campbellii*, margined with the golden-feathered *Pyrethrum* and the golden-striped Thyme, are still exceedingly effective; indeed, the Aubrietias appear to be among the very best of spring-blooming bedding plants, and are much more effective in

Veronica incana, with many of the Saxifrages, such as *S. Andrewsii*, with its neatly serrated foliage, *Aizoon longifolia*, and *umbrosa*, with its various varieties, &c. P. GRIEVE.

CULTURE OF PRIMULA CORTUSOIDES AMÆNA.

WHAT may be termed the original type (*Cortusoides amœna*), has rosy-magenta flowers with a white centre; then there are such varieties as *lilacina*, or, as it is sometimes called, *striata*, the flowers marbled white and lilac; *alba*, with pure white blossoms; and a large form of *amœna*, called *grandiflora*, with blossoms of greater size, deeper in hue, and not so white in the centre. Soon after this fine Primrose was introduced there was a large variety of it called *grandiflora*, the blossoms of which took a cupped shape, greyish-white in the face of the flower, the reverse of the petals being deep rose. As this is rarely if ever seen now, I suppose it has nearly gone out of cultivation. The large-flowering rosy-magenta form, the lilac or striped variety, and

the pure white one, are all distinct, and well merit cultivation. It will bloom well in the open ground, but the flowers are liable to be much injured by rain and winds, which soon detract from their beauty; when grown well in pots under glass it is capable of a high stage of development, and the flowers are numerous, large, and well-coloured. The plant is easily propagated or increased by root-divisions. It has the peculiar habit of throwing out creeping roots which form crowns, and so furnish plants; when the plants begin to go to rest at the end of the summer, these young plants should be removed and potted singly into small 60-sized pots, well-drained with crocks, in a free open compost of turfy loam and leaf-mould. These should be wintered in a cold frame and kept slightly moist during the winter. The parent plant, after the crowns are removed, should be left in the pot till growth sets in, when it should be re-potted without shaking away much of the old soil. It is a plant that is fond of establishing itself and remaining undisturbed. When potted, the plants should be afforded pot-room according to their strength; the pots should be drained and a little Moss placed over the drainage to prevent the soil from getting down among the crocks, and preventing a free passage of the water. Good mellow loam, leaf-soil, and some well-decomposed manure, will form an excellent compost, and the crowns of the plants should be quite buried. Pot the plants moderately firm, and do not give them any water for two or three days; when the plants grow freely they should be watered abundantly. It is a good plan to allow the plants to remain in the same pots at least two seasons without shifting; they will flower much more freely in consequence. In the spring of the second year, some of the top soil should be removed, and some good rich soil added, and, as the plants begin to unfold their buds, a little weak manure-water should be given. What the cultivator should aim at is a vigorous healthy growth, or else the plants are liable to be infested with red spider. During summer the plants should be syringed daily, to keep this pest in check. If shaded from the effects of hot sunshine the bloom will be prolonged, and an excellent decorative effect will be maintained for many days.

R. D.

SAXIFRAGES.

By J. C. NIVEN, Botanic Gardens, Hull.

The Mossy Group. (Concluded from p. 371.)

S. obscura of Godfron bears considerable resemblance to the *Cæspitosa* group; it is, however, more procumbent and lax in its general habit of growth, its leaves are not so compactly arranged, but distributed in a somewhat scattered manner along the barren shoots. They are pedatifid, seven-lobed, the lobes deeply divided and linear, pointed but not mucronate; the whole suffused with soft irregular hairs, which assume a dense interlacing character on the foot-stalks. The flowers are white, produced on short foot-stalks. In the petals we have, perhaps, one of the most marked peculiarities that this species possesses, each petal being distinctly incurved on the margin, as to the lower half; this character, though not alluded to by Engler, appears to me to be very constant. This species is only recorded as occurring in the Eastern Pyrenees, but may possibly have a much more extended range, as it might easily be passed over as one of the forms of *Cæspitosa*.

S. ajugæfolia.—This is by no means the happiest of Linnaeus's specific names, as the ordinary forms of the *Ajuga* or "Bagle" with which most people are familiar, have large entire leaves. There is however, a small section of annual plants, in the genus of which the *Chamæpitys* is the type, and this particular section he must have had in view when he gave the name; here we find the leaves trifid with linear segments in place of entire, and certainly bearing a fair resemblance to this species of Saxifrage. In habit of growth it is decidedly a rambling plant, producing long trailing shoots. The leaves are deeply divided into three lobes, each lobe being notched at the point, the divisions are wider apart than in the previous species, and the whole plant less hairy. The flowers are less profuse, and the petals narrower, with a short claw; the marginal incurvature being altogether absent. This also is a Pyrenean plant, on which range it appears to have a pretty extended distribution.

S. aquatica of Lapeyrouse and *adscendens* of Vahl are synonymous; both names are appropriate; the former, which I adopt, indicates the medium in which it grows, the latter the habit of its growth. The ascendent character is, however, more or less general through this section, whereas the aquatic one is almost peculiar to this species; hence the reason for its adoption. The marshy Saxifrage produces its leaves in large densely-arranged rosettes; individually, they are divided into three lobes; each lobe again has three somewhat broadish and blunt sub-divisions; these divisions, however, do not extend more than half the depth of the blade of the leaf, the foot-stalk becomes dilated or sheathing at its base, and the whole is covered with short downy hairs, slightly viscid in the early stages of

growth. The inflorescence is leafy, many-flowered, and, when growing vigorously, is said to attain a height of 15 or 18 inches. The canline leaves are much more sharply cut than the radical ones just described. All the flower-stalks are thickly covered with a dense glandulous pubescence. The capsules are inflated, and said to present a very marked appearance after the blooming period is over. This plant, when growing in a favourable position, say at the margin of a water rill, is readily distinguished by its free, luxuriant, and rambling growth; if cultivated under the same conditions as the majority of the previous species in this section it becomes stunted and starved, its true character being altogether suppressed. It is a native of Corsica and Sardinia, where it affects the margins of the high mountain streamlets. Before completing my remarks on this species let me note that we have for years cultivated a plant under the name of *adscendens* which is nothing more than a form of *hypnoides*.

S. irrigua of Sternberg, and also of the "*Flora Taurica*," is removed from this section by Engler, for reasons which are of so technical a character, that I need not here state them. Suffice it to say, the general aspect of the plant claims a place among the major forms of the mossy group; and, seeing that it has been considered by some as a variety of the preceding, we must give it its true family position. As a species, it is perfectly distinct, were it in no other respect, in the fact that it is little more than biennial, and does not produce those creeping stems that form the succeeding year's rosettes. Grown from seed, the first season it develops a mass of much-divided long-stalked leaves, covered with long, soft, lax hairs; in the second year, an erect, much-branched, and leafy flower-stem rises to a height of 12 or 15 inches, remarkable, also, for the abundance of long hairs, and general upright habit of all the secondary branches. The petals are white, narrow, and supported on short stalks, thus giving the flower a stellate character. The capsules, as in the preceding, are inflated, and, on the maturity of the seed, the whole plant dies. It is a native of the Caucasus and Armenia. Though, in its young state, it is very sensitive of moisture and damp, and liable to rot off therefrom, when it is in bloom, it may be almost said to be aquatic, so happy and vigorous is it when abundantly supplied with root-moisture.

S. Schraderi of Sternberg is a species which, though wholly omitted by Engler, has good claims to recognition; most Saxifrage cultivators must have been familiar with the plant for years. It is of a somewhat slender wiry growth, producing its lateral stems (procumbent they can hardly be called) so freely that it soon forms a large patch on a rockery, conspicuous for the red-coloured flower-stalks, which are extremely beautiful, especially before flowering takes place. The lower leaves are divided into five or seven very narrow fleshy segments, each division terminated with a rigid mucro or point. The stems are branched from the base, about 12 inches high, the lower leaves thereon being trifurcate; the upper ones entire; the whole plant is devoid of hairs or glandular pubescence. The flowers are numerous, of a very pure white, which contrasts beautifully with the almost coral-red floral stems. It is recorded in London as a native of Spain, but what part I cannot say. We have a form of it slightly more slender in growth, and which I recognise as a variety under the title of *leptophylla*.

S. ceratophylla of Dryander.—The Stag's-horn Saxifrage is such an appropriate descriptive name of the plant that I do not feel at all inclined to endorse Engler's substitution of Schrader's name *trifurcata*, which would in truth be a much more appropriate one for the preceding species, where the trifurcate stem leaves are very conspicuous. The Stag's-horn character is represented in the individual lobes of the leaves, which are somewhat broad, each one notched more or less deeply into five irregular divisions; the foot-stalks are between 1 and 2 inches long, dilated at the base, thus giving a large and lax character to the lower growth of the plant. The panicle is much branched from the bottom upwards, the lower secondary branches being long; the whole plant is glabrous. It is a free grower, with noble panicles of pure white flowers, which rise from an irregular cushion of notched and divided leaves. This species is sometimes grown under the name of *S. paniculata*; at one time I thought this had sufficient character to be considered a variety, but, after three years' culture I find it is nothing more than a synonym. Here I cannot resist adding another synonym I picked up at one of our grand national exhibitions a few years ago, viz., *S. stag's-horniana*! The exhibitor modestly withheld the authority for the name, but, judging by the general nomenclature of the group, I think I may safely consider it to have been original. The plant is a native of the central mountains of Spain.

S. Willkommiana of Bourgeau is the name under which this very distinct species of Saxifrage made its *entrée*, some three or four years ago, into cultivation in this country. I, therefore, prefer to retain it rather than Boissier's name, *Canaliculata*, though I admit, at once, that his name is most appropriate. To this plant the title

Elk's-horn Saxifrage would be equally appropriate as an English name, as Stag's-horn was to the preceding; here we have a plant of straggling slightly woody habit, with large leaves divided towards the margin into five or seven unequal oblique divisions, the great portion of the leaf being entire, narrowing gradually into a sheathing petiole, and deeply channelled through its upper surface, slightly viscid below, thick and leathery in substance, and altogether glabrous. The inflorescence does not possess the same magnitude in development as might be expected from the size of the foliage and the general appearance of the plant; moreover, the flowers are comparatively small, and supported on very short foot-stalks; in the bud they are prettily tipped with pink. It is a native of the mountains in the province of Leon and also the inland mountains of Southern Spain.

S. pentadactylis of Lapeyrouse is a dense, rigid, compact-growing plant, whose height, including blooming stem and all, rarely exceeds 6 or 7 inches. Its leaves, besides the three primary subdivisions, have each division again notched into three, the points of each being rigidly mucronate and slightly reflexed; hairs are absent, but the upper surface of the leaf is covered with glands that excrete a viscid fluid. In autumn and early spring the presence of these glands is indicated by tiny white dots, which give the plant a very pretty appearance, something of a frosted silvery character. The leaves and the divisions thereof are deeply channelled. The inflorescence is small, but the flowers themselves are of snow-white purity. The several distinctive features I have enumerated will at once indicate that it is a most desirable species to cultivate. It is a native of the Eastern Pyrenees, and has long been in cultivation, but is not so frequently met with as it ought to be.

S. geranioides of Linnæus is a good distinct species, of slightly shrubby and rambling habit of growth. Its leaves are reniform in general outline, three-lobed, the centre one being the smallest, and divided into three terminal teeth. The lateral lobes are irregularly notched in a pedate manner; the foot-stalks are long and spatulate, and the whole covered with a dense arrangement of short hairs, which are glandular in the young state. The flowers, which are produced in simple panicles, with one or two secondary branches, are clustered together in a corymbose manner, owing to the shortness of the foot-stalks; the petals are narrow, gradually tapering to the base. At this season of the year, the whole plant yields a balsamic odour, very similar to some of the species of *Cistus*. So volatile is the essential oil given out by the glandular hairs, that, on passing a large patch after a shower of rain, the atmosphere appears to be laden with it. There is a variety to which the title *ladanifera* has been given by Laperouse, in the description of which he alludes to the presence of numerous purple balsamic globules on the leaves. Were it not for the absence of colour, I should be disposed to refer our present plant to the variety, rather than the true *Geranium-leaved* species, as, in Linnæus's description of it, no allusion whatever is made to the balsamic odour. Most probably his description was made from a dried specimen, in which case this special character would have vanished. The plant, however, is admirably adapted for overhanging a broad ledge of rock, which its free growth will soon cover, and where it will flourish far away from its original root-hold for years. It loves a bit of shade, and, in this respect, is exceptional in this section. It is a native of the Pyrenees. There is also some old tradition of its having been found in Britain, but to this statement we must append—doubtful.

S. Maweana, introduced from Tetuan, in Morocco, where it was discovered by our friend Mr. Maw, of Benthall Hall, and named after him, is of too modern date to claim a record in Engler's enumeration. It is, unquestionably, tolerably closely related to the previous species. The leaves are, however, more entire and less reniformly pedate, more fleshy, and devoid of the downy pubescence. One marked peculiarity consists in the presence of dense hard leaf-buds in the axil of each leaf. The flowers are large, nearly three-quarters-of-an-inch across, not unlike the old *granulata*—but produced in lax panicles—the stalks being hairy, as also the calyx, and the whole flower-stem suffused with a purplish-chocolate tint. The buds, before expansion, are drooping. As I said before, it is a native of Morocco, where it grows on the Beni Hosmar range of mountains. It would appear that the axillary buds to which I have alluded, are an admirable provision of Nature—whereby, in an arid climate, under an almost tropical sun, the plant is enabled to retain its vitality through the hottest seasons of the year, when its foliage becomes completely withered up—but with a return of moisture, green leaves are developed from these fleshy-buds, and soon fresh rosettes are formed; this peculiarity—to which I have before alluded under the title of summer hybernation—is not peculiar to this species alone, but is likewise characteristic of the next one; and also of another charming little species, also introduced by Mr. Maw, which is just now coming into bloom; and which, though perhaps not so showy, will, I suspect, be found worthy of a name—to this I may, possibly,

have occasion to refer, before I bring my series of articles to a close.

S. globulifera of Desfontaines, is a dwarf, somewhat hard, prostrate plant. The leaves are cuneate, irregularly seven-lobed, with a scarious margin, of a light yellowish-green, springing from coral-red stems, and each one containing in its axil a hard compact bud, similar to those described in the preceding species. The flowers are small, produced in a lax corymbose panicle; the calyx is covered with short glandular hairs. It is a pretty and distinct species; both it and its variety *gibraltarica* are natives of the South of Spain and North Africa. I have for some years cultivated plants under the two names, and consider them both referable to the typical species *globulifera*.

TREATMENT OF ALTERNANTHERAS.

The *Alternantheras* are mostly indigenous to South America, and belong to the natural order *Amarantaceæ*. Many of them are now well known, and are found to be exceedingly useful as decorative plants in the parterre during the summer months. The delightfully ornamental-foliaged species known as *Alternanthera amœna*, is, perhaps, the most beautiful and delicate of the family. It is, nevertheless, of comparatively easy culture, although it is found to be somewhat difficult to induce it to grow, or to "make wood," sufficiently early in the season for the purpose of propagation. The following method of treatment has, however, been found to be generally successful. Early in the autumn, or before the plants have been injured by frost, a few plants are removed from the beds and planted, not too thickly, in store pots or pans, and, during the winter months are kept near to the glass, in a tolerably high temperature. About the middle of April (which is sufficiently early to commence the propagation of this plant), these store pots are placed in a close moist propagating-case or under hand-glasses, when the plants will soon begin to grow with considerable rapidity, and, by keeping the interior of the propagating cases saturated with moisture, they will emit abundance of aerial rootlets from the stems and at the base of each little shoot, and these, when taken off and inserted as cuttings, root into the soil in the course of a very few days. The soil used should be a mixture of river or silver-sand, and finely-sifted leaf-soil, and the cutting pots should be well drained. From a few store pots of this plant, treated in the manner described, it is found that a very considerable stock can be produced by the first week of June, which is quite early enough to plant them in the flower beds. Previous to being planted out, the plants should be, of course, gradually inured to the open air, but should never be potted off singly, nor removed from the store pots until they are about to be planted in the beds. When they are taken from the store or cutting pots, each plant is generally found to retain a little ball of the soil, held together by numerous fibry rootlets. The plants should be at once planted in the beds tolerably close together, in order to produce immediate effect, watering them well as the work proceeds, and if the weather is at all dry this should be frequently repeated. Wherever carpet-bedding is extensively practised, the various varieties of *Alternanthera* are found to be quite indispensable. A variety which promises to be an improvement upon even *A. amœna* has been recently introduced under the name of *A. amœna spectabilis*. It appears to be equally robust in its style of growth as *A. magnifica* and *A. paronychioides*, and attains to a similar height, while its beautiful magenta-rose leaf colouring is quite equal to that of the old variety, *A. amœna*.

P. GRIEVE.

CULTURE OF THE PETUNIA.

The *Petunia* may be raised from seed, and selected and named varieties may be propagated by cuttings. If the plants are required to be large and vigorous when planted out, so as to yield flowers at once, sow the seed in pans in August, and put them on a shelf in the cool shady side of a greenhouse, covering the pans with pieces of glass, and shading from hot sun. The soil must be kept moderately moist. As soon as the plants are large enough to handle with safety, let them be potted singly into thumb-pots, and kept close and shaded in a warm house till they make root, and then shift them into small 60-pots to winter there. If they are placed on a shelf near the glass in a greenhouse, and kept moderately dry, they will bear a little frost without injury. It is only those, however, who have but little convenience for raising seeds in early spring in

warmth that need trouble to raise *Petunias* at the end of the previous summer and preserve them through the winter. Those who have a brisk heat at command should sow the seed at the end of February, and pot off as directed, and grow on into nice strong bushy plants; use a soil made up of fine loam, leafy soil, and some silver-sand. In the flower garden *Petunias* can be employed during the summer with great advantage. A bed of mixed seedlings is a very attractive sight when in full bloom, presenting, as it does, such a number of varying hues of colour—from deep purple-crimson flowers, down to white flowers handsomely varied and striped with rose. Seedling *Petunias* are pretty certain to make vigorous growth, hence the necessity for planting them in rather poor soil. *Petunias* are often employed to form dense masses of colour, and beds of particular varieties are employed, the plants being raised from cuttings. In all cases of using *Petunias* in the flower garden it would be well to raise the plants from cuttings; they do not grow so strongly, nor do they seed freely, and thus the energies of the plants are directed to producing flowers. A purple-crimson self *Petunia* forms a fine mass of colour, and a silvery-leaved plant is generally used as an edging. If a deep-coloured *Petunia* and the old variegated *Mangle's bedding Pelargonium* be mixed together in a bed, the effect is very charming indeed. In damp situations it will often happen that during wet weather in late summer the plants will damp off and decay. But *Petunias* are also excellent plants for the decoration of the greenhouse and conservatory when grown in pots; and then there is scarcely a horticultural exhibition held now, large or small, at which prizes are not offered for *Petunias* in pots. In some parts of the west of England, wonderful examples of *Petunias* are grown for show purposes. They are put into large pots, and the plants tied out to sloping oval wire frames, by which means the flowers face all one way, and quite a dense surface of flowers is thereby obtained. If some plants are grown on into 48 and 32-sized pots, and pinched back for a time, to form nice pyramid-shaped plants, they soon become covered with flowers, and remain in bloom for a long period. They should be kept well watered, for they speedily suffer if allowed to become dry at the roots. *Petunias* are also well adapted for growing in stone vases and baskets, as they hang down over the sides, and have a charming effect. Fine strains of striped and blotched *Petunias* are now so general, owing to the improvement that has been effected in this charming flower of late years, that seed can be had from any seedsman. The earlier flowers nearly always come self-coloured, then they break into pretty striped forms that are most effective when mingled in beds. I have always regretted the banishment of the pleasant *Phlox Drummondii* from our gardens. In some old-fashioned places, it is never absent during the summer months, and it is always a welcome guest in the floral circle. The seed should be sown about the first week in March in shallow pans or boxes, using a light rich soil, and placing the seeds in a nice warm and rather moist temperature. As soon as the plants can be handled without injury, it is a good plan to prick them off into boxes, or on a bed in a warm house, in a temperature of from 50° to 60°. They soon make growth, and, as the weather gets warm out of doors, the boxes should be placed out in the shade to harden the plants. Those growing in a bed should be again transplanted to a prepared bed in a cold frame, and kept covered for a few days, and hardened gradually. When the plants are from 3 to 4 inches high they should have the main shoot pinched out; this induces them to make a lateral and bushy growth, and greatly assists the prolongation of the period of flowering. The soil in which the plants are to grow should be rich; an abundance of decayed leaves suits the *Phlox* well. The bed should be in a position fully exposed to the sun; as long as there is a good moist soil at the roots they will not be injured in the hottest bright weather. Quo.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Daffodils.—It may not be generally known that Daffodils do well planted in fields, which are not broken up, and to which cattle have access. I am acquainted with batches of them (and they look well every year) where cattle are constantly grazing, and yet they do not even tread upon them. On lawns, too, they have a pretty effect.—H. M.

Arabis rosea.—Although this novel form of a well-known *Arabis* was introduced into this country from Calabria in 1832, it is yet most rare. I have inspected hundreds of gardens of late years, and never met with it until a few days ago. It has a less robust habit than *Arabis alba*, but is a stronger grower than the *Anbrietas*. It blooms from March onwards, the blossoms being rosy-pink in colour, and it will, doubtless, make a capital carpet plant for early beds.—D.

Collinsia violacea.—This variety, introduced a few years ago by Mr. Thompson, of Ipswich, is not yet generally known. It is much dwarfer than the old *C. bicolor*, is comparatively hardy, and blooms after standing the winter in the open ground, about the third week in April. This *Collinsia* may be recognised by the colour of its flowers, which have white upper petals, the lower ones being bluish-violet. It makes a capital spring bedding plant, and Mr. Thompson considers it to be the best of all the family.—Q.

GARDENS OF LE PETIT TRIANON, VERSAILLES.

BEFORE the completion of the vast Palace of Versailles, Louis XIV. was already becoming tired of its monotonous splendour, and determined upon the creation of a lesser palace (since known as the Le Grand Trianon) in which he could escape from the irksome and *quasi* public magnificence of the greater structure. His project was imparted to Mansaart, the court architect, who undertook to create both palace and gardens with the least possible delay, and who made use of fully as much stone in the creation of the garden as in the erection of the palace, which, though consisting only of a ground-floor, or *rez-de-chaussée*, is yet, after a fashion, a repetition of the uninteresting style of the greater structure. Neither the palace of the Grand Trianon nor the gardens, so called by a somewhat inappropriate figure of speech, would have been mentioned in this article but that they form such a singular contrast to those of Le Petit Trianon, which were laid out and planted in a happier period of French taste in garden making.

Le Petit Trianon, constructed at a somewhat later period than its greater neighbour, was intended to be much smaller and less pretentious than Le Grand Trianon, and more calculated to afford the means of greater privacy; as a *regal casino*, it is in no way remarkable for beauty of any kind; but the gardens, which were planned and planted at a later period, in the style of a romantic kind of landscape gardening, at the suggestion of the unfortunate Marie Antoinette, instead of exhibiting the stone formalisms of the gardens of the greater Trianon, in which vegetation, either arboreal or floral, played a very secondary part, were, and are still, as we shall see, extremely pretty. Louis XV., at the instigation of the Duke of Ayeu, had caused a botanical garden to be laid out between the two Trianons, which subsequently became the scene of the important studies of Bernard Jussieu, whose system of botany, known as the natural system, for many purposes has superseded the artificial arrangement of Linnæus; and the trees then planted formed a kind of foundation for the laying-out of the pleasure-garden as it now appears. To carry out her special views, the young queen employed M. Mique, an artist whom she had appointed her special architect, and also the clever painter, Robert. She combined the talent of the two, in order that the hard lines of architecture should not predominate; and we find that this mingling of the two arts was highly advantageous; M. Robert insisting with the queen that, in a "garden," foliage, water, and paths undulating with the play of the soil, or the contour of the lake, combined with appropriate rustic buildings, should be the leading features. The architectural adjuncts, of a necessarily formal kind, were to be few, and grouped with foliage in such a way as to soften the hardness of their lines, as is seen in the pretty Temple of Cupid, figured in a former number of THE GARDEN.

A pet idea of the young queen was, not only the creation of a partially wild landscape-garden, but also the introduction of many of the ordinary features of humble country life, such as a rural village, a dairy, and a mill. These were accordingly constructed from the painter's, rather than the architect's, point of view, being pictures made with real trees, sketch-book cottages, a fanciful mill, a dairy, and a rude bridge, all designed by the painter Robert, and carried into execution by M. Mique; the cottages being, at the suggestion of the queen, in the style of Swiss *châlets*. Here it was that the beautiful young Austrian princess, habited as a shepherdess, or, at all events, in silk and lace attire, imitating, in general form, a rustic costume of more homely materials, assisted in milking the cows, carrying the milk to the dairy, superintending the churning; fancying that she had discovered the true secret of rustic simplicity and happiness, and enjoying her discovery accordingly. When we call to mind that this pretty little queen was the personage who wondered how it was that people could be starving in Paris while they could buy delicious Raspberry tarts at the pastrycooks, for two *sous*, it is not difficult to imagine that the graceful mock rusticity she had created should appear to be almost the very reality itself, especially as she felt so happy in throwing off the shackles of royalty while playing at rustic life among the bosquets of Trianon. Another of the enjoyments of Trianon, not quite so consistent with rural life as milking and churning, was the performance of private



GARDENS OF LE PETIT TRIANON, VERSAILLES.

theatricals in the palace-casino, as was the custom in French country houses at that time; the *comédie de château* being one of the favourite amusements of the *vie de province*. Here, in fact, was enacted—the Queen and the Comte D'Artois, afterwards Charles X., taking leading parts—Beaumarchais' celebrated comedy, "The Barber of Seville," with the author himself for the stage-manager. One cannot wonder that Charles X., when driven from his throne by the revolution of a single day, lingered a few hours in the gardens of the Petit Trianon, recalling sweet and bitter memories, before hastening to the frontier and quitting France for ever.

The young trees planted by Marie Antoinette, and those previously established during the reign of Louis XV., are now venerable with age, and, during the summer and autumn, throw the greater part of this exquisitely-pretty pleasure garden into a soft and pleasing half-light, which greatly adds to its charm. The annexed illustration represents the dairy, with its latticed windows and thatched roof, and its irregular walls, more than half concealed by a heavy mantle of Ivy and other climbing plants. The lofty trees, towering high above it, give it somewhat the air of a woodman's hut nestling deep in the bosom of a forest, the partial gleam of sunlight which the artist has thrown upon it adding to the sylvan effect. As it stands at present, the dairy and its surroundings offer a good model to a landscape gardener about to erect labourers' cottages on a large estate, with instructions from a tasteful proprietor not to allow them to become spots or disagreeable excrescences in the domain, but to blend with the surrounding scenery in a natural and artistic manner. Of course it is not recommended to make literal and slavish copies of the scenery of the Petit Trianon, but merely to study it and take in the general character of its beauties, as a young painter, after gazing steadfastly upon a work of Raphael, might instinctively infuse into his next picture somewhat of the ineffable grace that distinguishes the work of that great master.

Jussieu has left his footprints in the charming garden of the Petit Trianon, in the rare and beautiful trees that still flourish there, most of them (planted in 1764) being now in their prime, and some of them the finest specimens known of their kind. The Cypress of Louisiana (*Cupressus* or *Taxodium distichum*), with its remarkable roots which exhibit their singular forms partially above the ground, often rising, in their native marshes of Louisiana, to the height of 6 feet, is one of the fine trees alluded to. Many of them are very interesting now on account of the splendid growth to which they have attained. The Weymouth Pine, for instance, and a great variety of American Oaks; while a Willow-leaved Oak (*Quercus salicifolia*), has attained a height of above 90 feet.

Many trees, of recent introduction, have since been added to the woods and gardens of Trianon, such as the Wellingtonia, the Araucarias, the Himalayan Cypress, and others. The flower-garden, established, in 1850, by M. Charpentier, has much interest for botanists and all lovers of horticulture; the collection of Rhododendrons and Azaleas being magnificent, as well as that of other bog shrubs, and also the most remarkable novelties in herbaceous plants; which are invariably procured with the least possible delay, and, in most cases, cultivated with unusual success. There are also some remarkable trees in this part of the grounds, especially a magnificent pyramidal Oak, a Montezuma Pine, and a *Pinus Lambertiana*, which last is so vigorous that it promises rapidly to attain its native growth of 100 feet or upwards.

H. N. H.

This year the budding of the Oak is far in advance of that of the Ash. The tradition is, if the Oak gets into leaf before the Ash we may expect a fine and productive year; if the Ash precedes the Oak in foliage we may anticipate a cold summer and unproductive autumn. Referring to "Cassell's Dictionary of Phrase and Fable" we find that in the years 1816, 1817, 1821, 1823, 1828, 1829, 1830, 1838, 1840, 1845, and 1850 the Ash was in leaf a full month before the Oak, and the autumns were unfavourable. In 1831, 1833, 1839, 1853, 1860 the two trees came into leaf about the same time, and the years were not remarkable either for plenty or the reverse; whereas, in 1818, 1819, 1820, 1822, 1824, 1825, 1826, 1827, 1833, 1834, 1835, 1836, 1837, 1842, 1846, 1854, 1868, and 1869 the Oak displayed its foliage several weeks before the Ash, and the summers of those years were dry and warm, and the harvests abundant.—*Daily Paper*.

THE ARBORETUM.

TREES AND SHRUBS WITH VARIEGATED LEAVES.

At the present day, in gardens, large and small, we make groups (regular or irregular in form) of trees and shrubs with variegated foliage, arranged in straight lines, or in zones, and in positions suited to the height of each subject. In all the plantations which we have superintended for some years past, we have introduced one or more groups of this kind, even in gardens of small extent, and always with great success, as this mode of arrangement accommodates itself to grounds of all varieties of size and form. In order to succeed well in plantings of this kind, it is important to have a knowledge of the materials employed, and to take into account the effect that will be produced by the different modifications of which trees and shrubs are susceptible in their height, shape, and even colour, according to the mode of culture and training to which they are subjected. In order to be complete in our instructions on this important question, it will be necessary to describe the trees and shrubs which may be used in compositions of this sort, and to make some remarks on the mode of training and propagating them, as both these operations modify the use of this or that tree or shrub. Lastly, we shall have to point out what positions, relatively to each other, these shrubs can, or ought to, occupy, in order to produce the desired effect. These practical instructions will be found more useful than a general dissertation, from which the reader would have to draw his own inferences, at the risk of deceiving himself, or arriving at imperfect conclusions. We have no intention of putting forward here a complete catalogue, or a treatise on culture, but simply a few notes which we have abridged as much as is consistent with an intelligible exposition of the subject. We shall conclude the article by giving some examples of combinations or groupings, which may suggest to our readers other arrangements, varied according to individual taste.

Descriptive List of Subjects.

Acer Negundo foliis albo-variegatis.—This handsome tree is pretty generally known. It may be employed in various ways; grown in bush form on its own roots, or grafted close to the ground on a stock of the plain-leaved variety, it forms handsome bushy specimens which may be used in combinations of all kinds. It may also be used to form the outside margin of groups which have been already planted in the ordinary way, with variegated or plain-leaved trees or shrubs. Grafted as a half-standard at various heights, it can be employed in groups planted with regularity, and consisting of trees or shrubs arranged in an order graduated according to the stature of each. If a rather tall half-standard is required, it should be grafted on a stock of *Acer californicum*. A group formed exclusively of this variegated Maple, grafted as tall standards and half-standards, with purple-leaved or deep green-leaved shrubs planted among them as underwood, presents a most splendid effect. Upon the whole, we shall not exaggerate in saying that, for our present purpose, the white-variegated Maple is, indeed, one of the most valuable subjects—we would say, the *pièce de résistance*, if this fine tree were not too handsome, airy, and graceful to merit the epithet.

Acer platanoides fol. aur. marginatis.—A handsome, new, and, as yet, rare variety, with fine large leaves, the margin of which is edged with a broad border of a handsome yellow. When it becomes more plentiful, it will do good service in forming contrasts of colour. It may be grown either as a bush or as a standard. When cut back to the ground it speedily sends up a fresh young growth.

Acer polymorphum var.—We are somewhat shy of mentioning this handsome Japanese species, with its numerous varieties, *atropurpureum*, *palmatum*, *palmatifidum*, *rubrum*, &c., because they are not within the reach of everyone's means. We hardly know anyone, except the honourable President of our Circle, M. Edm. de Ghellinck de Walle, who (in view of the expense) has not withstood the desire of possession which tempts all true amateurs at the sight of these magnificent trees. In his large and splendid park we have seen a superb group, single young specimens of which cost as much as £8 each. One great merit of these trees is that, contrary to what might have been expected, they stand our winters very well.

Acer Pseudo-platanus fol. aur. et arg. var., &c.—Of the Sycamore there are several varieties with richly variegated leaves, which well deserve to be introduced into plantations, arranged in zones

of large extent.* What would not be the effect of these trees in an avenue, planted as tall standards, alternately with subjects of the variety with leaves purple underneath, and powdered with white, streaked and mottled with yellow, all mingling in a tri-coloured shade! The effect would be less imposing, less majestic, less severely dignified, than that of the stiff quincunx formed of a single species of forest tree. Granted! At the same time, let no one contend that our combination, although not exhibiting such a patrician appearance, would be less beautiful.

Berberis vulgaris atropurpurea.—This is a variety of the common Barberry, with leaves, which, in spring, are of a vinous red colour, afterwards becoming brown by degrees, until, in autumn, they change to a purplish-green. When the plant reaches a certain age, it undergoes the common lot of mortals, loses its charms, and becomes ugly. The branches droop and become warped, and the leaves grow small and wan-coloured. Fortunately, it is easy to preserve this handsome shrub in a condition of perpetual youth, beauty, and freshness, by cutting it back, close to the ground, every second year. When cut back in this way, the plants seldom bear their yellow flowers and their red little berries; but what does that matter? Does anyone complain that the Coleuses, the Alternantheras, the Achyranthes, the Perillas, the Amarantuses (tricolor and melancholicus), do not flower? And are not the sometimes very handsome flowers of variegated-leaved Pelargoniums, and the button-like flower-buds of *Pyrethrum Golden Feather* carefully removed?

Catalpa syringæfolia aurea.—This tree, a recent acquisition, which made its appearance simultaneously among seedlings of the type, in the nurseries of M. Gaujard, at Wetteren (Belgium), and of M. Vander Bom, at Oudenbosch (Holland), is distinguished by its large leaves of a fine golden colour. They present the remarkable phenomenon of becoming green in the summer, and resuming their fine golden spring-colour again in autumn. It is an excellent subject, either for the centre of a regular group of shrubs with variegated foliage, or for the margin of a large irregular group of such subjects. *Catalpa Bungei*, C. *Kempferi*, and the plain-leaved form of *C. syringæfolia*, are also highly ornamental green-leaved plants.

Cerasus Mahaleb fol. arg. marg.—A valuable plant, recently raised, and a great acquisition to gardens in general, but more especially for the mode of planting which forms the subject of the present notice. It is grafted as a half-standard on the Wild Cherry, or close to the ground on the ordinary Mahaleb. The last-named mode of propagation is, as yet, little practised, although it is much to be recommended. So far as we can judge from our experience up to this time, we believe we may assert that the grafts on the Mahaleb are more lasting. Plants of the variegated Mahaleb, grown in bush form, make excellent edgings to groups, on account of their moderate growth, and the facility with which they may be pruned and trimmed. Grown as half-standards, they do well for the centres of regular groups of small size, or as the principal subjects among dwarf shrubs planted as underwood, and in irregular groups. The tree grows well in dry soils, whether chalky or schistose.

Cornus mascula fol. var.—A shrub with finely-variegated leaves, and of moderate growth, in fact, rather poor unless it is planted in fertile and, especially, in moist soil. It is grafted either as a half-standard or close to the ground on the common *Cornus mascula*, and is employed much in the same way as the *Cerasus Mahaleb*, but the soil in which it is planted must be of an entirely opposite character to that which suits the *Cerasus*.

Cornus sibirica albo-marg.—This pretty shrub presents a contrast in itself, its light green white-margined leaves standing out in bold relief from the shining blood-red bark of the stem and branches.

Cornus sanguinea fol. var.—A shrub with green leaves splashed with white; bark of stem and branches brownish-red. It may be used for the same purposes as the preceding variety. Both delight in very moist positions.

Corylus Avellana atropurpurea.—This is the king of shrubs with variegated leaves! Hitherto, people were satisfied to throw away these Nut trees, by placing them at random, here and there in front of, or in, a group of other shrubs, where they look like spots of ink on a sheet of paper. When planted in zones, or in full groups with an inter-plantation of white-foliaged subjects, this shrub has a marvellous effect, and we can say that, with the white-variegated Maple, it forms the basis of the finest combinations. As yet, it is chiefly grown as a half-standard, being grafted by approach on the common Hazel, and is employed as an ordinary isolated subject, or as a central tall tree in groups of dwarf white-leaved shrubs. When grown in the bush form, it should be completely cut back to the ground every third year, after which, it sends up a fresh young

growth. This variety produces excellent Nuts when it is allowed to develop itself freely.

Eleagnus angustifolia.—All the parts of this plant—stem, branches, spines, and leaves—are covered with a greyish-white down, forming a good ground-work for relieving and contrasting all the shades of other variegated trees and shrubs. It is a valuable subject for high and dry grounds, and is sometimes even seen flourishing on certain parts of the sea-coast. In favourable positions, it attains large dimensions, and forms dense impenetrable bushes.

Eleagnus (Shepherdia) argentea.—This is a very hardy shrub in dry soils. In itself, it is nothing very remarkable, but its silvery-grey colour affords some singular contrasts to the foliage of other shrubs.

Fagus sylvatica atropurpurea.—Most people are familiar with and appreciate this fine variety of the common Beech, which it equals in hardiness. It also appears now to be almost as permanently established, as the "mast" or seed of the Purple Beech (not grafted), when sown, produces scarcely 5 per cent. of plants whose leaves are green or simply tinged with copper-colour. It is not sufficiently remembered how well this tree submits to be trimmed with the pruning-knife, or even to be clipped with the shears, and that it allows itself, without difficulty, to be confined within the narrowest limits. It may be grown as a pyramid for the centre of a group. Arbours and verandahs formed of Purple Beeches, shaped by the gardener's shears, have a very fine effect, as also have hedges and palisades, or curtains, formed exclusively of this tree, and divided into panels or compartments by the insertion of plants of the common Beech or of the Hornbeam. We imagine that it is possible to arrive at combinations of more cheerful aspect than the stiff old Hornbeam hedges. At a country-seat at Melle, near Ghent, we once saw a covered way or tunnel formed of Purple Beeches. This is a very characteristic mode of employing it for ornamental purposes. There is a variety of the Purple Beech which has pendent or weeping branches, and very broad and dark-coloured leaves.

Hibiscus syriacus fol. var.—It is the variety with double purple flowers, and large white-margined leaves, which we mean to recommend here. This plant affords another example of leaf-variegation, which is a disease, or evidently a sign of weakness, in the individual, accompanied with doubleness in the flowers, which is a mark of plethora or surplus of vigour. This plant is cleft-grafted close to the ground, on the common *Hibiscus syriacus*. It may be objected against the *Hibiscus* that it comes late into leaf, and it is, in fact, very disagreeable to see its branches in a group of other shrubs, remaining leafless up to the end of April. On this account, we recommend that entire groups should be made of the *Hibiscus* alone, without the admixture of any other kinds of shrubs. Such groups will be very pleasing from the fine contrast of the flowers (which are amongst the latest in autumn) with the neat variegation of the foliage. They should be planted in positions fully exposed to the sun.

Hippophae rhamnoides.—This is a very hardy spiny shrub, and may be employed in any position or aspect. It is a particularly good subject for sea-side gardens or grounds. The whole plant is of a silvery-white colour.

Hydrangea japonica fol. arg. var.—We cannot too much recommend this fine plant as a subject either for the centre or the margin of groups consisting of one or more of the following handsome varieties:—*H. hortensis*, *H. J. Otaksa*, *H. paniculata grandiflora*, *H. rosalba*, &c. Such groups are particularly remarkable for beauty and vigour, when grown in moist soil, on the bank of a piece of water, with a little leaf-mould laid about the roots.

Kerria (Corchorus) japonica fol. arg. marg.—This is a handsome little shrub, of the family of the Tiliaceæ, with slender green branches, and small white-margined leaves. In early spring it is covered with a multitude of yellow flowers. On account of its dwarf stature, it should always be planted on the margin of a group.

Lonicera brachypoda reticulata.—Although this is a sarmentous shrub and more properly adapted for vases, hanging baskets, flower-stands, and rock-work, it is also an admirable subject for pegging down close to the soil as an edging to flower-beds or groups of small shrubs. Its foliage is of a delicate green, overspread with a fine-meshed golden net-work, and contrasts well with all other colours, even the commonest green.

Quercus pedunculata Concordia.—This is a superior variety of the old *Q. pedunculata aurea*, and is a most ornamental tree, its leaves and branches being of a fine golden colour. What a pity it is that the purple-leaved variety of *Quercus robur* has not a handsome habit of growth! Had it this, it would form a fine and fitting contrast to the present variety. The golden-leaved Oak is easily multiplied by cleft-grafting, at any height, on saplings of the common Oak.

Salix caprea tricolor.—This is an excellent subject for forming

* *Acer Leopoldi*, amongst others, is one of those varieties of which we should recommend the universal employment, were it more vigorous. It is especially distinguished in early spring, when the leaves first appear, by a coppery-yellow tinge of incomparable richness and effect.

contrasts, both on account of its handsome variegation, and its property of thriving in wet ground. It is advisable to cut it down close to the ground every second year, as it will then send up numerous fresh young shoots. It may be grafted at different heights on the common *Salix caprea*, or Goat-Willow.

Salix regalis and **S. rosmarinifolia**.—These are two very valuable species, both on account of their easy growth and the peculiar shade of their foliage. They may be introduced into combinations for the sake of contrast, and for the purpose of forming backgrounds and vistas. Like the preceding species, it is all the better for being cut down from time to time. *S. rosmarinifolia*, when crown-grafted on *S. caprea*, or on *S. viminalis*, is a handsome tree to plant out as an isolated subject. It forms a rounded head of foliage of the most graceful aspect.

Salix sericea.—A pretty miniature shrub, with slender, white, and very downy leaves. It may be grown in ball-like clumps, or, if grafted on larger-growing kinds, will form pretty little heads. There is one very ornamental variety of this plant with pendent or weeping branches.

Sambucus nigra fol. arg. variegatis.—All the varieties of Elder which have variegated-leaves are most useful in plantations for filling up the spaces under the larger trees, as underwood. The golden-leaved Elder turns brown if exposed to the sun, and the mealy-leaved variety is very dwarf. These plants may always be maintained in full vigour, if they are cut back to the ground every four or five years.

Symphoricarpus parviflorus fol. var.—This shrub, which is of extremely easy growth, remains naturally dwarf and preserves the shape of a small regularly-shaped ball, after being trimmed up in spring. It is valuable for small regular groups in gardens of limited extent.

Tilia argentea.—A very handsome tree, of well-formed and majestic habit, great vigour of growth, and perfect hardiness. Plants of it grafted on the common Lime, have the disadvantage of growing thicker than the stock, and thus produce a very unsightly swelling or nodosity at the point of junction of the graft. As it is impossible to graft it in any other way except by approach, it may be grafted low so that ultimately it may come on its own roots. We recommend that it should be multiplied either from seed or by layering. The leaves, which are of a pale green on the upper surface and greyish-white underneath, form a pleasing contrast to any foliage of a dark-green or other colour. In some nurseries there is a variety which has leaves variegated with yellow; this has not yet been distributed to any great extent. If the variegation proves permanent, it will be a very great acquisition as a subject for isolating on lawns, or for planting in groups.

Ulmus campestris aurea.—This valuable tree, for which we are indebted to M. Rosseels, of Louvain, is not only remarkable for its brilliant golden foliage, which remains unchanged under the hottest sun (unlike the golden-leaved Elder, Ribes, &c.), but it is also interesting on account of the characteristic form of its leaves, and its squat habit, which leads us to anticipate that it will eventually prove to be of dwarf stature.

Ulmus campestris fol. argenteo-variegatis.—This is one of the oldest variegated trees that we know of. Sometimes, as the tree advances in age, the variegation diminishes; but, in other cases, age appears to make no difference. There is a gigantic specimen of this tree in the Parc St. Georges, at Courtrai. At a distance, and seen from the side on which it appears over a curtain of green foliage of other trees, the effect is that of a tree the upper part of which is covered with snow. The leaves do not turn red when exposed to the sun, like those of the variegated Weeping Elm. Although this Elm attains great dimensions, it is possible, by the use of the pruning-knife or shears, so to curtail both it and the yellow-variegated sub-variety, that both may be advantageously employed in combinations of subjects with coloured or variegated foliage. We may here, also, mention *Ulmus campestris punctata*, *U. c. purpurea tricolor*, *U. c. viminalis marginata*, and *U. montana aurea*, as very suitable for the same purpose.

Vitis heterophylla fol. albo-var.—The use of this handsome little climbing Vine in suspended baskets and vases, and on trellis-work, is common enough; but few persons have any idea of the charming effect which it produces when used as an edging around large flower-beds, and groups of dark-leaved plants and shrubs. Trained on a suitably-shaped trellis, it forms an admirable centre-piece for a group or small parterre.

Weigela rosea nana fol. var.—As will be seen further on, when we come to describe a few combinations, this charming little bush enters into groups of all sizes. It serves as an edging to plantations of all sorts, as well the screen-plantations of gardens (which consist of an assemblage of promiscuous subjects), as the most regular groups. Entire groups are also composed of it alone,

on the margin of which a space is left, in which, during the summer, a border of *Iresine acuminata*, *Perilla*, or the red-leaved *Amaranth* is planted. The varieties *W. amabilis fol. var.* and *W. Kosteriana fol. var.* are in every respect inferior to that which we have just described. Japan has also furnished us with the handsome *W. hortensis*, which has produced here a variety variegated with yellow, and not without merit.

Arrangement.

The foregoing enumeration comprises most, if not all, of the best subjects with variegated or coloured leaves. Other varieties, less remarkable, have been passed over in silence. Neither have we mentioned any of the novelties which have been lately announced with great *clat*, such as the Purple-leaved Birch and the Purple-leaved Peach, which certainly are valuable acquisitions, if they correspond to the eulogistic descriptions which have been given of them. We now come to the question of how to dispose our plants in an artistic, tasteful, and judicious manner, fine effects being produced not only by these trees themselves, but also when they are used in combination with other trees and shrubs which have green leaves. The shape or outline of the group is altogether an arbitrary matter. Here the little details of design and subdivision, which please so much in beds of herbaceous plants, are worse than useless. The extent of the group is also a matter depending on circumstances, but any pleasure-ground, of the most modest size, whether it be round, elliptical, or, in fact, any shape whatever, may be embellished with pretty and suitable combinations. For small groups, it is well not to vary the species or varieties too much, and not to allow them to attain a high stature. This last advice does not, as some might think, render the forming and keeping of small groups more difficult. All that is required is a judicious use of the shears, which will also serve to increase the beauty of the groups. For all small groups, whether regular or irregular in outline, we recommend one or other of the following combinations, the first-named subject in each being for the centre, and so passing through the rest to the margin.

A.	C.
<i>Corylus Avellana purpurea.</i>	<i>Weigela rosea nana eleg. var.</i>
<i>Acer Negundo fol. alb. var.</i>	<i>Lycosteria formosa</i> (leaves, dark green).
<i>Berberis vulgaris atropurpurea.</i>	<i>Kerria japonica fol. var.</i>
<i>Lonicera brachypoda reticulata.</i>	<i>Vitis heterophylla fol. arg. var.</i>
B.	D.
<i>Hippophaë rhamnoides.</i>	<i>Acer Negundo fol. arg. var.</i>
<i>Berberis vulgaris atropurpurea.</i>	<i>Corylus Avellana atropurpurea.</i>
<i>Elaeagnus argentea.</i>	<i>Symphoricarpus parvifl. fol. var.</i>
<i>Symphoricarpus parvifl. fol. var.</i>	<i>Spiraea callosa alba nana.</i>

These four examples may be varied *ad infinitum*, either by transposing the plants named in them, or by substituting others. Small groups are very much improved in appearance, if margined by a border of perennial herbaceous plants. For instance, *Campanula carpatica*, which has blue flowers, forms a pleasing contrast to any light-coloured foliage, and *Spiraea* (*Hoteia*) *japonica* is equally effective when opposed to purple or dark green. We employ these two plants very largely for this purpose. We also, sometimes, use an edging of variegated Ivy or *Euonymus radicans*, whose leaves are marbled with white and tinged with rose, for these little groups. In groups of large size, our resources are more extensive. In them we can have a large tree in the centre surrounded by other trees trained as pyramids or half-standards, passing on in succession to zones of shrubs with variegated or coloured leaves.

We have already spoken, in the course of this article, of plantations of shrubs with white, grey, or purple leaves, in a single or double line (each formed of one kind of shrub) before groups of miscellaneous subjects. We again call attention to this subject in remarking that dark-coloured foliage is best suited for margining groups which fall directly under the eye, white foliage for the most distant parts, while grey-leaved plants, such as *Elaeagnus*, *Hippophaë*, *Shepherdia*, *Salix rosmarinifolia* and *regalis*, *Hydrangea glauca*, &c., are best adapted for the background. In plantations of this sort, advantage may also be taken of the colour of the bark of the various subjects. For instance, a tasteful combination of *Cornus sanguinea* and *C. sibirica* (which have red bark), *Kerria* and *Lycosteria* (fine green bark), *Salix daphnoides* (nearly glaucous bark), *Salix vitellina* (yellow bark), and *S. purpurea* (purple bark), produces one of the finest effects imaginable.

What we have just said will suffice to give an idea of the immense resources which trees and shrubs afford us for producing charming effects in our gardens. In pointing out the course to follow in making these artistic combinations, we by no means require that all the plantations in a garden should be made in this manner, and we should be the first to condemn any such abuse, knowing well that a distinction must be drawn between landscape-gardening properly so-called, and such artificial embellishments as we have

described. These will only contribute favourably to the general effect when not too lavishly indulged in.

The preceding notes on trees and shrubs with variegated foliage, and the most effective ways of grouping them, contributed by M. Fr. Burvenich to the *Bulletin d'Arboriculture*, contain much useful and interesting information. W. M.

CUPRESSUS CORNUTA.

THIS Californian Cypress is described by some authors as a variety of *C. californica gracilis*, while others make it a distinct species. It forms a small bushy tree, from 16 to 20 feet high, with numerous spreading branches, and small scale-like leaves, closely set together, broad at the base, and pointed at the apex. It is particularly distinguished by the shape of its cones, of which we give an illustration. These are of a dark brownish colour, streaked with lighter lines, each of the four scales bearing, near its apex, a horn-like projection, nearly half-an-inch long, whence it derives the specific name *cornuta*. These horns are generally curved at the point, as shown in our engraving, which represents the cones in their natural size. The tree is a native of the mountains of California, and is a hardy and tolerably ornamental sub-ect.

Half-Hardy Shrubs.—The following shrubs have stood out all the winter on the Orchid-house walls at Kew, viz.:—*Fabiana imbricata*, a plant closely resembling an *Erica* in habit and flower, and, though a native of South America, generally hardy. It is a first-rate free-blooming window plant grown in a pot, and bears tubular flowers, of snowy whiteness, about an inch long. It is now blooming outside as above. *Coronilla glauca*, another old-fashioned greenhouse or window shrub, having pinnate glaucous leaves and clusters of golden-yellow Pea-like flowers, also appears to do well planted out. In the Isle of Wight, Devonshire, and the Channel Islands, most of our cool greenhouse plants grow planted outside far more vigorously than when grown in pots. *Aloysia citriodora*, or Lemon-scented Verbena of our cottage windows, is now growing freely, and, if possible, its perfume is intensified by outdoor culture. The last plant to which we shall allude, is *Phygelius capensis*, a scarlet-flowered shrub well adapted for open air culture as a wall plant in warm sheltered localities. Last summer this plant was 5 or 6 feet high, and bore a fine display of its drooping scarlet flowers in terminal panicles. It makes a good plant for the herbaceous border when in a small state, and used to grow and flower very freely at Chiswick when only about a foot in height. Anyone possessing old greenhouse or half-hardy plants that are no longer suitable for pot-culture, cannot do better than give them a trial outside on any bare bit of wall not already covered. They should be planted out as soon as possible after all danger from spring frosts is over, and induced to grow freely and establish themselves as early as possible by careful watering, so that they may be better able to resist the sudden fluctuations of our uncertain climate.—B.

A Giant of the Forest.—A noble Pine tree has recently been felled in the forest near Erlsbach, the property of the Canton of Aargau, Switzerland. Its diameter, according to a continental paper, was 5½ feet at the base, and its cubic contents 800 feet. It sold for 500 francs (£20.)

Judas Tree (*Cercis Siliquastrum*).—This may be found in many gardens round London, where its branches are just now laden with clusters of rosy-purple flowers. There is a good specimen of it near the entrance to the herbarium at Kew. It is ornamental when in leaf, and deserves planting, if only as a spring-flowering tree.—B.

GARDEN DESTROYERS.

THE LACKEY MOTH.

(BOMBYX NEUSTRIA).

WALKING in the garden the other day, I came upon a veritable garden destroyer, and one which plays terrible havoc amongst fruit trees. The upper branches of an espalier Apple tree were already denuded of their leaves, and, though the remaining portion of the tree was as yet unharmed, it would not have remained so long, had the caterpillars not been discovered and captured, for they would soon have devoured every leaf. They were the larvæ of one of our commonest and most destructive of moths, the lackey (*Bombyx neustria*). In a fork of the tree was their closely woven web, not easily seen

by an unpractised eye, as its light and airy texture took the form of the branches upon which it was constructed. However, it was seen, and 121 caterpillars were soon taken. For the benefit of those who may not know this larva by sight, I will describe its appearance. It is decidedly remarkable for its beauty, being many-coloured, and the various tints and shades and markings are so exquisitely arranged that they are nearly certain to excite the wonder and surprise of the beholder. The dorsal line is brilliant white, with a narrow black velvety stripe on either side of it. Next to this is an orange stripe, then a broad black one, spotted with blue; then a narrow orange stripe, then a narrow black one; next to this there is a light blue stripe, speckled with very small black dots, and, below it, two scalloped lines, one black and the other orange; next to this is a blue line, speckled with black, and a few orange markings beneath. The head is blue, and has two black patches, like eyes, on the forehead. The eggs are laid on the branches of the tree in a ring round the bark, and the moth flies in July and August.

OWEN WILSON.



Cones of *Cupressus cornuta*.

Now is the Time to Attack Wire-worms.—Wherever the temperature of the soil has risen to 51° Fahr., there will wire-worms be found in a pupa state, and that is the time to wage war against them. They lay about 1½ or 2 inches below the surface. Flat-hoe between all crops, whether there are weeds or not. The hoeing will, in many instances, disturb the helpless pupæ, and bring them to the surface, where birds will find those that have not been crushed. I have also found that treading the ground between the rows crushes many. In fields, roll

wherever the roller can go without injury to the crops, especially in the case of old pastures. This will destroy more wire-worms than at any other season of the year. They remain in the pupa state about thirty days, so that every one destroyed now prevents the breeding of hundreds. The beetle only remains in sight a few hours.—W. PRESTOE.

Destruction of Crickets.—Some two years ago my Vineries were over-run with these, and being large houses they could be counted by thousands, I may say, indeed, tens of thousands, and they eat the young foliage of the Vines to such an extent that it became a serious matter how to prevent the mischief. I consulted Mr. Chase as to whether his blackbeetle destroyer would kill crickets; he said he thought not. However, I placed the contents of six boxes about the haunts and runs of the crickets, and at the foot of each Vine; they disappeared like magic.—J. PERRETT, *Herne Hill, Dulwich*.

THE FRUIT GARDEN.

PEACHES AND APRICOTS ON OPEN WALLS.

THESE have set well and have begun to swell; the young wood will, therefore, soon require thinning, an operation which must be performed with care, as, when a wood bud is roughly pulled off, the bark of the shoot adheres to it, inflicting a wound from which sap soon exudes. Where three fruits have set in one cluster, or in such close proximity that one would injure the others if allowed to remain, two must be removed, taking care to leave the largest and best formed of the three. Disbudding the shoots should not be done all at once; on the contrary, they should be removed at three or four different times; first, when the flowers have fallen off, and, subsequently, at intervals of two or three weeks. The shoots intended for the following year should not, I consider, be stopped at all, but should be allowed to grow at will, with the exception of any gross strong-growing shoot, which should be wholly removed, serving all deformed and badly placed shoots in the same manner. In this way, those that remain get more air and light, than they otherwise would get. Tying in those intended for future working is more a disadvantage than otherwise, and should not be practised except where they appear to be unsightly. A good washing with the garden engine, at least twice a week, will be found beneficial; even twice a day is not too often, if time can be spared for the purpose. I have, however, seen excellent Peaches and Apricots gathered which have never been operated on either by engine or syringe. The weather has been favourable to aphides, and, if undisturbed, they will soon overrun everything. Various antidotes for their extermination have been recommended, but I have found nothing more efficient than a good syringing with tobacco-water. This should be given in the evening, and, if too strong, any ill effects can be counteracted by a thorough syringing with clean water in the morning. This season I have seen Pooley's tobacco powder used with good effect, and, if put on with a distributor, a very small quantity suffices to destroy all such insect pests on a large tree. Before this is used, the trees should receive a good syringing, say about three o'clock in the afternoon, and, before they have become dry, apply the powder, which may remain on all night, and be syringed off in the morning. I have also seen soap suds used to destroy aphides, but they leave an unsightly sediment, and it is doubtful if they kill the aphides. Watering at the root in dry weather, when the trees are in a good growing state, is of great benefit to them, both as regards health and the production of good fruit, but, unless given often, and in large quantities, it is of little value. Where the soil is light, of course, more water is required than where it is a heavy clay. As a general rule, water well both at top and root, thin liberally, keep insects in check, and good crops, in all favourable seasons, may be confidently expected.

JAMES MORRISON.

Wotton Gardens, Aylesbury.

WATERING PINES.

I HAVE read Mr. Muir's remarks on this subject (see p. 402), wherein he incidentally refers to my practice in watering Pines as not being in accordance with his and that of other Pine growers, which may be the case; but that abundant watering up till the ripening of the fruit is attended with the disastrous results which he describes is, according to my constant experience, not by any means the case. I quite agree with Mr. Muir that "excessive watering" is decidedly wrong, but I am not aware that anyone has ever recommended such irrational practice. I leave $2\frac{1}{2}$ inches of space in my fruiting-pots to ensure copious watering when watering is done, and I water just as copiously when the fruit is ripe as at any other time. My object in doing this is to ensure well-finished fruit and healthy suckers, and I have always succeeded in securing both. The following facts will probably be a sufficient reply for Mr. Muir. The fruit which I have sent to table has always been pronounced to be excellent. No black cores have been found, but they have been so exceedingly rich as to fill the plate with juice whenever they were cut up. So much for home experience, but I have other facts. At the

Royal Society's Show at Nottingham, a few years ago, I exhibited six or eight Pines, all of which had been watered well till the day before the show. They were Queen's, which ran from 4 to 5 lbs. apiece, and all received first or second prizes, the only important opposition being from Mr. Miles, of Wycombe Abbey, who told me that he had never seen better-finished fruit than mine, and Mr. Muir will find them described in the horticultural papers of that date to the same effect, *i.e.*, as being "very perfectly ripened." A noted fruit dealer, from Glasgow, offered at the time to give me the highest price for them and take his chance with them at the end of the six days' show, but I declined. In 1871 I entered three Pines in the class for "two or more kinds" at the Manchester "Rose and Fruit Show," and they were awarded the first prize solely on account of their finely-swelled and finished appearance, though much larger fruit was opposed to them. In two collections of fruit, which I exhibited at the same show, the Pines were largely instrumental in securing me the first prize in both cases. At the Royal Society's show at Manchester, also, I exhibited six Pines which received a prize; and one fruit, in a collection of mine which received a first prize, was reported on by the press as being one of the finest Queen Pines in the show. At York and Leeds I have won first prizes on several occasions for Pines, and also at other places. Further, I can always get the highest prices for our Pines, and a fruiterer, with whom I deal, informed me that his customers said the Pines from this place were the best they had ever eaten. So much for facts. Now all these Pines, above noted, exhibited that peculiarly plump and glistening appearance which indicates, not only a well-swelled fruit, but one sound to the core, and the plants from which they were cut were treated exactly as I have described at page 217 of *THE GARDEN*. I would ask Mr. Muir if he knows under what conditions the Pine grows and fruits in its own native habitat? I am informed that it makes its growth during the rainy season, and fruits at the same time, or immediately afterwards; but in the steaming climate, of which it is a native, the soil is at no time dry, let alone parched, like the soil in a pot above hot-water pipes. Moreover, the finest fruits which have been produced have, as a rule, been grown on the planting out system, and it is a well-known fact that a bed of soil does not soon get dry. I have grown the Pine both ways, and I know that the bed will retain its moisture for months, though no water is given during the time; and, no doubt, this equable condition of the soil, as regards moisture, has much to do with the excellence of the fruit produced under such conditions. I am sorry to hear from Mr. Muir that in "very many instances" certain dates are put down and strictly adhered to in watering, irrespective of weather and other matters, *i.e.*, whether the plants want water or not. Let us hope that such practices are confined to those out-of-the-way regions which *THE GARDEN*, and similar instructors, have not yet reached, but towards which they may be travelling like the light from the sun to those far away planets that have been waiting so long for rays which have not yet reached them.

J. SIMPSON.

Wortley.

WIRING GARDEN-WALLS.

I HAVE deferred answering Mr. Grieve's courteous critique upon my views on this subject, to see what response would be made to his request for the opinions of those who have fully proved the system; for mere conjecture on this, as upon hundreds of other matters that at first sight seem to be all that could be desired, are often, in practice, found wanting. When I first had a wall wired, I was delighted with its appearance. The wire, one-eighth of an inch thick (if stronger, and fixed close to the wall, tightened up, as necessarily it must be, there is difficulty in getting the tying material behind it; if thinner, and strained, even until it breaks, the branches that require any pressure to bring them to the wall will spring it away further than the distance I mentioned), seemed to say, "No more nails and shreds!" But I soon found that, unless the bast was crossed once or twice betwixt the wire and the shoots, so as to keep the wood from contact with the wire, I had any amount of gumming; then, again, unless the young wood was allowed, at the time of tying, double its thickness for after expansion, the shoots were half cut off and injured before

the end of the season. As the trees grow up and get stronger, unless the wire is so thick as in itself to remove the shoots too far from the protecting influence of the bricks, they will spring it away, in many places, quite as far as the distance I name. Again, to make the system complete, the wire should run on every joint, instead of, as is usually done, every third course of the bricks, which would make an expensive job still more costly. In the three-course intervals the shoots, in innumerable places, will bulge up between the wires an inch or more away from the bricks. From this, Mr. Grieve will see that the distance the shoots lay from actual contact with the wall (their great protection) when tied to wires, as compared with being nailed is not so little as he supposes, and I need not remind anyone possessing Mr. Greive's experience and observation, that it is in small—infinitesimal, if you like—differences, that success or failure depend in matters horticultural. To name wired walls along with wired fruit trellisses, as improvements in gardening, is simply to couple a mistake along with a system of fruit culture that is admirable, the only drawback being first cost. In reference to nails not entering the bricks I never yet met with any bricks that ordinary cast-iron nails would not enter without one in fifty breaking. The injury they do to the bricks, if the work is done with care, is a great deal more imaginary than real, not so in respect to nailing into the mortar. In reply to "Fair Play," who asserts that I have not given a single valid argument against wired walls, may I remind him that what I have advanced are amply sufficient and valid, and that mere assertion to the contrary, neither proves nor disproves anything. I can assure him that I have tried the system fairly, and without prejudice. Why speak of it as a new French system, when it has been in the country, to my knowledge, over twenty years. If it deserved such unqualified praise, fruit-growers in this country must be awfully dull in not more generally adopting it.

T. BAINES.

Peach and Nectarine Trees Dropping their Buds.—In the spring of last year I planted a new house with Peaches and Nectarines, and some of the branches of the trees did not break well. This year they bloomed pretty well and bear a fair quantity of fruit for the first year; but, on many of the fruit-bearing branches the buds have all dropped, leaving the fruit naked, which, I suppose, will not come to perfection; the trees will, also, have a deformed appearance by the failure in growth of the branches. I do not think the valuable observations which you have lately published on watering Peaches will help me in this case, as I believe the trees in question have had sufficient water.—KENT. [The dropping of the buds on the fruit-bearing branches of the Peach and Nectarine trees in "Kent's" newly-planted Peach house may, perhaps, be owing to insects. Early this year I had some manure brought from a farmyard to top-dress the inside of a Peach-house border, and this brought into the house a beetle, or "bracken clock," as it is called here. As soon as the Peaches and some young Vines began to get into leaf these beetles began to eat the young shoots, and destroyed many of them before they were found out. These beetles feed at night and are easily detected by searching for them with a candle; they drop down as if dead when touched. If they have been the cause of eating your correspondent's Peach and Nectarine tree buds, it will be seen by the nibbled state of the foliage. If there is reason to fear that the soil of the border is the cause, and not insects, I should re-plant the trees in the autumn in fresh soil, and see that the drainage is perfect.—WILLIAM TILLEY.]

Our Fruit Crops.—We never had such a promise of a bountiful fruit year as we have this season. Peaches have set by the score, and Plums by the thousand. The earliest varieties of Pears set well, while the late ones are one sheet of beautiful snow-white blossoms. Apples also promise, so far as bloom goes, to be the best we have had for years past; while Cherries (our most precarious fruit here) have all set well. Currants and Gooseberries, the latter of which are ready for tarts, are quite ten days in advance of former years, and are both literally laden with fruit.—R. GILBERT, *Stanford*.

Tobacco-Water.—At what strength should tobacco solution be used when syringing Peach trees?—H. S. [We have found that steeping about half-a-pound of shag tobacco in a large watering can is sufficient. The tobacco must be tied in a calico or canvas bag, to prevent the pieces from choking up the syringe when using the solution. After the first day's solution is used the water will not be so strong, and a little more tobacco may be added to the bag to keep up the strength for four or five steepings of the same tobacco. If the strong tobacco liquor from the tobaccoists is used, about a quart of it to a large painful of water will destroy all the aphids on Peach trees with two or three applications.—W. TILLEY.]

THE KITCHEN GARDEN.

THE SEASON AND KITCHEN GARDEN CROPS.

THE late winter has been throughout one of the most favourable to the horticulturist on record for performing both outdoor and indoor operations; and the spring months, so far, have been quite as favourable as their predecessors. There have been ample opportunities for pruning and nailing, for preparing and pulverising every kind of soil, and for securing seed-beds. Thus a good foundation has been laid for luxuriant and healthy crops of all kinds of vegetables, provided succeeding operations are duly attended to. The season is also, judging from the progress of vegetation, a tolerably early one; a circumstance which, however, gives none the better prospect of a general crop of early vegetables or heavy crops of fruit, judging from previous experience. Notwithstanding the atmosphere has been dry, north-east and easterly winds and many frosty mornings and nights, have cut down the early foliage of Potatoes in places shaded from the evening and subject to the first rays of the morning sun; also in some low-lying, damp, imperfectly-drained spots, the Potatoes are also cut rather badly; but, on dry sheltered borders, exposed and well-pulverised quarters, fields, and dry spots, open to the full sun and wind, the Potatoes are strong, sturdy, and free from frost-bite. In this locality the Lilac, in variety, was in full bloom by the 10th of April. The White Thorn was likewise to be seen in full bloom, in warm sheltered spots. Also the Laburnum, Horse Chestnut, and other spring-flowering trees, shrubs, and flowers, were in about the same condition by the middle of April. I called on Mr. John Westcott, market gardener, at Topsom, the last week in April, and found his crop of Strawberries, as usual, something wonderful. No matter what structure they were placed in, whether in low or high pits, Vineries or Peach-house, on shelves near or far from the glass, on the brick kerbs of pits, or on tan or dung-beds in the pits, or whether they were placed in a north, east, west, or south aspect—all were alike remarkable for a wonderfully heavy set for swelling, ripening, and the finishing of a perfect crop, bearing, in some cases, from 100 to 150 swelling fruits on one little plant growing in a small pot? The fruit ground, too, I was pleased to see in a fine healthy prosperous condition. Small fruit abundant, a large quantity of fine Gooseberries being gathered for the London market on April 20th. Cherries, Plums, and Pears, in general, well set; indeed, as to Plums, on some varieties, every blossom was set, and the size of Hazel Nuts, all in clusters. Apples showed strongly for a heavy blossom, and were beginning to open some of the bloom. A good strong open foliage was fast unfolding, which will be the means of much shelter. This, I observe, is pretty general in the orchards in various localities, and is owing, no doubt, to the few warm days which occurred in April. In all the gardens I have seen, there seems to be a good crop set of Apricots, Peaches, and Nectarines, and, in reply to several inquiries I have had the opportunity of making, I am informed that these fruits, in general, are pretty well set; indeed, at present, there is a good prospect of fair crops.

JAMES BARNES.

Exmouth, Devon, May 6th.

EARLY CABBAGE.

CABBAGES, in a suitable condition for the table, are more esteemed in April and May than later in the season; therefore, any system or mode of culture that tends to hasten their maturity is worthy of consideration. From the 18th to the 25th of July has hitherto been generally considered the right time to sow the seed of the earliest crop for spring use, making, of course, some allowance for the degree of latitude in its relation to climate, a point to which I will refer more fully presently. During the last few years I have tested various varieties of Cabbage, with the object of ascertaining the variety most suitable for early sowing. I need scarcely say that early sowing has much to do with early maturity; but most varieties, if sown too early, will, most assuredly, "bolt;" that is, they will run up into flower instead of forming hearts, especially if the winter is mild. For early sowing to stand the

winter, the Enfield Market, according to my experience, is the most trustworthy. It rarely bolts prematurely, turns in quickly, is of fair size; and is in all respects a first-rate Cabbage. Now, as regards sowing for early crops, I have no sympathy with the cultivator who fixes a certain day for the annual performance of a particular operation, and then sticks to it through thick and thin, without any regard to local conditions. On the other hand, however, much may be said in favour of punctuality, especially in sowing or planting crops that are required at a particular time. We usually make the first sowing of the Enfield Market from the 8th to the 12th of July, and by sowing a week or ten days earlier than is customary we gain frequently three or four weeks in spring, but then every variety will not stand it. The second sowing, which may include other varieties, should be made from the 18th to the 22nd; and a third sowing about the end of the month, to stand in the seed-bed till spring, as, if the weather is unusually severe, they are less affected by it, and may be easily sheltered. Although I have thus specified three periods for sowing, it does not follow that any large quantity of seed need be sown; every one will easily understand that this is a matter that must be entirely governed by the demand. In sowing the seeds, if the weather is dry in July, let the bed be thoroughly soaked with water previous to sowing. Cover with fine soil, and shade with netting, or something similar, till the plants appear. A sufficient number of the first sown should be pricked out as soon as they are large enough. Transplanting has a tendency to prevent over-luxuriance, and its influence will be felt, as the season advances, in preventing undue growth or premature bolting. Plants, so treated, will be ready to plant out finally about the third week in September, and may appropriately follow the Onion crop. If the land is in good heart, there is no necessity for digging or manuring. Simply hoe the surface over, draw rather deep drills 18 inches apart, and put the plants out in the drills, from 15 to 18 inches apart, with a dibble, planting firmly. The late crops may have more room allotted them. If the plants are strong, which in all probability they will be when put out, there is no occasion to water them, even if the weather is dry. A slight check from this cause at that season will do them no harm. An old market-garden friend, who was a successful early Cabbage grower, frequently left his plants exposed on the surface of the ground several hours before planting them, his theory being that a check at that time was beneficial in preventing premature bolting. The plants from the second sowing may be put out in October; and the third sowing, as I have previously stated, may remain in the seed-bed till spring, as a precautionary measure. Wheeler's Cocoa-nut Cabbage is a capital one for sowing in spring for late summer use. It is not large, but very mild in flavour. One word more as to latitude, and its influence upon climates, in reference to seed-sowing. The dates I have given are such as I have found applicable to the midland districts. In the south, sow a few days later; and, in the north, five or six days earlier. E. HOBDAY.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Best Four Broccoli.—Four kinds of Broccoli which everybody should grow are Walcheren, for autumn; Snow's White, for winter; Watt's Excelsior, for mid-season; and last, but not least, Cattel's Eclipse. Excelsior here, this season, is simply perfection.—STAMFORD.

Kitchen Garden Crops.—Here Pans are in full flower, William the First being the earliest to bloom. Cabbages have been cut for a month past. Hardy Hammersmith Lettuce is plentiful, and Potatoes are looking well.—R. GILBERT, Stamford, May 6.

A Good Edging for a Kitchen Garden.—Sow in a small bed best Moss-curl Parsley in August, and, about April 10th, prick it out along the edges of the walk 1 foot apart, and two rows instead of one. Behind it sow a drill, or better, sow in boxes Dell's Beet, and plant it out as soon as it is ready. These two common but all-important plants give the vegetable quarters a nice downy appearance.—BURGHLEY.

Road Scrapings as Manure.—Will you kindly inform me as to the properties of road scrapings, i.e., how they will act in the way of manure on garden ground?—A CONSTANT READER. [The manurial properties of road scrapings are various, according to the character of the materials used in making and mending the roads. On strong soils road scrapings are beneficial in disintegrating them, and rendering them more fertile for the growth of vegetables or fruit trees. If the scrapings are collected from roads on which calcareous materials are used, they are best suited to soils deficient in lime. There are some manurial properties in scrapings taken from roads on which much horse traffic occurs, owing to the quantity of droppings in it.—W. T.]

WORK FOR THE WEEK.

Flower Garden.

SHRUBBERIES are now gay with early Rhododendrons, Ghent Azaleas, Berberises of different kinds, scarlet and common May; masses of blue Iris, and other herbaceous plants, also set them off to advantage. Spring flower gardens are yet brilliant with Heartsease, Trolliuses, Daisies, Alyssums, Iberises, Wallflowers, Saxifrages, Tulips, and various other plants. Preparation should now be made for bedding plants. Although many persons are reluctant to remove the fading beauty of spring for the more gaudy display of summer, unless this is now done, summer droughts may overtake late-planted beds before their occupants get established. Indeed, in sheltered warm situations, Pelargoniums have already been planted out. Flower-beds should now be edged with Gazania, variegated Arabis, Japan Honey-suckle, and dwarf variegated Grasses; Violas should be divided and planted, and likewise such plants as were divided and transplanted into nursery lines in February and March. Polyanthus should be divided and planted in lines, the soil for their reception having previously been enriched with fresh loam. Early spring flowering Violets should be lifted, the offsets separated from the parents, and transplanted in lines 12 inches apart, a handful of sandy soil being placed around each root. Sweet Peas, Tropæolums, and other annuals raised from seed in beds, wall-borders, or in boxes in frames, should now be planted out permanently.

Greenhouses and Stoves.

Conservatories are now gay with Azaleas, which are coming into flower without the aid of fire-heat. In order to prolong their beauty, they should be carefully shaded from bright sunshine. New Zealand plants, such as Boronias, Eriostemons, Pimelcas, Tremandras, Everlastings, &c., now coming into flower, should be neatly staked. These, as well as Heaths, occupy the coolest and most airy part of the conservatory. All plants in active growth should receive plenty of water; and those done flowering should be freely syringed, and have the benefit of a little artificial heat and shade. Azaleas, Rhododendrons, &c., done flowering, should be re-potted, pressing the soil rather firmly in the pots. Soft-wooded plants, such as Celosias and Balsams, should not be allowed to receive any check from under-potting, but should have plenty of root room whilst growing; a little bottom-heat and air being given them at the same time, also a little manure-water. When it is desired to retard the flowering of Balsams, the flower-buds should be picked off as they appear, until say a short time before they are required for use. A few Balsam seeds should also be sown in pans in gentle heat; as soon as the young plants appear, they should be placed near the glass, and when fit to handle should be potted off singly. Humcas required for conservatory decoration should have now received their last shift, using for the purpose a compost of loam and well-decomposed manure. Stove plants, which are now making good progress, should have plenty of light, heat, and moisture; but shaded from strong sunshine. Stephanotis, Allamandas, and Dipladenias should have their shoots regularly trained as desired. Orchids making growth should have plenty of water, and such as are in flower should be removed into a drier house than that in which they have been growing. Ferns should be kept well shaded; paths, stages, and walls being kept moist by means of frequent sprinklings with water.

Warm Orchids.

Keep a careful look out for insect pests, when hot weather sets in, and do all that is possible to prevent their appearance by frequent syringings, and occasionally sponging every plant with clean tepid water. Gradually increase the temperature, and take advantage of every opportunity to give an abundant supply of fresh air without causing cold draughts; the bottom ventilators may be left open night and day, taking the precaution to cover the openings with tiffany, or, what is still more durable and better, perforated sheets of zinc or fine wire gauze netting. Care must now be taken not to let the internal temperature be influenced by the rapid and sudden fluctuations which are now taking place outside more than can possibly be avoided, for the young growth is easily checked, and when this happens the plant is often ruined for a season at least. Keep up humidity by sprinkling the floors and benches; and, if the houses are inclined to become very dry, a layer of Sphagnum Moss may be laid over the staging, and kept wet by constant sprinklings. Any bare spaces under the central stage or side benches may be covered with a layer of soil, and then planted with Selaginella Kraussiana, Tradescantia zebrina, and other creeping plants. This not only adds to the attractions of the houses, but assists materially in maintaining that uniform and genial state of moisture in which Orchids, above all other plants, luxuriate. If other plants are admitted into the Orchid houses, carefully exclude all weakly or unhealthy specimens that are liable to be infested with thrips, red spider, or other insect pests.

The best of all plants for associating with Orchids in bloom are Palms, Dracænas, and other hard-leaved foliage plants. The following are now in flower, viz., *Dendrobium nobile*, *D. Infundibulum*, *D. Jamesianum*, *D. transparens*, *D. densiflorum*, *D. fimbriatum*, *D. Wardianum*, *D. devonianum*, *D. bicolor*, and *D. albo-sanguineum*, *Vanda suavis*, *V. tricolor*, *V. Cathartii*, *V. carulescens*, *Cypripedium naviium*, *C. villosum*, *C. hirsutissimum*, *C. concolor*, *C. Roezlii*, *C. candatum*, *C. Stonei*, *C. lævigatum*, and *C. barbatum*. The wax-like *Lycaste Skinneri*, *Angulosa Clowesii*, *Cattleya Mossiae*, and *Lælia purpurata* are now at their best.

Pits and Frames.

Polyantheses, Pansies, and Auriculas should now be raised from seed in cold frames, in boxes or pans. Cinerarias and Primulas should also be raised from seed sown in gentle heat. Auriculas done blooming and kept in frames should have the ashes removed; some may also be placed out on sheltered situations. The seed vessels of all, if seeds are not wanted, should be removed. Seedling Cyclamens should be kept near the glass in a moderately warm temperature; old plants producing seed should be placed on shelves close to the glass in cool houses; some of the others should be placed in cool, shady frames, or on a bed covered with ashes behind a north wall. Stocks should be re-potted; the best of the single ones being kept for seed.

Indoor Fruit Department.

Pines in active growth should now be abundantly supplied with light, heat, and moisture, but, as soon as they begin to ripen, watering should be to some extent, discontinued. Successions should receive a little weak manure-water, and the walls and the tan beds should be syringed with the same. In the case of Vines, the fruit on which has done colouring, the temperature should be reduced a little and the atmosphere kept rather dry. Pinching, thinning, &c., should be attended to in the case of later crops. Peaches and Nectarines passed the stoning period should have the temperature increased to 65° at night, and from 80° to 85° during the daytime. The borders should be well watered before the fruit begins to ripen; for, if done afterwards, the flavour is often deficient. Figs growing should receive plenty of water at the roots and overhead; those ripening should have the supply diminished a little; but not too much, as that would destroy the second crop. Cherry trees ripening off their crops should be kept rather drier than usual, and when the fruit is gathered they should be gradually hardened off, and after a time completely exposed.

Hardy Flowers.

A mild and genial April has been succeeded by extremely cold weather—so cold, in fact, as to more resemble winter than May—and hardy flowers, many of which looked so promising last month, have received a severe check, and, in many cases, the bloom has been completely destroyed. Several large tufts of *Dielytra* (*Dicentra*) *spectabilis*, which a fortnight ago looked flourishing, have been completely denuded of both flowers and foliage by the recent severe frosts and cutting winds. To have this plant in fine condition, indeed, it is desirable to plant it in a warm sheltered spot, such as at the foot of a wall. The flowers of that favourite old plant *Gentiana acaulis* have also suffered much, and so have those of many varieties of *Iris*. Notwithstanding the inclemency of the weather, however, there are a good number of attractive hardy plants at present in flower, conspicuous among them being the *Trolliuses*, *Ranunculuses*, *Alyssums*, and the pretty *Lithospermum prostratum*, which is now in its best condition. In the case of this latter plant a charming combination may be made by the use of it and a variegated form of *Helianthemum* planted alternately with each other as an edging, the effect of which is excellent, the variegation of the one appearing to show forth the lovely blue of the other to the fullest extent. Various kinds of *Squills* are now finely in flower; and a form of *Scilla nutans*, called *Viola*, appears to be an improvement on the many varieties of this species now in cultivation. Its flowers are of a deeper blue than those of any other form with which we are acquainted. *Pæonies*, too, are just coming into bloom, but the fine double variety of *P. tenuifolia* has suffered much from the severity of the weather. The poet's *Narcissus* is still finely in flower, and so is the lovely *N. triandrus*, which has withstood the weather better, perhaps, than any other species. Absence of rain and cutting winds have, in many cases, prevented the planting out of annuals and biennials raised in pots; also the division of scarce perennials. Hardy perennials requiring stakes should be attended to, and the stock of spring-flowering plants, such as *Aubrietins*, *Alyssums*, &c., should, if necessary, be increased by means of cuttings, which root readily at this season. Sowings of annuals for successional blooming should also be made, and those already up should be thinned if necessary. Any rare plant which may be seeding should have the seeds gathered as soon as ready.

SOCIETIES, EXHIBITIONS, &c.

ROYAL HORTICULTURAL SOCIETY.

MAY 13TH.

THE chief attraction at this exhibition was the pot Roses, especially those shown by Mr. George Paul and Mr. Charles Turner, whose collections were so equal in point of merit that many present considered that equal prizes here, as at the Palace, should have been awarded them. They were, however, placed first and second in the order in which the names stand. Celine Forestier, a sulphur-coloured Noisette in Mr. Paul's group, was a rare example of good culture, and was very skilfully contrasted with Madame Victor Verdier, a vivid crimson-rose of good form and substance on the one hand, and Charles Lawson, a bright rose variety, on the other. This arrangement set off the group to excellent advantage. Its weak point was a plant of *Souvenir d'un Ami*, a lovely flesh-tinted Tea Rose of rare excellence, but hardly at its best on this occasion. Other varieties were Juno, rose edged with white; Camille Bernardin, a deep crimson-purple; Madame Villermoz, a beautiful pale Tea-scented variety; John Hopper, a well-known old favourite; President, flesh; Vicomte Vigier, rich crimson-purple; and Elie Morel, of a bright silvery rosy-hue, and very effective. In Mr. Turner's group the finest specimen was, undoubtedly, La France, one of the very best of light Roses, and, in this case, it was a profusion of splendid blooms of good substance, their freshness and beauty being further enhanced by juxtaposition with the brightest and greenest of foliage. The same group included fine plants of General Jacqueminot, Juno, Charles Lawson, Paul Perras, a rich rosy-lilac, beautifully flowered; Paul Verdier, a crimson-purple; Victor Verdier, rather lighter in colour than the last, but a fine Rose; *Souvenir d'un Ami*; Beauty of Waltham, similar to, but better in the present instance, than Paul Verdier; Madame Levet, a fine full incurved flower, and one of the best specimens in the group, together with *Souvenir de la Malmaison* and Anna Alexieff, both fine old-established varieties, either as specimens or cut blooms. In the class for twenty plants in 8-inch pots, the judgment was reversed, Mr. C. Turner and Mr. G. Paul being first and second respectively, both having nice little specimens, that is to say, little in comparison with the plants just named. Messrs. Veitch & Sons also showed some well-grown plants in this class. In the amateur's class there were also some good plants.

Orchids.—Mr. Denning staged a fine group from Lord Loudeston's collection, including a blooming plant of the Cow's-horn Orchid (*Schomburgkia tibicinis*), a common plant; but one that rarely flowers in our collections. Sir K. Schomburgk found large masses of this fine plant in Honduras; but its large horn-shaped pseudo-bulbs were infested with ferocious ants, in such quantities as to render obtaining specimens a matter of considerable difficulty. It bears rosy-lilac flowers on the apex of a scape 3 to 4 feet high. A plant of *Odontoglossum retusum* bore a fine branched spike of deep orange flowers, very distinct, and not unlike a *Mesospindium* in habit and general appearance. A good specimen of *Lælia majalis* (the Flor de Mai, or May Flower of the Mexicans) bore three very fine flowers. This plant is common; but rarely flowers, except in one or two collections. This group also included well-bloomed plants of *Dendrobium Parishii*, *D. Jamesianum*, contrasted with its nearest relative, *D. Infundibulum*; *Epidendrum ibaguense*, bearing numerous spikes of bright rosy-lilac flowers; *Leptotes bicolor*, a pretty little Orchid when well-grown; and *Masdevallia Harryana*, very richly coloured. An extra prize was also awarded to Messrs. Veitch & Son for another fine group, including a fine specimen of *Odontoglossum naviium*, *Cypripedium lævigatum*, a splendid specimen, with four spikes, bearing in all fifteen flowers. The flowers are smaller and darker than in the case of *C. Stonei*, which, in general habit, it closely resembles, and further differs in its scapes, ovaries, and sepals being densely set with short hairs. A fine variety of *C. caudatum* bore three fine flowers with remarkably long tails; and a plant of *Aërides Fieldingii* bore five fine branched spikes. Mr. Williams and Messrs. Rolisson also had fine plants in their collections.

Azaleas.—These were rather small, the best collections coming from Mr. Charles Turner and Messrs. Ivery & Sons, of Dorking. The first-named exhibitor had naturally trained half-specimens, well-flowered, of *Grandis*, a fine rosy-scarlet; Madame A. Verschaffelt, a fine mottled flower; Duc de Nassau, rich purple-lilac, and others. Messrs. Ivery had closely-trained plants, compact and well-flowered, the best plants being Donna Maria, salmon, white edge; Flower of the Play, white; *Reine des Pays-Bas*, a fine rosy-lilac; and Roi des Doubles, a fine deep rosy variety. Messrs. Jackson & Son had a neat group of well-flowered plants. In the Amateur Class for Azaleas, in 12-inch pots, Mr. G. Wheeler staged a nice group, the best being *Couciuna*, a fine lilac-purple; *Modèle*, bright rose; Duc de Nassau and Magnet; and, in the Open Class, Mr. Charles Turner had some well-bloomed specimens trained as standards. Messrs. Ivery & Son also staged a miscellaneous group of small plants, remarkably well flowered. Messrs. Veitch & Son sent a new bright rosy variety, named Mrs. Scorer.

Florists' Flowers.—These were well represented, especially in the case of collections of *Calceolarias*, staged by Messrs. Dobson & Son and Mr. James; the collection of the latter exhibitor, however, looked rather dull on account of an absence of light-coloured varieties. Mr. Rapley also had a fine group. The best plants exhibited were remarkable for their dwarf compact character, the flowers and foliage being extremely fine and well-coloured. Messrs. Jackman and Sons staged some fine examples of some of their best hybrid *Clematis*, and these were much admired. Auriculas were not so good, as their season is now past, the

best, however, came from Mr. Charles Turner, who had Colonel Champney, one of the best green-edged varieties, Fletcher's Ne Plus Ultra, and others. In the class for Alpines, Mr. Turner and Mr. R. Dean had nice collections. Messrs. E. G. Henderson staged two baskets of the finest *Mimulus* we have ever seen, the flowers being extra large, of good substance and richly coloured.

Table Plants.—These constituted one of the most interesting features of the show, and some excellent groups were staged by Mr. Wimsatt, Mr. Bull, and Mr. Hudson, the prizes being awarded in the order named. The first named exhibitor had *Aralia Veitchii*, *Pandanus Veitchii*, *Croton undulatum*, *Adiantum Farleyense*, *Cocos Weddelliana*, *Dracenas*, *Thrinax gracilis*, and others equally elegant. In the second group we noted *Aralia leptophylla*, *Dracena Gemma*, a dwarf plant with curious hairy foliage of a bronzy-green and rich deep crimson, *Croton Wisemannii*, *Curculigo recurvata variegata*, *Dracena Guilfoylei*, and *Dæmonorops plumosus*, one of the most elegant of all table Palms when in a small state. Mr. Hudson's group comprised elegant examples of *Cocos Weddelliana*, *Casuarina sumatrana*, a graceful feathery plant of the freshest green imaginable, *Dæmonorops fissus*, *Euterpe edulis*, and others equally graceful.

Miscellaneous Subjects.—Fine groups of decorative plants, Ferns, and Orchids came from Messrs. Veitch, Bull, Williams, Cutbush, Rollisson, Parker, Aldous, and others; and fine collections of hardy herbaceous plants came from Mr. R. Parker, of Tooting, and Mr. R. Dean, of Ealing.

Fruit.—Splendid Strawberries came from Mr. E. Bennett and Messrs. Munro and Wilkinson, of Potter's Bar; and Mr. Miller, of Clumber, sent a box of British Queen. Mr. Clayton sent a fine box of Hepper's Goliah Tomato, a fine smooth fruit, of large size. A dish of the Chinese Kumquat (*Citrus japonica*) came from Knypersley, and was much admired.

First-class Certificates were awarded to the following:—

Hæmanthus Cooperii (Henderson).—This is a tall-growing species, fully a yard high, having glossy foliage, and dense heads of deep orange-coloured flowers, the most conspicuous portion of the latter being the anthers.

Pelargonium Duchess of Edinburgh (Braid).—A dwarf compact habited plant, belonging to the fancy or show groups, having dense clusters of crisped-petalled white flowers, the segments blotched with purple. It is a most profuse bloomer, and promises to be extremely useful for market work.

Adiantum gracillimum (Williams).—This is an extremely elegant form of the common wedge-leaved Maiden-hair, and is very useful for bouquets and other cut floral decorations, as well as for general cultivation as an ornamental Fern.

Aquilegia leptoceras lutea (Douglas).—The plant shown closely resembles the figure in the "*Botanical Magazine*" [6,073] and is, in all probability, the same plant. It has rich yellow flowers sweetly perfumed, and is one of the finest plants in the genus, and should be planted as a worthy companion to the blue-flowered *A. glandulosa*. It was introduced by Messrs. Backhouse from California.

Viola White Swan (Dean).—This is a fine creamy-white flower and will doubtless prove serviceable for spring bedding.

Tea Rose Duchess of Edinburgh (Veitch).—This is an anomaly in its class, its flowers being of a deep rich lilac-purple, while the odour which is generally marked feature in Roses of this class, is in this instance scarcely perceptible. It has a good habit, and is to be recommended on account of its rich colour.

Gymnogramma triangularis (Williams).—This is an elegant little Fern, and has previously been alluded to in our columns.

Clematis Robert Hanbury (Jackman).—Another good addition to this fine group of decorative plants.

Mammillaria Roezlii longispina (Croucher).—This is a strong-growing globular species, having white spines and rich crimson flowers.

Agave filifera superba (Croucher).—This is a dense-growing plant and a nice addition to its class.

Azalea Mollis v. *Alphonse Lavelle* (Lane & Son).—A fine sweetly-perfumed variety belonging to the hardy section.

Hypolepis Bergiana (Rollisson).—This fine Fern has been previously described in our columns.

Hybrid *Mimulus* (E. G. Henderson).—This is a fine strain, the flowers being of large size, and richly spotted with bright crimson on a yellow ground.

CRYSTAL PALACE.

MAY 9TH.

OWING to a change of date on account of the Czar's projected visit to the Palace, and the unavoidable absence of one or two of the principal exhibitors, this show was scarcely so good as usual, although some classes, as, for example, those in which the Roses and stove and greenhouse plants were placed, were well represented, the former being, perhaps, the most attractive feature of the exhibition.

Stove and Greenhouse Plants.—The best collections were staged by Messrs. Jackson & Son, of Kingston, and Mr. J. Ward, of Leyton, who represented the nurserymen and amateurs respectfully. The first-named collection consisted of twelve well-grown and, what is of equal importance to an exhibitor, well-shown plants. They consisted of *Pimelea Hendersonii*, an old favourite, and, in this case, a remarkably effective one, forming a dense mass of bright rosy flowers, fully 3 feet through. The specimen of *Erica Cavendishii* in this group, although by no means the largest plant in the show, was by far the best, its foliage being of a rich deep green, and its golden flowers remarkably fine and well-coloured. *Imantophyllum miniatum*, one of the best of all *Amaryllidaceous* plants for exhibition purposes, was represented by a fine plant, bearing at least twenty-five trusses of orange-scarlet or vermillion-coloured flowers; and a plant of *Aphelaxis macrantha purpurea* was a perfect picture of health and floral beauty. There were, too, *Draco-*

phyllum gracile, a good plant, either for show purposes or cut bloom, and a fine *Erica Victoria*, well bloomed, in addition to good plants of *Clerodendron Balfourii*, *Genethyllis tulipifera*, and one or two good *Azaleas*. Mr. Ward's group also consisted of well-finished plants, including a good *Boronia pinnata*, an old, but effective, plant, which, when well-grown, bears numerous deep rosy-lilac flowers, set off by elegant finely-cut foliage. *Genethyllis* (*Darwinia*) *Hookeri*, in this group, was a nice plant, its flowers being numerous and richly-coloured, a sure indication that it had been well treated and accustomed to plenty of light and air. Two fine *Ericas* graced this collection, one being *E. Cavendishii*, about 4 feet by 4, and the other a fine *E. depressa*, about 3 feet by 3. The last-named plant was a picture of health and vigour, its characteristic sombre-tinted foliage banging over the sides of the pot, both examples being well flowered. *Genethyllis tulipifera* in this group was also well flowered, as was likewise a large specimen of *Statice profusa*, about 4 feet high, and 3 feet through. This is, when well finished, one of the best of all blue-flowered exhibition plants, yet it belongs to a genus rarely represented at exhibitions, although several of its members are well adapted for such purposes. A specimen of the scarlet *Anthurium* bore at least twenty of its brilliant spathes. Mr. B. S. Williams, of the Holloway Nurseries, showed a nice group in the nurserymen's class, in which was a splendid specimen of *Acrophyllum venosum*, a fine plant, both as regards foliage and flower, and one that few but the very best plantmen succeed in growing into a presentable specimen. Mr. Williams had also a good *Genethyllis tulipifera*, remarkably well flowered; also *Aphelaxis macrantha purpurea*, well coloured, *Erica Victoria*, and a fine specimen of *Anthurium Scherzerianum*, bearing thirty fine richly-coloured scarlet spathes. This plant is a broad-leaved variety, and closely resembles the one which Mr. Baines used to show so well. Mr. W. Kemp showed a nice group from the Duke of Northumberland's collection at Guildford. The most conspicuous plant in it was *Adenandra fragrans*, a fine old exhibition plant; it had fresh green foliage, and a profusion of pink flowers, each as large as a shilling. The same collection also included a good plant of *Chorozeina Henchmannii*, covered with its deep rosy-scarlet flowers. Mr. Peed's collection contained well-grown plants of *Erica Cavendishii*, *Allamanda grandiflora*, well flowered, but it, together with several other specimens, appeared to have suffered from cold during transit, and *Clerodendron Balfourii*. In the amateur class were also some good plants.

Pot Roses.—These were very good, some of them being fully 5 feet high and as much in diameter, and profusely covered with fine flowers. Mr. G. Paul, of Cheshunt, and Mr. Charles Turner, of Slough, were equal first. The latter had Victor Verdier, deep rose; Madame V. Verdier, crimson; Souvenir de la Malmaison, fine blush; Juno, rose; Charles Lawson, deep rose; Duke of Edinburgh, crimson-purple; Souvenir d'un Ami, fine flesh; and the old favourite Anna Alexieff. Mr. G. Paul had Dr. Andry, crimson-purple; Charles Lawson, Anna Alexieff; Princess Mary of Cambridge, blush; Horace Vernet, deep crimson-purple; Céline Forestier, lemon-yellow, very fine Noisette; Theresa Levet, fine deep rose; John Hopper and Madame de St. Joseph, fine flesh-coloured Tea. In the amateur's class Mr. Moorman and Mr. E. Ellis both staged fresh well-bloomed specimens. One of the great attractions of the show was the magnificent collection of cut blooms staged by Mr. W. Paul, of Waltham Cross. These consisted of Maréchal Niel and other fine varieties, and, throughout the day, were surrounded by a throng of admiring visitors, thus affording a pleasing assurance that the charms of the Floral Queen are yet unrivalled.

Florists' Flowers.—*Pelargoniums* were well shown by Messrs. Dobson & Sons, and also by Mr. James, both growers staging dwarf, fresh, and well-bloomed plants. *Calceolarias* were also well represented by a good strain from Messrs. Dobson's collection. Mr. Hooper, of the Vine Nursery, Bath, had a group of *Ranunculus*, and some fine Pansies, belonging to the show and bedding sections, were staged by Messrs. Downie, Laird, & Laing, and Mr. James, of Isleworth. Messrs. Jackman staged three or four dozen of their new hybrid *Clematis*, very profusely flowered, and they formed a striking and effective feature in the show.

Orchids.—These, on the whole, were very poorly represented, the best collections coming from Mr. B. S. Williams and Mr. J. Ward, of Leyton. The former had good specimens of *Vanda tricolor*, *Cypripedium villosum*, *Cattleya Mossiae*, still one of the best of all Orchids; *Cypripedium caudatum*, with very long petals; and a fine plant of *Aërides Fieldingii*. In Mr. Ward's collection, we noted one of the best plants of the delicate little *Odontoglossum Phalaenopsis* that we have ever seen. It was fresh and vigorous, bearing about fifty of its white and rosy-purple flowers. In addition were *O. Pescatorei*, with three or four good spikes; *Cypripedium villosum*, a free-growing species, with glossy-brown flowers; *Dendrobium nobile*, and *Lycaste Skinneri*. The other exhibitors were Mr. Reed, Mr. J. Wheeler, Messrs. Jackson & Son, and Mr. Edward Morse.

Miscellaneous Subjects.—Three fine specimens of *Echinocactus visnago* were staged by Mr. J. Croucher from the collection of J. T. Peacock, Esq., of Hammersmith. Mr. W. Paul had a dozen pyramidal specimen *Ivies*, both green and variegated. These were very effective and much admired. Messrs. W. Cutbush & Sons staged a very effective group of ornamental stove and greenhouse plants, as did also Mr. B. S. Williams, the latter collection including new and rare kinds. Messrs. Dick Radclyffe & Co. exhibited half-a-dozen Fern cases for window or drawing-room, these being very tastefully filled with Ferns, Palms, and other decorative plants; and Mr. Voce exhibited several of his patent garden frames, remarkable for their ingenuity and useful alike to the professional and amateur cultivator.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

FLOWER AND FRUIT PICTURES AT THE ACADEMY.

DIFFERENT classes of visitors to the Royal Academy Exhibition enjoy this annual display of British art from different, and more or less special and distinct, points of view. The opening day was, in our case, occupied with the great annual display from the garden point of view. A large class of highly accomplished artists devotes itself almost entirely to the painting of flowers and fruit, or to subjects in which they are made very prominent features; and from the methods which true masters of their art pursue in their selection of form, their adjustment of masses of colour, and the happy juxtaposition of suitable contrasts, the most skilful and highly-trained horticulturist may learn more than he expects if he has never carefully studied what one may fancifully term floriculture on canvas. The florist who works in a groove with a fixed idea, not always of a very elevated kind, will perceive, in the study of flowers treated as subjects for a picture, that mere formal regularity is abhorred by the accomplished artist. For instance, the florists' prize Pansies—flat as pancakes, and round as penny pieces, are no subject for his pencil, when seen "full face," as the exhibitor shows them on his perforated showboard, to display their perfection of flatness more emphatically. That such specimens are not triumphs of skill in floriculture no one will for a moment assert; nor will it be denied that the present mode of exhibiting is a convenient one for the display of their forms and colours. But, it will be well to note how the artist deals with that kind of formalism in the flower which has been the chief aim of the florist. He evades it—he glances above it—beneath it, shirks the "full face"—throws the splendid novelty into perspective, or shows a portion of the paler colours of the backs of the petals, and allows only a glimpse of the gorgeous hues of the front. Or, if one or more of the flowers are shown in a nearly (but never quite) front view; others are seen in profile, or with an entirely back view; and there is always a fair admixture of foliage, the several tones of green in the old, the young, and the already browning leaves forming an exquisite and contrastful background to the flowers, that, when well-managed, even the florist is charmed with, and the reason is that the laws of Nature are obeyed. Nature does not produce her flowers without leaves, nor do they all turn their faces in exactly the same direction, so that all may be seen in plump full face. The avoidance of the natural laws of plant growth is one of the chief causes of the Cauliflower-like aspect of some of the most costly Covent Garden bouquets. Even in the exhibition of Pansies, or Dahlias, it is by no means impossible that an artistically arranged bouquet, with a fitting portion of well-selected foliage would not prove more attractive to the spectator than a show tray with the decapitated Pansies or Dahlias, all in row, with which, however, it would always be useful to supplement the picturesque bouquet, like a tailor's card of waistcoat patterns, which, nevertheless, remains entirely subservient to the perfect suit. These remarks are intended merely to show that a good deal may be learnt from paintings of flowers, even by those who grow them. Miss A. F. Mutrie's "Poppies" form an eloquent illustration of the ideas that have just been touched upon. The work is a gloriously rich morsel of pure Nature, with its flowers, buds, foliage, and dewdrops *au grand complet*. The wild, informal, even unsymmetrical, luxuriance displayed is so elegant in its wildness, that the artist actually seems to have "snatched a grace beyond the reach of art." This group of cultivated varieties of the wild Corn Poppy, generally known as Carnation Poppies, are, in treatment and natural grouping, equal, if not superior, to the grandest compositions of Van Hysum himself; and, if superior, it is because the *ars celare artem* has been more skilfully and modestly observed by the English paintress. The great Dutch painter audaciously exhibits the art of his device, as a chief part of its merit; but, in Miss Mutrie's

"Poppies," there is no obtrusive display of the means by which her beautiful picture is produced. The grand flowers, heavy with the opulence of richly-tinted petals, reel in graceful carelessness to right or left, to or from the spectator, gently bowed by the weight of their own luxuriance, and seeming to revel in a nonchalant consciousness of their beauty. The charming varieties of colour which the different double varieties of Carnation Poppies assume, have rendered them great favourites. Sometimes a narrow band at the edges of the petals is milky-white, deepening to rosy-crimson at their bases, the profuse anthers and the markings on the green seed-vessel being of a soft sombre purple. In some varieties the whole petals are soft pearly-white, verging to grey, with a bright crimson band at the edges. The flowers of other varieties have the entire petals of dazzling scarlet, but deepening to intense purple-black at the centre. There is, in fact, no end to the varieties of and marking into which these Poppies capriciously sport; and Miss Mutrie has selected several of the most beautiful for her composition, the main character of which has evidently been founded on a real living and growing group. The treatment of the foliage is as fine as that of the flowers. The buds, especially, are wonderfully well studied; some are still small and green, and tightly closed; others, through a narrow opening from point to base, just reveal the colour of the still closely-folded and well-protected petals; while others, again, have just cast off their green night-cap, as Poppies do, and the petals are just beginning to expand. Some of the flowers have already lost their petals, which lie like butterflies' wings among the foliage; while the seed-vessels, graceful in form as a Grecian urn, and crowned with their radiated lids, are standing more erect, now that they are disencumbered from their heavy robing. One grand flower, over expanded, and truly glorious in its tinting but an instant since, has just shed the whole panoply of its beauty at the summons of a passing whiff of a June breeze; and the shreds of floral satin, such as no loom can match, lie a little heap of exquisite ruin on the gravel walk, a glimpse of which is shown. The border, roughly enclosed by low strips of wood, rain-stained and sun parched, and not a trimly kept one, is allowed to run half wild; and a group of wild Daisies nestles behind the wooden edging and forms a charming episode in the composition, which comes out clearly and sunnily from a back-ground of shrubs that are judiciously cast into a soft shadow. One more episode there is in this charming picture, which cannot be passed over. There are two gemlike objects gleaming brightly in the deep shade beneath the group of Poppies. Shakespeare, in one of the many passages in which he asserts that in all created things, even the most repulsive in general aspect, there is always some latent beauty, tells us that, "the toad, hath yet a jewel in his head"—alluding to the splendour of his eye. The two gemlike objects glistening in the partial darkness of Miss Mutrie's gorgeously luminous Poppies are the jewels in the head of a crouching toad, more truthfully painted, if possible, than the flowers themselves. It is a feature, however, so carefully subdued and kept out of prominence, that few who are not guided towards it by the small beacon light of those marvelous eyes will ever notice it, but a gardener would, at once, for he knows that his friend the toad is one of his chief slug destroyers. Miss M. D. Mutrie, a relative of the preceding artist, has a pretty study entitled "Camellias and Azaleas" (972), white and rose Camellias are placed in a shallow tazza with a spray of scarlet Geranium by way of contrast. The Azaleas are represented by a plant of a pink variety growing in a common red-clay pot. Its growth has not been trimmed, and its branches have made their natural growth, which is somewhat angular, and are well clothed, but not smothered with flowers. The picture is fresh and natural. Mr. Hardwick, under the title of "Spring Flowers" (795), has a pretty group of early blossoms from both field and garden. Here are Lilac from the shrubbery, Hawthorn from the roadside hedges, and Primroses from the banks and woods; a pretty group, placed naturally and without any painful attempt at symmetry, in a simple jar. The artist has four other subjects, Nos. 650, 778, 800, and 803, among which (800) "Roses and Nasturtiums, a study of colour," is very suggestive in regard to contrasts of tone, and light and shade. "Spring time" (861) has furnished Miss Chase with a pretty model in the form of a

deeply-sheltered meadow nook, in which Cowslips, Daisies, and Blue Bells are blooming together; and a pleasant little spring party they make; though the treatment is somewhat conventional, and the growth of the thick early Grasses has not been sufficiently studied. The artist has another subject (899)—“Sprays of ripe Blackberries,” which may remind us of what Americans have made of Bramble culture; but, one must recollect, at the same time, that the Blackberry, which American horticulture has made a delicious fruit, is, in appearance, much more tempting and luscious looking than the berries represented by Miss Chase. Mrs. Duffield has a charming drawing (892), entitled “Fallen petals.” The subject consists of two pale yellow Roses which deepen to rich orange in the heart of the centre. They are possibly flowers of that beautiful and favourite Rose, *Maréchal Niel*, or perhaps of some newer kind of the same group. They appear to have been laid carelessly upon a Mossy bank, and the petals of one have, apparently just fallen, a little shower of golden snow-flakes. Nothing can be more artist-like than the whole treatment of this simple theme. “A labour of love” (961) is a prettily treated flower subject. Surely nothing connected with the treatment of flowers, whether in the garden, or on paper, or canvas, can be other than a labour of love. The “labour of love” consists in this composition [in the arrangement by a pair of delicate hands, guided by an evidently appreciative instinct, of a harvest of freshly-gathered Roses. The idea is pretty, and so is the picture. “My First Bouquet” (1,342) is another work of the gifted Miss A. F. Mutrie. It forms a sad and sorrowful contrast to the exquisite Poppy picture; not because it is worse painted, or that any one of the flowers is touched with a less skilfully-directed brush, but it is an absolute *fac simile* representation of one of the Covent Garden Cauliflower bouquets, even to the minutest detail of the lace-paper envelope. Surely this is a desecration of such talent as that of Miss A. F. Mutrie. But, perhaps, it was “a commission;” perhaps there really is a young lady who received the original of that painted bouquet—her first authorised present of the kind—from one of those irresistible languid Adonises with “sad eyes and beautiful gloves,” who are allowed to be such fascinating creatures; and she immediately rushed to Miss Mutrie’s to have its every flower reflected in undying colours by the magic touch of art before it had time to fade. Let us hope it may be so; for, if so, the sentiment was “sweet,” though the bouquet, despite the beauty of each individual flower thus lumped together, is odious. Cannot the Covent Garden bouquet-makers let us have a choice; cannot they exhibit a few, ever so few, gift bouquets, grouped in that grand free old nosegay and posey style, which our old flower painters loved to reproduce on their oak panels, and Grinling Gibbons delighted to carve out of the solid oak itself? There surely would be found a few customers who would prefer a freer style, in which a due proportion of the foliage of each plant should mingle, instead of endeavouring to make it appear that Maiden-hair Fern alone bore flowers of all kinds, from Camellias to white Lilacs, scarlet Geraniums and Lilies of the Valley. No. 872 is a fruit subject, painted by Mr. Sherrin. It is simply a sturdy branch thickly studded with magnificent Plums, ripe and luscious, with the velvet bloom so rich and full upon them, that one fears to approach too closely lest he might brush away some particle of that powdery beauty. The branch leans against a bank partially clothed with rich olive Moss, and the general treatment closely and successfully approaches the style of those well-remembered fruit subjects by Hunt which were for so many years the charm of the senior Water Colour Exhibition. This subject might suggest to growers of choice fruit for the table that it would be a far more elegant and refined method of displaying it, to place it on its plateau, still attached to its native branch, no finger ever having touched the fruit itself. There are several other flower and fruit subjects worthy of notice, but space scarcely remains for the brief description of a few figure subjects, which combine the prominent introduction of flowers. The most important of these is the “Pet Pourri,” (129), by Mr. G. D. Leslie, a very delightful picture. There is, perhaps, a little too much of mere prettiness in the charming pair of fresh young girls rejoicing in the very flush and bloom of youth. Yet, as their delicate fingers sprinkle the dried Rose leaves into the great

china jar, and one of them holds up a handful in a living cup, formed by rosy fingers, more delicately tinted than the crisp petals she is handling, in order to inhale and test the quality the perfume, the picture must certainly be pronounced a very attractive one. Let us hope that, seeing the interest which young ladies take in the manufacture of pet pourries, that our Rose growers will at once send out lists of the best kinds for the purpose, especially those whose dried petals preserve their perfume the longest. No. 1,385, entitled “5 o’clock,” that is to say, 5 o’clock tea, represents a comely lady, seated in a conservatory, full of long borderings of *Lycopodiums*, and richly elegant with feathery Ferns and half-hardy Palms, all fresh and dewy-looking, from recent watering. There is scarcely in all the exhibition a picture, in any way connected with fruit and flowers, that does not afford some kind of hint more or less worthy of note to a horticulturist. No. 1,350 is called “A Venetian Fruit Seller.” A wiry young fellow has just driven his boat close up to the back door of one of the great palaces, opening in the rear to a narrow canal, by a dexterous stroke of his single oar. A Venetian servant girl is waiting for the arrival of the daily supply, which consists of Onions, Leeks, Grapes, and Garlic—and, piled high in the boat, is a great heap of mighty Italian Gourds, of every variety of strange shape—some elongated to a curious extent, some whole, and some cut, to sell by weight—showing their rich scarlet-orange flesh. There is a somewhat ambitious picture, called “Covent Garden in 1873,” representing the arrival of fruit and flowers in the early morning. The figures, nearly half life-size, are well drawn, and the colouring has the merit of sobriety; but the fruit and flowers displayed are scant in quantity to a poverty-stricken degree; and in quality so poor, shabby, and stunted, that, few as they seem to be to meet the greedy demand of each day, even their rarity would be of no advantage to them; “they wouldn’t sell!” not at any price. One would like to have spoken of Mr. Faed’s “Violets and Primroses,” Mr. Yeame’s “Flowers for Hall and Bower,” Mr. Poole’s “Grape-gatherer,” and many other works; but the allotted space is already over full, and there is scarcely room to tell gardeners that they have every reason to be proud of this section of the exhibition; for, with the exception of the wild flowers and the Blackberries, they have furnished both the flower and fruit models for all these charming pictures.

Levelling the Malvern Hills.—Digging down the Malvern hills, has, it seems, been seriously contemplated. The available agricultural land of England, in proportion to its population, has been long a subject full of the darkest doubts and forebodings to those who are always on the look-out for imaginary rocks ahead. Under the excitement of such reflections the idea of levelling the Malvern Hills, and so rendering the area which they cover amenable to the production of human food, made so strong an impression upon the brain of a certain Mr. Johnstone, of the hamlet of Colwall, situated near the foot of the Herefordshire Beacon, that he determined to devote his fortune, which was considerable, to this, as he deemed it, most sacred purpose. He commenced, and long persevered gallantly, in his self-imposed task. But death overtook him, the other day, “before he had completed the great work,” though he had succeeded in making a tolerably big hole in the beacon. He must one would think, at some time or other, have come across the remarks of the American traveller in Switzerland, who said that the tiny Republic indulged in very tall talk about its high mountains, and that all the people were a good deal stuck up themselves on that account—and that it was an “almighty pity” the said mountains were not rolled out flat, as by that means the tiny Republic might attain the dimensions of a respectable little State.

THE Duke of Devonshire, who has only recently completed the formation of an extensive recreation and cricket-ground at Eastbourne, has expressed his intention of executing further works for the benefit of the town at an estimated cost of £16,000. The want of a large assembly-room has long been felt, and his Grace intends erecting a spacious pavilion, 350 feet in length, on land near the new cricket-ground. While providing a large hall for meetings, space will also be afforded for a public library. Adjoining will be winter gardens and a skating-rink. The whole of the fittings and appointments will be of the newest and most complete description. The land recently devoted to the town of Eastbourne by his Grace comprises about thirteen acres, in the best part of the town, and would realise for building purposes £30,000.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare*.

GARDEN FERTILISERS.

By THOMAS BAINES.

THERE are few matters connected with a garden, whether large or small, of greater importance than manure; and there is nothing in which gardeners are so often reduced to severe straits, as they are, through an insufficiency in the supply of this all-important element to success in the cultivation of vegetable crops. This does not so much apply to small or moderate-sized places, as it does to those of greater extent. In many large establishments, where the gardener has every load of dung meted out to him, with a grudging hand, through the farm bailiff or agent, he stands much in the same position as the Israelites found themselves in the Egyptian captivity, of being required to burn bricks without stubble, and yet he is held responsible for the accomplishment of an equal impossibility. The man who cultivates his broad acres on the farm has the advantage over the gardener that his opportunities for change of crops are much greater, and the elements they extract from the soil, in the process of development, are so different in the cereals, grasses, and roots, that, through skilful rotation, he is enabled to make shift with much less manure per acre over a series of years than the gardener can possibly do with. The greater number of the crops which the gardener has to grow, in many instances from ground that has produced the same things for scores of years, vary little except in degree as to the elements they require for their sustenance; the difference laying principally betwixt deep-rooting and surface-rooting plants. Strawberries and bush fruits may be held as some exception, but the breadths they occupy in private establishments are comparatively small, and, with the exception of Strawberries, cannot, with advantage, be often changed. During the present century the chemical researches and experiments, with respect to manures, of Liebig, Lawes, and others have done much to enlighten the world upon this subject, and have also pointed out to us how ruinously wasteful our practice, as a nation, has been, not alone in the matter of the sewage with which we have polluted almost every river and stream in the kingdom, but also in the case of our wasteful proceedings in the preparation of manure; in this latter, gardeners have, in many instances, either unwittingly, or, in some measure, through necessity, been accessory to the general waste. Before hot-water was extensively introduced as a heating medium to plant and fruit structures, more especially pits and frames, hot dung was the principal material employed, and then, as now, the preparation was highly destructive to the essential constituents of the manure, more especially as regards its richest element—ammonia, which, as is known by nearly every gardener, is dispelled by the heat in the process of fermentation. Through the preparation it has undergone, old hot-bed manure often holds, relatively as to strength, a similar value that brewers grains holds to good malt, most of the best fertilising elements being gone from it through violent heating; this, to some extent, will occur under the best of management, but when the manure is not allowed to lay too thick, sufficiently often stirred, and mixed with half-rotten leaves, the loss which it sustains is reduced to a minimum. When guano was first introduced the prejudice against it was so great, not only amongst the farmers, but also amongst gardeners, that many were slow to either try it or admit its fertilising properties; this was, in some measure, attributable to the frauds perpetrated through its adulteration; and, even, at the present day, after some forty years' trial, this, the richest of all ammoniacal manures, is insufficiently known or appreciated by many gardeners. Great numbers of plants, like ourselves, thrive best upon a mixed diet; and I never yet met with a quick-growing plant, from a Rhubarb root to a Raspberry cane, that was not benefited by the judicious use of guano. As an experiment, I once gave a liberal dressing of this manure to a Raspberry plantation that had stood for thirty-seven years from the time of its formation, and which was in

a very weak state, the canes not running more than 4 feet in height, and correspondingly thin. With nothing but the guano applied in the beginning of April, and a light surface dressing of leaf-mould, the canes grew from 7 to 8 feet in height, and proportionately thick, bearing an enormous crop the following year. By an alternate yearly dressing of guano and farm-yard manure, they have, for some years, kept on doing as well as any plantation I ever saw, of only a few years standing. Even Strawberries, when not sufficiently strong, are benefited by a moderate application after the fruit is gathered, but, with these, care must be taken not to overdo the dressing, or the plants will make too much growth to ever ripen the crowns properly. Currants and Gooseberries, where at all poor, are much improved by it. There is one thing that I scarcely expected to find, and that is, they have no tendency to wear out, or become exhausted, by its use. All the Brassicas, Carrots, Turnips, Peas, Beans, and, more especially, Lettuce and small salads, are greatly benefited by it. This, to some, may look like the repetition of a very old story, but we meet with numbers of gardeners who are at their wits ends for an adequate supply of manure, and yet who have never used this or any other description of what may be called light fertilisers, except in, perhaps, some experiment that was insufficient to determine their value. I do not mean to say that farm-yard manures can be done without, quite the contrary, but, to all who labour under a short supply of these, I would say, make up the deficiency with guano, nitrate of soda, or sulphate of ammonia, changed according to the character of the soil, or the particular element in which it is found deficient, for the particular crop it is under. For old gardens that have been manured continuously with farm-yard dung, heavy dressings of leaf-mould and other vegetable soil, I much prefer the use of a portion of some light manure to that which is of a heavy nature. One great advantage which these concentrated manures possess is their immediate action. Where a scarcity of dung existed at the time of preparing the land or putting in the seed, assistance can be given, in this way, to the crop in its after stages, as occasion may require. In the case of culinary vegetables on strong retentive soils, there is no better way of applying these light manures than that of sowing them broadcast over the land before digging, and working in with, whatever portion of dung is used. By this means the manure is dispersed through the body of the soil, in which the roots ramify, meeting with food in whatever direction they extend. On light surface soils, or where the sub-soil is of a sandy or gravelly character, light ammoniacal manures should be applied on the surface, when the crops are in active growth, for the obvious reason that they are soluble in water, and unless the roots are in a state to at once absorb the essence of the manure held in suspension, the descending rains carry it deep down into the hungry substratum out of their reach, and so it gets lost. On all such soils as these, heavy dressings of manure, of whatever description, are a mistake, for the land is not of a nature to hold it longer than the requirements of a season's growth; and when the autumn and winter rains descend it is carried away. All experience leads to the conclusion, that manure, of whatever description, is the quickest in its action when applied in a liquid state, consequently, when any crop gives evidence of an insufficiency of support, there is nothing so effectual as liquid manure, this in particular applies to kitchen-garden crops, where the necessary application is practicable. In fact, there are some vegetables that, in their more advanced stages of growth, can be brought to a perfection by the use of liquid-manure, that could not have been arrived at by any application of manure previous to planting, without inducing plethora. The French summer salads that are held in equal estimation with those they produce in winter, owe their excellence largely to the rich liquid with which they are unstintingly supplied. Lettuces, Radishes, and even Mustard and Cress, that are grown quickly by the use of liquid-manure, are as different as can well be imagined from the tough, flavourless, undigestible stuff of which an English salad is too often composed. The comparatively large plants in the smallest of pots, unsurpassed in their way, which the growers for Covent Garden Market turn out, are telling examples of what may be accomplished by means of liquid-manure alone.

NOTES OF THE WEEK.

— THE dismal character of May, up to the present time, has not made Covent Garden much less attractive than usual at this time of year, though the supplies have been considerably affected by the cold. Good samples of English Peas are now in the market, the produce of Somersetshire. Tomatoes are visible on many stands, forced, and from Algiers; Cherries have come in considerable quantity from Algeria and the south of France; a small cargo of excellent Pine-apples arrived from the Azores during the week. Peaches (forced) are plentiful and have been obtainable since the middle of April. In the case of Grapes our forcing-gardeners now produce them all the year round; Melons, English grown, are to be had of good quality; and also Figs and Nectarines, both the produce of hot-houses. New Potatoes arrive in large quantities from the Channel Islands, and some of good quality have come from Lisbon of late.

— GAILY decorated as was the Crystal Palace on Saturday last, it contained nothing of more interest, even to royalty itself, than Mr. W. Paul's exhibition of Roses, including, as it did, not only a formidable array of old and well tried favourites, but also many new varieties, worthy additions to the court of the Queen of flowers, raised at Waltham Cross. These were all skilfully and effectively grouped along with specimen Ivies, Acers, variegated Oaks, and other hardy trees and shrubs of a highly decorative character.

— THE council of the Royal Horticultural Society telegraphed on Tuesday last to the President of the Tuscan Royal Horticultural Society, to propose that an international show be held in 1876. In the event of the proposition proving acceptable, the council will at once take steps to organise a joint committee representing the society, the Royal Botanic Society, and other leading horticultural bodies, should they be willing to lend their assistance. The council also propose that the Royal Horticultural Society should hold a dinner this year in the latter part of June. The prices of tickets and other details will be notified as soon as possible, and, if practicable, the dinner will take place at Chiswick.

— SEVERAL interesting herbaceous plants have recently been in flower at the Exotic Nursery, Tooting. Among them may be mentioned the beautiful *Omphalodes Lucilio*, a glaucous-leaved species, with pale-blue flowers; *Aquilegia cœrulea*, nice plants of *Cheiranthus Dillenii*, which bears brownish-yellow blossoms in profusion; and *Anthyllis erinacea*, a quaint-looking spiny shrubby species, about 6 inches high, with purplish-blue pea-like flowers, produced in tolerable abundance. We also noticed a good plant of the double variety of the Cuckoo Flower (*Cardamine pratensis*), an old, but somewhat seldom-seen, plant. This was growing on a moist bank—a position that fully answers its requirements.

— ALTHOUGH many plants are suffering from the inclemency of the weather, a considerable number of highly attractive subjects is now in flower at the Hale Farm Nursery, Tottenham. Foremost among these are the American Cowslips (*Dodecatheons*), of which great numbers are in full flower, particularly the dwarf deep rose-coloured *D. integrifolium* and the distinct-looking *D. Jeffreyanum*. The double variety of the scarlet-blossomed *Geum chilense* is very conspicuous in one of the borders, as are also fine specimens of the yellow-flowered *G. montanum*. The pretty dwarf light rose-coloured *Iberis jucunda* is in bloom, and a large tuft of *Oenothera lutea*, has an abundance of pale yellow flowers. *Scabiosa montana*, just beginning to produce its purplish flowers, promises to become an attractive plant; large masses of our well-known spring-flowering plants are in bloom here.

— MR. BAILEY DENTON, in a letter to the *Times*, remarks that in the winter just passed the rainfall has been very considerably below the average, though not so much less, as the previous winter had been more than the average. In the eastern counties—the driest part of the country—for instance, the quantity of rain that fell in the six months from October, 1872, to March, 1873, inclusive, was 21½ inches, while the amount due to the same period last winter, 1873-4, has barely reached nine inches. The mean of many years is somewhat above 13 inches. Comparing this mean with the rainfalls of the last six winters (in the eastern counties) we shall see (proceeds Mr. Denton) that although we have had within that period two singularly dry years, the fall of this last winter (nine inches) was less than any.

— THE English edition of the *Illustration Horticole*, for April, contains excellent figures of the following choice plants, viz.:—*Carludovica imperialis*, an elegant plant, closely resembling in general appearance some of the *Geonomas*, but, in reality, belonging to the *Cyclanthaceæ*. It has dark green bifid foliage elegantly recurved, and will prove an ornamental addition to stove plants. Of *Oncidium sarcodes* there is a good figure, evidently made, however, from a pale-flowered variety. It is probably only a good variety of *O. amictum*—and in habit is identical with that species, *O. pubes*, *O. cruci-*

gerum, and one or two other species. We have seen this plant with 100 flowers on a spike 4 feet long. *Dieffenbachia lancifolia* is a narrow-leaved plant blotched with pale green on a darker ground. It is an elegant addition to a useful genus of foliage plants.

— THE old-established firm of Osborn and Son is, we find, turning its attention to matters of decoration. Those at the Foreign Office, when it was visited by the Czar, were, we are informed, done by Messrs. Osborn.

— ON the rock-work at Kew, which has been rebuilt, and the planting just finished, several plants are conspicuously in bloom, and among them may be named *Erodium petraeum*, *Anthyllis montana*, a pretty dwarf species, admirably adapted for such positions, and a vigorous composite called *Craspedia Richea*, a plant which bears a large round head of yellow flowers.

— THE Americans have introduced a Silver Occidental *Arbovitæ* (*Thuja occidentalis argentea*), which they name *Victoria*, and which is described as a curious and beautiful dwarf plant, wholly unlike any hitherto described, being of a fresh green colour, with the branchlets distinctly tipped with white, entirely hardy, and most attractive and pleasing in appearance.

— A FINE hybrid *Phyllocactus*, is in flower just now in Mr. Peacock's collection of succulents at Sudbury House, Hammersmith. It somewhat resembles *P. Corderoyi*, but differs from that kind in colour, which is a delicate satiny-rose. Even in the case of a small plant the flowers are so large and showy as to clearly indicate that, when better grown, it will stand in the first rank amongst what are termed tall Cacti.

— *CHRYSANTHEMUM CATANANCHE*, a plant brought, we believe, from Morocco, has lately been in flower in a frame at Kew. Its foliage somewhat resembles that of some dwarf *Artemisia*, and the flowers are about the size of those of *Catananche cœrulea*, but of a white or sulphur colour, with a dark ring outside the disk. We also noticed in a frame in these gardens *Phlox bifida* a plant resembling *P. divaricata*, but with narrower foliage, and petals narrower and more distinctly two-parted than those of that variety.

— AMONG recent additions to the floral attractions of Covent Garden, we may direct attention to the beautiful specimens of *Ixias* now being exhibited by Messrs. Hooper in the Central Row. These vary in colour from faint rose and white to rich crimson-purple, while one form has flowers of a peculiar metallic green. The blossoms are borne on slender spikes and are well adapted for purposes of indoor decoration. These *Ixias* are imported from the Channel Islands.

— AT the exhibition of the Royal Botanic Society on Wednesday last, a plant of *Dendrobium Falconeri* was exhibited from the collection of D. Hanbury, Esq., The Poles, Ware, bearing some fifty large richly-coloured flowers. The plant, which was not a large one, was the best-bloomed specimen, for its size, which we have ever seen. It is a plant which, during the growing season, likes a good supply of water; but after it has finished growth, which is by autumn, it should be kept rather dry till it begins to show flower, but it must never be allowed to suffer from want of water, as it frequently grows during the winter months. Under this treatment it well repays the trouble that is taken to induce it to produce its charming white and purple flowers.

— M. LINDEN has received, says the *Illustration Horticole*, three new species of *Masdevallia* from M. Roehl, who discovered them in northern Peru. They are, *M. melanopus*, having white flower-tubes, and very dark ovaries and tails; *M. caloptera* having larger, probably white, flowers, with dark purplish or violet longitudinal stripes on the sepals—two on the upper sepal and three on each lateral one; and the highly curious *M. polysticta*, bearing spikes of seven or eight pale or white flowers, with numerous dark brown spots. M. Roehl found tufts of this species bearing twenty flower-spikes at the same time. These additions to this peculiar and interesting genus will give a fresh impetus to the favour in which these plants have been held during these last few years, both in this country and on the Continent.

— NOT only are the directors of the Alexandra Palace Company fortunate in possessing a fine building and a beautiful park, but the internal arrangements of the palace promise to be on an equally grand scale. Flower and fruit shows will be occasionally given, and certain portions of the building are to form a perennial horticultural exhibition of a high character. In conservatories and under glass domes, of great beauty and lofty elevation, hundreds of magnificent greenhouse plants will find a home. Palms of great size, and other tropical plants, have been given to the company by many distinguished lovers of horticulture. Mr. Peacock, of Hammersmith, has arranged to transfer to the palace a duplicate collection of his *Agaves* and *Cacti*, in the formation of which he has spared neither time nor money; and this example will, no doubt, be followed by other liberal gifts of choice collections, making this department of the palace equal to anything of the kind in the country.

THE GARDEN IN THE HOUSE.

FLORAL DECORATIONS AT THE CRYSTAL PALACE.

THE decorations on Saturday last (the 16th inst.) in honour of the Czar's visit to the Crystal Palace, were of a very tasteful character, the saloons being carpeted with crimson baize, and fringed with banks of the choicest flowering and foliage plants. Among these were Palms, Cycads, Ferns, Azaleas, Clematis, Roses, and other plants, while hanging baskets overhead were decorated with the gracefully pendant branches of the Golden Cobæa, Ferns, Selaginella, and other exotics. The staircase leading to the royal saloon and private box was divided in the centre by means of a ribbon design, composed of Golden Feather Pyrethrum and purple Iresine, the column at the top being gracefully wreathed with Clematis profusely covered with great lilac and satiny white flowers. The semi-circular front of the royal box was fringed with fresh green Selaginella growing in small pots, the latter, of course, being concealed, and on the Selaginella were laid clusters of Spiræa, Lily of the Valley, double pink Pelargoniums, and Eucharis flowers, the whole forming a charming contrast with the heavily gilt and crimson-velvet lined furniture. The chief point of attraction, however, was the saloon immediately behind the box itself, the decoration of which was entrusted to Miss Annie Hassard, whose taste in such matters is well known. The main features consisted of three handsome vases of parian and porcelain ware beautifully modelled, and the medallions at the base were very gracefully designed. These Miss Hassard rendered still more beautiful by using them as receptacles for the choicest of flowers and the most graceful of foliage, the bright glowing colours of the one being toned down and artistically blended by the judicious contrast of the other. The largest of these vases was about 2 feet high, and its rim and pedestal were gracefully draped with fresh green fronds of *Pteris serrulata*, and the still more elegant spray-like drapery of *Lygodium scandens*. Above this, and resting on the rim of the vase itself, were choice Rose blooms, consisting of *Maréchal Niel* (golden-yellow) and the exquisitely-tinted roseate-hued *La France*, the two alternating with each other, the line being broken here and there by the introduction of flowers of the *Æthiopian Lily*. These were the largest blooms used, and formed a foundation for smaller and still more elegant blossoms. These consisted of sprays of rosy and white *Rhodanthe*, the flowers of the latter glistening like frosted silver or the richest of satin fabrics. Mingled with these, and rising as naturally from the vase, as if growing, were feathery sprays of the white *Spiræa japonica*, common wedge-leaved Maiden's-hair, and a stem or two of the gracefully-arching *Solomon's Seal* (one of the most attractive of all hardy plants, so far as form is concerned)—these were added with excellent effect, the whole forming a very beautiful group. In addition to the above, two smaller vases were tastefully filled with the fresh green fronds of *Pteris cretica albo-lineata* and *Adiantum cuneatum*, among which were grouped clusters of pearly *Stephanotis* and *Lily of the Valley*, *Pelargoniums*, *Ericas*, and *Spiræa japonica*. These occupied positions on the side-tables; and, with the addition of a few graceful *Dracænas* and other plants, made one of the most charming arrangements we have ever seen.

Duration of Cut Flowers.—This spring I have carefully noted the time during which some of the most showy of early-blooming plants retain their beauty when cut, and I find the *Narcissus* amongst the most durable. This, if cut when the buds are fully developed, opens out beautifully in water, and lasts in flower, on an average, nine or ten days. One species, *N. gracilis*, lasted sixteen days, and was not much withered even at the end of that period. The blossoms of the German *Iris* contrasts well with those of the *Narcissus*, and if the spike is cut with the first flower expanded, the other two or three unopened buds will follow in succession, causing the same spike to last fully a fortnight. *Solomon's Seal* keeps fresh for a week or ten days, and sprays of *Forget-me-not* even longer if arranged either in damp sand or Moss. Squills, such as *Scilla patula*, *S. campanulata*, *S. ceruua*, and their varieties, also last long indoors; the flower-spikes turn upwards, and the flowers open almost as well when cut as when on the plants themselves.—B. J. I.

WORK FOR THE WEEK.

FLOWER GARDEN AND PLEASURE GROUND.

By PETER GRIEVE, Culford Gardens.

THE present spring, which is now merging into summer, succeeded a remarkably mild winter; consequently, vegetation generally had acquired undue earliness, which, in many instances, has been severely checked by the long-continued drought, and inclement character of the latter part of the spring and early summer. Even now the weather is remarkably cold, and hardly a night has passed without frost, of more or less intensity. This degree of cold, therefore, combined with drought, has, of course, been unfavourable to the display of spring flowers, and has induced early-flowering Tulips, &c., to pass out of flower much earlier than usual, while tolerably hardy spring flowers, such as the beautiful *Myosotis dissitiflora*, have suffered severely from the effects of the late frosts. Other species of spring flowers, however, such as *Aubrietias*, which possess, in a greater degree, the power of resisting cold as well as drought, have for some considerable time been exceedingly attractive, and will, no doubt, continue in excellent condition for some time to come, where they can be allowed to remain undisturbed; but, in many instances, this will not be the case, for, as regards the *parterre*, the time has arrived when spring-flowering plants and bulbs of various sorts must be removed into the reserve garden, in order to leave the beds at liberty for summer-bedding plants. This removal, however, must be effected with the greatest possible care, allowing as much soil as possible to adhere to the roots; and the planting should be immediately followed by liberal waterings, and shade from bright sunshine until the plants have become again fairly established in their fresh quarters. In cases where it may be desirable to increase any of the varieties of plants used for spring bedding, such as *Aubrietias*, Daisies, *Forget-me-nots*, *Polyanthuses*, *Primroses*, *Pansies*, *Violas*, &c., this can now be done by division and planting in a shady situation in the reserve garden, or under a wall; while cuttings of *Wallflowers* and similar plants may be inserted under hand-glasses, and should, when fairly rooted, be planted out in beds in the reserve garden, to be in readiness for again furnishing the beds in the *parterre*, &c., when summer-bedding plants have again passed away. As soon as the spring-blooming plants have been removed, the empty beds and borders should have their margins carefully regulated, and to the soil should be given a liberal application of manure, or some suitable material, such as fresh soil of good quality. This should be well incorporated with the original soil by deep digging; and, in supplying fertilising materials to flower-beds, the nature and probable requirements of the plants intended to occupy them should, of course, have due consideration, as, for some species, the soil can hardly be too rich; while, for others, such as *Tropæolums* and strong-growing *Zonal Pelargoniums*, this is by no means desirable, as it tends more to the production of foliage than bloom.

The arrangement of the flower garden should always be decided upon during the previous summer, so that the material required should all be in readiness by the present time; and, supposing this to be the case, planting out ought to commence at once, beginning with the more hardy species, such as *Calceolarias*, *Verbenas*, *Zonal Pelargoniums*, &c.; while the first week of June is quite early enough to plant out the various varieties of *Tricolor Pelargoniums*, *Heliotropes*, *Coleuses*, *Iresines*, *Alternantheras*, &c. In planting the various beds in the flower garden, care should be taken to avoid a too free use of the primary colours, as few things can be more objectionable than large flat surfaces of bright scarlet and yellow, &c., unless the same is duly toned down by the inter-sper-sion of more quiet and pleasing shades, in the form of margins to beds and clumps of considerable dimensions; while anything like monotony may be greatly relieved by the judicious introduction of standard and pyramidal plants of various sorts, such as *Pelargoniums*, *Fuchsias*, *Cytisuses*, &c., together with plants of remarkable foliage, such as the *Acer Negundo variegatum*, *Abutilon Thompsoni*, *Dracænas*, *Palms*, and *Yuccas*; and nearly all the beautiful new Clematises form most ornamental objects when planted upon the turf and trained to wire arches or other tasteful devices. Annual flowers, which may have been sown in the open air, may now require to be thinned out; and others, sown under glass, such as *Asters*, *Stocks*, *Phlox Drummondii*, &c., will require to be carefully planted out in beds or borders where they are intended to flower. Very few annuals are suitable for furnishing the beds of the flower garden, on account of the short time during which some of the most beautiful varieties remain in perfection; but they are, nevertheless, exceedingly useful as marginal plants for shrubby borders, and for planting in beds containing bulbs in the spring garden, with the view of rendering the beds gay when the bulbs have ceased to bloom; and a border devoted to the purpose of growing a

selection of the finest annuals forms an interesting and often a very attractive feature in a garden. Hardy herbaceous plants, many of which are exceedingly beautiful, should now have every necessary attention paid to them, such as thinning out the shoots, staking and tying up, removing decayed flowers, weeds, &c., while climbing Roses, Honeysuckles, Jasmines, &c., should be carefully regulated. In establishments where a hardy Fernery exists, and this, if properly managed and favourably located (in a situation not too much exposed to the sun), is a very interesting department; and, whether in the form of a rock or rock-garden, must now have its share of attention as regards eradicating weeds of all sorts, removing decaying frouds, loosening the soil, and introducing young plants of the comparatively delicate sorts which it may be found necessary to keep, during winter, under glass. In the pleasure grounds evergreen shrubs may yet be transplanted if necessary, while the growth of others may be regulated by being cut in, so as to prevent strong-growing species from encroaching too much upon their more delicate and slower-growing neighbours. Box and other edgings may now be trimmed, and the Grass margins to walks, drives, and coach roads, &c., should also be regulated, or edged if this has not been already done. Plantains and other broad-leaved plants should now be carefully extracted from lawns and Grass belts; while the Grass should, in all cases, be kept level and short by the frequent use of the mowing machine; advantage, too, ought to have been taken of the long period of dry weather, which has in most localities been experienced, to stir up the surface of gravel walks, in order to thoroughly eradicate weeds and Moss, and when this has been accomplished, roll the gravel well down with a heavy iron roller, soon after the first heavy rainfall, and this rolling (if the gravel be of a good binding quality) will render the walks firm and comfortable; and to ensure a continuance of this desirable condition, throughout the season, an occasional application of the roller, soon after a heavy fall of rain, will be all that will be required.

COOL ORCHIDS.

By F. W. BURBIDGE.

MANY of these will now be making vigorous growth, and must not on any account be allowed to suffer from want of moisture either at the roots or in the atmosphere, as nothing tends so much towards checking their vigour and injuring the plants as sparsity of moisture when making their growth. Keep a sharp watch for red spider, thrips, and green fly. The two former are extremely fond of *Pleiones* and *Cypripedium Schlumieri*, and the latter, if present, are sure to be found on the flower-spikes of other species. The red spider and thrips are readily kept in check by repeated spongings, and occasional fumigations with tobacco-cloth or rag will settle the aphides. It is not advisable to smoke Cool Orchids too vigorously, as it often causes *Odontoglossum* and *Miltonias* to shed their leaves prematurely. Give air freely, carefully guarding against cold draughts, and shade the plants from bright sunshine as may be required. Any species that have been resting, and are now starting into fresh growth, may be re-potted at once. *Masdevallias* will now be growing freely, and should be placed at the coolest end of the house, and syringed once or twice daily. *Cypripediums* and *Disas* are also benefited by being syringed occasionally. Some of the pots that are unsightly may be top-dressed with lumps of fibrous peat and fresh living Sphagnum, so as to give them a fresh and healthful appearance. Sphagnum, in a fresh state, is rather difficult to procure, especially in the south of England, while that which has been heated in sacks, and which has become lifeless, is of little service to the cultivator. The following plants, amongst others, are now in flower, viz., many beautiful forms of *Odontoglossum Alexandræ*, *O. citrosanum*, *O. retasum*, *O. Lindleyanum*, *O. luteo-purpureum*, and others, *Masdevallia nycterina*, *M. Harryana*, *M. Lindeni*, *M. ignea*, *M. Veitchii*, *Epidendrum lbaguense*, *Oncidium concolor*, *Ionopsis paniculata*, *Laelia majalis*, *Nasonia cinnabarina*, and *Ornithidium coccineum*.

HARDY FLOWERS.

By THOMAS SPANSWICK.

WITH bitter cold winds in the day time, and more or less frost at night, many hardy plants which would have been in full bloom had genial weather prevailed, have received such a check as will probably spoil their beauty for the season. Two fine-leaved hardy *Polygonums*, viz., *cuspidatum* and *sachalinense*, in the neighbourhood of London, have suffered considerably from spring frosts; as has also a fine specimen of the Official Rhubarb, at Kew (*Rheum officinale*). The latter promises to be, when more plentiful, a foliage plant fit to be associated with such noble leaved subjects as *Gunnera scabra*, *Rheum Emodi*, *Acanthus latifolia*, and plants of similar character suitable for isolation on turf or other prominent positions. Notwith-

standing the weather, however, there is a good display of bloom on many plants, as, for instance, the *Columbines*; than the varieties of common *Columbine* (*Aquilegia vulgaris*) there are no more valuable plants for purposes of general decoration, and they may be easily raised from seeds, which are cheap. *Iberis coraeifolia*, probably the best of the perennial species, is just now coming freely into flower. It is a plant which forms a compact edging thickly studded with pure white flowers about mid-May, and when grown in pots it is equally ornamental. Several *Veronicas* are also nicely in bloom, prominent among which may be mentioned the pale blue flowered *V. gentianoides* and the dwarf dark blue *V. prostrata* and *pulchella*. *Lupines*, too, are now highly attractive; also *Thermopsis fabacea* and *lanceolata*, two yellow-blossomed ornamental leguminous plants, well worthy of general culture. Spring and early summer-flowering annuals have come so tardily into bloom this season that we miss the grand displays usually made about this time by such kinds as *Collinsia grandiflora*, *Saponaria*, *Collomia*, *Limnanthes Douglasii*, *Nemophilas*, and others, raised from seed sown in the open ground in autumn. Little advancement has been made in the planting out of annuals from pots, on account of the dryness of the weather and coldness of the winds, but as soon as rain comes they should be planted out with as much expedition as possible. Early-flowering hardy bulbs may be taken up, if necessary, to make room for summer-flowering plants; but, except in the case of rare kinds, this is not at all a commendable practice. Seedlings of perennials sufficiently advanced for pricking off should be attended to, and any choice additions made to collections of herbaceous plants should be looked after, and, if necessary, increased by means of division, or, if this is not practicable, cuttings should, if possible, be taken off and inserted in pots.

HARDY FRUIT AND KITCHEN GARDEN.

WHERE Apricots, Peaches, and Nectarines have been protected, the coverings will want gradually taking off, so that the trees may not suffer from too sudden exposure. Disbudding the shoots, by only taking off a few at a time, till all danger from the influence of cold weather is over, must now or soon be proceeded with. Apricot trees are often much infested with a grub, which curls the leaves up and eats the young fruit. As this pest is safe from syringings or dressings of any kind, it must be searched for and crushed with the finger and thumb; and the more effectually this is done, the fewer grubs will appear next year. In the kitchen garden, Brussels Sprouts, Savoys, and Cauliflowers should be transplanted into deeply-worked, well-manured soil. Another plantation of white Paris Cos Lettuce should be made. The ground intended for the main crop of winter Greens and Broccoli should be prepared by well manuring and deeply digging it. These crops generally succeed Celery, autumn-sown Onions, Parsnips, or early Cabbages, as may be most convenient. New Zealand Spinach may now be planted in rich warm soil. A sowing of Scarlet Runners for succession may be made, also of French Beans, and a few of the Broad Windsor. Some dwarf Marrow Peas may now be sown, and early ones topped; Spinach for succession may be sown, also a few seeds of *Scorzonera* and *Salsafy*. A few Lettuces and Turnips, if required, may be sown in cool shady places; sowings of Rampion and Cern Salad may also be made. Root-crops, such as Beet, Carrots, Parsnips, and Turnips, should be thinned as they advance in growth. Potatoes should be hoed, and, in some cases, the soil between the rows loosened with a steel fork; a little earth should be drawn to the most forward of them. Ridges for Cucumbers may be prepared, and the ground got ready for Celery.

Epithets of the Months.—The following titles of the months are taken from "Five Hundred Points of Good Husbandrie, newly set forth by Thomas Tusser, Gentleman." London, 1610:—

A kindly good Janiacere Freezeth pot by the feere.	No tempest, good July, Lest Come look ruefully.
February fill the dyke With what thou dost like.	Dry August and warme Doth harvest no harme.
March dust to be sold Worth ransom of gold.	September blow soft Till fruit be in loft.
Sweet April showers Do spring May flowers.	October good blast To blow the hog mast.
Cold May and windy Barn filleth up finely.	November take haile Let Skep no more faile.
Calm weather in June Corno sets in tune.	O dirty December For Christmas remember.

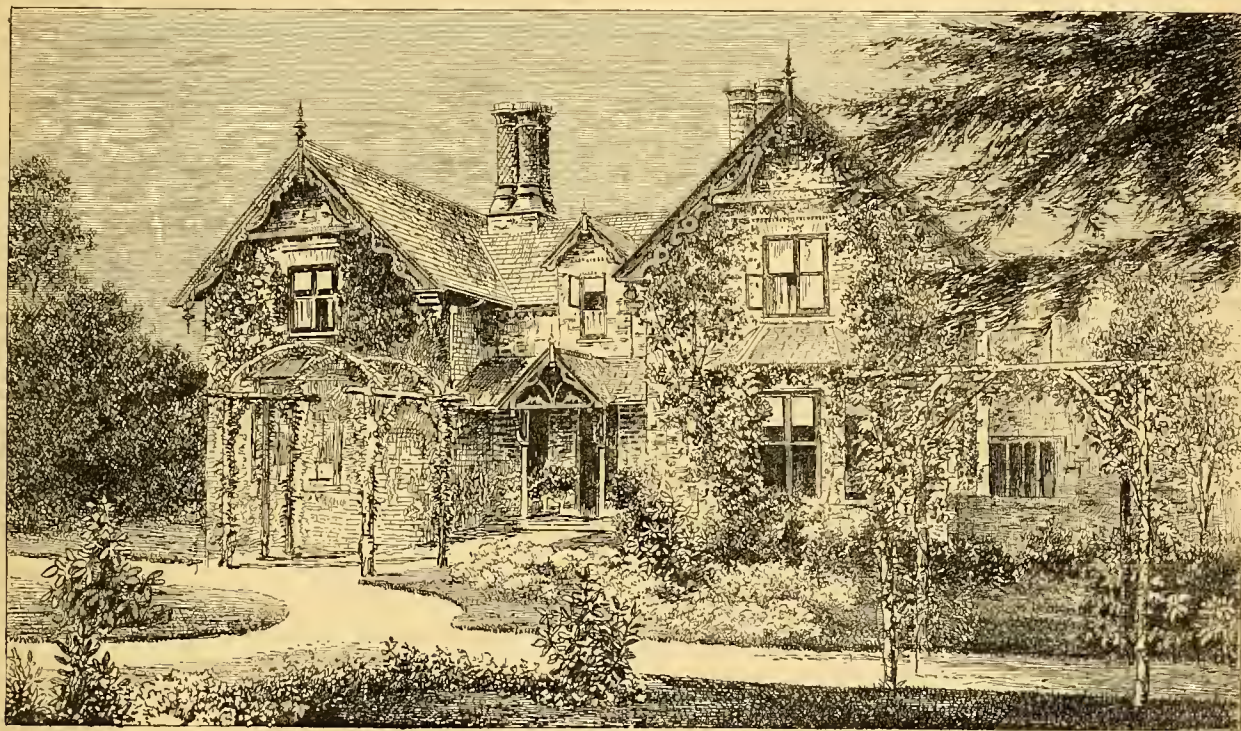
The word *skep*, in Lincolnshire, is in constant use for a peck measure; while in Leicestershire, and elsewhere, it is used indiscriminately for any small wicker-work basket used for packages, the larger forms being called "hampers." In Scotland, beehives are called "skeps."

GARDENERS' COTTAGES.

THE accompanying sketch, which represents the gardener's cottage at Henham Hall, Suffolk, the residence of Earl Stradbroke, may well be taken as a model of how such a necessary appendage to a garden may be made an attraction, instead of an eyesore requiring a screen to hide it from view. Its internal arrangements are quite equal to its external appearance; it has a good entrance hall and spacious staircase, from which ready access may be obtained separately to each room. The four front rooms are about 14 feet square, and the back rooms, kitchen, and other appurtenances, about 12 feet square. The back premises communicate with a private road, a better arrangement than that of making the gardener's cottage form, as is often done, a central object in the kitchen gardens, or range of forcing houses. The garden-front, partly shown in the accompanying illustration, is tastefully laid out in the form of a flower garden enclosed by evergreens, and an ornamental wire-fence clothed with Roses, and the walks leading to the kitchen gardens and pleasure grounds are also spanned by arches, which are covered with climbing plants. The

to afford a pleasing variety of colour; and, by way of experiment, such plants as Camellias, Myrtles, and scented Verbenas, are used in sheltered spots, in which they will stand mild winters without any protection. I may remark, in conclusion, however, that the effect produced by these plants, comparatively common though they are, is, as in all other matters connected with gardening, just in proportion to the care bestowed on them; if they are annually thinned, and the young wood trained in to replace the old and worn out shoots, fine blossoms will repay the operation, but if their pruning consists in simply mutilating them with garden shears, their blooms will grow "small by degrees and beautifully less." J. G.

Weather Predictions.—At a recent meeting of the East Kent Natural History Society, Mr. Kingsford said he agreed with the general impression that the seasons were more subdued as regards cold and heat than formerly; at the same time extremes of temperature from time to time occur. Prognostications of forthcoming weather, he considered only mislead, because not tested by or based on true knowledge and facts. The test of the general condition of



Gardener's Cottage at Henham Hall.

central porch forms a sort of open conservatory, in which, owing to its sheltered position, a gay display of floral beauty is constantly kept up. It is, however, to the increased interest which climbing plants give to buildings, that I wish now specially to refer. Drapery of this kind not only enhances architectural beauty where it exists, but also covers a multitude of defects in buildings of ordinary appearance. I need only refer to trade lists to prove that there is abundance of material in the shape of flowering, foliage, and berry-bearing plants suitable for the purpose, and for producing a fine effect at all seasons. I may add that the most conspicuous plant in bloom at present (May 11th) is the Yellow Banksian Rose, which is quite a cloud of blossom, and which contrasts well with large masses of Forget-me-nots, and other spring flowers at its base. When this Rose goes out of bloom the different varieties of Perpetuals, Teas, and Chinas come into beauty, conspicuous among them being the Climbing Devoniensis, which, under the shelter of the overhanging roof, blooms in perfection. To provide for autumn and winter effect, plants of variegated Ivies, Cotoneaster, Pyracantha, &c., are trained amongst the Roses so as

the summer by the character of the weather at the vernal equinox had more than once proved correct, but he preferred more scientific methods. The early arrival of birds in autumn was said to foretell a severe winter. Last September a woodcock flew up from the shrubs near his house, but there had followed anything but a hard winter. Similarly, the abundance of Holly-berries, greater than had been previously noticed, did not confirm the adage as regards the season; for neither was the weather severe, nor were there as many redwings and fieldfares, as usual, to feed on the thick crop. His grandfather had recorded that on January 1, 1779, a remarkable storm occurred, long known as the "new year's gale," which blew the roof off his house; yet the following spring was so forward that Gooseberry pudding was eaten in April. The severity of former winters, as well as the presence of birds, not now seen in the same localities, was demonstrated by several incidents. Associated with climatic changes were many alterations in the lands in the neighbourhood of Canterbury. The surface had become drier, the places where water remained for months, yielding an extensive evaporation to the atmosphere, had been greatly reduced. Ditches had been filled, woods cut down, and more land brought into cultivation and drained; these, and other causes, speak for themselves in a meteorological point of view.

GARDENS AND VEGETATION IN THE RIVIERA.

TO THE EDITOR OF "THE GARDEN."

SIR,—I have recently received two letters from a friend travelling in the South of France, principally in the department of the "Alpes Maritimes," which appear to me so interesting that I fancy they may prove equally so to the readers of THE GARDEN. I have selected those passages which I deemed of general interest, placing them under distinct headings, and forward them to you for publication, if you think proper.

H. NOEL HUMPHREYS.

Hereabouts the Alps come down to sun themselves by the southern sea, and Mentone is one of the towns that nestle at their feet, protected by them from the harsh north and east, and it is usually considered the best sheltered spot on the coast. In the gardens the Geraniums seem to grow wild, and flower profusely during winter and spring; the Castor-oil plant lives through the winter; the Wigandia (macrophylla, grown for its huge leaves only in the London parks) becomes a tree 20 feet high, covered with panicles of blue flowers, very handsome; the Mesembryanthemum drapes the walls and rocks, as at Naples; Salvia gesneriflora is a bush of fire, in April; the Heliotrope flowers untouched through the winter, as it would against a back wall in a warm greenhouse; the fine old Sparmannia africana blooms freely in the open air; and over 200 kinds of Cacti and succulent plants thrive there also. So much for the gardens of the town; gardens, which, however, contain many other things, including the Gum trees talked of so much of late. The main features of the place are the cultivated gardens, nearly all terraced, as you have so often seen in Italy, but covered with a vegetation which one rarely sees there.

Olive Trees.

In Italy the Olive is merely an "orchard tree," and does not seem to be at all happy with its lot. Here, too, it is essentially a cultivated creature; but it grows so big, stately, and venerable-looking, that it has little trouble in deceiving one as to its real position in the world. One sometimes forgets the prim narrow terraces, and the world of care bestowed on its culture, and groups it with the old park Oaks and Kensington Elms, and other tree patriarchs. It has grace too, for it often weeps like the Willow, and, however old the trunk or branches may seem, the shoots are always fresh and vigorous, as if on seedling trees. It never knows when to die! They say some of the trees hereabouts may have afforded oil in the time of Augustus; and they certainly look as old as any trees I have ever seen. Sometimes you see a tree split up into three or more stems, as if he had been on the point of death from old age 500 years or so ago, but was saved by several young strips of living bark running down his time-worn hide. These said to themselves we must not let the old one die; and, by each doing his best, they have managed to keep a little of him together near the ground yet. Sometimes the trees are pierced with holes, as if they had in old times stood a siege; but they tell me that in olden times it was thought a good practice to bore holes into the trees to make them fertile. These holes you must have frequently seen in your long Italian journeyings. When the branch of an aged tree here seems at all overlaid or weak, it is propped carefully up—as a good old man might be—on a crutch. Some trees spread wide about the root, so as to remind one of an old Chestnut. It is impossible to give any idea of the variety and beauty of form possessed by the Olives here; but, as I have not seen them either in flower or fruit, as yet, I have perhaps said enough of them for the present.

Lemons and Oranges.

After Olives, Lemons—the staple crop of the land. A shade or two warmer, and better sheltered than many of the shores of this sea, the Lemon is at home. Madame Lemon is a little more delicate in constitution than Monsieur Orange, and, as she is the more valued here, he mostly goes to the wall. Everywhere you see the Lemon groves, which are flowering and fruiting at all seasons, and form a most valuable property even on a small piece of ground. The Oranges are grown, particularly the bitter variety, but not nearly so much as the Lemon. They, however, can be grown over a much

greater area of Southern Europe, and are therefore not so profitable as the Lemon. What is this fair star-like white flower, in such profusion beneath the Oranges and Lemons? The Naples Allium, pretty as any Daffodil, and as bright a spring flower as you would wish to paint. I intend to bring home a thousand bulbs of it; and, should you make a wild-garden, I will ask you to scatter some of them in it. It is so plentiful in the Lemon groves, that the ground is whitened by the blossoms, which appear about the time those of the Anemones are passing away.

Indigenous Vegetation.

There is a little cape Francewards, and just outside of the town, not altogether occupied by Olives, and here one gets some idea of the native vegetation of the place. Here, too, one gets out of the odour of the Lemon groves and feels the cool breath of the sea. And what a sea! You know its divine blue well; but nobody, I suppose, has ever attempted to paint, or even remember in any distinct way, the many different tints that one sees in it; near a muddy or sandy beach it seems but a northern wave that is washing the shore; but here, on the brow of this cape, where there is no shingle or loose material, a very different aspect is presented. The worn rocks spring from the deep blue water, and, as the waves roll high against them, the crest of each, as it rears over, is exactly of the same peculiar green hue as the crest of Niagara, when the light from below first strikes the falling mass. It is on stormy showery days that the tints of this sea seem the most varied and charming. The vegetation is peculiarly interesting, as a good many of the native plants are among the oldest and most favoured plants of northern gardens. The low copse vegetation beneath the Aleppo Pines is composed almost exclusively of Myrtle and Rosemary; the last in flower in April, and showing here and there a white variety. The Rosemary is seen everywhere. In such company, one would naturally expect to meet Miss Lavender; and here she is, happy enough on the warm rocks. The Lavender is so abundant on the sunny mountains all round here, that there is no need to cultivate it for distilling, so the stills are brought on to the mountains when the flowers are ready. As interesting in their way as any of the preceding, are the little bushes of the true garden Thyme, which everywhere dot the land. It is exactly the plant cultivated for ages as a pot-herb, and, of course, quite different from our common field Thyme. Then we have the Rue, common enough; as if so many fragrant herbs could not be permitted to grow together in peace without an emissary from the evil one, in the shape of the foetid Ruta. If we pass from this cape to the hills around the town, many interesting plants are met with, as, for example, an Acis, which flowers in spring, and is like a Snow-drop; beautiful insect-like Ophrys; Hepaticas, here and there mixed with our common Primrose; and, most beautiful of all, perhaps, the graceful and handsome Dog's-tooth Violet, with its mottled leaves. Daffodils and Anemones have been very numerous, but in April they are seen less frequently, and many of the rarest flowers select the winter as their blooming time.

A Valley in the Maritime Alps.

If we pass up one of the valleys for some distance, a better idea of the region generally may be obtained, and there is no more interesting one than that which runs up to the Col de Tende, three hours' walk or so above Tende—the Tende of Beatrice, of whose history you know. We enter the valley through miles of conglomerate cliffs, often several hundred feet high, and here and there veined with sandstone, which is fretted into tracery, looking almost like that of a decaying gothic cathedral. Few things among the rocks look more imposing than these cliffs, made up of blocks and stones and pebbles, from the ruins of some old world. Imagine the torrents, and the rivers, and the continent they must have seen into to admit of such a cyclopean deposit! The culture of the Olive by no means ceases with the sea slopes, but runs very far into the warm valleys, the slopes of which are terraced for its reception. There is one place in this valley where the hills assume the form of an amphitheatre, and the terraces and Olives follow the same outline. This is a peculiarly interesting sight, and one you would like to sketch. It looks like the Coliseum escaped to the woods, and enlarged a

hundredfold. Hard by, and nestled in the grey wood, is one of those close built Italian towns, so attractive to the artist (and to the general eye, at a distance of some hundred yards or more), but which are so dismal when you walk through them; the streets like deep graves; the houses so miserable-looking, externally; the filth inside so evident, that one begins to be grateful for having first seen the light in a clean, if not a picturesque house. Some of the streets are so narrow that you might hand articles from one house to another from the windows! And into these towns the people crowd, instead of building in their pretty Olive gardens. It is part of the curse of the old time that is upon them. I suppose they crowded up for defence, and now, when both castle and ramparts are gone, they crowd still. They look all the worse for it, too, and have the faces of creatures born in the stews of some unhealthy city. As we pass along the outer street, a great snake-like stem of a Vine is seen emerging from a hole in the wall of the lower storey, and gradually winding its way to the top, where it forms (trained on a trellis over the flat roof) the upper story, so to say. This is but one of the countless ways of training the Vine in Italy. What a docile plant it is for the trainer! and what curtains it makes at Naples, stretching in lines, four deep, from tree to tree! And what covered walks at Florence! But I must not begin. A man with one-half of your knowledge of Italy might form a charming illustrated volume on the "Vine in Italy." What a contrast to the primmer than Currant-bush Vines in France! But taste the *vin du pays* in these valleys, and, ten to one if you do not imagine that the fiend of astringency has possessed you at last. Happily, however, the inns mostly have some fair Asti, and Asti, when good, seems to me (a poor judge) the most agreeable wine of Italy.

Terraces.

When the terracing for the Olives on the low grounds and hill-sides is completed, next come terraces for Wheat and Vines. It is surprising to see how these terraces are won from the mountains. You look above the Olives and against the face of a mountain that seems too steep for any climber but the chamois, and are astonished to see little horizontal lines, which prove to be terraces. Man, the featherless biped, has been there, and, wherever it was possible, stolen a few yards of earth from the stony face of the scarp. Some of these terraces are not more than a few yards long and 4 or 5 feet wide. Talk of difficulties of culture after this! In more accessible places than this, one can see the terraces with their green young Wheat, which, I am told, they bear, year after year, without end and without change. After the Wheat frequently comes a crop of Indian Corn, which the climate is so good as to perfect, even though sown after the Wheat is cut. In some of the small fields, and most easily accessible terraces, we saw the old Roman plough—the Virgilian plough—at work; and not a bad implement, though a very rude one. I presume this was the first of the great series of English ploughs also; as, of course, the Romans would have introduced it. They could not rule and civilise us for nearly 500 years without using the plough as well as the sword. There seems a great scarcity of animal life in these valleys—even the dogs are few, happily. Some few teeth and a tuft of black wool on a high ridge, however, remind us that the wolf is yet seeking what he may devour on the hills, for these are all he has left of a sheep. He is, however, far from common, only leaving the high woods when driven by the heavy snows to seek food lower down.

The red Valerian grows well everywhere in the Riviera Valleys. So, by the way, do some of our favourite garden shrubs, as, for example, the beautiful Venetian Sumach (*Rhus Cotinus*) which is a true rock shrub, dotted over the enormous precipitous walls of stone everywhere. So, too, in these valleys we find the Oleander—which we usually associate with the Jordan. It grows in the river-beds and banks, and freely in the warmer and lower parts of the valleys. In these valleys, like many others, the rocks frequently become almost perpendicular, and this by no means only when the great face is formed of one solid mass! Many of the masses of stone are free, having just a resting place on the mighty wall. Hence, after heavy rains and similar causes, ponderous slices slide down into the valley or on to the mountain road, leaving such a ruin

as makes one grateful to have been out of the way when it tumbled down. Well, for many miles throughout this valley one sees these colossal walls of rock, and they interest us mainly from the vegetation that clings to them. Wherever a chink occurs, or a resting place of any kind, there is the home of a mountain shrub, so that no matter how high the rocks are, they are garnished everywhere, sparsely, with the young green of spring or the silvery tints of its bush flowers. Most frequent, perhaps, is the common European *Amelanchier*, which forms a low-spreading bush, with white flowers, very ornamental as it dots the cliffs 400 feet overhead. With it, and a little prettier, and also with white flowers, is the Mahaleb Cherry, a species very much used by the French for grafting purposes—I mean as a stock. Here and there, among these whitened bushes, is a stain of glistening green, that of our old friend, the Ivy—native here, of course. Sometimes the eye is refreshed with a mass of the most delicious, fresh, and tender green; it is that of the Lime tree, which, on a ledge larger than usual, has attained, after many years of effort, a height of 10 feet. It looks all the more striking from contrast with the dark green Cypress bushes near, and with the dark green Pines above. The *Arbutus* may be seen on the warmer slopes, not at great elevations; its fruit is very good here in autumn. Here, too, is a rather uncommon tree, the *Celtis australis*, small and bush-like, but forming a noble tree in good ground in shrubberies. Pretty among all these is the yellow *Coronilla Emerus*, which suspends its strings of coronas from every rock. The ground is carpeted, in the higher parts of the valley, by the curious little Cob-web House Leek (*Sempervivum arachnoideum*), and the fine strap-leaved silvery Saxifrage (*S. ligulata*) is abundant in large tufts. But what are these delicate stains of lilac among the Grass on that high bluff? The flowers of the charming Margined Primrose (*P. marginata*); you know, the little Primrose with a vein of silver round the margin of the leaf. This is abundant here, and frequently spreads so as to form almost a tuft. There are two other good Primroses here, *P. latifolia*, which I saw very few plants of, a rare kind, and Allioni's Primrose—a beautiful dwarf kind, with fine rose-coloured flowers. This was in abundance, staining the face of an enormous cliff of solid rock, several hundred feet high. The roots had wormed themselves into the smallest chinks, and there formed tufts of little rosettes, every one of which bears a brilliant flower, almost large enough to obscure the plant that bore it. Except for a few yards at the base the plants are wholly inaccessible to man, so that P. Allioni will, probably, have its garden there for as long as the rocks will endure. I forget if I told you before that our common Harebell is replaced in these regions by a species with somewhat larger flowers, and very ornamental, *C. macrorrhiza*. The Maiden-hair Fern abounds, as you might suppose; sometimes, as one goes down to drink at some stream—the streams that come into the main valley from the gorges, are usually clear as crystal—one sees the worn walls carpeted with the Maiden-hair Fern. Frequently it creeps into caves, and mantles them too, hanging down freely from the roof. A striking contrast occurs between the arid-looking mountains and the water-meadows in the valleys, through which tiny streams wind, and from which several crops of Grass are annually obtained. Between these meadows and the rocks on stoney flanks, for the most part, the common Chestnut is abundantly cultivated; the Chestnuts from this valley having a great reputation. This is probably owing to the trees being pruned, and in an excellent manner. They are not mutilated, but the branches are simply thinned, and this, of course, throws the vigour into the remaining ones. This is a lesson in its way, as, obviously, if the Chestnut is greatly improved by this process, it is no less needful for every other kind of fruit. The Chestnut is peculiarly valuable here, as it grows on arid-looking slopes where the Pear and Apple would, I fear, have no chance. The Mulberry is common, and so is the Fig, which latter attains stately dimensions in the lower part of the valleys. I measured one since I wrote last, 2 feet 6 inches in diameter of stem, and 60 feet in diameter of branches—a very noble object. What a paradise it must be in autumn for those who love green Figs, if the Figs happen to be of good kinds! The Walnut is also common, and profitable.

I should like to have a walk with you through one of these valleys, but then you would want to sit down and sketch at every step. I will now bid you good bye for the nonce, by the fringe of the receding snow on the Col de Tende, where a few blossoms of the small white form of the spring Crocus, are opening their deep cups to the sun.

THE FLOWER GARDEN.

SELECTIONS OF ROSES FOR VARIOUS PURPOSES.

THERE is a difficulty in making selections of Roses even for special purposes, because so many gardens have their peculiarities of soil and climate which require to be taken into account, in order that the best possible selection may be made. With those who are not well acquainted with Roses and the conditions of their successful cultivation, it is the best plan to appeal to some one who is well informed on the subject. By this means the end desiderated may be surely and completely attained. The following lists, then, should be taken as of a general character, as the best only for such gardens—which are numerous—where no special conditions of soil and climate exist.

Moss.

Crested
Hybrid Chinese.
Charles Lawson
Hybrid Perpetuals.
Abel Grand
Alfred Colomb
André Danand
Antoine Ducher
Baron Chaurand
Beauty of Waltham
Bessie Johnson
Black Prince
Camille Bernardin
Caroline de Sansal
Centifolia rosea
Charles Lefebvre
Claude Levét
Comte Raimbault
Comtesse de Chabrilant
Countess of Oxford
Devienne Lamy
Dr. Andry
Duc de Rohan
Duchesse de Caylus
Duke of Edinburgh
Dupuy Jamain
Edward Morren
Elie Morel
Emilie Hausburg
Etienne Levét
Exposition de Brie
Felix Genero
Ferdinand de Lesseps
Fisher Holmes
François Michelon

Provence.

Cabbage or Common
White Provence

Moss.

Baron de Wassenaër
Crested
Common
Gloire des Mosseuses
Lancé
Reine Blanche
White Bath

Damask.

Madame Soetmans
Alba.

Félicité Parmentier
French or Gallica.

Éillet Parfait
Perle des Panachées

Hybrid Chinese.

Charles Lawson
Coup d'Hébé
Madame Plantier

Paul Ricaut
Austrian.

Persian Yellow
Perpetual Moss.

Madame Moreau
Madame William Paul

Perpetual White Moss
Salcé

Hybrid Perpetuals.

Abbé Brammerel
Alfred Colomb
Anna Alexieff
Antoine Ducher
Auguste Rigotard
Baron de Bonstatten
Beauty of Waltham
Boule de Neige

100 Good Show Roses.

Francois Trevey
General Jacqueminot
Horace Vernet
Jean Lambert
John Hopper
John Keynes
La Duchesse de Morny
La France
Lælia
Lord Macaulay
Louis Van Houtte
Lyonnaise
Madame Alice Dureau
Madame C. Crapelet
Madame Chas. Wood
Madame Chirard
Madame C. Joigneaux
Madame Creyton
Madame Fillon
Madame Geo. Schwartz
Madame Lacharme
Madame la Baronne de Rothschild
Madame Victor Verdier
Madame Vidot
Madlle. Annie Wood
Madlle. Bennaire
Madlle. Eugénie Verdier
Madlle. Maria Rady
Madlle. Thérèse Levét
Marguerite de St. Amand
Marie Baumann
Marquise de Castellane
Maurice Bernardin
Monsieur Noman
Paul Neron

100 Good Garden Roses.

Centifolia rosea
Charles Lefebvre
Comtesse de Chabrilant
Countess of Oxford
Dr. Andry
Duchesse de Caylus
Duke of Edinburgh
Duke of Wellington
Dupuy Jamain
Elie Morel
Elizabeth Vigneron
Felix Genero
Firebrand
Fisher Holmes
General Jacqueminot
Jean Goujon
Jean Lambert
John Hopper
Jules Margottin
Lady Suffield
La Brillante
La France
Lord Macaulay
Louis Van Houtte
Louise Darzens
Mme. Alfred de Rougemont
Madame Boutin
Madame Chas. Wood
Madame C. Joigneaux
Madame Emile Boyau
Madame la Baronne de Rothschild
Madame Rivers
Madame Victor Verdier
Madlle. Annie Wood
Madlle. Eugénie Verdier
Madlle. Maria Rady
Madlle. Thérèse Levét

Pierre Notting
Prince Camille de Rohan
Princess Beatrice
Richard Wallace
Seneateur Vaisse
Souvenir de Mons. Boll
Victor Verdier
Xavier Olibo
Bourbon.
Souvenir de Malmaison
Noisette.
Céline Forestier
Cloth of Gold
Mme. Caroline Kuster
Tea-scented.
Alba rosea
Belle Lyonnaise
Catherine Mermet
Climbing Devoniensis
Gloire de Dijon
Jean Pernet
Madame Margottin
Madame Villermoz
Madlle. Marie Arnaud
Maréchal Niel
Marie Ducher
Marie Van Houtte
Niphotos
Perfection de Monplaisir
Perle de Lyon
Rubens
Souvenir de Paul Neron
Souvenir d'Elise Vardon
Souvenir d'un Ami
Triomphe de Gaillot fils.

Marie Baumann
Marquise de Castellane
Maurice Bernardin
Paul Nerin
President Thiers
Prince Camille de Rohan
Xavier Olibo
Prince de Portia
Princess Beatrice
Princess Christian
Princess of Wales
Seneateur Vaisse
Thorin
Victor Verdier
Bourbon Perpetual.
Baron Gonella
Comtesse Barabantanne
Madame Gustave Bonnet
Michel Bonnet
Bourbon.
Souvenir de Malmaison
Noisette.
Celine Forestier
China.
Mrs. Bosanquet
Tea-scented.
Adrienne Christophle
Alba rosea
Belle Lyonnaise
Gloire de Dijon
Homer
Madame Falcot
Madame Margottin
Madame Villarmoz
Marie Van Houtte
Safrano
Sombreuil
Souvenir d'un Ami.

32 Roses for Town Gardens.

Madame Hardy
Madame Soetmans
Brennus
Charles Duval
Charles Lawson
Chenedolé
Coup d'Hébé
Madame Plantier
Alphonse Damaizin
Anne Alexieff
Beauty of Waltham

Charles Lefebvre
Dr. Andry
Duchess of Sutherland
Duke of Edinburgh
Elizabeth Vigneron
General Jacqueminot
Glory of Waltham
Horace Vernet
John Hopper
Jules Margottin
Mme. Clemence Joigneaux

Madame Victor Verdier
Maréchal Vaillant
Prince Camille de Rohan
Prince de Joinville
Princess of Wales
Souvenir de la Reine
d'Angleterre
Aimée Vibert
Mrs. Bosanquet
Sombreuil
Gloire de Dijon.

12 Weeping Roses.

Falgens
Gen. Jacqueminot (Hyb.)
Mme. Plantier [Chinese]
Vivid

Ruga
Félicité perpétue
Laura Davoust
Céline Forestier

Desprez à fleur jaune
Ophirie
Gloire de Dijon
Maréchal Niel.

24 Pillar Roses.

Growing from 8 to 10 feet high.

Princess Adelaide (Moss)
Lanei
Madame Soetmans
Brennus
Charles Lawson
Chenedolé
Madame Plantier
Paul Verdier
Vivid

Anna Alexieff
Baron Chaurand
Duke of Edinburgh
Elizabeth Vigneron
General de Lamartinière
Glory of Waltham
Madame C. Crapelet
Madame Jacquier

Marquise de Gibot
Marquise de Ligneris
Perfection de Lyon
Princess Louise Victoria
Souvenir de la Reine
d'Angleterre
Climbing Aimée Vibert
Gloire de Dijon.

24 Climbing Roses for Trellises, Arcades, &c.

Growing from 20 feet to 40 feet in height.

Laure Davoust
Félicité perpétue
Myrianthus renoneule
Ruga
White Banksia (Wall)
Yellow Banksia (Wall)
Blairii, No. 2
Céline Forestier

Desprez à fleur jaune
Cloth of Gold (Wall)
Ophirie
Solfa terra (Wall)
Belle de Bordeaux
Belle Lyonnaise
Climbing Devoniensis
Gloire de Dijon

Madame Levét
Madame Trife
Maréchal Niel (Wall)
Triomphe de Gaillot fils
Brennus
Charles Lawson
Chenedolé
Vivid.

100 Pot Roses.

Hybrid Chinese.
Charles Lawson
Paul Ricaut
Hybrid Perpetuals.
Alba mutabilis
Alfred Colomb
Alphonse Damaizin
Anna Alexieff
Antoine Ducher
Auguste Rigotard
Baron Adolphe de Rothschild
Beauty of Waltham
Bessie Johnson
Camille Bernardin
Caroline de Sansal
Centifolia rosea
Charles Lefebvre
Claude Levét
Cœur de Lion
Comte Raimbault
Comtesse de Chabrilant
Countess of Oxford
Devienne Lamy
Dr. Andry
Duchesse de Caylus
Duke of Edinburgh
Duke of Wellington
Dupuy Jamain
Edward Morren
Elie Morel
Etienne Levét
Felix Genero
Ferdinand de Lesseps
Fisher Holmes
Françoise Fontaine
François Michelon

Francois Trevey
General Jacqueminot
Glory of Waltham
Horace Vernet
John Hopper
Jules Margottin
La France
Lælia
Louis Van Houtte
Lyonnaise
Mme. Alfred de Rougemont
Mme. Alice Dureau
Madame Chas. Wood
Madame C. Joigneaux
Madame Fillon
Mme. la Baronne de Rothschild
Madame Lacharme
Madame Victor Verdier
Madlle. Annie Wood
Madlle. Eugénie Verdier
Madlle. Maria Rady
Madlle. Marguerite Dombrain
Madlle. Thérèse Levét
Marguerite de St. Amand
Marie Baumann
Marquise de Castellane
Marquise de Montmartre
Maurice Bernardin
Paul Neron
Paul Verdier
Pierre Notting
Princess Beatrice
Princess Christian
Princess Louise Victoria

Princess Mary of Cambridge
Richard Wallace
Seneateur Vaisse
Souvenir de Mons. Boll
Victor Verdier
Xavier Olibo
Bourbon Perpetual.
Michael Bonnet
Bourbon.
Souvenir de Malmaison.
Noisette.
Céline Forestier
Tea-scented.
Alba rosea
Catherine Mermet
Devoniensis
Gloire de Dijon
Jean Pernet
Madame Camille
Madame Falcot
Madame de St. Joseph
Madame Jules Margottin
Madame Margottin
Madame Villarmoz
Madlle. Cecil Berthod
Maréchal Niel
Marie Ducher
Marie Van Houtte
Monsieur Partado
Niphotos
Perfection de Montplaisir
President
Rubens
Souvenir d'Elise Vardon
Souvenir de Paul Neron
Souvenir d'un Ami.

Old Roses that should not be lost sight of.

Cabbage, or common
Provence
Crested Provence
White Provence
De Meaux Miniature
Provence
Old or Common Moss
Pompon Moss

White Moss
Maiden's Blush (Alba)
Painted Damask
Tuscany
Rosa Mundi
Village Maid
Yellow Austrian
Copper Austrian

24 Seed-bearing H.P. Roses.

Alfred Colomb
Antoine Verdier
Baron de Bonstatten
Beauty of Waltham
Dr. Andry
Duke of Edinburgh
Dupuy Jamain
Fisher Holmes

General Jacqueminot
Glory of Waltham
John Hopper
Jules Margottin
Lady Suffield
Madame Chas. Crapelet
Madame Victor Verdier
Madlle. Annie Wood

Madlle. Eugénie Verdier
Madlle. Thérèse Levét
Marie Baumann
Prince Camille de Rohan
Souvenir de Dr. Jamain
Thorin
Victor Verdier
William Jesse.

—Florist.

Anemone Robinsonii.—As there is no answer in last week's GARDEN to the inquiry (see page 372) about this Anemone, I may mention that I got my original plant of it from the Manse Garden of Kirkpatrick-Juxta, Dumfriesshire, some eleven or twelve years ago. The Rev. Mr. Little, the late incumbent, was an excellent botanist,

and he considered it merely a seedling of the *A. nemorosa*, which overran his borders, and he allowed me to take the only little patch I could find of it. In our prepared spring border it grows stronger and larger than it did in the horder and walk about the Mause door. I have given it away to many friends, always under the name of "Mr. Little's Anemone," and I saw it first at the Botanical Garden here, named *A. Robinsonii*.—F. J. HOPE, *Wardie Lodge, Edinburgh*.

THE TRUE MEDICINAL RHUBARB.

(RHEUM OFFICINALE.)

UNTIL quite recently, the species of *Rheum* yielding the best medicinal Rhubarb has never been seen in our gardens, owing, probably, to the fact that a great part of the district where the plants grow has not, as yet, been explored by travellers. What is known in English commerce as the best Turkey Rhubarb in reality comes from China, through Russia, by way of Kiachta. It was formerly imported from Natolia, whence the name Turkey Rhubarb. The root is said by Pallas to be dug up in the summer, washed, bored with a hole, strung on a thread, and dried in the sun. In this state it is sent to the chief towns of China, and to the Russian frontier town, Kiachta; at the latter place it undergoes careful examination by the agents of the Russian Government, and all inferior or decayed specimens are rejected. In 1867, what is now regarded as the medicinal Rhubarb, was introduced into French gardens, and has more recently, we believe, been added to the Kew collection of medicinal plants. At p. 206 for the present year, we gave an account of the plant; and we are now enabled to give an illustration of it. This Rhubarb, as will be seen, is a plant of noble aspect; and, although, perhaps, not sufficiently hardy to withstand severe spring frosts, it will, doubtless, form an attractive decorative plant, either on lawns singly, or in other prominent positions, during the hottest months of the year.

WINTER STOCKS.

WINTER Stocks comprise the finest and most effective of this charming family of sweet-scented flowers—not that they possess brighter or richer hues than the summer or annual kinds; but their biennial growth admits of a much larger development of the flowers, and to this is generally allied a free-branching habit combined with a long blooming period. Winter Stocks comprise the Brompton, Queen, Winter Cape, and Intermediate kinds; but these latter cannot, in any case, be regarded as hardy, and scarcely deserve this classification. The true Giant Brompton is the finest of all the Stocks; as, where it is well grown, it oftentimes rises to a height of 2 feet, and then throws up magnificent spikes of bloom 12 inches in length. When grown in this way, the Brompton is a grand border-plant, and is well worthy a place in the finest garden. There are three colours in the Brompton—scarlet, white, and purple; and there is an inferior strain of the Brompton, as distinguished from the Giant, that is more branching, and but rarely develops double flowers. Of these I have grown all three colours; but have found them so inferior, that they have been discarded. Of the Giant kinds, I grow both the scarlet and white; but I have not, nor have I, indeed, ever, seen the purple. No doubt it exists somewhere; but it

is certainly rare. The scarlet is well known; but it is more commonly found amongst cottage gardens than in those of greater pretensions. It is said that all single flowers that have, say, five or six petals, will assuredly produce pods that will contain seed of double kinds. This may be partially true, as regards a good double strain; but that it is not absolutely true of ordinary strains, I have had abundant proof, having, on several occasions saved and raised the seed from such flowers, but the result was that they all came single. Where a good strain exists it is best to pinch out the points of all flowering shoots after they have developed a fair number of blooms; and then, as the seed swells and ripens, there is more strength and plumpness in it than would be found if the plants were allowed to seed indiscriminately. The true Giant White Brompton is a magnificent Stock, producing enormous spikes of huge double flowers. I obtained this kind after considerable trouble, and I have now a fine lot of it in bloom. The Winter Cape Stocks are little known, and form quite a distinctive class, as they are intermediate between the Brompton and the Queen, having the tall stems of the one with the bushy heads of the other.

They are, however, not so hardy as the latter; although they would do well in sheltered gardens, where they would make delightful border-plants in spring. Of these I have five colours—white, scarlet, purple, lavender, and fawn; the two latter shades being exceedingly pleasing, and are not to be found in any other winter kinds. I find that these give about two-thirds double to one of single; the Bromptons, if of a good strain, giving about one-half of each. The Queen Stock forms one of the oldest and most useful of all winter kinds, and it is, I believe, the hardiest. Here, again, the three common colours of scarlet, white, and purple only are found, except where, in some cases, variegated flowers come, a circumstance probably arising from the fact that the white and scarlet, or the white and purple, have been grown in close juxtaposition. As I pass to and from here to the Feltham railway-station I pass several cottages, the front gardens of which are almost full of scarlet and purple forms of Queen Stocks, dwarf, branching, and literally a mass of beautiful flowers, of these more than one-half are double, and the strains pure and good. These Queens



Rheum officinale.

seem to be almost stemless as their heads rest close to the ground and their branches of flower rise to a height of from 10 to 12 inches. The white kind of Queen Stock is not common, although I have seen it in years past, and, no doubt, some of the readers of THE GARDEN are acquainted with its whereabouts. The Queens are largely grown in market gardens, and their flowers are cut for market purposes; they are of equal value for decorating the borders of private gardens. Intermediate Stocks are, necessarily, Winter Stocks, but by no means hardy. If seed of them be sown early in spring under glass, it is probable that the plants will only just come into full perfection in the autumn, too late to be useful. Seed of these should be sown during the months of July and August, but the first week in August is very suitable if sown under glass. The plants should be pricked out in a cold frame, or be potted up and placed in a frame or cold house to stand the winter, and then, if so desired, should be turned out into the open borders or beds about the middle of April, when they will bloom freely for several weeks. The Intermediates give still white, scarlet, and purple, and, if of a good strain, will yield

about 80 per cent. double. I should much like to see growing at Chiswick a collection of every known variety of Stock, it would be a most interesting sight and as sweet as beautiful.

Bedfont.

A. D.

LILY OF THE VALLEY.

THE flowery month of May produces no plant more exquisite either in form or fragrance than this. Most plants have an especial beauty of their own—a something distinctive that is capable of endearing them to us; but this Lily has attractions peculiarly its own. The graceful manner in which its pretty white bells hang on the slender, arching stems, and the agreeable contrast which they make with the bright green foliage, have rendered this little flower not only a favourite with all parties, but especially so with our poets. This little modest flower formerly grew in our woods and valleys in great abundance; but increased cultivation has rendered it comparatively rare in a natural state. In gardens, however, it is the most cherished of all hardy flowers, and the quantities of it used for forcing in early spring would surprise the uninitiated in these matters. Old writers on gardening tell us that about the end of the fifteenth century it grew abundantly on Hampstead Heath, in Bushy Park, at Lee, in Essex, and, indeed, in most counties in England. It grows plentifully in the woods of France and Germany, and is indigenous to most parts of Europe—from Italy to Lapland. It is sometimes called May Flower; but as it grows spontaneously in shady places, though not in reality a Lily, the name Lily of the Valley seems a natural one. The best situation in which to place this Lily in the garden is where it will be partially shaded by shrubs and trees, and it flowers even better in a north aspect than when fully exposed to the noonday sun. It will succeed in almost any kind of soil; but it blossoms in greatest abundance in a light soil, rather poor than otherwise; for, when planted in rich garden earth, the roots spread, and multiply rapidly, but the plants produce but few flowers, and, like many other creeping-rooted plants it seldom seeds. This Lily may be planted with advantage by the sides of water, where, beneath the branches of some Weeping Willow, or other pendulous tree, its fragrance quite scents the air. Autumn is the best time for placing the roots of this Lily in the ground, in which they should be covered about 2 inches in depth, and should not be disturbed oftener than every third or fourth year, as they seldom flower strongly or plentifully the year after being removed. When above ground they will require no other attention than that of keeping them free from weeds. Lily of the Valley is said to be so abundant in woods in Hanover that the ground in many places is completely carpeted with it, and the air to a considerable distance scented with its agreeable perfume. In Germany it used to be common to make a wine of the flowers, by drying them in the summer, and in the time of vintage mixing them with Grapes when pressed. A snuff has also been sometimes made of the dried flowers and of the leaves and essential oil of Marjoram. The fresh blossoms, gathered while wet with the morning dew, have also been used for purposes of distillation.

J. M.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The Double Cuckoo Flower (*Cardamine pratensis*).—While travelling near Boston, the other day, I met with a double-flowering variety of this plant, growing near a clump of the single kind, which it far surpassed in beauty, and was about 6 inches taller. Is a double-flowered Cuckoo flower a rarity or not?—A. B., *Stonford*. [By no means a rarity.—Ed.]

Androsace coronopifolia.—This elegant species, with its beautiful diffuse umbels of snow-white flowers is flowering beautifully with me this season. I find it best to treat it as a biennial; it seeds freely. Plants raised from seeds in early spring, and wintered in a cold frame, flower well the following season.—J. W. MORLEY.

Cheiranthus ochroleucus.—Plants of this useful hardy perennial, divided and planted out in July last, are now masses of bloom, about as much in diameter as in height (6 to 8 inches). Being deliciously sweet-scented, this showy little Wallflower deserves even more extensive cultivation than it at present receives.—Wm. RUMSEY, *Joyning's Nursery, Waltham Cross*.

The Stemless Gentian (*Gentiana acaulis*).—Gentians of various varieties are generally supposed to follow pretty closely the thaw lines on mountains. As the snow melts, the azure blue springs forth behind it, and no severity of weather seems to hurt the Gentians. The best I have ever seen were in Perthshire, on a cold clay bottom and a northern aspect. Yet I have never seen Gentians in East Anglia so full of flower as now. The plants are all flower, and their flowers are large and fine, and the plants healthy, as if they had rather enjoyed, and thriven the better for, the mildness of the winter.—D. T. F.

St. Bruno's Lily (*Anthericum (Czakia) Liliastrum*).—When in bloom, this is one of the most charming of all spring-flowering plants, either for a warm sheltered border, or for pot-culture. I recently saw some pretty little specimens of it blooming in a cold pit in Messrs. Barr & Sugden's trial ground at Tooting, and it struck me that it ought to be more generally grown, as a decorative plant, than it is. It has narrow glaucous foliage, and erect spikes of pearly-white blossoms, deliciously scented. If planted out, select a warm moist border in a sheltered position for it, as its delicate blossoms are often injured by dry cutting winds.—B.

THE FRUIT GARDEN.

WATERING PINES.

IN reply to Mr. Simpson's strictures on my remarks on this subject (see p. 426), I beg to say that what I have advocated, and further wish to confirm, was sufficient, but not excessive, watering. I did not, nor have I any cause to describe, any disastrous results attending this practice; but it is abundant watering, or watering of any kind, after the fruit commences to ripen, and the baneful consequences which I have found to follow, that I particularly wish to guard against. That many Pines are over watered cannot be controverted. Fruits of all kinds, Pines not excepted, that are ripened and gathered from plants that are living in a semi-aquatic state, are always very much inferior in flavour to those ripened under more genial conditions. Pines so ripened may be exceedingly rich and flowing in juice, but where is that peculiar saccharine flavour, so desirable in the Pine, and without which it is of little value? I have not the schedule of the Nottingham show by me, but I presume the society must have been more liberal in those days than it is now, if six or eight Queen Pines were awarded first and second prizes individually. Here again the finely swelled and finished appearance is all that is looked at. Unfortunately, Pines are never tasted on such occasions. Good prizes were awarded to Pines at the Glasgow International Show in 1872, and those who obtained them are, of course, at liberty to make the most of them now, but the editor of the *Gardener* (whose opinion on anything connected with Pine culture is worthy of the highest respect), in his notice of the exhibition in question, sagaciously observed—"We have omitted remarking on the Pines exhibited at this show, for they were very ordinary, and some of them were all but rotten, and should never have been staged." As I am not in the habit of frequenting any of the local shows which Mr. Simpson mentions, I have never inspected his fruit on such occasions; but, if those which he exhibited last year at the International Show in Manchester were samples of his wet practice, I would recommend him to give the comparatively dry system a trial. I am asked if I know under what conditions the Pine grows and fruits in its native habit? I have always given more attention to its artificial cultivation at home than abroad; but, so far as that is concerned, I suppose that Mr. Simpson's knowledge and my own are derived from much the same source. A friend of mine, a planter in the tropics, who is rather fond of a good Pine, in a recent letter, says—"Pine-apples grow naturally here; they are as finely flavoured as English grown Pines during the dry seasons; but, if not protected during wet seasons, they are not worth eating." Can any but one inference be drawn from this? I have for weeks and months watered every stove plant under my charge daily, and Mr. Simpson (see p. 217) says, "The Pine requires as much water as any ordinary stove-plant; and, unless it gets it, it will not thrive." The inference, therefore, is that it should receive water every day. After some comments on air-giving, watering, and many figures of temperature to be strictly adhered to, we are informed that "with plenty of water at the root a Pine will thrive luxuriantly without shutting up or syringing at all." The technical definition of "shutting up," as applied to Pine growing, is the closing of the ventilators to exclude cold air. Surely, therefore, there must be some mistake in reference to this statement.

J. MUIR.

WIRING GARDEN WALLS.

TWENTY-TWO years ago I had two Peach-houses erected under my direction; they were lean-to houses, the length of which was about 120 feet, and the trees were to occupy the back wall, which I had wired pretty much in the way in which walls are now wired. When building the walls I had square plugs of wood placed in them at certain distances apart; to these upright laths were nailed, at distances of 5 feet. Between the laths the wall was plastered, and the laths were embedded in the plaster to a depth of nearly an inch, leaving no interstices in which vermin could find a shelter. After the plastering was finished and the projecting portion of the laths painted, the wires were stretched along the wall at distances of

5 inches apart, each wire was firmly secured to the upright lath by a staple after the wire had been tightened to its greatest tension by a screw and nut. The Peach trees planted against this wall were under my care for sixteen years, and during the whole of that time I cannot remember that any harm was done to the young shoots by tying them to the wires; but the system which I followed may, in part, account for this; they were pruned on the spur system, the young leading shoots I never tied to the wires until they had grown a considerable length, and even then I began at the base of the shoot, proceeding with the operation at stated intervals, as the shoots had acquired hardness and consistency sufficient to bear the pressure of the ties. In tying I wound the matting once round the wire, tied it in a single knot on the side next the wall, and then brought it round to the front; by this means the shoot had room to develop itself, besides having protection from direct pressure upon the wire. Whatever, therefore, may be the faults of wire trellises out-of-doors, I consider them a great advantage where Peaches are grown upon walls under glass. I have here only two small Peach-houses, the trees in which are grown in a similar way to those I have just described. Every year the trees are taken entirely off the wires and the back wall is white-washed. After the trees have been carefully painted with a suitable composition, they are re-tied to the trellises ready for spring work. I have never had an opportunity of trying a wire trellis on walls out-of-doors.

J. T.

FRUIT SHEDS.

A YEAR or two ago I gave an account of an open glazed shed built by Mr. Foster, of Beeston, accompanied by an illustration and description. It is five years since it was planted, and it has every year had a fine crop of fruit. This season it is worth going a long way to see. In my experience I have seen nothing in fruit culture so remarkable as the uniform success of this fruit shed. Who would have thought that a shed open to the north-east would have produced crops five years in succession as this has done, in spite of unfavourable seasons? Last year, when no one here had Apricots, Mr. Foster gathered twenty-five dozen beautiful fruit from two trees which had been loaded every year since they were planted. One Plum—a Rivers' Prolific—produced, when it was cleared, thirty-five pounds, and it was estimated that ten pounds had been previously gathered. A Pitmaston Orange Nectarine here twelve dozen beautiful fruits, and now every tree in the shed is as full of fruit as it is possible for it to be. When it is added that these trees have never been watered since they were first planted, that they have never been syringed at all, and that the only trouble taken with them has been to train them to the wires, thin, and gather the fruit, I think few will deny that the success of this plan of growing fruit is very remarkable. Whoever before heard of a plan of growing fruit under glass when a week or a month's absence of the gardener made no difference, when a frost of 14°, when the trees were in flower—as we had when Apricots were in bloom—did not require to be guarded against, and did no harm? No wonder people are building similar sheds all over the country; for, one thing is quite certain, that no plan of growing unforced fruit has ever been tried to be at all compared with this, either for certainty or economy. Nobody, after seeing this shed, would for a moment think of building a shed for pots and soil, and covering it with slates or tiles instead of glass.

Chilwell.

J. R. PEARSON.

Wood instead of Fruit in Gooseberry Bushes.—How is it that our Gooseberry bushes are throwing out quantities of young wood and not bearing fruit? They were pruned as usual in the autumn and manured; in early spring they showed good promise of fruit, and blossomed at each joint along the stem, but now, instead of fruit, a young shoot about 3 inches long has appeared, besides the young wood which always comes in the centre of the tree, and any fruit that was formed is falling off. This is the case with young as well as old trees. They are planted along the borders of a fruit and vegetable garden, and are manured every year.—A CONSTANT SUBSCRIBER, *Belfast*. [The bushes in question have, probably, been too close pruned in the autumn, and by being very vigorous from growing in a richly-mannured border, that would cause them to make a

quantity of young wood instead of setting fruit. If this is the cause the evil may be cured by root-pruning, or by lifting the bushes and replanting them in the autumn, if not too large and old. No pruning the young wood should be done till the spring of the year after being planted, and then only by thinning out a few of the branches where too thickly placed, and especially all in the heart of the bush. I never prune or spur the young wood of my Gooseberry bushes; all I do is thin out the branches in the spring, before the buds break, and thus they never suffer from the birds eating the fruit-buds in severe winters, or from their making too many shoots to the detriment of the fruit.—WILLIAM TILLERY.]

Gooseberry Caterpillars.—I have seen acres of Gooseberry trees in market gardens stripped of foliage by caterpillar, a cure for the ravages of which may be found in a decoction of Foxglove. Get a quantity of stalks and leaves of this plant, bruise them, and throw them into a copper of boiling water, and let them simmer all night. The next morning the liquor will be the colour of porter; this strength can be reduced by adding water. Strain through muslin or fine netting, and syringe with a very fine rose, if possible, letting the liquid fall on the trees like dew. If no copper is handy, use a water-barrow; pour scalding water on the Foxglove, and cover up with sacks or mats. We have used the above, more or less, for the last twenty-four years, and have always found it to answer. Some recommend Hellebore powder; this I have never tried.—WILLIAM HILL, *Keele Hall, Staffordshire*.

Codling Moth and Sheep.—We have repeatedly urged for years past the importance of turning flocks of sheep and pigs into orchards at the time the young and wormy fruit is dropping. These animals will get at least a part of them. One of the most successful experimenters in this way is Mr. Harris, of Rochester, who gives some striking proofs of the advantages of the practice. He holds the codling moth in check in one orchard by pasturing it with sheep. Another orchard, forty years old, has always been used as a hog pasture, and the Apples are entirely free from the codling moth. Outside the orchard in which the sheep run, is a row of seven trees, which produced last year from two to five barrels of Apples per tree, and being unprotected by animals from the codling moth, all the good Apples from these seven trees were put into one barrel. In his garden, where the animals cannot run, from fifty sorts of dwarf Apples there is scarcely a fair specimen.—*Cultivator*.

The Alpine Strawberry.—In many places Alpine Strawberries are not in much demand before the bulk of the large varieties has been consumed; therefore, as it is not necessary for them to bear till August, it will be better (to avoid exhaustion by unnecessary cropping) to go over them now, and, as far as possible, to cut off all the flowers. Where only a few are grown, this may easily be accomplished with the knife; but, where they are grown in quantity, this would be found a tedious process, involving a good deal of labour and time. We, therefore, use a sharp scythe. Any man accustomed to the handling of such a tool would run over the beds in a few minutes, skimming off the flowers; and, if a few leaves are sacrificed, it is comparatively of little importance, as the plants make foliage so rapidly at this season. This, also, would be a good opportunity to mulch them, if not already sufficiently done. Half-decayed stable manure we find to be the most suitable material for mulching Alpines, as it furnishes a good deal of support and stimulates production. It will settle down and form a clean surface long before the fruit is ripe, and the fruit of the Alpine is supported more by dense close foliage than other Strawberries.—E. HOBDAY.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

The Golden Queen Grape.—Can you kindly give me any information respecting this Grape.—DELTA. [It is a seedling between Ferdinand de Lesseps and Black Alicante. The bunch and berry are exactly like those of the Madresfield Court, but in colour bright yellow. The flavour is said to be excellent.—En.]

Singular Lemon.—Prof. Oudemans has recently narrated a case in the *Archives Néerlandaises*, in which a Lemon, when cut across was found to partake internally of the characters of both the Lemon and the Orange, four of the segments having the colour and taste of the Lemon, the remaining five those of the Orange. The exterior was in no wise different from an ordinary Lemon. M. Oudemans inclines to the view that this fruit resulted from the fertilisation of the flower of a Lemon by the pollen of an Orange.

Attempts to Protect Vines from Frost.—During the recent severe and most destructive frosts, every possible attempt was made in France to protect the Vines by means of straw coverings, made up into the shape of beehives, umbrellas, &c., and in many places wooden planks have been used; but these devices have been attended with but little success. Artificial clouds of smoke from fires kindled in the Vineyards have also been had recourse to, but have equally failed; and the only shelter that has at all succeeded, has been linen cloth spread out over the Vines. Surely these facts are enough to convince Vine growers in these regions that cheap canvas, or similar covering, is what is wanted to prevent wholesale destruction.

DRUMMOND CASTLE GARDENS.

By NOEL HUMPHREYS.

ALTHOUGH Drummond Castle is not remarkable either for site, magnitude, or architecture, and although the park is not of great extent, the gardens have become more celebrated than any others in Scotland, and, owing to their interesting character and beauty, have cast a reflected light, as it were, of celebrity on the somewhat inconspicuous building. The charms of horticulture have, in fact, rescued the place from obscurity. Drummond Castle only consists of an ancient keep, still perfect, but now tenanted merely by a fine collection of Scottish weapons and defensive armour, and a fine series of family pictures, many of which are of historical interest. The modern residence is on the same level as the old castle, but is of very recent date. The castle, like most of the strongholds of the period, was naturally placed on the highest point to be found in the domain. The side of the small but elevated piece of high table-land, beneath which the present noble gardens lie, was originally, no doubt, a precipitous and inaccessible rock, the practicable approach to the keep being at the back. In early times the only garden was, doubtless, such a one as could be planned within the battlements surrounding the crest of the rocky hill, in which narrow space the *Chatelaine* had, probably, her bower and her Rose bush, and a few old-world flowers, such as we see represented in the painted miniatures of mediæval chronicles. But in later and less lawless times, when it became possible for a lady to pass outside her castle gates without a company of men-at-arms, the present gardens were gradually formed, which, as a specimen of the geometrical style, are, on the whole, more attractive than any with which I am acquainted—principally on account of the richness and abundance of the foliage which surrounds them, and which occasionally breaks up with such graceful interruptions the lines and devices of the ground-plan, which, without this softening, would have been somewhat glaring and obtrusive. The approach to the castle hill, through the park, is beneath an avenue of Beeches nearly a mile-and-a-half in length, yet not at all monotonous, on account of the many picturesque variations of aspect which occur during the approach, in consequence of the natural irregularities and rocky character of the ground. In many places the road has been cut through solid rock, and these cuttings have become entirely clothed with Mosses and Lichens of olive, grey, orange, and creamy tints, forming a soft velvet mantle of many colours, and producing a most charming effect. In some places the irregularities of surface are of sufficient dimensions to give to the general effect an air of considerable grandeur. It is, in fact, a half wilderness of mountain-like aspect, often becoming solemnly impressive by the continuous shadow of the great Beeches, between the ancient trunks of which sparkling glimpses are obtained of a picturesque lake. The final ascent to the castle is bright and open, and the entrance is through the ancient gateway of the "keep." By a narrow-vaulted passage the visitor enters a spacious court, on the opposite side of which are the more modern buildings which form the present residence. At the time of my visit the banner of the Drummonds was flying, denoting that "the family" were at home; yet no restrictions on the free circulation of visitors was the consequence. After visiting the interesting collections of arms and pictures in the ancient chambers of the keep, the principle object of a garden-lover's visit began to be realised by a glorious view over the wide-spread display of foliage, flowers, walks, and fountains, obtained from the parapets of the castle court, which, though not so extensive as that from the top of the old tower, was more rich and beautiful, the objects seeming to be more pictorially grouped and blended than in the bird's-eye view from the greater elevation. It put me somewhat in mind of Fontainebleau, but it is certainly finer. The main lines of the design are those of the cross of the patron saint of Scotland (St. Andrew), namely, two bands crossing each other diagonally in the centre. Beyond these characteristically national main lines there are, at each end of the design, two broad walks running past the end of the cross, with a circle between them; and beyond is another walk in the same direction. From this main and simple nucleus of the plan scores of minor ramifica-

tions spring, spreading themselves in every direction, and creating, by their intersections, geometric figures, which are each filled (on the present system of planting this garden) with a mass of only one kind of some handsome flowering plant. These are oftener tall-growing plants than dwarf bedding plants, and their upper stems and branchlets, laden with flowers, bend and sway in the wind, like the surface of a lake gently moved by a summer breeze—

And o'er them lights and shadows pass,
Like lights and shades on waving Grass,—

but with a more magical effect, inasmuch as each waving mass is of a different colour—from crimson and purple to the opaline-pearly tints of orange, green, and emerald. It must be confessed, however, that the geometrical principle is sometimes carried to excess; in such devices, for instance, as that of the production in living flowers of the Drummond badge, the red wavy band on a gold ground, an effect produced by a carefully planted band of scarlet or crimson flowers serpentine through a square or shield-formed mass of yellow ones. This, and other effects of a similar kind are, perhaps, scarcely defensible on æsthetic grounds; but the dimensions of the devices are so large (the kind of plants by which they are effected being tall and robust) that effects are produced which quite over-ride the ordinary objections to the small neat fashion of the "bedding system," which has been satirically called the "pin-cushion style." The intermixture of free-growing foliage, too, combined with the tall and (I am sorry to add) cropped spires of greenery formed of Yew, Holly, Juniper, and other trees, combine to produce a general effect extremely rich and striking; inasmuch, that one might fancy the whole scene the glittering fancy of a passing vision—a waking dream of the gardens of some fairy palace, such as one might read of in mediæval romances. The accompanying engraving represents a perspective view of the upper terrace—a noble piece of semi-rustic masonry, surmounted with vases and busts—above which appears a portion of the modern buildings, and some of the foliage of the high ground on which the castle and modern residence stand. At the time of my visit, last autumn, this terrace-wall was clothed with beautiful climbing plants, most of them ornamental flower-bearers, among which, it appeared to me, that *Clematis Jackmanni* (with its masses of streaming purple, looking like vast festoonings of velvet or satin, according to the light) most certainly bore off the palm of splendour. The border in front was filled with masses of *Canna*, *Hydrangea*, *Scotch Thistle* (so-called), with its hoary leaves and spines glistening like frosted silver. But to allude to all the plants, by name only, which completed the display of that glorious border, would be a useless recapitulation, as every horticulturist at the present day knows well how to fill a border, even of that extent, and make it, through its whole length, a scene of as great floral splendour as that at Drummond was when I saw it. The lower terraces are equally attractive, though of a different character; but of all the terrace work it is the grand central flight of marble steps, guarded by carved balustrading, and surmounted in suitable places by handsome urns, which is the most decorative and most effective feature, and is the one most frequently selected by artists. It has been transferred to canvas, to paper, and to photographic cardboards, over and over again. The general quality of the statuary and fountain-work of the gardens is not of a high character, but it serves to produce the effect required, and, not being overdone, is a valuable and, indeed, necessary adjunct to gardens of a geometric character. A vase or a statue, forming the closing object of many a long vista of green (such as a turf walk, shadowed on either side by evergreen shrubs), is, indeed, one of the most pleasing features of these extensive gardens. Walks, of the kind described, radiate at many points from the more geometrical portions of the design, and are, in each instance, formed by shrubs of different kinds. The more outlying divisions of the general plan, as they become large by divergence, are filled with detached, well-grown, and slightly-trimmed shrubs, generally evergreens, and these masses have the richest possible effect when seen from the terraces above.

The eventual blending of the gardens with the fine surrounding woods is also one of the agreeable characteristics of the place, and it should be noted that some of the Laurels and Portugal Laurels of the outlying portions of the gardens are



VIEW IN THE GARDENS AT DRUMMOND CASTLE.

of enormous size, some of them having trunks almost as big and stately as those of forest trees. At one point, closely adjoining the woods, there is a bridge over a small stream, which has been partially enclosed, so as to form a rocky pond, well furnished with handsome water plants; and from the bridge, between the trunks of great trees, a picturesque glimpse of the park is obtained, lighted up by the bright waters of one end of the lake, the blue-grey mountains rising beyond it in the far distance. Much more might be told concerning interesting features in and about these celebrated gardens, but enough has been said, aided by the accompanying engraving, to give a fair general idea of their style and aspect. One more feature, however, I cannot avoid dwelling upon for a moment—it is a sort of continuation of the terrace effect, in one direction, by means of a vast green wall of Portugal Laurels of enormous size, with a fine broad walk in front of them. These trees have been cropped into recesses at certain distances, and in each recess is a handsome stone seat. This Topiarian device is scarcely defensible according to the higher codes of law, which are beginning to govern modern gardening as despotically as the geometric system ruled over horticultural proceedings in the days of Le Notre; but, in this instance, its effect is pleasing, and not purposeless; for, on sultry summer afternoons, when the sun is blazing down upon the broad gravelled walk, these sheltered recesses must present themselves as very agreeable retreats for an hour of musing, or reading, or other enjoyment.

INSECT DEVOURING PLANTS.

HOWEVER opposite the parts which animals and vegetables play in the economy of the world, as the two opposed kingdoms of organic nature, it is becoming more and more obvious that they are not only two contiguous kingdoms, but are parts of one whole—antithetical and complimentary to each other, indeed, but such “thin partitions do the bounds divide” that no definitions yet framed hold good without exception. This is a world of transition in more senses than is commonly thought; and one of the lessons which the philosophical naturalist learns, or has to learn, is, that differences, the most wide and real in the main, and the most essential, may nevertheless be here and there connected or bridged over by gradations. There is a limbo filled with organisms which never rise high enough in the scale to be manifestly either animal or plant, unless it may be said of some of them that they are each in turn and neither long. There are undoubted animals which produce the essential material of vegetable fabric, or build up a part of their structure of it, or elaborate the characteristic leaf-green which, under solar light, assimilates inorganic into organic matter, the most distinguishing function of vegetation. On the other hand there are plants—microscopic, indeed, but unquestionable—which move spontaneously and freely around and among animals that are fixed and rooted. And, to come without further parley to the matter in hand, while the majority of animals feed directly upon plants, “for ‘tis their nature to,” there are plants which turn the tables and feed upon them. Some, being parasitic upon living animals, feed insidiously and furtively; these, although really cases in point, are not so extraordinary, and, as they belong to the lower orders, they are not much regarded, except for the harm they do. There are others, and those of the highest orders, which lure or entrap animals in ways which may well excite our special wonder—all the more so since we are now led to conclude that they not only capture but consume their prey. As respects the two or three most notable instances, the conclusions which have been reached are among the very recent acquisitions of physiological science. Curiously enough, however, now that they are made out, it appears that they were in good part long ago attained, recorded, and mainly forgotten. The earlier observations and surmises shared the common fate of discoveries made before the time, or by those who were not sagacious enough to bring out their full meaning or importance. Vegetable morphology, dimly apprehended by Linnæus, initiated by Caspar Frederic Wolff, and, again, independently in successive generations by Goethe and by De Candolle, offers a parallel instance. The botanist of Goethe’s day could not see any sense or practical application to be made of the proposition that the parts of a blossom answer to leaves; and so the study of homologies had long to wait.

Fly-catchers.

Until very lately it appeared to be of no consequence whatever (except, perhaps, to the insects) whether *Drosera* and *Sarracenia* caught flies or not; and even *Dionæa* excited only unreflecting wonder as a vegetable anomaly. As if there were real anomalies in

Nature, and some one plant possessed extraordinary powers denied to all others and (as was supposed) of no importance to itself. That most expert of fly-catchers, *Dionæa*, of which so much has been written and so little known until lately, came very nearly revealing its secret to Solander and Ellis a hundred years ago, and, doubtless, to John Bartram, its probable discoverer, who sent it to Europe. Ellis, in his published letter to Linnæus, with which the history begins, described the structure and action of the living trap correctly; noticed that the irritability which called forth the quick movement closing the trap entirely resided in the few small bristles of its upper face; that this whole surface was studded with glands, which probably secreted a liquid; and that the trap did not open again when an insect was captured, even upon the death of the captive, although it opened very soon when nothing was caught, or when the irritation was caused by a bit of straw or any such substance. It was Linnæus who originated the contrary and erroneous statement, which has long prevailed in the books, that the trap re-opened when the fatigued captive became quiet, and let it go; as if the plant caught flies in mere play and pastime! Linnæus also omitted all allusion to a secreted liquid—which was justifiable, as Ellis does not state that he had actually seen any, and, if he did see it, quite mistook its use, supposing it to be, like the nectar of flowers, a lure for insects, a bait for the trap. Whereas, in fact, the lure, if there be any, must be an odour (although nothing is perceptible to the human olfactories); for the liquid secreted by the glands never appears until the trap has closed upon some insect and held it at least for some hours a prisoner. Within twenty-four or forty-eight hours this glairy liquid is abundant, macerating the body of the perished insect. Its analogue is not nectar but the gastric juice. The observations which compel such an inference are recent, and the substance of them may be briefly stated. The late Rev. Dr. M. A. Curtis, forty years and more ago, resided at Wilmington, North Carolina, in the midst of the only district to which the *Dionæa* is native; and he published, in 1834, in the first volume of the “Journal of the Boston Society of Natural History,” by far the best account of this singular plant which had then appeared. He remarks, that “the little prisoner is not crushed and suddenly destroyed, as is sometimes supposed,” for he had often liberated “captive flies and spiders, which sped away as fast as fear or joy could hasten them.” But he neglected to state, although he must have noticed the fact, that the two sides of the trap, at first concave to the contained insect, at length flatten and close down firmly upon the prey, exerting no inconsiderable pressure, and ensuring the death of any soft-bodied insect, if it had not already succumbed to the confinement and salivation. This last Dr. Curtis noticed, and first discerned its import, although he hesitated to pronounce upon its universality. That the captured insects were in some way “made subservient to the nourishment of the plant” had been conjectured from the first. Dr. Curtis “at times found them enveloped in a fluid of mucilaginous consistence, which seems to act as a solvent, the insects being more or less consumed in it.” This was verified, and the digestive character of the liquid well-nigh demonstrated, six or seven years ago, by Mr. Canby, of Wilmington, Delaware, who, upon a visit to the sister-town of North Carolina, and afterwards at his home, followed up Dr. Curtis’s suggestions with some capital observations and experiments. These were published at Philadelphia, in the tenth volume of *Mehan’s Gardeners’ Monthly*, August, 1868, but they do not appear to have attracted the attention which they merited. The points which Mr. Canby made out are, that this fluid is always poured out around the captured insect in due time, “if the leaf is in good condition and the prey suitable;” that it comes from the leaf itself, and not from the decomposing insect (for when the trap caught a plum-currulo, the fluid was poured out while the was still alive, though very weak, and endeavouring, ineffectually, to eat his way out); that bits of raw beef, although sometimes rejected after awhile, were generally acted upon in the same manner—i.e., closed down upon tightly, slavered with the liquid, dissolved mainly, and absorbed; so that, in fine, the fluid may well be said to be analogous to the gastric juice of animals, dissolving the prey and rendering it fit for absorption by the leaf. Many leaves remain inactive or slowly die away after one meal; others re-open for a second and perhaps even a third capture, and are at least capable of digesting a second meal. Before Mr. Canby’s experiments had been made, a similar series had been made in England by Mr. Darwin, with the same results, and with a small but highly curious additional one—namely, that the fluid secreted in the trap of *Dionæa*, like the gastric juice, has an acid reaction. Having begun to mention unpublished results (too long allowed to remain so), it may be well, under the circumstances, to refer to a still more remarkable experiment by the same most sagacious investigator. By a prick with a sharp lancet at a certain point, he has been able to paralyze one-half of the leaf-trap, so that it remained motionless under the stimulus to

which the other half responded. Such high and sensitive organisation entails corresponding ailments. Mr. Canby tells us that he gave to one of his *Dionæa*-subjects a fatal dyspepsia by feeding it with cheese; and under Mr. Darwin's hands another suffers from paraplegia. Finally, Dr. Burton-Saunderson's experiments, detailed at the last meeting of the British Association for the advancement of Science, show that the same electrical currents are devolved upon the closing of the *Dionæa*-trap, as in the contraction of a muscle. If the Venus's fly-trap stood alone, it would be doubly marvellous—first, on account of its carnivorous propensities, and then as constituting a real anomaly in organic nature, to which nothing leads up. Before acquiescing in such a conclusion, the modern naturalist would scrutinise its relatives. Now the nearest relatives of our vegetable wonder are the

Sundews.

While *Dionæa* is local, the *Droseras*, or Sundews, are widely diffused. The two whose captivating habits have attracted attention, abound in bogs all round the northern hemisphere. That flies are caught by them is a matter of common observation; but this was thought to be purely accidental. They spread out from the root a circle of small leaves, the upper face of which especially is beset, and the margin fringed, with stout bristles (or what seem to be such, although the structure is more complex), tipped by a secreting gland, which produces, while in vigorous state, a globule of clear liquid like a drop of dew—whence the name, both Greek and English. One expects these seeming dewdrops to be dissipated by the morning sun; but they remain unaffected. A touch shows that the glistening drops are glutinous and extremely tenacious, as flies learn to their cost on alighting, perhaps to sip the tempting liquid, which acts first as a decoy and then like birdlime. A small fly is held so fast, and in its struggles comes into contact with so many of these glutinous globules, that it seldom escapes. The result is much the same to the insect, whether captured in the trap of *Dionæa* or stuck fast to the limed bristles of *Drosera*. As there are various plants upon whose glandular hairs or glutinous surfaces small insects are habitually caught and perish, it might be pure coincidence that the most effectual arrangement of the kind happens to occur in the nearest relatives of *Dionæa*. Roth, a keen German botanist of the eighteenth century, was the first to detect, or at least to record, some evidence of intention in *Drosera*, and to compare its action with that of *Dionæa*, which, through Ellis's account, had shortly before been made known in Europe. He noticed the telling fact that not only the bristles which the unfortunate insect had come in contact with, but also the surrounding rows, before widely spreading, curved inwards one by one, although they had not been touched, so as within a few hours to press their glutinous tips likewise against the body of the captive insect—thus doubling or quadrupling the bonds of the victim, and (as we may now suspect) the surfaces through which some part of the animal substance may be imbibed. For Roth surmised that both these plants were, in their way, predaceous. He even observed that the disk of the *Drosera* leaf itself often became concave and enveloped the prey. These facts, although mentioned now and then in some succeeding works, were generally forgotten, except that of the adhesion of small insects to the leaves of Sundews, which must have been observed in every generation. Up to and even within a few years past, if any reference was made to these asserted movements (as by such eminent physiologists as Meyen and Treviranus) is was to discredit them. Not because they are difficult to verify, but because, being naturally thought improbable, it was easier to deny or ignore them. So completely had the knowledge of almost a century ago died out in later years that, when the subject was taken up anew, in our days, by Mr. Darwin, he had, as we remember, to advertise for it, by sending a "note and query" to the magazines, asking where any account of the fly-catching of the leaves of Sundew was recorded. When Mr. Darwin takes a matter of this sort in hand, he is not likely to leave it where he found it. He not only confirmed all Roth's observations as to the incurving of the bristles towards and upon an insect entangled on any part of the disk of the leaf, but also found that they responded similarly to a bit of muscle or other animal substance, while to any particles of inorganic matter they were nearly indifferent. To minute fragments of carbonate of ammonia, however, they were more responsive. As these remarkable results, attained half a dozen years ago, remained unpublished (being portions of an investigation not yet completed), it would have been hardly proper to mention them, were it not that independent observers were beginning to bring out the same, or similar facts. Mrs. Treat, of New Jersey, noticed the habitual enfolding of the leaf in the longer-leaved species of Sundew (*American Journal of Science* for November, 1871), as was then thought for the first time—Roth's and Withering's observations not having been looked up. In recording this, the next year, in a very little book, entitled "How Plants Behave," the opportunity was taken to men-

tion, in the briefest way, the capital discovery of Mr. Darwin, that the leaves of *Drosera* act differently when different objects are placed upon them, the bristles closing upon a particle of raw meat as upon a living insect, while to a particle of chalk or wood they are nearly inactive. The same facts were independently brought out by Mr. A. W. Benett at last year's meeting of the British Association for the Advancement of Science, and have been mentioned in the journals. If to these statements, which we may certify, were added some far more extraordinary ones, communicated to the French Academy of Science, in May last, by M. Zeigler, a stranger story of discrimination on the part of Sundew-bristles would be told. But it is safer to wait for the report of the committee to which these marvels were referred, and conclude this sufficiently "strange, eventful history" with some details of experiments made last summer by Mrs. Treat, of New Jersey, and published in the December number of the *American Naturalist*. It is well to note that Mrs. Treat selects for publication the observations of one particular day in July, when the Sundew leaves were unusually active; for their modes vary with the weather, and also in other unaccountable ways, although, in general, the sultrier days are the most appetising:

At fifteen minutes past ten of the same day I placed bits of raw beef on some of the most vigorous leaves of *Drosera longifolia*. Ten minutes past twelve, two of the leaves had folded around the beef, hiding it from sight. Half-past eleven of the same day, I placed living flies on the leaves of *D. longifolia*. At 12^h 48' one of the leaves had folded entirely around its victim, the other leaves had partially folded, and the flies had ceased to struggle. By 2^h 30' four leaves had each folded around a fly. . . . I tried mineral substances—bits of dry chalk, magnesia, and pebbles. In twenty-four hours, neither the leaves nor their bristles had made any move like clasping these articles. I wet a piece of chalk in water, and in less than an hour the bristles were curving about it, but soon unfolded again, leaving the chalk free on the blade of the leaf. Parallel experiments made on *D. rotundifolia* with bits of beef and of chalk gave the same results as to the action of the bristles; while with a piece of raw Apple, after eleven hours, "part of the bristles were clasping it, but not as closely as the beef," and in twenty-four hours "nearly all the bristles were curved towards it, but not many of the glands were touching it."

To make such observations is as easy as it is interesting. Throughout the summer one has only to transfer plants of *Drosera* from the bogs into pots or pans filled with wet Moss; if need be, allowing them to become established in the somewhat changed conditions, or even to put out fresh leaves, and to watch their action or expedite it by placing small flies upon the disk of the leaves. The more common round-leaved Sundew acts as well as the other by its bristles, and the leaf itself is sometimes almost equally prehensile, although in a different way, enfolding the whole border instead of the summit only. Very curious, and even somewhat painful, is the sight when a fly, alighting upon the central dew-tipped bristles, is held as fast as by a spider's web; while the efforts to escape not only entangle the insect more hopelessly as they exhaust its strength, but call into action the surrounding bristles, which, one by one, add to the number of the bonds, each by itself apparently feeble, but in their combination so effectual that the fly may be likened to the sleeping Gulliver made fast in the tiny but multitudinous toils of the Lilliputians. Anybody who can believe that such an apparatus was not intended to capture flies might say the same of a spider's web. Is the intention here to be thought any the less real because there are other species of *Drosera* which are not so perfectly adapted for fly-catching, owing to the form of their leaves and the partial or total want of co-operation of their scattered bristles? One such species, *D. filiformis*, the thread-leaved Sundew, is not uncommon in America, both north and south of the district that *Dionæa* locally inhabits. Its leaves are long and thread-shaped, beset throughout with glutinous gland-tipped bristles, but wholly destitute of a blade. Flies, even large ones, and even moths and butterflies, as Mrs. Treat and Mr. Canby affirm (in the *American Naturalist*), get stuck fast to these bristles, whence they seldom escape. Accidental as such captures are, even these thread-shaped leaves respond more or less to the contact, somewhat in the manner of their brethren. In Mr. Canby's recent and simple experiments, made at Mr. Darwin's suggestion, when a small fly alights upon a leaf a little below its slender apex, or when a bit of crushed fly is there affixed, within a few hours the tip of the leaf bends at the point of contact, and curls over or around the body in question; and Mrs. Treat even found that, when living flies were pinned at half an inch in distance from the leaves, these in forty minutes had bent their tips perceptibly towards the flies, and in less than two hours reached them! If this be confirmed—and such a statement needs ample confirmation—then it may be suspected that these slender leaves not only incurve after prolonged contact, just as do the leaf-stalks of many climbers, but also make free and independent circular sweeps, in the manner of twining stems and of many tendrils. Correlated movements like these indicate purpose. When performed by

climbing plants, the object and the advantage are obvious. That the apparatus and the actions of *Dionæa* and *Drosera* are purposeless and without advantage to the plants themselves, may have been believed in former days, when it was likewise conceived that abortive and functionless organs were specially created "for the sake of symmetry" and to display a plan; but this is not according to the genius of modern science.

Sarracenias.

In cases of insecticide, next to be considered, such evidence of intent is wanting; but other and circumstantial evidence may be had sufficient to warrant conviction. *Sarracenias* have hollow leaves, in the form of pitcher or trumpet-shaped tubes, containing water, in which flies and other insects are habitually drowned. They are all natives of the eastern side of North America, growing in bogs or low ground, so that they cannot be supposed to need the water as such. Indeed, they secrete a part, if not all, of it. The commonest species, and the only one at the north, which ranges from Newfoundland to Florida, has a broad-mouthed pitcher with an upright lid, into which rain must needs fall more or less. The yellow *Sarracenia*, with long tubular leaves, called "trumpets" in the Southern States, has an arching or partly upright lid, raised well above the orifice, so that some water may rain in; but a portion is certainly secreted there, and may be seen bedewing the sides and collected at the bottom before the mouth opens. In other species the orifice is so completely overarched as essentially to prevent the access of water from without. In these tubes, mainly in the water, flies and other insects accumulate, perish, and decompose. Flies thrown into the open-mouthed tube of the yellow *Sarracenia*, even when free from water, are unable to get out—one hardly sees why, except that they cannot fly directly upwards; and a microscopic *chevaux-de-frise* of fine sharp-pointed bristles which lines most of the interior, pointing strictly downwards, may be a more effectual obstacle to crawling up the sides than one would think possible. On the inside of the lid or hood of the purple northern species the bristles are much stronger; but an insect might escape by the front without encountering these. In this species the pitchers, however, are so well supplied with water that the insects, which somehow are most abundantly attracted thither, are effectually drowned, and the contents all summer long are in the condition of a rich liquid manure. That the tubes or pitchers of the southern species are equally attractive and fatal to flies is well known. Indeed, they are said to be taken into houses and used as fly-traps. There is no perceptible odour to draw insects, except what arises from the decomposition of macerated victims; nor is any kind of lure to be detected at the mouth of the pitcher of the common purple-flowered species. Some incredulity was therefore natural when it was stated by a Carolinian correspondent (Mr. B. F. Grady), that in the long-leaved, yellow-flowered species, the lid just above the mouth of the tubular pitcher habitually secretes drops of a sweet and viscid liquid, which attracts flies and apparently intoxicates them, since those that sip it soon become unsteady in gait and mostly fall irretrievably into the well beneath. But, upon cultivating plants of this species, obtained for the purpose, the existence of this lure was abundantly verified; and although we cannot vouch for its inebriating quality, we can no longer regard it as unlikely. No sooner was it thus ascertained that at least one species of *Sarracenia* allures flies to their ruin, than it began to appear that—just as in the case of *Drosera*—most of this was a mere revival of obsolete knowledge.

The Insect Destroying Process.

This was well described sixty years ago, the part played by the sweet exudation indicated, and even the intoxication hinted at, although evidently little thought of in those ante-temperance days. Dr. James Machride of South Carolina—the early associate of Elliott in his "Botany of South Carolina and Georgia," and to whose death, at the age of thirty-three, cutting short a life of remarkable promise, the latter touchingly alludes in the preface to his second volume—sent to Sir James Edward Smith an account of his observations upon this subject, made in 1810 and the following years. This was read to the Linnean Society in 1815, and published in the twelfth volume of its "Transactions." From this forgotten paper (to which attention has lately been recalled) we cull the following extracts, promising that the observations mostly relate to a third species, *Sarracenia adunca*, *alias* *variolaris*, which is said to be the most efficient fly-catcher of the kind:

If, in the months of May, June, or July, when the leaves of those plants perform their extraordinary functions in the greatest perfection, some of them be removed to a house and fixed in an erect position, it will soon be perceived that flies are attracted by them. These insects immediately approach the fauces of the leaves, and, leaning over their edges, appear to sip with eagerness something from their internal surfaces. In this position they linger; but at length, allured, as it would seem, by the

pleasure of taste, they enter the tubes. The fly, which has thus changed its situation, will be seen to stand unsteadily; it totters for a few seconds, slips, and falls to the bottom of the tube, where it is either drowned or attempts, in vain, to ascend against the points of the hairs. The fly seldom takes wing in its fall and escapes. . . . In a house much infested by flies, this entrapment goes on so rapidly that a tube is filled in a few hours, and it becomes necessary to add water, the natural quantity being insufficient to drown the imprisoned insects. The leaves of *S. adunca* and *rubra* [a fourth species] might well be employed as fly-catchers; indeed, I am credibly informed they are in some neighbourhoods. The leaves of the *S. flava* [the species to which our foregoing remarks mainly relate], although they are very capacious, and often grow to the height of 3 feet or more, are never found to contain so many insects as those of the species above mentioned.

The cause which attracts flies is evidently a sweet viscid substance, resembling honey, secreted by or exuding from the internal surface of the tube. . . . From the margin, where it commences, it does not extend lower than one-fourth of an inch.

The falling of the insect as soon as it enters the tube is wholly attributable to the downward or inverted position of the hairs of the internal surface of the leaf. At the bottom of a tube split open, the hairs are plainly discernible pointing downwards; as the eye ranges upward, they gradually become shorter and attenuated, till at, or just below, the surface covered by the bait, they are no longer perceptible to the naked eye nor to the most delicate touch. It is here that the fly cannot take a hold sufficiently strong to support itself, but falls. The inability of insects to crawl up against the points of the hairs I have often tested in the most satisfactory manner.

From the last paragraph it may be inferred that Dr. Macbride did not suspect any inebriating property in the neectar, and in a closing note there is a conjecture of an impalpable loose powder in *S. flava*, at the place where the fly stands so unsteadily, and from which it is supposed to slide. We incline to take Mr. Grady's view of the case. The complete oblivion into which this paper and the whole subject had fallen is the more remarkable when it is seen that both are briefly, but explicitly, referred to in Elliott's book, with which botanists are familiar. It is not so wonderful that the far earlier allusion to these facts by the younger Bartram should have been overlooked or disregarded. Fine writing was his foible; and the preface to his well-known "Travels" (published at Philadelphia in 1791) is its full-blown illustration, sometimes, perhaps, deserving the epithet which he applies to the Palms of Florida—that of pomposity. In this preface he declares that "all the *Sarracenias* are insect-catchers, and so is the *Drosera rotundifolia*." "Whether the insects caught in their leaves, and which dissolve and mix with the fluid, serve for aliment or support to these kinds of plants, is doubtful," he thinks, but he should be credited with the suggestion. In one sentence he speaks of the quantities of insects which, "being invited down to sip the mellifluous exuvia from the interior surface of the tube, where they inevitably perish," being prevented from returning by the stiff hairs all pointing downwards. This, if it refers to the sweet secretion, would place it below, and not, as it is, above the bristly surface.

Why should these plants take to organic food more than others? If we cannot answer the question, we may take a probable step towards it. For plants that are not parasitic, these, especially the *Sandews*, have much less than the ordinary amount of chlorophyll—that is, of the universal leaf-green upon which the formation of organic matter out of inorganic materials depends. These take it, instead of making it, to a certain extent. What is the hearing of these remarkable adaptations and operations upon doctrines of evolution? There seems here to be a field on which the specific creationist, the evolutionist with design, and the necessary evolutionist, may engage in an interesting, if not decisive, "triangular duel." [For the foregoing article, lately published in the *New York Nation*, we are indebted to the author, who kindly furnished us with the papers in which it appeared.—ED.]

Sulphate of Iron and Vegetation.—M. Easbe Gris has been making experiments on the influence of sulphate of iron on vegetation, and comes to these conclusions—that the salt is a stimulating manure; that it presents no danger when intelligently applied; that its action is evident upon the colouring principles of leaves; that from its cheapness a few cents' worth is sufficient to treat hundreds of plants; that it might be applied to cultivation on a large scale, and especially to the cultivation of fruit. His manner of applying the sulphate is as follows:—A solution of two drachms to one quart of water is made, and with this the plants, previously placed in the shade, are watered. It is presumed that the earth surrounding the plant is moist; if this is not the case, a more dilute solution must be used. The solution may be applied daily for five or six days; about two-and-a-half ounces are sufficient for each watering of an ordinary-sized plant, as a *Calceolaria*.

THE INDOOR GARDEN.

DIPLADENIA BREARLEYANA.

THIS, one of the best of all the Dipladenias, has flowered beautifully in Mr. Bull's establishment in the King's Road, where its blossoms, being, as will be seen by the accompanying illustration, of large size, have been most effective. When they first open, they are of a pale rose colour; but, afterwards, they

drained. In order to bloom these plants in perfection, they must be grown on vigorously, without a check, until the pots, into which they are shifted to flower, become filled with roots, and kept free from insect pests, to which they are especially liable if subjected to irregular treatment. As the plants make their growth, thin out the weakest shoots, and re-pot them as required. When the pots become filled with roots, a little clear manure-water will be found beneficial in strengthening the remaining shoots and in improving the colour of the



Dipladenia Brearleyana.

change to brilliant crimson, each flower, when fully expanded, measuring fully 5 inches in diameter. Like the rest of the genus, to which it is a valuable addition, it is a plant of comparatively easy culture. Dipladenias are readily propagated by means of cuttings, plunging the cutting-pots in a mild bottom-heat, and keeping them moderately moist until rooted; after that, they should be potted off into small pots, using a fresh compost of fibrous loam, leaf-mould, and sand. To this, some growers add one-fourth or more of fibrous peat; but the former ingredients are sufficient, if the pots are thoroughly well

foliage. During the growing season they should be syringed two or three times daily, not only as a means of promoting vigour, but as a preventive of the ravages of red spider.

PLUNGING AND DIS-ROOTING BRUGMANSIAS.

A VERY slight modification in the culture of a plant is often found to be a matter of a good deal of importance. I allude more particularly to *Brugmansia arborea*, *B. suaveolens*, and *B. frutescens*, but the same remark is also applicable to *B. sanguinea*. Taking it

for granted that the plants have been properly cultivated for three years from the first blooming in pots plunged each summer in the open garden, and kept in winter in a greenhouse, duly watered and shifted each year into larger pots, they should be, say, about 4 or 5 feet high, with four or five primary branches at that height. The usual course after this period, if it be not intended either to throw the plants away or to continue increasing the size of the pots indefinitely, would be to plant them without pots, or to plunge the pots with their rims so far below the surface as to allow the roots free access to the open ground above the pots. When lifting time comes round, if you have not plenty of border under glass to replunge your plants, but must place them side by side, as lifted, under glass, or in a cellar, or outhouse, it becomes impossible to water the balls properly, from the water running off, the spongioles dry up, and, in addition to the usual damping off of the herbaceous extremities of the plant, it will generally be found in spring that the want of properly preserved spongioles by a due degree of moisture, has caused one or more of the primary branches to die away, thus completely disfiguring the tree. My modification is this, unpot the ball, take out the crocks, and enlarge the hole by chipping with a chisel to the size, say, of half-a-crown, replace the ball without any crocks, and plunge the pot, leaving the rim above ground, water as usual, but within the pot, and in a short time the roots will dive downwards through the hole, causing the plant to thrive and bloom as magnificently as if it were planted without a pot. In autumn, cut off the external roots even with the bottom of the pot, then house as usual, and it will be found that a little water now and then will keep those spongioles all right, which have been kept growing within the pot all summer, and the plants will never lose a branch, *i.e.*, if duly ventilated and not under drip; and so, from year to year, you can keep the same plant blooming and thriving, not indefinitely, of course, but quite long enough to be a great boon to those having but small gardens, little house room, and unable to keep up a regular rotation of cuttings to renew the rejected plants. I have kept in this way, for many years, various huge and unwieldy *Opuntias* and *Cereuses*, and anyone having kept a regular collection of *Cacti* is aware what a nuisance they become when the size of the pot is yearly increased. Those who have not tried it will be astonished at the wonderful growth which slow-growing *Cacti* will make in one single summer when grafted upon one of these old *Opuntias* or *Cereuses*, left to run loose through an open bottom, as compared with what they would do upon the same plant starved in its pot under scorching glass, and always, more or less, infested with vermin. The same method may be applied to almost any greenhouse woody plant which is quiescent during the winter and will thrive in the open garden during summer. It provides for that very slight and slow motion of the sap which constitutes the life of the hibernating plant, and is only apparent to the observer when, by its total cessation, it shows us the plant shrivelling, dying, and, finally, dead. FREDK. PALMER.

Versailles.

Euphorbia splendens.—The genus to which this species belongs is a very extensive one; but few of its members are worth cultivation as decorative plants, but these, few though they are, are so useful and valuable as winter and spring-blooming plants, that we never care to be without their flowers when they are to be had. For bouquets and button holes they are extremely handy, and their coral-tinted blossoms set off white or lilac flowers to the best advantage, and have the additional good property of lasting long after being cut from the plant. *E. jacquiniæflora* is one of the finest, and its wreaths of orange-scarlet flowers come in very usefully as natural wreaths for ladies' hair, or separate flowers set off a button-hole bouquet admirably; this plant, however, only blooms during the winter and spring. The best species for perpetual flowering is the old *E. splendens*, a formidable plant with thick branches, armed at all points with stout spines. It has bright-green foliage and clusters of vermilion or scarlet flowers larger than those of the last-named plant, although not quite so vivid in colour. A plant of this species should be included in every select list of flowering plants grown for a supply of cut bloom.—B.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Scutellaria pulchella.—This is a dwarf blue-flowering Labiate, well worth growing in the plant-stove for variety. It is readily propagated from cuttings struck in a gentle bottom-heat under a bell-glass, or close shade, and flowers freely when only a few inches high. *S. violacea* is similar in habit, but has darker violet-purple flowers.—B.

Toxicophlæa spectabilis.—I often wonder that this plant is not more seen in collections than it is, especially as it blooms freely and lasts long in perfection. I bought a plant of it some time ago, potted it in turfy loam and peat on a well-drained bottom, and it grew well, and has borne a fine crop of its pure white flowers. These last are produced in the axils of the deep glossy green foliage, and emit an agreeable perfume. I consider it one of the most useful of all warm greenhouse plants.—J. B. S.

A FLOWER SERMON.

"CONSIDER the Lilies, how they grow," said our Saviour; "they toil not, they spin not—yet Solomon, in all his glory, was not arrayed like one of these." One day I visited our Horticultural Exhibition. A placard gave notice that the subject of the day's discussion was to be the Lily; so I went in to hear the gardeners "consider the Lilies, how they grow." The Japan Lily was the special subject of the talk—how the stranger could be made to grow among ourselves. One man told of his greenhouse luck, and another of his pot-luck, and the next one talked of soils; and so on round the circle. And all the while the superb things stood upon their stalks and looked at us—no king, in all his glory, arrayed like one of them! That is almost the only tender word about flowers in all the Bible. In the books of the Apocrypha and the Song of Solomon, Roses and Lilies are mentioned twice or thrice in the lover's way; but the Hebrew feeling for Nature was rather the feeling of its sublimity than its beauty. The sun and stars, the mountains, and the desert, and the sea, the rains, the lightning, and the earthquake—these stand forth in the Old Testament imagery. And trees were loved, and fruit was praised; but Grass and leaves are scarcely spoken of, save as the emblem of withering ("All flesh is Grass," "We all do fade as a leaf"); and, when the Hebrew thought of fragrance, he thought of myrrh and frankincense rather than of Roses; and, when he thought of beauty, a gem, rather than a blossom, was the wonder to his eye. Many a flash of ruby, and sapphire, and emerald gleams from the Bible pages. The wall of the New Jerusalem is built up of them, and its twelve gates are twelve pearls; and in that city is a tree of life, and it has twelve fruits, indeed; but never a word of flowers in that heaven-on-earth that was to be. Paul was too earnest in his gospel of repentance, and too deep in the love of God to man, to think of the love of God to the hill-sides, and the good news printed off in illuminated text through all the fields; so this little verse of Jesus stands almost alone, to make us know that there was one pair of eyes at least in Palestine that saw the Father everywhere. It is one of the verses that show that Jesus was no common man.

Spring and Flowers.

What would the spring be without the flowers! And yet a spring with flowers is a modern improvement. For ages and ages, through far the greater part of its life thus far, a flowerless earth turned its sombre face up to the sun. It had not learned to smile. All winter we warm ourselves with the ancient sunshine of springs and summers in the far-off past that made the trees that make our coal-beds. But the spring times of those carboniferous ages had no flowers, no fruit-blossoms, no Grass, and of course no bees, and no song-birds, in them! All the plants, the wise men say, were like our Ferns or our Club Mosses, or our meadow Horsetails, only they "were giants in those days," or else, like our cone-bearing trees, all reproducing in the secret way the Ferns still know, or the quiet way the Pine-cones have. Not till long, long ages afterwards did the earth bear blossoms. Thinking of that we cannot say "The good old times!" We thank Heaven that the birds and flowers came before us. Indeed, the earth had to be ripe for them before it could be ripe for us. So here we are to-day, and the whole land is laughing for us—laughing in Grass and flowers. Great tribes of beings have been already born, and others are on their way into existence, to people the planet again with colour and beauty. What place on it shall have the fairest? Where will the Great Gardener walk and work most fondly? On the broad stretches of prairie-floor paved with gay mosaic? Or in the secret places of the woods? Or in our meadows? No, none of these—for Dr. Hayes says he never saw such beautiful wild-flowers as he found in the Arctic zone, where the summer is almost counted by hours! And Ruskin, with his mountain-love, claims the noblest for the uplands. The Grass grows nowhere softer and greener than on the Alpine pastures; and set out of the glaciers, nestled by eternal snows, rise rocks whose bright tops are gardens of Anemones and Gentians. The Great Central Plain of California for six months of the year is a scorched and dust-swept desert. In April it becomes one flower-bed nearly 400 miles long and thirty wide, set there under the snow mountains. A traveller writes of it: "Go where I would, east, west, north, south, I still plashed and rippled in flower-gems. More than a hundred flowers touched my feet at every step, closing above them as if I were wading in water." To count the riches he gathered the harvest of 1 square yard of plain, taken at random like a cupful of water from a lake, and it gave more than 7,000 distinct flower-heads, besides 1,000 stems of silky Grasses, these rising from an inch-deep velvet floor containing by estimate a million of the tiny cups and hoods that we call Mosses. Where then, is the place of the fairest, seeing that all eyes claim it for their own? Nay, which one of all these children of the sun is fairest? Thoughts about beauty turn into poetry of themselves. And one can hardly think about flowers with-

out twining his words with verse. Let me quote, at least, this one delicate answer to our question—Which one is the fairest?

LA FLOR DEL SALVADOR.

The Daffodil sang, "Darling of the sun
Am I, am I that wear
His colour everywhere!"
The Violet pleaded soft in undertone:
"Am I less perfect made,
Though hidden in the shade
So close and deep, that heaven may not see,
Its own fair hue in me?"
The Rose stood up, full-blown,
Right royal as a queen upon her throne:
"Nay, but I reign alone,"
She said, "with all hearts for my own."
One whispered with faint flush not far away,
"I am the eye of day,
And all men love me;" and, with drowsy sighs,
A Lotus, from the still pond where she lay,
Breathed—"I am precious halm for weary eyes."
Only the fair field Lily, slim and tall,
Spoke not for all—
Spoke not, and did not stir,
Lapsed in some far and tender memory.
Softly I questioned her,
"And what of thee?"
And winds were lulled about the bended head,
And the warm sunlight swathed her as in flame,
While the awed answer came—
"Hath He not said?"

The flowers are children of the sun, I said. Literally so. The sun makes these as actually as it makes the clouds. It is sun-stir, that motion in the earth-atoms which continually unbuilds and builds them up anew. All things take part in the great circulations of the system. It is heat and light that organise the minerals into root and stem and leaf, and then green leaf still higher into flower-organs. Emerson's verse holds simple fact:—

Heat gives the Reed and Lily length,
Adds to Oak and oxen strength.

Earth and sun—it takes them both to make a Clover-head! And the flowers show their kinship with the sun by waiting on it punctually. As he takes his station in the heavens above, they take theirs in the fields below. Spring is spring for each flower separately, and the gay procession of life marches in in order. We can predict the coming banners. We can date the passing weeks by flower-arrivals and departures—can count the quick hours by flower-wakings and flower-closings. But, without thinking of these upper sympathies that possess the little souls of our dumb spring angels, what a marvel is each one in itself, in its own make and stature! Think what the mathematics of the leaf-arrangement imply—that every leaf on every budding tree, in this whole spring, is set in its place by law! that not one has stumbled to its twig, or to its station on the twig, by any accident! and that this same ordered stationing can be traced all through the close phalanx of the Pine-cone's scales, and determines where the limbs shall start on every tree, and the very spot within the blossom where each stamen shall droop or nod.

Form, Colour, and Fragrance.

That last word touches the greatest flower-secret that has thus far been discovered. The high-school boys all know it now, but the wisest men were just high enough a century ago to guess it; and its outcome, the thought involved in it, has rechristened all our modern science. It is the secret that the botanics call metamorphosis, but, in its grander name transfiguration, evolution, the secret that every organ of the flower is but a transformed leaf; that bud-scale, bract, and sepal, and petal, and stamen, and pistil, back to the new bud-scale, in spite of all the difference of their forms and all their various tintings, are but successive leaf transfigurations. Economic Nature gets her new effects, not by selecting new themes, but by playing variations on the old themes; and when she makes a blossom on an Apple tree or on a pasture-weed, she only shortens and alters what would else have been a common leafy branch. How do we know it? By tracing the cousinship of each pair of neighbour organs through graded series of transitional forms; by watching the conversion and the reconversion of these organs into each other in domesticated double flowers; by studying the cases of monstrosity that so often blab nature's riddles and reveal the latent tendencies of beings. On such full evidence as this we know it. But, not content with such transfiguration, the mother of all beauty takes up the separate organs and tenderly carries out her variations on each one. She bears fixed laws in mind, and never really forgets her arithmetic—the rules of twos and threes and fours and fives;

but, by multiplying parts, by dividing parts, by joining them at this place on their edges and then at that, by enlarging some and making others smaller, by their complete abortion sometimes, by moulding horns and cups, by unfurling wings, by hanging bells and ravelling fringes out, by all sorts of dainty devices of sculpture, she makes the myriad distinct species of miracles that men stare at untiringly as the flowers of spring. It is rare luck, in some old classic land, to turn up from the soil the fragment of a marble statue of great beauty. But Nature, she flings her carvings everywhere above the ground—each one complete and fresh and perfect in its niche, and such a joy that, were it the lone one of its race, it would draw the nations into pilgrimage for its worship. She paints them, too; she gives them colour. If any one seems ugly, as a whole, take a bit and put it under a microscope, and see what firmaments of colour, what mines of sparkling gems, you have burst into! Under the lens a quarter-inch of rosy petal flushes and spreads like a sunset sky! A mottled streak turns into a glorious sunrise! You can think of nothing else for fit comparison. And then, instead of speech, she gives them fragrance. They have no language, but in this way "their music goes forth through all the earth, and their word to the end of the world." Unless, indeed, Huxley's fancy be true, and by ears fine enough (possibly only insect fine), a voice also could be heard, "a beauty born of murmuring sound" would pass into our face as we bent over them—sound such as streams have that run through secret channels. If so, what choruses rise through all our fields that some one hears!

The Flower Weddings.

But what is all this lavish sculpture and painting and fragrance for?—lavished on the waste where no eyes see as well as in the garden bed, lavished on the inner slopes and curves where human eyes cannot detect it, as well as on the inch of outward surface. We used to say, God made it so! we used to say, see His delight in simple beauty by itself! We used to say:—

If eyes were made for seeing,
Then beauty is its own excuse for being;

but to-day again steps forward with a new and better word, and hints—not that the beauty is not beauty—that use is the end, and that all this beauty and fragrance is but a path to that end. We can see plainly enough that all the energy of the plant goes to secure reproduction, that all the parts of the flower subserve the purpose of seed-making. Deep hidden within the flower's heart lies the little nursery where the seeds are to be born; most cunningly the pistil and the stamen watch each other like true lovers for a greeting; tenderly the petals close around them in the cool, and open through fit hours of sunlight. And when the stamens and the pistils cannot meet directly, but the message must be borne by insect rovers, then the complication of contrivance to secure the transport of the message almost exceeds belief. The pollen must be brought from one certain spot in one flower and left upon a certain spot upon another. Says one, speaking of Darwin's search into the fertilisation of the Orchids: "'Moth-traps and spring-guns set on these grounds' might well be the motto of these flowers. There are channels of approach along which the nectar-loving insects are surely guided so as to compel them to pass the given spots; there are adhesive plasters nicely adjusted to fit their probosces or to catch their brows, and so unload their pollen-burden; sometimes where they enter for the honey there are hair-triggers carefully set in their necessary path, communicating with explosive shells that project the pollen-stalks with unerring aim upon their bodies." And now Darwin adds to his explanations the thought (it is not yet wholly proved, but it is well advanced in proof) that the lustrous colours of the flowers and their rich odours are also contrivances to aid in the reproduction. He has found it "an invariable rule that flowers fertilised by the wind never have the gaily-coloured petals," and draws the inference that the beauty and the fragrance come upon the blossoms by long processes of natural selection, because attractive to the insects that are needed to assist in fertilising them. The colours and the songs of birds and insects, he shows in part, are similarly brought about—and thus all that gives the life and motion and peculiar gladness to the fields in spring would be literally but the deep in-breathing of the spirit of love in Nature. When we "consider" the flowers, and find such thoughts as these all waiting for us, the words of Tennyson grow very real to us:—

Flower, in the crannied wall,
I pluck you out of the crannies,
Hold you here, root and all, in my hand,
Little flower; but if I could understand
What you are, root and all, and all in all,
I should know what God and man is!

But I must leave the flowers themselves to speak a word about flower love. The Arabs, passing a rich harvest-field or a tree in full

bloom, will greet it with a "Barak-Allah!"—May God bless you! That hints the world-wide feeling. And the Arab beggars name their children Ruby and Diamond, Lily, Rose, and Jessamine. So still do we. Gems and flowers, each the highest product of its kingdom, for a gem is the exquisiteness of flint or clay, and flower the transfiguration of the plant; instinctively and fitly we take them to name all other things precious and beautiful.

Flowers in Art and Poetry.

Art has always fed itself on flowers. Architecture tells the story earliest. The heavy Egyptian column imitates, it is supposed, the Palm tree's trunk, and its capital the Lotus bud of the Nile. The Corinthian capital is the Acanthus leaf, and the stoues of Gothic architecture conspire in a hundred forms to imitate the vegetable structure. Poetry is full of flower fields, because each flower seems so full of poetry to us. The very flower names are often poems. Some come down to us unimpaired with old myth and story and tradition, like the Hyacinth, Narcissus, Solomon's Seal, Arethusa, and the Passion flower. What sacred romances the Lotus flower, the Martyr's Palm, the Victor's Laurel recall! Those long uncouth Greek names we dread in botany, yet there are meanings in them, only they are Greek to us. Heliotrope is "she who turns to the sun;" Mesembryanthemum is simply "flower of the mid-day;" Nasturtium carries its meaning of "bent nose" in its face; Geranium is "crane's bill," let the seed-vessel grow and it will tell the reason why; Saxifrage is rock-cleaver, named so from its birthplace; Anemone is "wind flower." These were all but simple heart and eye names to the Greeks or Romans—each people has its own; just as we call the pets Heartsease, Day's-eye, Morning Glory, Honeysuckle, Mignonette. And when the lovers want to tell the unutterable words they still betake themselves to the dumb messengers that have learned to say so much. There is probably no famous poet that has not sealed his fame into a song about some favourite of the fields. Wordsworth's Celandines and Daffodils are noted, and Burns's Daisy, and Herbert's Rose, and Emerson's Rhodora, and Lowell's Dandelion; while, in Chaucer, the whole spring buds and sings, and all along the lines of Tennyson flowers brush you with fine touches. Nay, every one plays poet with them, though he write no verses. We use them to interpret all the tenderest things in life. When we want to remember a hill-top view, a meeting that has made a holiday, some spot holy with old history, we pluck a flower to make the memory last. If we want to send the home-presence tangibly in a letter, a flower from the window or field close by will carry it best. Old books drop out the "faded yellow blossoms 'twixt page and page," put there "to mark great places with due gratitude." The Californian miner saw the mountain Heartsease where his pick was going to fall, and, before it fell, he was at home across the Continent, quicker than telegrams can fly. And so the flower love, mounting, comes to show itself in man's worship also; and the thought never rises more naturally up to God, than when it rises from bending over flowers. In Buddhist lands they have long been the choicest offering that man brings his Maker, and there are holy blossoms that have symbolised the sun, the world and God's throne! We bring them into church; like visible music they fill the pauses; and who comes here with purer face or life of sweeter obedience to the great laws of Nature! So sweet, so pure, they are, that, like our holiest friends, they fit not joy and wedding moments only but still more naturally they come in together with the tragedies, the silences, the heart-breaks. And why? Is not this the reason:—

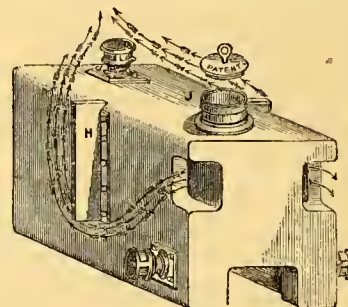
When heaven grows dim and faith seeks to renew
The image of its everlasting dew,
I know no argument so sweet as through
The bosom of a flower—
A wicket-gate to heaven (of which death
Is the grand portal sealed to mortal eyes),
Between whose little bars there comes the breath
Of airs from Paradise.

When the "grand portal" has opened and shut close to us, and we are left with straining gaze outside, the "wicket-gate" seems to give comfort. It seems to grant some little vision into the hidden heart of things, suggesting that the darkness everywhere holds possibilities better than our brightest hopes. Save for the flower-fact here before us who could have dreamed that such beauty lurked in the dark earth, was latent in the tiny seed! So we place the flowers round the still cold face; we lay them on our soldiers' graves; we bring them to the sick room, and the bedside of the dying; and everywhere, after words fail and even music hushes, their presence abides—a voiceless, unconfuted argument that the power within all silences and pained and tragedies is love, and that the possibilities of life are infinite. Flowers and art. Flowers and poetry. Flowers and worship. But the flower-thought of all is that I spoke of—growth; and so we add the flowers and science. For in the flower "a new name is written," and that name now is found to have been

written in all things that are. The old name was revelation; it is not false; but the new name, evolution, widens out its meaning. All things grow—all. The flower is type of the universe, and the Lily of the field is solving over again all problems. [The above is a portion of an able discourse, preached at Boston, by the Rev. W. C. Gannett.]

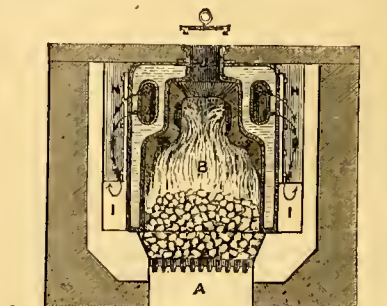
THE PATENT CLIMAX BOILER.

This boiler, brought into notice by The Thames Bank Iron Company, Old Barge Wharf, Upper Ground Street, promises to be both powerful and economical. It is made of wrought iron, firmly welded; it will bear great pressure, and, having no joints or sockets connecting the various portions, there is no risk of leakage. It has a water-way back and front, which adds materially to its heating power; there are also within the boiler itself, two side flues, as in the Gold Medal Boiler, and the fire from these flues passes under the mid-feather or wings on each side of the boiler before reaching the chimney shaft. It is fed from the top, and ample space is provided for fuel (any kind of fuel may be used), to last from twelve to



Front elevation.

fifteen hours, or even a longer period than that, so that all night stoking is dispensed with, even in the most severe weather. This boiler, which is patented, is made in various sizes, from 24 inches to 60 inches in length, the smallest being capable of heating 750 feet of 4-inch pipe, and its price is small compared with that of other boilers. It is easily set in brickwork, there being no complicated flues to make or keep clean, and it can be fixed with the ordinary furnace-bars, or the so-called "water-bars." This latter form of fire-bar adds very considerably to the heating power, while there is comparatively little or no risk of leakage. The front water-way, extending down to within 5 inches of the bottom of the boiler, forms a substantial front for brickwork, and as



Cross section through feeder.

the fire-door is only used for lighting the fire or to get out clinkers, it need only be some 6 or 8 inches high, thus dispensing with the ordinary heavy cumbersome door, so often used to the destruction of all brickwork round about it. These boilers do not require any great depth of stoke-hole; for instance, a boiler to heat 2,000 feet of 4-inch pipe can be set in a hole 5 feet deep by 5 feet wide. Those who have tried this boiler, state that its operation is most satisfactory, and that expenditure, in the way of fuel, is reduced by it to a minimum, a great point now-a-days. It will, therefore, doubtless meet with the success which it deserves. It is, in fact, the Gold Medal Boiler, with important improvements.

THE KITCHEN GARDEN.

CULTURE OF THE MOREL BY MEANS OF TAN.

SOME eighteen months ago, attention was called to a method practised by Mr. Laurent Geslin at Bourg-la-Reine, near Paris, of raising Morels like Mushrooms in artificial beds, the latter being formed of borsedung, earth enriched by night-soil, and decayed wood, kept constantly moist and shaded. The recent observations of Messrs. Lorenz and Schollmayr, in Germany, would appear to show that in tan—the spent bark, &c., of the tan-yard—we have another and, perhaps, still more valuable material for promoting the growth of the above highly-prized edible Fungus. Mr. Lorenz, head gardener at Bunzlan, in Silesia, gives the following as his experience with it:—A short time since he had occasion to make a hot-bed for wintering Roses, Verbenas, &c., the lower lining of it 14 to 15 inches in depth, consisting of leaves of the Lime tree; the upper one 9½ inches thick, of tanners' spent bark (Fir mixed with a little Oak bark). Over the two linings was spread a thin covering of the same kind of leaves, and upon this came the frame. Into the beds thus formed the pots were plunged up to the rim; and, according to the state of the weather, the frame was either shaded and protected against the frost, or so arranged as to admit light and air. Owing to this careful management, the plants looked healthy and well in the following spring, when the time arrived for removing them. On taking up some of the pots at the end of March, great, however, was Mr. Lorenz's surprise to find the soil in them, and the whole of the tan in the bed, over-run with a network of fibres and threads resembling Mushroom spawn; nor was his astonishment less, a month or six weeks later, on seeing spring up in his pots a fine crop of Morels. Unfortunately, instead of leaving the bed and pots undisturbed, as he would have done had he been able to foretell the upshot of this fibrous network spread over them, he removed the tan in order to form another bed; and, in the latter, not a trace of a Morel was to be seen. As the Fungus is frequently met with in the neighbourhood of Bunzlan, some spores of the same had doubtless found their way into the tan of the original hot-bed, and thus been placed under circumstances favourable for their development. No opportunity occurred to Mr. Lorenz to make, on the strength of the above experience, a regular trial of tan as a stimulant to the growth of the Morel; but the results obtained by Mr. Schollmayr, director of an experimental farm at Laibach in Carniola, afford strong additional evidence of its efficacy. That gentleman, with a view to check the ravages of the masses of snails and slugs which, year after year, destroyed the buds put forth by young seedling fruit trees in his nursery, covered the ground in the autumn of one year and the spring of the next a foot deep with spent tan, chiefly consisting of Fir bark and Gall-nut meal. The application of this strong-smelling material had the desired effect. For a twelvemonth or more the ground was freed from snails, and the young trees grew vigorously. Another, and quite unexpected result, however—and it is this alone which interests us here, as corroborative of Mr. Lorenz's experience with tan—was the appearance in great quantities of fine, delicately-flavoured Morels; these shooting up most abundantly wherever the top-dressing was thickest and consisted of bigger pieces of bark. The staple soil of the nursery, it should be mentioned, was a poorish sand; and Mr. Schollmayr observed the curious fact that in those spots which—consequent on the heads of the trees being here and there closer together—were more shaded than the rest, the Morel was replaced by another fungus (*Phallus impudicus*). As Mr. Schollmayr's nursery was dug over several times after the Morels ceased to appear the year above alluded to, he had no means of judging how long his dressing of tan might have effected their growth. He does not doubt, however, that if the application were renewed annually, and a suitable situation selected, the cultivator would be rewarded with a plentiful crop. In expressing this opinion he pre-supposes, of course, the existence of a sufficient supply of spores. T. S.

Early Vegetable Culture.—In front of our plant-houses are several very warm early borders; they are not large, but the soil in them has been specially prepared for early cropping to the depth of 3 feet or so. In preparing sites for early crops this labour is of the most profitable kind; as, when once thoroughly done, annual top-dressings afterwards will sufficiently maintain fertility, with, of course, deep stirring of the soil. These warm borders are devoted early in the season to such crops as Potatoes, Cauliflowers, Lettuce, Horn Carrots, and Radishes, making a sort of rotation with each other annually. We usually commence dipping Potatoes from these borders in the open air by the middle of May. This year we took up the first dish on the 12th inst. Such borders are very easily pro-

tected, which, in the case of Potatoes with us is accomplished in this way—stout Ash or Hazel rods have their thick ends planted firmly in the front of the border; they are then bent over and the other ends secured under the wall-plate of the house. A sufficient number of mats is sewn together, so that two pieces will cover all up; two men can easily cover or uncover in a few minutes, and in windy weather a tie or two makes all secure.—E. HOBDAK.

Killing Weeds.—There are very few gardens, the soil of which has not been allowed to become filled more or less with the seeds of weeds. When crops spring up, the weeds spring up with them. If numerous, the weeds get above the crops. Hard work at hoeing, and laborious finger weedings follow. The crops are overborne and become small. More weeds give a plentiful seeding another year. With industrious gardeners, who take time by the forelock, much of this trouble and loss is prevented by destroying the weeds when very small. When only half an inch high, the bulk of a weed is not a hundredth part as great as when six inches high. It has not yet drawn a hundredth part as much on the crop and on the soil. A single movement of a steel rake at this early stage will kill fifty weeds; but when they grow six inches high, the rake will do nothing, and the hoe must be ground sharp and applied with many hard strokes. There is a better way still. Kill the weeds broadcast just as they are coming up. The main thing is to do this right. The seeds of nearly all garden weeds are small. Very few will find their way up through two inches of soil. Now, get your ground or beds all ready to plant, but do not plant yet. A little warm weather will start all the seeds for about an inch down; and as soon as you see the first green or yellow point peeping up through the black mould, then is the time for action! Do not wait till next day nor till afternoon, for they will now spring up amazingly fast. Take your steel rake and go over the surface two inches down, raking and cross raking, till you have torn all the delicate little plants to fragments. Now then, there is a pretty fair chance for a clean surface, for very few that are deeper than two inches will get up to the light. It would be safer, however, if you can afford the time, to wait a few days, and give your beds a second raking. If your soil is good, you will go over it thus with great rapidity—twenty times faster than after the sowing of the crops, and you will pulverise the soil admirably. The few days delay will be more than made up by the clean surface, freedom from choking weeds, and by vigorous crops.—*Cultivator*.

SOCIETIES AND EXHIBITIONS.

ROYAL BOTANIC SOCIETY.

MAY 20.

This exhibition was one of the best that has been held by the Society for several years, nearly all the classes being well represented by fine, well-grown plants. The chief features were stove and greenhouse plants and pot Roses, the former being far above the average. Orchids were scarcely up to the mark, but possibly the inclemency of the weather kept the best specimens at home. Florists' flowers were fine, but limited in quantity, the best being the fancy *Pelargoniums* of Mr. J. Ward, and the splendid *Calceolarias* staged by Mr. James and Messrs. Dobson. Some charming cut blooms of Tea-scented and other Roses were furnished by Mr. Geo. Paul, of Cheshunt.

Stove and Greenhouse Plants.—The principle exhibitors of these were Messrs. Jackson, of Kingston, and Mr. B. S. Williams, of Holloway, amongst nurserymen; and Mr. J. Chapman, Mr. J. Ward, and Mr. Kemp among amateurs. Messrs. Jackson had a fine group, in which were *Anthurium Scherzerianum*, with about thirty brilliant spathes; a fine specimen of the rosy-flowered *Pimelea Hendersoni*, 4 feet through, and a remarkably good and well-flowered *Stephanotis*, than which few plants are more effective in a miscellaneous group, especially if, as in this instance, they are contrasted with bright scarlet and purple-flowered plants. Other remarkable plants in this group were *Ixora coccinea*, bearing great trusses of orange-scarlet flowers, *Aphelaxis macrantha* purpurea and *Genetyllis tulipifera*, each about four feet through. Mr. B. S. Williams had a well-grown collection, in which were splendid plants of *Acrophyllum venosum* and *Beronia pinnata*, both perfect in their way; also, a fine example of the scarlet-spathed *Anthurium*, but, unfortunately, rather past its best. This group also contained the two best specimen *Azaleas* in the show, a good *Erica Cavendishii*, and other well-grown plants. In the amateur class, Mr. Ward had an excellent group, the most remarkable plants in which were *Azalea sinensis*, a glowing mass of bright yellow flowers; *Statice profusa*, when well grown, one of the most effective of flowering plants; *Erica depressa*, *E. Cavendishii*, a good *Anthurium Scherzerianum*, and well-bloomed specimens of *Aphelaxis macrantha*, both rosy and purple varieties, being well represented. Mr. W. Chapman followed very closely with a highly creditable and well-finished group, containing a splendid plant of *Bougainvillea glabra*, a dense mass of bright rosy lilac bracts; *Ixora javanica*, a perfect specimen, its flowers being well coloured, and the foliage remarkably

fresh and good. The same group also included fine plants of *Erica ventricosa*, *coccinea minor*, and *Pimelea Hendersoni*, each about 3 feet high, and fully as much through; and good specimens of *Azalea Juliana* and *Chorozema Chandlerii*.

Orchids.—The best collections came from Mr. B. S. Williams, Mr. Ward, and Mr. Hill. The last-named exhibitor had the finest specimen Orchid in the show, but, unfortunately, it was staged as a "new plant" instead of as a "specimen orchid," and the result was that it only received a cultural certificate. It was *Dendrobium Falconeri*, bearing some fifty fine richly-coloured flowers. The same exhibitor also had six nice specimens, including a *Vanda suavis*, *V. tricolor*, *Lælia purpurata*, *Masdevallia Lindenii*, with nine or ten flowers, and a good *Phalenopsis Luddeemanniana*. Mr. Child had one of the finest plants of *Oncidium ampliatus majus* we have ever seen, bearing, as it did, great branched flower-spikes fully a yard long. A plant of *Aërides Fieldingii*, in this group, was well bloomed. Mr. J. Wheeler had a nice collection, in which was a good *Dendrobium Bensonii*, evidently recently imported. Mr. B. S. Williams had a fine group, in which were excellent examples of *Aërides Fieldingii*, *Oncidium sphacelatum*, *Cattleya Mossie*, and others. Mr. Ward had fine plants of *Cypripedium villosum*, *Odontoglossum Pescatorei*, *Lycaste Skinneri*, *Oncidium ampliatus majus*, and a well-grown specimen of *O. crispum*, bearing long flexuose spikes of yellow and brown weird-looking flowers. In the class of six the same exhibitor had a splendid plant of *Odontoglossum Phalenopsis*, *Phalenopsis Schilleriana*, with large flowers; *Cypripedium Stonei*, with four spikes; and good plants of *Oncidium sarcodes*, *Phalenopsis grandiflora*, and *Dendrobium thrysiflorum*.

Roses in Pots.—The competition in the classes devoted to Roses was confined to two exhibitors, viz., Mr. Geo. Paul, of Cheshunt, and Mr. Charles Turner, of Slough, both of whom had fresh well-bloomed plants. The latter contributed nice specimens of *Camille Bernardin*, a rich crimson-purple; *Juno*, rosy flesh, the outer petals nearly white; *Victor Verdier*, deep rose; and *Marie Baumann*, a rich rosy-crimson, and evidently a fine Rose for pot culture. Among the Tea-scented kinds, so valuable for bouquets and floral decorations in a cut state, we noted the President, a flesh-tinted variety with very fine buds; *Madame de St. Joseph*, and *Madame Margottin*, a fine clear sulphur. Mr. Turner's group contained exceptionally fine plants of *Madame de St. Joseph*; *Souvenir d'un Ami*, one of the finest of all flesh-tinted Tea-scented Roses; *Madame Villermoz*, and others previously alluded to. Mr. Geo. Paul furnished ten stands of cut blooms in good condition; and small plants in 8-inch pots, from both exhibitors, were remarkably fresh and well-flowered, just suitable for greenhouse, conservatory, or drawing-room decoration.

Fine Foliage Plants and Ferns.—Some good specimens of Palms and other fine foliated plants came from Mr. Donald, who had, among others, *Cyathaea dealbata*, *Croton variegatum*, and an excellent plant of *Cycas circinalis*, which, when well grown, is one of the most effective of all Cycads. Mr. Cole, of Ealing Park, had a splendid plant of *Chamaerops humilis gracilis*, one of the best of all Palms for a cool greenhouse or conservatory; a good plant of the glossy-leaved *Latania borbonica*, *Scaevola elegans*, and others. In the nurserymen's class, Mr. Williams had splendidly-grown plants, among which were fine examples of the rare *Gleichenia rupestris*, about 5 feet high, and as much through; *Cycas revoluta*, *Cordylina indivisa*, and one or two richly-coloured *Crotons*. Mr. J. W. Wimsett had the finest plant of *Maranta Mackoyana* we have yet seen; also a fine specimen of *Croton undulatum*, and excellent examples of *Dracaena amabilis* and *D. Mooreana*. Messrs. Williams, Wimsett, Croucher, and Butler staged fine groups of Palms, suitable for indoor decoration, and the first-named exhibitor also contributed six well-grown Ferns, among which the most remarkable were—*Gleichenia spelunca*, *G. flabellata*, *Dicksonia antarctica*, and the choice *Adiantum Farleyense*.

Azaleas and Heaths.—These quite equalled former exhibitions of such plants, the Heaths being especially meritorious. Mr. Ward, Mr. W. Kemp, and Mr. G. Wheeler, represented the amateurs, while Mr. E. Morse and Messrs. Jackson exhibited in the nurserymen's classes. Mr. Ward had good examples of *E. elegans*, *E. ventricosa magnifica*, *E. eximia superba*, *E. Cavendishii*, *E. affinis*, and *E. florida*, each a yard through. Messrs. Jackson had fine plants of *E. Candolleana*, *E. tricolor speciosa*, *E. tricolor superba*, *E. ventricosa grandiflora*. Smaller specimens were staged by Mr. E. Morse and Messrs. Jackson. Fine as these Heaths undoubtedly were, however, they exhibited little or no improvement in the way of varieties on old-established kinds.

A full list of awards is given in our advertisement columns.

Certificates were awarded to the following, viz. :—

Acer septemlobum tricolor (Smith), *A. s. marginatum* (Smith), *A. s. elegans* (Smith), and *A. pictum maculatum* (Smith).—These are all elegant forms of Japanese Maples, many of which promise to play an important part in our landscape scenery.

Agave marmorata (Croucher), *A. micrantha picta* (Croucher), *A. filifera superba* (Croucher), *Eleocharis Peacockii* (Croucher), and *Mammillaria Roeziana longispina* (Croucher).—All useful and beautiful additions to a popular class of decorative plants.

Anaryllis virginialis (Williams).—A pure white variety, and very distinct.

Adiantum gracillimum (Williams).

Boronia elatior (Veitch).—A pretty greenhouse plant, with fresh green finely-cut foliage something like *B. Drummondii*, and deep rosy-purple flowers, not fully expanded on the plants exhibited.

Athyrium Filix-femina cernuum cristatum (Ivery).—A very beautiful variety of the well-known native Lady Fern. It is likely to be generally cultivated for its beauty, and voted a nuisance on account of its long list of names.

BOTANICAL SOCIETY OF EDINBURGH.

At a meeting of this society, which took place the other day, Mr. M^cNab submitted his report on the open-air vegetation at the Royal Botanic Gardens. In doing so, he said it was not customary to continue his remarks on open-air vegetation beyond the April meeting of the society, but as this spring had been rather of an unusual character as regarded earliness, a few observations in reference to it were worth recording to contrast with seasons which might follow. In his previous reports of this year, beginning with February, it would be found that from the comparatively small amount of continued frosts, also of snow and easterly winds, vegetation commenced at a very early period. Several of those plants selected for recording their flowering, and which usually opened their first blooms during January, and very often in February, were mentioned as flowering in December, thus giving two bloomings in one year, a circumstance which also happened during the early part of the winter of 1863-64. No similar cases had happened with the same species of plants during the twenty-five years that he had been in the habit of recording their dates of bloom. As the past winter had been particularly favourable, vegetation had continued to be from two to three weeks in advance of those hitherto mentioned by him, excepting the spring of 1868. With the exception of the Catalpa and Locust trees, *Celtis occidentalis*, or Nettle tree, *Schabertia disticha*, the deciduous Cypress, and a few Beeches, most others at this date (14th May) presented a rich clothed appearance, while others were in all stages of advancement. Since last meeting, in regard to shrubby plants, vegetation had continued to progress rapidly. Various members of the Hawthorn tribe were in full bloom on the 1st of May—a very unusual circumstance, with the Thorn in Scotland, where, with few exceptions, it was seldom to be seen in bloom before the end of May or beginning of June. This spring has also been very favourable for the flowering of many of the hybrid Rhododendrons, particularly the arborescous forms, many of them being in full bloom in the open air on the 26th of April. Since the last meeting of the society the thermometer had been ten times at and below the freezing point, viz., on the 11th, 12th, 13th, 15th, and 23rd of April, and on the 2nd, 4th, 9th, 11th, and 14th of May, each morning indicating 32°, with the exception of April 13th and May 9th, when it fell to 28°. The highest morning temperatures were on the 20th and 21st of April, indicating 50° and 52° respectively. From a table which Mr. M^cNab submitted, showing the number of degrees of frost registered below the freezing point from 1st October till 30th April for the last eleven winters, it was seen that winters 1865-66, 1867-68, 1868-69, 1871-72 showed fewer degrees of frost than the one just passed, and yet none of them, with the exception of the spring of 1868, exhibited any unusual earliness of vegetation in the month of April and May of these years. In concluding, Mr. M^cNab said that since the 1st of May up to this time a continuance of strong north-easterly winds had been much against the progress of vegetation. Cold, dry winds, with occasional frost at night, were beginning to tell on the early foliage, as well as on many tender herbaceous plants, besides considerably blighting the blossom of the late-flowering fruit trees.

THE INTERNATIONAL HORTICULTURAL EXHIBITION AT FLORENCE.

GREAT flower shows are now become so numerous at home that exhibitions which take place in other countries can hardly possess much interest for English readers who have not the opportunity of seeing them. Besides, foreign exhibitions, like our own, have a monotony as regards the subjects shown, which, after a time, pall. The great Florence show, like most others on the Continent, was mainly distinguished by the presence in abundance of those fine-leaved plants, Tree-ferns, Palms, &c., which are so popular in Continental gardens. They were principally sent from the richly-stored garden of Prince Demidoff at Florence, and from various private and public collections in and near that city. Perhaps the most striking plant of all was the remarkable specimen of *Ruscus androgynus*, spoken of in our account of Prince Demidoff's garden at Florence. Belgian horticulturists also distinguished themselves, as usual, in this department of horticulture; details as to the numerous subjects exhibited in this way can hardly interest the reader, so we omit them. Dr. Moore, of Dublin, exhibited a hybrid *Sarracenia*, between *S. flava* and *S. Drummondii*, and some other interesting pitcher plants. His brother, Mr. Charles Moore, of Sydney, and director of the Sydney Botanic Gardens, brought all the way from his southern home, various tropical fruits, such as the Mango-Jack, Nutmeg, Cashew Nut, and which proved interesting to those only accustomed to the productions of European gardens. Messrs. Veitch were, we believe, the only English exhibitors, and they showed many of their best novelties, and an interesting detachment of their unique collection of Pitcher plants, which were objects of much interest to the Italians, who are not accustomed to see these plants in variety, or in a well-grown condition. Among fruit, the best collections were those of the Orange tribe, which are among the most important products of the country; and some remarkably well-kept Apples and Grapes. Pansies, the culture of which is deservedly popular in Italy, were, of the various subjects known as "florists' flowers" with us, the best grown. The show, which was held in a newly-erected market, was tastefully arranged, and it can hardly fail to spread the love of horticulture in this fair land; in which the march of events has recently prepared the way for progress of all kinds.

In another column we direct the attention of our readers to the possibility of London being selected as the centre for an International Exhibition in 1876.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

WHITE LILAC FORCING.

FOR many years, the forcing of Lilacs in France was a speciality confined to one or two Parisian nurserymen, who kept the process a secret, and to whom it proved a source of vast income, as the flowers, which were pure white, were eagerly sought after, and as the growers of them had no rivals in the trade they were enabled to ask almost any price they pleased for them. Few, however, were then aware that these white Lilacs were produced by forcing the coloured varieties; but this fact is now pretty generally known. The variety used for forcing is that known as the Lilac de Marly. The plants which are intended to be forced should be healthy and vigorous, without having too long-drawn shoots, and it is especially important that they should be old enough to be capable of producing an abundance of flowers. Such plants may be generally obtained after three, four, or five years' culture in a nursery, where they should have been planted at a sufficient distance from each other to allow of the growth of strong thick-set specimens. It is an excellent plan to transplant them once or twice (taking them up with a good ball), as this will cause them to form branchy compact subjects. It also prevents too great a development of the larger roots, while, at the same time, it increases that of the fibres. This facilitates the final lifting from the nursery-ground, and is favourable to success in forcing. Supposing we have such plants of the Lilac de Marly as have been just described, and that we wish to have them in flower in January, we must proceed in the following manner:—In August the plants are to be taken up from the nursery-ground, and carried to the north side of a wall, or other shelter, where they will not be exposed to the sun, but still in the open air. Here they are placed close together, like faggots, standing upright on the ground, the roots being left quite uncovered. The leaves will very soon fall, and the bark will begin to wither and become wrinkled. This, however, should cause no alarm. But, as soon as the bark has become well wrinkled, the stems (not the terminal shoots and branches) should commence to receive slight waterings at such intervals as may be necessary. The object of this is to keep up some degree of vitality in the plants, without, however, exciting them to make any fresh growth. This is a very important point. The plants, in this condition, are to remain where they are placed, in all weathers, until the beginning of December. Should any frost occur in November, as sometimes happens, there is no necessity to shelter them; on the contrary, plants which have been frosted are all the better prepared for forcing. In the beginning of December, forcing should be commenced, that is, if flowers are required by Christmas or New Year's Day. It does not matter much what kind of a house or structure is employed, provided it is large enough to hold the plants (which are sometimes 6 or 7 feet high) without crushing them, and that it is provided with a heating apparatus which will keep up a steady high temperature. Where there is no special structure for this kind of forcing, and the other houses are too low, it is easy, by digging away and lowering the floor, to obtain the desired height, so that the plants, placed erect, with their roots on the ground, may have sufficient room to develop their flowering branches without being pressed against the glass. Failing a plant-house of any kind, a cellar, stable, &c., may be employed, as light is not only not necessary, but absolutely injurious to the operation, the chief points now being to keep the plants in darkness and in the proper temperature. The house being quite prepared, the next step is the introduction of the plants. Supposing flowers are required by the 20th December and the 1st January, it will be necessary, at the end of November, and from the 1st to the 8th December, at the latest, to bring in from the open air the number of plants which it is determined to force. Any earth which remains on their roots should be carefully shaken off; about half the roots should be cut away; all the useless branches, shoots, and twigs—that is, those which do not show flower-buds (which are large, swollen, terminal,

and easily recognised)—should be trimmed off; and, on each of the flowering shoots, not more than from one to three leaf-buds should be left, and these should be immediately under the coming flower-bunches which they will serve to set off. A number of these leaf-buds on a flowering shoot would absorb a large proportion of sap, to the detriment of the flowers. All these preliminary operations having been carefully performed, the plants are next to be brought into the place where they are to be forced, great care being taken, in removing them, not to injure the flower-buds. When brought into the forcing-house, the plants are placed upright, with their naked roots on the floor (whether it be of earth, tiles, bricks or flags), and as close together as possible, so that the roots may overlap each other, and that a great number of plants may occupy a very small space. Where space is not an object, it is not absolutely indispensable that the plants should be placed so close together; nevertheless, this arrangement has one great advantage—viz., that, as the roots are quite uncovered (any soil placed over them would be fatal to the operation), the closer they are placed together, the denser is the network they form, and, in consequence, the more easily do they retain moisture. Another advantage of this close arrangement is that, the space to be heated being smaller, there is less loss of heat, which may then be more easily kept up, and at less expense. The plants being now placed in position, the stems and branches should be slightly watered, but not the terminal shoots. The house should be then closely shut up, and the glass covered in such a way as to completely exclude the light, so that the plants may be kept in continual darkness. Heating should then commence, the temperature being raised to 78° Fahr., at which it should be maintained night and day until the flowers are gathered. During the whole period of forcing, gentle waterings should be frequently given—several times a day, if necessary—in order to keep up a constant humidity in the atmosphere; and, when the flowers are coming into bud, arrangements must be made so as to introduce air without admitting any light, and without allowing the temperature to fall below 78° Fahr., this being absolutely necessary to success. All that now remains is the gathering of the flowers, which, as well as all other operations in the house, should be done by the light of a lantern, and this should be extinguished as soon as the work is over. In this way, and in this way only, is it possible to obtain the charming pure white Lilac as it is produced by the best Parisian growers. It is waste of time and labour to force the varieties of Lilac which have naturally white flowers, as they produce few flowers, and the bunches are small and unshapely. In order to have flowers to cut in succession throughout the winter, the operation of forcing should be repeated every eight or fifteen days, taking the number of plants required, and treating them as before directed, remembering that it takes from a month to six weeks' forcing to bring these shrubs into full flower. Plants destined for late forcings need not be removed from the nursery until September and October, but in all other respects they are to be treated in the same manner as those taken up in August. With respect to the plants which have been taken up, and await their turn for forcing, it will be well, in very frosty weather, to cover their roots with straw or leaves; but this will not be necessary, if, as we have directed, the plants have been placed at the north side of a wall, and sheltered from the sun. We may here remark that plants that have been once forced in this way become completely exhausted, and are afterwards good for nothing except to be used as fire-wood. Lastly, these plants should never be forced in a house, of which the frame-work is of iron, as the rusty drip from the roof is sure to fall on and spoil the flowers. There can be no doubt that the production of this charming winter-flower is as practicable here as in Paris; Mr. Howard, of Balham, succeeded in producing good samples last winter in a warm darkened shed. By following the directions previously given, very fine samples may be obtained. A portion of a low forcing-house, or deep pit, may conveniently be spared in most gardens where there is any extent of glass. In connection with this subject, it may be well again to call attention to the merits of the rather numerous varieties of the Lilac. They are great improvements on the type; and, when well-grown, most effective in the pleasure ground. The Lilac de Marly is one of the kinds alluded to.

W. M.

NOTES OF THE WEEK.

— At the International Botanical Congress, at Florence, we find that an additional grand medal has been voted to Messrs. Veitch & Sons, of Chelsea, whose specimens of *Nepenthes* were amongst the wonders of the exhibition. It is understood that they have been purchased by Count Casanova, an eminent horticulturist, one of those Italian nobles, increasing in number every day, who devote themselves, with enlightened zeal, to the promotion of science in Italy.

— GOVERNMENT returns show that Ireland produced in 1873 2,683,060 tons of Potatoes. The acreage under this crop has been decreasing for the last two years; but the produce of 1873 showed a large increase over that of 1872.

— It may be of interest to plant growers to know that the "Davis competition plants" are to be shown next week (June 4th and 5th), at South Kensington, on the occasion of the great show which is to take place on these days.

— WE learn from the Italian papers that the attempts made last year in Italy, without success, to grow the Tea-plant, are being renewed in the Southern districts of Sicily. It is hoped that this attempt will prove successful, as special pains have been taken to procure seeds and plants from the best sources, direct from Japan.

— THAT interesting little annual festival, the "Flower Sermon," was preached the other evening in the Church of St. Catherine Cree, which was crowded, the greater part being young people, who, almost without exception, carried flowers in their hands. It is customary in these flower sermons to make the discourse turn upon some well-known plant or flower, and on the present occasion the words "Sweet Cinnamon" were chosen, a text from which the preacher drew a picture of the Cinnamon plant, and pointed out the lessons to be derived from it.

— Now, when the culture of hardy plants in pots is receiving the attention which it deserves, it may not be uninteresting to know that *Hyacinthus amethystinus* succeeds perfectly, when grown in this manner. Thus treated, plants of it grow strongly and bloom well, their lovely clusters of blue flowers having a charming effect. The pretty little *Iris cristata* also succeeds well in pots, a 2½-sized potful of it, nicely in bloom, being one of the most attractive hardy plants shown at the recent exhibition at Manchester. Its flowers are of a delicate blue, the outer divisions being prettily streaked with orange.

— NEVER within our recollection has there been such a dearth of hardy herbaceous plants in bloom at the end of May as there is this year, a circumstance, doubtless, attributable to a very genial spring being succeeded by May weather, seldom or never equalled in severity. The following, among other plants, have been particularly affected by the weather, viz., *Iris*es of different kinds, *Dicentra spectabilis* and *eximia*, *Corydalis lutea* and *Leucojum hyemale*. The foliage of *Funkias*, too, generally fine at this season, has suffered in a marked degree, an occurrence almost unprecedented. We have also noticed beds of *Lilium umbellatum* and its varieties, in which the flower-buds have been completely destroyed.

— PARTS of Great Cumberland Place and Oxford Street, near the Marble Arch, are now being subjected to a new system of watering by means of pipes, invented by Messrs. Brown, British River Irrigation Office, Edinburgh. The trial shows that the method is calculated to lay the dust perfectly with great economy of water, a remarkable saving in labour as compared with the water-cart system, and also with a saving in the wear of the road, both on granite and hard-faced macadamised street. With the pipe system the whole surface can be washed; or, for the purpose of laying dust only, a narrow strip next to each curb is watered in a few seconds. This arrests the whole of the deposits of dust, preventing them from rising in clouds; and the road being left for the most part dry, obviates both the creation of dust and the excessive wear of pavement occasioned by the common mode of watering twice every day.

— THE effects of the late frosts on market gardens are, we fear, worse in some localities than was at first anticipated; we shall, however, without doubt, have plenty of Apples, Pears, Plums, Cherries, Strawberries, and Gooseberries, although not that excessive abundance which the profusion of bloom at one time foreshadowed. Currants, in exposed situations, are much injured, two-thirds of the fruit having fallen; but under over-hanging trees the damage is not great. The earliest and finest blooms of Strawberries have also suffered, but still plenty has been left for a crop, which will be somewhat late, and its duration shorter than usual. Early Peas, such as Dillistone's Early, Dickson's First and Best, Sangster's No. 1, and other white round kinds that were so badly cut up when coming into bloom, will, in some cases, scarcely repay the trouble of

gathering. Late Marrows, however, look well and are likely to be abundant. Picking, generally, will now be from ten to fourteen days later than usual. Of Moss Roses, which are grown by the acre in market gardens, not a single sound bud, in some places, is to be found; every one, without exception, has been either partially destroyed, or has fallen off quite soft and black.

— ANOTHER edition of the Rev. S. Reynolds Hole's "Book about Roses" is in preparation; it will thus be seen that the book has met with the success which it deserved.

— THE first part of the third issue of Sowerby's "British Wild Flowers" (Van Voorst) is now out; the descriptions, with an Introduction and a Key to the Natural Orders, being by C. Pierpoint Johnson, Botanical Lecturer at Guy's Hospital.

— A CURIOUS little book has just been privately printed for Mr. William Bagge, of Shirle Hall, Sheffield, under the title of "Bibliotheca Nicotiana—a First Catalogue of Books about Tobacco." It comprises the title in full of about 170 separate works of various dates, from 1547 to the present time, upon the properties and uses of this popular herb. The collection of titles covers, in fact, with tolerable completeness, the special literature of tobacco since its original introduction into Europe.

— WE find that the fine plant of *Dendrobium Falconeri*, alluded to by us last week (see p. 432) was grown by Mr. J. Hill, gardener to Sir William Marriott, Down House, Blandford, and not by Mr. Hill, gardener at the Poles, Ware, as stated. A specimen of this *Dendrobium*, on a block, has, however, produced over 100 flowers at the Poles; and, since receiving Mr. Hill's letter, we have seen another fine specimen, which has from 200 to 300 buds, nearly open. As this plant, however, will shortly be exhibited, we shall again have an opportunity of alluding to it more fully.

— BLOOMS of the Cape Tulip (*T. Broyniana*) have been sent to us from Messrs. E. G. Henderson's nursery, in the Wellington Road. It is an old species, which bears small yellow, or rather orange, flowers tinged with reddish-brown, and delightfully sweet-scented. At Messrs. Osborn's it is grown in quantity under the Dutch name of *T. persica*, and elsewhere we have seen it labelled *T. Celsiana*. It seeds freely, produces offsets in abundance, and is well worth growing, if only for the sake of its fragrance, which, even in a cut state, it long retains.

— SOME of the Oxford undergraduates have taken up an idea of Mr. Ruskin's, not without interest to our readers. Mr. Ruskin deprecates the prevailing rage for athletics, chiefly on the ground that the results of such amusements as cricket, rowing, &c., are practically *nil*, excepting, of course, those produced on the individual athlete. He says, let us develop a new form of athletics, one which will leave some practical result, not only on the frames of the workers, but on the object of the work. It is for this purpose that a band of amateur gardeners has been formed, and the numbers who have joined are already so considerable that, whether for good or evil, this scheme will have a full and impartial trial. The place selected for the work is at Hincksey, about a mile from Oxford, and the ardour with which a number of undergraduates enter into the new scheme is a proof that Mr. Ruskin made a happy hit in suggesting this method of working off the superfluous physical energy of the University. The scheme has been ridiculed, of course, as was to be expected, but has been thus defended by Dr. Acland in the *Times*:—"Mr. Ruskin, a man of no narrow sympathies, has known Oxford for forty years. He is as interested in the greatness of the educated youth of England as he is in the well-doing of the poor. He is loved by both. To the high-spirited youth of Oxford he has said, 'Will none of you out of the abundance of your strength and of your leisure do anything for the poor? The poor ye have always with you. Drain a single cottage, repair a single village by-way, make good a single garden wall, make pleasant with flowers one widow's plot, and your muscles will be more strong and your hearts more light than had all your leisure hours been spent in costly games or yet more hurtful amusements.' Is he wrong? Are the hearty, kindly men who obeyed him, wrong? Are they likely to be worse Englishmen for their pleasant love of a respected teacher, and their cheery almost playful help to agricultural labourers? Will society be worse that a body of steady students, with a kindly enthusiasm, left their wonted games to lessen the sadness of the world, and make more bright some English cottage homes? To say nothing of the good of humane and hearty occupation to the men themselves, are we sure that sincere men such as these, when wisely directed, will not be among the best safeguards in the heaving, restless, social fabric of modern life. Is Mr. Ruskin unpractical in thus harmlessly evoking the sympathies and energies of the unspoiled minds about him?" We may add that garden work, especially any kind of ground-work, is good exercise, inasmuch as a greater variety of muscles are brought into play than is the case in walking, and various other kinds of exercise in which one set only is employed.

GARDENING IN THE TIME OF PLINY.

Ancient Roman Villas.

THE shattered remnants of our castles and abbeys are, in many instances, more beautiful than the perfect structures ever could have been. When new, their bare cold stones, notwithstanding the carven traceries that enriched their mouldings, cornices, and windows must have been far less attractive, from a pictorial point of view, than their ruins are now—when wild and gracefully-straggling Bramble and brush-wood have softened the asperities of their outlines, mantling Ivy robed their naked battlements, and the golden Wall-flower, crimson Antirrhinum, and wild Carnation crowned the broad broken ridges on which the prosaic roof once rested. Some of the Italian ruins, titanic remnants of Roman splendour are far more beautiful than any of our own; for, in addition to the grandeur of their dimensions, and the fascination of their greatly superior antiquity, the rich southern vegetation with which they are wreathed, as with funereal honours, invests them with a charm that northern climates cannot rival. Sebastiani, an Italian botanist, published an interesting account of all the plants found in the ruins of the

Coliseum, which he entitled "Flora Colisea," and enumerated 260 species. The author of "Childe Harold" pauses to describe the effect of that vegetation upon the hoary walls, as it appeared by night, alluding to the wreath of Bay or Laurel with which flatterers crowned Caesar's portrait-statues, and even the profile which appears on his coinage. Our poet would have been deprived of the opportunity of making his allusion had his visit to Rome been made at the present time, for the city authorities, grown over ac-

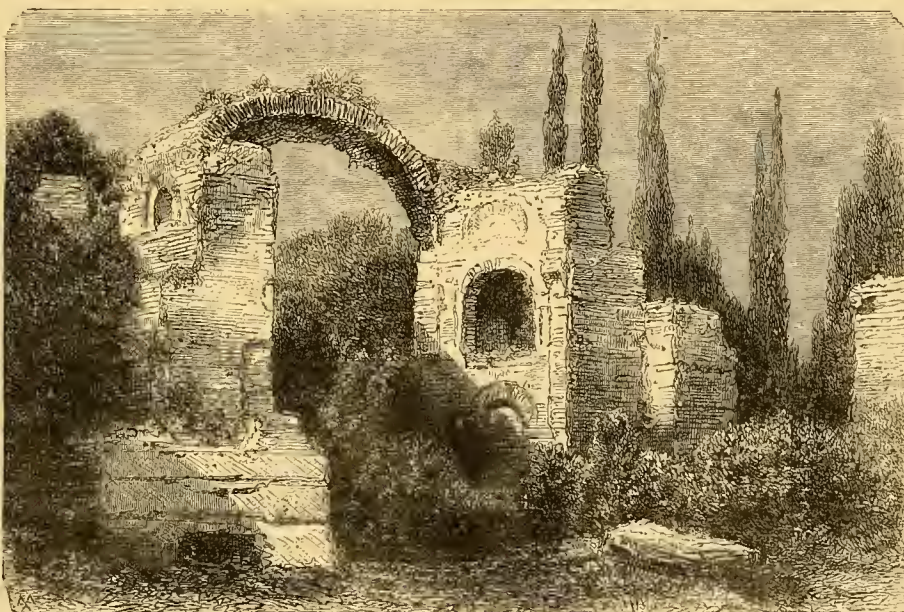
tive since their release from Papal thralldom, have cleared away the whole of the "Flora Colisea," and made it clean and tidy, in the same spirit that stimulated our British churchwardens to whitewash the interiors of so many of our fine parish churches, to make them neat.

The ruins of the villa of Hadrian, at Tivoli (the ancient Tibur), are among the most beautiful in the vicinity of Rome, partly in consequence of their site on the rugged western slope of the Sabine Hills, and partly in consequence of the more luxuriant vegetation, with which they are partially covered and surrounded, and in the midst of which dark spires of Cypresses are freely scattered, as shown in the accompanying engraving. It is possible that the architecture of this magnificent villa, which has proved a perfect mine of statues and other works of art, buried by continually falling ruins, was the design of Hadrian himself; as we know that several temples were built after his imperial devices, the non-observance of which, to the very letter, led to the "suppression," in the most fatal acceptance of the term, of the celebrated architect Apollodorus. The letters of a contemporary, Pliny the younger, afford a student the means of ascertaining pretty accurately what the character of those pleasant walks of the literary emperor were like; and a

few quotations from them will tend to prove that the Tiburian villa of Hadrian, and other villas of the ancient Romans, were very similar to those of the modern Italians.

Pliny possessed a villa at Tusculum (the modern Frascati), not far from that of Hadrian at Tibur; and he had also a marine villa at Laurentum, at one of the nearest points of the coast to the great city. He had also villas at Comum, the place of his birth (the modern Como), and in other parts of Italy, many of which he described with much minuteness in letters to his friends. Of the villa among the Apennines, close to the Larian Lake, now the Lago di Como, he gives, in a letter to his friend, Apollinaris, a very minute account, "The winters here," he says, "are severe and cold, so that Myrtles, Olives, and trees of that kind, which delight in constant warmth, will not flourish; but it produces Bay trees in abundance, though, indeed, they are sometimes killed to the ground by the frost. The summers, however, are exceedingly agreeable." Describing the view from the front of his villa, he says:—"The disposition of the country is the most beautiful that can be imagined. Figure to yourself an immense amphitheatre, such as Nature herself only can form. Before you lies a vast plain, bounded by mountains, whose summits are covered with venerable

woods." The lesser hills, he tells his friend, are as fertile as even the valleys, though they mature their crops somewhat later. "Below," he continues, "are numberless vineyards, which are terminated, as it were, by a border of shrubs; and lower are meadows and fertile fields." "You could not be better entertained," he exclaims, "than by a view from the top of one of our neighbouring mountains, which you might imagine not real, but some painted landscape, drawn with most exquisite beauty and exactness." It



Vegetation on a portion of the ruins of Hadrian's villa, at Tivoli.

is quite evident that Pliny had a keen taste for the beauties of unadorned Nature; though we shall see presently that he was a slave to the then prevailing fashion of gardening, in the principal features of which the Topiarins, or tree-clipper, played a very conspicuous part. "The aspect of the house is due south," he continues, "and seems to invite the afternoon sun into the spacious portico." "In front of the portico is an ambulatio (a kind of terrace walk), embellished with several statues, and bounded with a Box hedge, from which you descend by an easy slope, made agreeable to the eye by the representation of various animals in clipped Box . . . towards a lawn over-spread by the soft—I had almost said liquid—Acanthus." "This is surrounded by a walk, enclosed with suitable over-greens shaped into a variety of forms. Beyond it is a *gestatio*" (an arena for horse or carriage exercise) "laid out as a circus, ornamented in the central space by dwarf Box cut into numberless different kinds of figures; the whole being fenced in by a wall covered with clipped Box, rising by different ranges to the top. Beyond the wall lies a meadow that owes as many beauties to Nature as what I have been describing within owes to Art, and it is continued by other meadows and

* This name appears to have been given to some kind of Moss

fields interspersed with thickets." These last remarks are sufficient proof that Pliny admired Nature as well as Art in horticulture and arboriculture, and that something like our English park scenery, with trees unclipped, and interspersed with woods and thickets, generally formed a portion of the surroundings of a noble Roman's country seat. He next describes a "grand dining room" in a projecting portion of the building, which commands pleasing views of other parts of the structure, and also of the woods enclosing the Hippodrome. Also an adjacent apartment, consisting of three rooms in ordinary use, all of which "look out upon a small area softly shaded by four Plane trees, in the midst of which is a fountain, over the marble basin of which fresh spring water continually flows." There was also, it seems, another very snug room closely adjoining, which appears to have been a great favourite with Pliny. He tells his friend that it is "situated close to the nearest Plane tree, and enjoys a constant shade and verdure. Its interior," he says, "is lined half way up with carved marble;" and from thence to the ceiling, he informed his friend that foliage was painted, among which birds were seen perched upon the branches, which had an effect altogether as agreeable as the carving; while at the base, on one side, was a little fountain, ever playing, in several jets, into a graceful vase, "producing a most agreeable and soothing murmur." "Near at hand," he continues, "is an artificial cascade, which entertains at once both the eye and the ear." He next enumerates, in detail, the luxuries of the different bath-rooms, and the beauties of an elegant portico (colonnade) that connects the house with the Hippodrome. He then proceeds to dilate upon the charms of a grotto, with every accommodation for a pleasant summer retreat, *al fresco*, in which, he says, "during the summer heats pleasant coolness may always be enjoyed." In the annexed engraving it has been attempted to realise the probable aspect of Pliny's "cool and pleasant grotto." Just such a one, only more modest in extent and decoration, as was doubtless to be found in Hadrian's imperial villa at Tivoli; for such an adjunct was seldom absent from a Roman villa of any pretension. The woods seen through the entrance, shown in the illustration, may be supposed to be those enclosing the Hippodrome. Externally, the entrance presents the aspect of a rocky cave, softened in outline by closely-clinging Ivy; while the interior walls are formed of the imperishable Roman cement, decorated with fresco-painting, in designs similar to those of the Baths of Titus, which gave Raphael the first hint for his famous arabesques in the external galleries of the Vatican, and also by the presence of the never absent fountain. The ceiling is simply the naked rock, unadorned, except by a few climbing plants, that, with rambling grace, mock the unreality of the artificial foliage painted on the walls. The floor is, of course, of mosaic, and the marble table is spread with light refreshments, which may be awaiting the arrival of the host, with some select friend (the two seats are waiting for them) to discuss the merits of those poets of the day, long since forgotten, which it was the fashion of the time to consider superior to Homer and Virgil. Pliny tells us much more about his cherished villa—of apartments looking down the rocks to the Vineyards below—of an extra summer dining room, "cooled by the wholesome breezes which course through the Appenine valleys;" and he also tells his friend of a wood of "Plane trees covered with Ivy, so that while their heads flourish with their own foliage, their bodies enjoy a borrowed verdure, which spreads from tree to tree and connects them together." This plantation, his friend is told, formed "a straight boundary on either side of the Hippodrome, bending at the farther end into a semicircle, set round and sheltered with Cypresses, which cast a deeper and nobler shade." Within this plantation, and facing the course of the Hippodrome, there were seats for the comfort of spectators of the horse and chariot races; "and, behind them, among Bay and Box trees, were Roses that perfumed the air, making as pleasant a contrast to the dark foliage as the coolness of the shade does with the warmth of the sun." He next speaks of another portion of the ground, concerning which he says to his friend Apollinaris (after describing plantations of fruit trees and hedges cropped into various devices), "On a sudden, after enjoying the effect of this elegant

regularity, you are surprised with an exact imitation of the negligent beauties of rural Nature," the character of which he proceeds to describe, along with an account of a marble alcove, with a fountain in the centre surrounded by a broad flat margin, which, being at a convenient distance from the encircling marble seat, was made to serve as a summer dining-table, the larger dishes being placed upon it, "while the smaller ones, in the form of aquatic birds, floated about upon the surface of the water." Opposite to this, as Apollinaris was told, was an exquisitely-sculptured marble summer-house, opening into a delightful green enclosure; and, annexed to this summer-house was a small room, "with windows on every side, which, nevertheless," he says, "enjoys a very soft and agreeable gloom, derived from trained Vines, which climb to the top, and entirely overshadow it." The self-satisfied Pliny closes his description (to us so charming and instructive, but which may have seemed somewhat prolix to his victimised correspondent) by reminding him that Homer employed many verses in the description of the arms of Achilles, as did also Virgil in that of *Aeneas*; and he winds up by saying, that without such a minute description (of which our translation is but a mere sketch) he could not have fully explained why he preferred his villa at Comum to those which he possessed at Tusculum, Tibur, Preneste, and other places. Prosaic as his long account may have appeared to his friend, it has proved a most precious legacy to posterity, and enables us—while wandering through the beautiful ruins of Hadrian's villa in the midst of noble fragments of the past lying among Brambles—

Cypress and Ivy, weed and Wallflower grown,
Matted and massed together; hillocks heaped
On what were chambers, arch crushed, column strown
In fragments—choked vaults and frescoes steeped
In subterranean damps—

to realise, in imagination, the precise kind of characteristics which it presented in the palmy days of its newness and splendour. It has been remarked that the Roman gardens in the time of the Emperor Trajan bore a striking resemblance to French gardens of the seventeenth century in almost every particular of their arrangement.

H. N. H.

THE LIBRARY.

THE AMATEUR'S ROSE BOOK.*

MR. SHIRLEY HIBBERD's book—which is dedicated in a very genial and brotherly spirit to the Rev. S. Reynolds Hole, thus demonstrating that love among the Roses influences those who write about them, not with jealousy—green-eyed as a *Rosa Gallica*—but with pleasant fraternal sympathies—is well worthy of a perusal from all rosarians, but specially of those who, like the author, cultivate Roses close to cities and towns; but who, unlike the author, rarely realise even a resemblance of the royal flower. These desponding florists, however frequent and complete their disappointments may have been, should make this volume their own, not only by purchasing but by learning it; because he, who wrote, has proved that his instructions are no mere surmises and theories by producing at public exhibitions the Roses which he has grown. Therefore, "let the town amateur take courage," as Mr. Hibberd bids; "but let him also take care; for, to buy Roses hap-hazard, and plant them anyhow, will not answer in the furnishing of a town garden." Then follows advice, with the reason why it should be accepted, always simply and sensibly urged, as to size, situation, soil, planting, management, and selection of Roses most suitable for town gardens. But the townsman who loves Roses is wisely counselled by the author not to depend solely on the open ground for his supply, but to take advantage of the better climate, which may be secured by the employment of glass, and so, by good greenhouse culture, for which Mr. Hibberd gives ample and minute directions, to secure a plentiful bloom of those lovely Tea-scented Roses which he cannot grow in his garden. Here, again, we have the results of experience from the writer's own "Rose-house, at Stoke Newington," in lieu of mere speculations; and the reader is encouraged to trust his guide in the cheerful confidence that he knows the way, and that, if it be followed patiently, there is rest at the end of it—upon a bed of Roses. Many wood engravings teach the tyro far more quickly and accurately than words can, and there are some fine coloured plates of Roses, of which the best are *Perle de Lyons* and *Maréchal Niel*.

* "The Amateur's Rose Book." By Shirley Hibberd. A New Edition. London: Greenbridge & Sons.

THE FRUIT GARDEN.

WIRING GARDEN WALLS.

I must beg to differ from Mr. Baines's estimate of this system, which I consider to be a great boon to gardeners and their employers, and we must not forget that we are indebted to you, Mr. Editor, for bringing the system into notice; for, although, as Mr. Baines says, it is an old system, yet it used to be very clumsily done. Now it is so simple and easy, and the little raisisseur, or tightener, works so well that any handy garden labourer can wire a wall without much trouble or expense. Of all the systems I have tried this is the best; it saves much labour, a point of great importance, for I know that there are hundreds of gardeners who have stood by walls nailing till they were almost frozen into an icicle. By the wiring system, and good bast ties, I will engage to tie a dozen branches while Mr. Baines is doing one by the old method. In many places the walls are all studded with nails, quincunx fashion, 9 inches apart; but even in that case it takes longer to tie a shoot to a nail than to wire, and then one has the branches farther from the wall than where wires are used. As to the shoots gumming, I have had less of that since I adopted this system than before; and as for crossing the tying material betwixt the shoot and the wire, I never think of giving more than one single twist round the wire to keep the shoot in its place. As regards the trees bulging out from the wall when old, I have some trees on the walls more than thirty years of age that have been wired, and, instead of old straggling spurs I have got them much closer to the wall than when the old system of nailing was practised. So far I can prove wiring to be a success. I have had upwards of 4,000 yards of galvanised wire put up on my walls five years ago, and each year I have had satisfactory crops of Peaches, Apricots, Figs, Pears, Plums, and Cherries. This spring, one or two Peach trees were not protected during the frosts which occurred in March; still, on those two we have a fair crop. Some of the Apricots, too, which had only a few Fir boughs tied to the wires to protect them, set their fruit quite thickly. I am quite sure that anyone who gives the wiring system a fair and impartial trial will be pleased with it. I find that three courses interval for Peaches, and four courses for Pears, answer very well.

H.

STRAWBERRY CULTURE.

MAKE the three following points a basis of operations, and Strawberry growing will be found to be a reality, viz., dig deeply, manure heavily, and plant early. The young runners should be layered about the middle of the month of June, in small pots filled with good sound loam. The pots should be placed under the runners, and a stone about the size of a small hen's egg should be laid on each runner. This keeps the soil damp, the pots steady, and the young plant in its place. When sufficient runners have been layered (which may be easily got at by measuring the land to be planted, allowing 3 feet from row to row, and $2\frac{1}{2}$ feet from plant to plant in the row), keep the young plants regularly watered daily, and, in about fifteen days, they will be rooted round the pots, and ready for planting, which should be done as follows:—Setting the line for the first row, take out holes, 9 inches in diameter and 6 inches deep, with the spade, and fill them with good loam and dung, planting the Strawberries firmly. By doing this you give the Strawberries a fair start. Afterwards give each a good watering, nicely level the soil about them, and the work of planting is completed. The system adopted by many is to plant Strawberries after Potatoes, in August and September, taking the runners from the old plants at random, and planting them with a dibber. Under such circumstances they look sorry things all the winter, and in the spring many deaths occur, making the Strawberry quarter look unsightly. The plants have little or no fruit the first year; whilst I maintain that if Strawberries are managed as directed, the first year's fruit is by a long way the best. Some say the quantity is not got thus, but what about the quality? Are not twelve Strawberries, weighing 10 oz., better than thirty weighing the same weight? The varieties which I have grown here consist of Sir Charles Napier,

British Queen, Keens's Seedling, Black Bess, and President. This season I am trying Laxton's Traveller, which has received a first-class certificate from the fruit committee of the Royal Horticultural Society. If I were asked the following question: Which is the best Strawberry? I should without hesitation answer, "Sir Charles Napier." This variety is hardy and prolific; it packs well, and carries its bloom, after being gathered, longer than any other variety with which I am acquainted. Variety is, however, not only pleasing, but fashionable; therefore, I grow Keens's Seedling for early work (Black Prince is earlier, but too small), Sir Charles Napier, Dr. Hogg, Black Bess, President, and British Queen; and, for the latest of all grown on north borders, Late Pine. Strawberry preserves are much in request here, and for that purpose I grow a pure, selected stock of Grove End Scarlet, which is prized more than any other variety for preserving. As regards productiveness, where large supplies are in demand, I may mention that on a yearling plant of Sir Charles Napier I have counted 374 expanded blooms, on Keens's Seedling 200, British Queen 150, and on Black Bess, a variety too little known, 234. Of the last I may mention that it was raised by a gentleman who never "let it out," but who gave a few special friends plants, my late employer being one of them. Black Bess is a mid-season variety, and a prodigious bearer, very dark in colour, sugary in flavour, refreshing, and in every way worthy of a place in first-class collections. I find that the best way of supplying Strawberries for my employer's table is to send in a different variety weekly, and to label all for the sake of comparison. This has a tendency to advance the interest taken in fruit culture. As to general cultivation, it consists in keeping the ground open and the weeds down. Watering is an operation which has not been performed here for these five years past. My practice is, when the Strawberry plants are in flower, to mulch them with long dung from the stables, for the purpose of keeping them damp and the fruit clean. When the fruit begins to colour I place stakes in rows over the quarter, tying rope yarn from stake to stake; and, over these, I place a net to keep off birds.

R. GILBERT.

PEACH TREES DROPPING THEIR BUDS.

THIS disease, if it may be called a disease, is so common now-a-days, and so disastrous to the Peach crop when it does occur, as to deserve some attention. Most gardeners are more or less acquainted with it from experience. In some cases, especially in that of early-forced trees, it is attended with the most ruinous consequences, every leaf-bud sometimes falling, except the terminal one on each shoot, making it very difficult to lay in a stock of bearing wood for the following year. The dropping always begins just when the buds begin to move. If the branches are tapped with the hand at this stage, they will fall off like a shower of hail; and, if the trees have been pruned on the cutting-back system, the chances are that no terminal bud will be left; and there is then no alternative but to cut all the previous year's growths back to their base, or out altogether if no buds are left, and trust to adventitious buds forming on the older wood. I have known cases quite as bad as this. Peach growers, therefore, who, like your correspondent, "Kent," in THE GARDEN the other day, are troubled with the disease, should never cut back the shoots at the winter pruning. I never knew the natural terminal bud to drop, even in the worst cases; but in shortened shoots—that is, shoots cut back to a leaf-bud—the leading bud is just as likely to fall as the others. It is a noticeable fact, that the disease has increased very much with the extension of Peach culture under glass. With Peaches out of doors it is seldom or never troublesome. Only under glass does it occur to a serious extent, and, the earlier the trees are forced, the worse it is; and here, I think, we have a clue to the cause. In an early Peach-house, for instance, when the fruit is ripe, in May or June, perhaps, and the wood and buds approaching maturity, the trees are naturally disposed to go to rest with a gradually decreasing temperature; but, though the matured foliage will fall off in due time, little or no diminution of temperature is experienced; and often, during August and September, the trees are exposed to a strong sun-heat, aggravated by the protection of glass, which forces the buds into a partial activity at the wrong time. By

October the cold weather sets in, and the trees are again brought to a sudden standstill till December or January, when they are started in the usual course; but, no sooner do the prematurely forward buds feel the stimulus than they drop off—as the fruit would certainly do at the stoning period, under similar conditions. Whether this explanation is correct or not, I have described exactly what happens, at least under the circumstances, and I can further add, that when means are taken to save the trees from being prematurely excited, by removing the lights in summer and autumn, or shading, &c., the evil disappears, or nearly so. Nine years ago we planted an early Peach-house here, and for a few years after planting the buds dropped, more or less, when the trees were started, but more especially after hot summers and autumns like 1868. At such times, I have seen the thermometer in this house stand at 90° and 95°, day after day, in spite of ample ventilation, when the trees were leafless, and should have been at complete rest. Feeling, in my own mind, sure that this was the cause of the buds dropping, I made arrangements for having the roof sashes, which were fixtures, removed entirely after the fruit was gathered in June, which practice I have adhered to for the last five or six years, and the dropping has entirely ceased from that time. If a few buds do fall off occasionally, they are so few as not to attract attention. In late houses dropping does occur, but to a less serious extent. In such cases the remedy is to keep the houses as cool and airy as possible after the wood is ripe and the leaves begin to change colour—if possible keep the trees at complete rest till they start in spring. Where this practice is adopted, bud dropping will cease to be troublesome. Dryness at the root, and want of attention otherwise, may probably accelerate the disease; but I have seen the most healthy trees, in every respect, drop their buds under the circumstances described, where both border and roots were in the most healthy condition, and where the trees received every attention. Besides the case I have recorded, many instances have come under my notice from time to time, and I have always had good reason to suppose that the evil was due to the causes I have mentioned. J. S. W.

Watering Pines.—"That many Pines are over-watered," says Mr. Muir (see p. 440), cannot be contraverted; and, considering the number of Pine growers that exist in the country, we may, I think, admit the possibility of accidents and mistakes in this as in other things, and possibly, also, the counter proposition that "many Pines are under-watered" may be propounded with equal safety. Again, Mr. Muir remarks that "fruits of all kinds, Pines not excepted, ripened and gathered from plants that are living in a semi-aquatic state, are always very much inferior in flavour to those ripened under more genial conditions." In his experience as regards this matter Mr. Muir stands quite alone, though I should imagine he is perfectly right. Hitherto, I have not seen Grapes, Peaches, or Pines grown in water. Next, he reverts to the Glasgow show, at which I neither exhibited nor visited; and what that exhibition has to do with the subject under discussion I cannot imagine, but as he seems anxious to quote the opinion of the editor of *The Gardener* in such matters, I may inform him that Mr. Thomson called here a few days before the Nottingham show, on his tour southwards, and saw our Pines, and he afterwards told me that they were amongst the best he had seen on his journey; and in the brief report of that exhibition, which was given in *The Gardener*, the fruit, generally, is described as being somewhat ordinary, Pines excepted. As to my Pines at last year's Manchester show, the few which I exhibited in my collection were the tail end of the summer fruit, and had been kept five weeks in the fruit-room; consequently, the crowns were somewhat shrivelled, but, otherwise, the fruits, which varied from 3 lbs. to 4 lbs. weight each, were, when cut up, sound and excellent, even after having been kept so long. They were mostly smooth-leaved Cayennes, and, had it not been for these considerations I should, probably, have entered in the single class for Pines which I did not do. My object in stating my success was to corroborate my practice, and I would remind your correspondent that, before he proceeds to diminish the value of other people's evidence, he should furnish some of his own, in support of what are, as yet, apparently only assertions.—J. SIMPSON.

Early White Grapes.—The earliest variety in ripening with me is the Early Malvasia, or Early Keinzheim of the Horticultural Society; it is a luscious, sweet, little white Grape, which ripens in the end of August, followed by other early white sorts, such as Early Malingo, Early Smyrna Frontignan, Chasselas Vibert, Early Saumur Frontignan, and Royal Muscadine or Chasselas de Fontainebleau of the French.—W. T.

THE FLOWER GARDEN.

CULTURE OF THE VIOLET FOR THE PARIS MARKET.

Those who purchase or are presented with bouquets of Violets, have, as a rule, little idea of the labour and attention required to produce this pretty little flower and prepare it for market. They think, probably, that the woods, hedges, and meadows, furnish the immense quantities of it which are seen in Paris in the early spring, and in smaller or larger quantities throughout the summer, autumn, and even winter, according to the coolness or mildness of the three last-named seasons; whence the plant has been named "*Violette des Quatre Saisons*." It is a variety of the Wild Sweet Violet (*Viola odorata*), that may have been a wild seedling sown naturally, or it may have sprung from seed gathered and sown by some cultivator intent on raising varieties. However that may be, the variety is not very well fixed, as in some cases it produces plants which vary a good deal. The plants which unite all these qualities in greatest perfection are, of course, preferred by the growers. The Sweet Violet has also produced several other varieties, such as the Single White, the Double White, the Single Rose, the Double Rose, the Double Violet or Blue, and the variety named *Violette de Parme*. This last, which differs from the Sweet Violet in having smaller and paler leaves, and large, long-stalked, very double flowers of a pale or delicate blue colour mixed with a little white at the base, and with a stronger odour, which is different from that of other Violets, is, nevertheless, considered to be nothing but a variety of the same plant. It is almost the only variety which is grown for forming bouquets along with the *Violette des Quatre Saisons*.

Cultivation of the Sweet Violet.

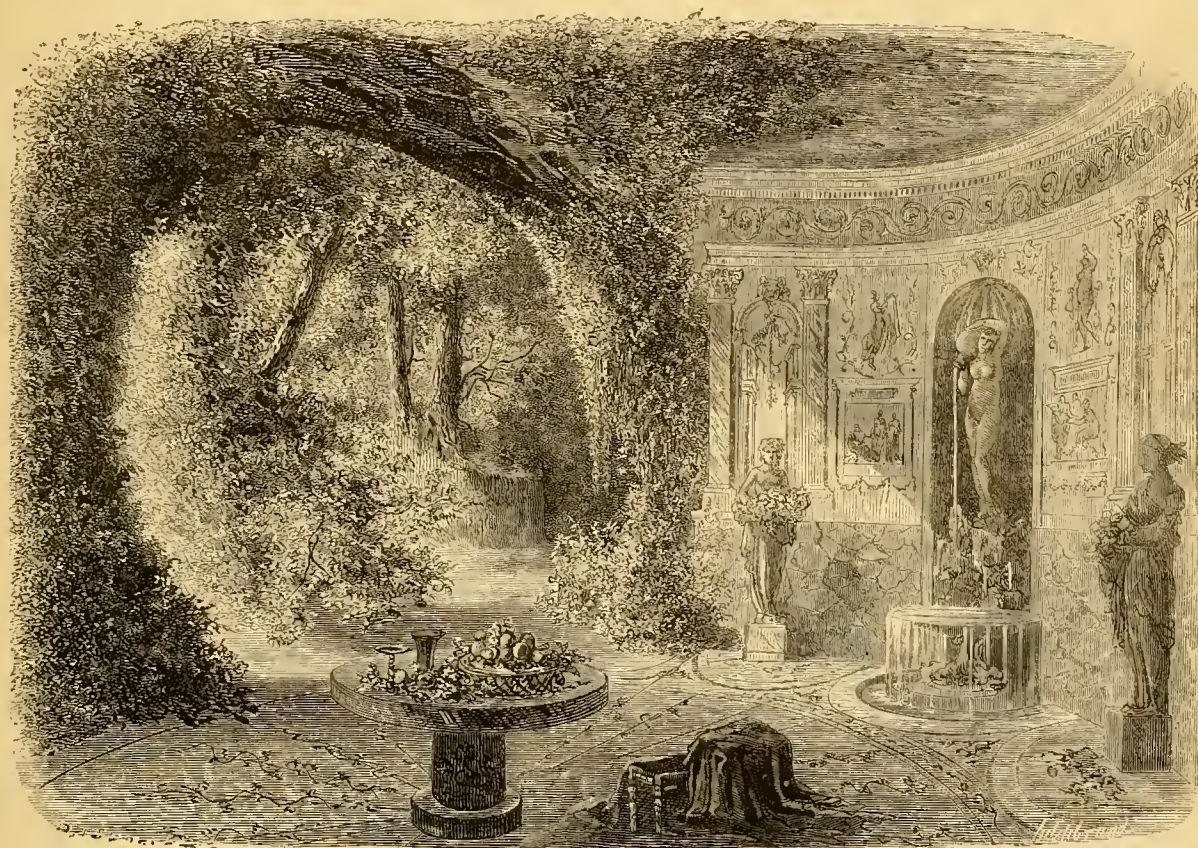
This charming flower is cultivated on a large scale in certain parts of the environs of Paris, often close to the Strawberry fields, and in March, when it is in full bloom, forms wide sheets of blue. It grows well in almost any kind of soil, but does best in that which is neither too dry nor too moist, and which is either flinty, sandy, or calcareous; or, better still, composed of all three. The sand especially keeps the soil slightly moist and cool during the summer, and helps to drain it in the winter. Moreover, if these plants are grown with a view to sale, it is best to choose, as much as possible, a position sheltered from the north and west, and sloping towards the south, as, under such conditions, the plants will flower better at the close of the autumn, and also in winter—two seasons when the flowers bring the highest prices. Before planting, the soil should be well stirred up with the spade or hoe, and, although the roots of the Violet do not descend very deep, the plants will grow so much the better and more vigorously, in proportion as the soil has been well stirred up. The large lumps or clods should then be broken and pulverised as much as possible with a long-toothed iron rake or with a fork. The ground having been thus prepared, lines or drills should be marked out, at a distance of 1 foot from each other, and the plants should be set at about the same distance from each other in the rows. Every four rows should form a bed, so that the flowers of two rows may be gathered from the alley on each side without trampling on the soil of the bed, or the plants themselves. These alleys should be about 20 inches wide. The plants are chosen from the strongest runners which the largest plants produce in quantities, like Strawberries, or these large plants themselves may be divided, providing they are not too old or worn out. The plants are usually inserted in the rows with the help of a dibber. The most favourable season for planting is in spring, when the greater part of the flowering is over, that is, in March or early in April. It may also be done late in summer or early in autumn, but, in cold or damp soils, young plants put in at that time are apt to suffer when the winter is severe, as they have not had time to become well-rooted; and as, in this case, it often happens that they will not flower sufficiently during the following winter and spring to be of any great value, it is a loss instead of a gain to plant them late in the year. The best kind of manure to employ, especially in rather cold soils, is street-scrappings, which are a mixture of rubbish of all kinds, and are the manure almost exclusively used by Violet-growers and Strawberry-growers in the neighbourhood of Paris. In autumn, when the ground is being dug and prepared, this manure is dug in, or sometimes it is merely spread on the surface around the plants. It possesses very active properties, and always promotes active growth. The Violet, like all other spreading plants, reproduces itself from runners, which, issuing from the parent plant, tend to exhaust it early. In the wild state this is always the case, but, under cultivation, the various operations of hoeing, manning, &c., necessitate the removal of the runners every year, at the end of summer or early in autumn. Notwithstanding this, they continue to be produced, to the exhaustion of the old plants, an exhaustion which is also hastened by the continuous flowering of the plants during nearly the whole year; so that

in the third year after planting, the flowers become less abundant, smaller in size, and on shorter stalks. It is therefore advisable, after the third year, to pull up the old plants and make a fresh plantation of young ones.

Forcing.

In forcing them diverse processes are employed, according to the season at which they are required to flower, as well as to the practice of different cultivators. In the first place, there is the system of cool forcing nuder frames, which is carried out in two ways. The first of these consists in planting in a well-drained light soil, and, if possible, on ground sloping to the south, or under the shelter of a south wall, either runners or divisions of old plants, six or seven inches asunder, in beds of a size proportionate to the width of the frames. This should be done in March and April; and, if divisions of plants are used, these should be taken from plants that have not been forced the year before. After the plants are set, a mulching of street-scrappings should be spread over the soil around them. This serves both as a manure and as a protection. If street-scrappings cannot be had,

mats. The frames also should be surrounded with warm manure, or leaves, for the same purpose of keeping out the frost. When treated in this way, the plants will afford a succession of flowers up to February, and, if the mats have been kept on, they will flower still longer. The flowers are usually gathered three times a week, when the plants are in full bloom; after that, twice and once a week. According to the size of the lights, the plants will yield from four to six bouquets to each light, which, at New Year's Day, sometimes sell for 5 francs (4s. 2d.) each. The expense of culture consists, in the first place, of the purchase of the plants, which amounts to from 5 to 6 francs (4s. 2d. to 5s.) per 100; to this must be added the cost of planting, watering, gathering, packing, &c., and the interest on the cost of the frames and mats. Taken altogether, the profit on each frame used in forcing Violets, in this "cool" way, amounts to from 2s. 6d. to 4s. 4d. Violets are also forced in heat, either on a hot-bed or with the assistance of hot-water pipes, and, sometimes, both are employed together. This method is generally resorted to when a good supply of flowers is desired about New Year's Day. The details of the process are these:—In the beginning of December,



A Grotto in the garden of a Roman villa of the time of Hadrian (see page 456).

then use short stable-manure or spent hot-bed dung. Water must be given during hot weather. The plants will commence to flower in September. When they have become pretty well hardened, which will be in the course of October, the frames and lights must be put over them for protection, and in such a position that the glass will not be more than 6 inches above the leaves of the plants. Air should then be given, in proportion as it is desired to hasten or retard the flowering of the plants, which generally lasts until December or January. The second mode of forcing consists in taking up, with a ball, plants which have been put out in open air in January or February of the same year, and transplanting them at once into frames. If the plants are required to flower soon, mats should be placed over the frames; otherwise, they need not be put on until November. Air should be given until they have rooted well; but then, and afterwards, unless the weather is fine, little air should be given, as it is not the air, but the sunlight on the frames which causes the plants to flower. But, if the weather is moist, without frost, a little air should be given, to counteract the humidity; and, when the nights are cold and frosty, the frames should be covered with

thick hot-beds are made, the best of which are composed of half new stable-manure and half of leaves; both should be well mixed together before the bed is finally completed. The *raison d'être* of the leaves is this, that, at first, they hinder the manure from heating too fast, and afterwards that they retain and prolong the heat. On these beds the frames are placed, and some good soil is spread over them sufficiently deep to allow of the plants being inserted. These should be chosen from those plants which have the best-developed and most numerous flower-buds. They should always be lifted with a good ball. The hot-beds should be surrounded with fresh stable-dung, and, during the night, the frames should be covered with mats or some other protection. Very little air should be given, and only occasionally in the middle of the day, as soon as the bed begins to heat, and provided there is not much either of frost or of north-east winds. The plants should be looked after, from time to time, in order to give them such a supply of air as will either advance or retard them, so that they may come into bloom at the desired time. In forcing Violets by means of hot-water pipes, the same rules prevail which we have indicated for the process of

forcing in hot-beds. There is this exception, however, that plants forced in hot-beds flower earlier and more regularly, because the heat is uniform and underneath. When hot-water pipes are employed, no matter what care may be taken, vicissitudes of temperature will occur, especially at night. When the plants are grown under frames, in which the air is more or less confined, mildew will often occur amongst them, and care must be taken to look them over frequently, and remove all leaves that show any sign of this enemy.

Snails and Slugs.

These frequently attack the flowers of the Violet. The best remedy for them is to place among the plants leaves of Lettuce or Cabbage. [The latter, if anointed with lard, will be found the best trap. Ed.] In the morning these can be taken up and thrown into hot water. At night-time, if one wishes to go round the frames with a lantern, the marauders may be detected in the act, and a sprinkling of a pinch of guano over them will put a stop to any further annoyance from them.

Culture of the Neapolitan Violet.

The "Violette de Parme" is seldom grown about Paris, because it is more tender than the *Violette des Quatre Saisons*. It often rots off and gets frozen during winter. Nevertheless, many growers plant it in beds in gardens, in well-sheltered positions, where the soil is well drained. They are also careful to cover it with frames before the frosts come on, for it does not do to plant it out, and then cover it with mats. If this is done, the flowers hardly ever come to anything; and the only time when this transplanting can be done with success is when the plants are showing buds, and even then care must be taken to remove them with good balls. When they are placed under frames, the same treatment which has been described for the *Violette des Quatre Saisons* is applicable to them also. The only advantage which the *Violette de Parme* possesses over the last-named plant is that it flowers later—generally until May. It always sells for a higher price than the *Violette des Quatre Saisons*. It has many sub-varieties, of which market growers give the preference to those which are most floriferous, and which have the deepest-coloured flowers. It may be easily seen, from what has been related, that the culture of the Violet requires more attention than is generally supposed, and that it is not only costly, because it demands much care and attention even when it does succeed, but that it is, in bad seasons, not much of a gain, if not a positive loss.

Profits of Violet Growing.

It is difficult to calculate accurately the probable produce of a crop of Violets, as it is exceedingly variable. In one season 12,000 bouquets may be gathered from 2½ acres of ground, while, in another season, the same ground may not yield more than 3,000 bouquets. But, usually, the profit is greater when the general crop is moderate, as, when the general crop is abundant, prices fall very low in the market, and sometimes hardly more than repay the various expenses of culture, rent of ground, &c. This will be made plainer from the following calculations on the produce of 2½ acres, during three seasons of maximum, medium, and minimum produce. In a year of plenty (say 12,000 bouquets to 2½ acres), the first bouquets of winter and the latest in autumn will fetch about 5d. a piece, and, when the full crop comes in in spring, 1d. a piece. Supposing one-half the crop sells at the first price, and the other half at the second, we have—

12,000 bouquets @ 3d. each	£150		
Against this we must set off the expenses as follows:—			
Rent of 2½ acres of ground	£	s.	d.
Digging and preparing the soil	12	0	0
Three hoeings at £2 8s. 4d. each	7	5	0
Manure	14	8	4
Spreading the manure	1	5	2
Cutting off the runners	0	16	8
Gathering, packing, and other market expenses of 12,000 bouquets at 1d. each	50	0	0
Total	£89	15	2
Deducting this from	£150	0	0
	89	15	2

We have a profit of £60 4 10

If, now, we take a season with a medium crop (say 6,000 bouquets to 2½ acres), these will sell for 2d. each at the lowest price and for 10d. each at the highest, or 3,000 at 2d. each and 3,000 at 10d. each=£140. The expenses will be the same as in the last case, except for the gathering, packing, and other market expenses, which for 6,000 bouquets at 1d. each will be £25, instead of £50. Deducting this from £89 15s. 2d. we have £64 15s. 2d., which, deducted from £140,

the market value of 6,000 bouquets, leaves a profit of £75 4s. 10d. Lastly, let us take a season with a minimum crop of, say, about 3,000 bouquets to 2½ acres, of which 1,500 will fetch 1s. 0½d. each (or £78 2s. 6d.), and 1,500 will sell for 4d. each (or £25), equal in the total to £103 2s. 6d. The general expenses will be still the same, except in the matter of gathering, packing, &c., which for 3,000 bouquets at 1d. each, will amount to £12 10s. To this must be added the other expenses, which, as before, amount to £39 15s. 2d., making a total of £52 5s. 2d. Deducting this from £103 2s. 6d. (the market value of the 3,000 bouquets) we have a profit of £50 17s. 4d. From the foregoing calculations (taken from the *Revue Horticole*, from which this article is translated), it will be seen that the profit is greatest in seasons of medium produce, since, in years of maximum yield, the various expenses of gathering, packing, &c., are much increased, while the market price is diminished to the lowest, indeed sometimes so much that growers do not care to gather their flowers. On the other hand, in seasons of minimum produce, it is the other general expenses, which, remaining, as they do, unchanged, swallow up the greater part of the profits. It must be understood, however, that the figures given here are only approximative, and that in the previous calculations, we have inadvertently omitted the cost of planting, which for the hectare (2½ acres) amounts to £2 10s. This must be added to the expense side of the account. W. M.

THE AURICULA.

THIS is by no means a tender plant, or one at all fearful of the cold blasts of chill winter; naturally it has a robust constitution, preferring an open, but dry, spot to one more sheltered and damp. In fact, the whole race of Alpine Auriculas does best when grown under conditions somewhat similar to those usually applied to ordinary Alpine plants; although these Auriculas have, of late years, been elevated to the rank of florists' flowers. I have now in my memory the experience of an old friend, a dock clerk, who suddenly became fond of Auriculas through seeing them grown by a friend. He purchased a few plants for himself, had a few given him, and got some seed, which he sowed, raised a batch of seedlings, and thus found himself fairly started as an Auricula grower. From a few indifferent plants, with the properties of which he was comparatively unacquainted, his collection soon increased to a hundred or more, besides a fine batch of seedlings. He then obtained a few useful frames with glass-lights and trellised bottoms; and now he has added some of the best show and fancy Auriculas that are within the reach of his purse. Now here is an example which those whose vocation is of a sedentary character might well follow; and there are hundreds—aye, thousands—similarly circumstanced, who have nice little gardens, and plenty of room to carry on such work. Verily, there is more pleasure, profit, and instruction to be derived from the working of a garden, however small, by oneself, than is dreamt of by ninety-nine out of every hundred persons. To those who love gardening for its own sake, the Auricula and its cultivation offers a special attraction. Technically, the Auricula is divided into two classes, viz., the show kinds and the Alpine or fancy sorts. The first are the more expensive and less easily cultivated varieties; the latter are emphatically everybody's flowers, but they depend for their beauty very largely upon the attention and selection which they receive under cultivation. I should earnestly advise all intending growers of this flower to content themselves with the Alpine class to start with; and then, when they have acquired knowledge, learnt from experience, they may safely invest in the choicer forms of the show kinds—those singular but beautiful white, grey, and green-edged flowers, with curious markings, beautifully-defined centres, and incrustations of so-called paste. These show kinds, also, have some splendid self-coloured forms, that is, flowers in which the centre is clearly and distinctly belted with some rich hue of colour, and in which there is no edging. These are invariably striking flowers in a collection, because of the preponderance of edged kinds, nearly all of which present a light appearance. In the Alpine class, on the other hand, dark colours preponderate, that is, if the strain be good; but some strains, remarkable for coarse growth and large trusses, commonly yield flowers of diversified hues, conspicuous amongst which are buffs, browns, and other objectionable colours. These may be pretty enough in ordinary borders, but are not worth special attention.

Alpine Auriculas are, after all, the most acceptable to amateurs, and especially, as I have said, to beginners; they are cheaper, harder, and more easily cultivated than the other kinds; indeed, they thrive well in ordinary garden soil without special care or attention, but if they are grown for purposes of exhibition, then shelter and good cultivation must be afforded them. The stock-in-trade, so to speak of an amateur Auricula grower, need not be extensive or expensive, say a couple of dozen plants to start with, one-half of which should be good and of a fair price; the other half second-rate, and, consequently, cheaper; then a "cast" each of large 60 and 48-sized pots will be stock of pottery enough for a long time. A barrowful of good compost, consisting of two-thirds yellow loam from a rich pasture, and the remaining third, well-rotted manure and silver-sand will be sufficient potting material for a twelvemonth at least. For housing the plants, a stout frame about 3 feet in width and 4 feet in depth will afford abundant space for a year or two, but if the stock be rapidly increased more room must be added. In the bottom of the frame should be either several inches of clean shingle, or, what is better, a moveable trellis, which could be raised or lowered as desired. By this means air can be made to circulate around the pots as freely as about the plants. Damp at any season is detrimental, but especially so at the blooming period, and if the frame be placed upon a few bricks, so that air may be admitted freely beneath, and plenty of air be given at the top, any mishap from that cause can scarcely occur.

Seeds may be sown as soon as ripe, but it will be useless to look for bloom from seedlings the next spring; these will, however, make strong plants for the following season, and be all the more satisfactory for the few additional month's growth they have had. Yearling plants, of the coarser kinds, will often produce good heads of bloom, but the best kinds, having a more refined habit, are of slower growth, and, in consequence, seldom bloom until the second year. If seed be sown in July, when just gathered, and it germinates freely, the seedlings should be large enough to prick out into pans or shallow boxes for the winter, and the next spring they may be potted into sixties, in which all but the very largest may flower the ensuing season, the others being shifted during the autumn into 48-sized pots. They will need but a moderate amount of water during winter; but, as blooms are thrown up, more water will be desirable. The frame should be placed under a north wall during summer, and shading should be given when sunshine is powerful.

ALEX. DEAN.

Bedfont.

EAST LOTHIAN INTERMEDIATE STOCKS.

THESE Stocks merit a fuller notice than the brief allusion to them at p. 391 of THE GARDEN. There are three distinct varieties of them—a deep purple, a pure white, and a bright scarlet; and so very distinct are these colours, that they are vividly conspicuous, even beside other plants having flowers possessing similar colours. When planted in beds by themselves, forming centres to other outlying colours, or in ribbon borders, their effect is simply magnificent. Nor are they suitable for association with Geraniums, and other summer bedding plants, alone; they are equally well fitted for planting in herbaceous borders. They grow rapidly, and flower abundantly. I have seen plants of them, put out in May, each produce two dozen full-bloomed flower-stems by August, their great Hyacinth-like spikes, of different heights, standing out in gorgeous relief against flat masses of colour. The worst feature about German Stocks raised from Continental saved seeds is, they cannot be depended on to produce definite colours; and, therefore, cannot be planted in the flower garden with any certainty that they will properly harmonise with other colours. In East Lothian, near the coast, the Stocks under notice are finely in bloom from July until February. Here, pretty far inland, they remain in tolerably good condition well into January, thus forming a link between summer and spring flowers. This variety of Stock was raised by a Mr. Campbell, near Drem, in East Lothian; and we are indebted to Mr. David Thomson for showing us how well suited it is for flower garden decoration. This he did at

Dirleton, and the rows of it, in the fine ribbon borders which he had at Archerfield, were well worth travelling miles to see. The flower-spikes of this Stock, which may be had in armfuls at Christmas from outside borders, are excellent for floral decorations of a sacred kind. Crosses and other symbolic devices may be made with them; such devices, generally on strips of ziuc 2 inches wide, are edged with a single row of Holly leaves, the centres being filled with Stock blooms. The dark shining green leaves of such Hollies as *Ilex Aquifolium*, make a fine edge when the centre is white, and the light-coloured foliage of the Silver Queen *Ilex* makes a pretty and becoming edge for deep purple. In order to attach the blooms to the ziuc a little glue should be rubbed on it, a plan by which the flowers can be secured as desired. Care should, however, be taken to obtain the East Lothian Stocks true to name, as other kinds are often substituted for them.

J. MUIR.

BEDDING PLANTS.

THOSE among us who are old enough to have witnessed the various phases through which the bedding system has passed will, I think, admit that, although in its present development it may have lost some of its rougher, perhaps more striking, elements of beauty in the banishment of such plants as Hollyhocks and Dahlias from the flower garden, it has gained in refinement by the introduction of beauty of form, in the shape of fine-leaved plants and plants of stately growth. What is called carpet-bedding, too, gives an additional and pleasing variety to our flower gardens, and in storm or in sunshine, unlike many beds of flowering plants, its effect is constant; and, as many of the plants adapted for it are hardy, it will, I think, continue to grow in favour. The mixed system of bedding has many advocates, and, whilst agreeing in the main with a good deal that has been advanced in its favour, I must say that for large gardens, grand masses of colour at certain points are a necessity; to fritter away all the beds in mixtures, however pleasing in themselves would be monotonous. Although I look upon the bedding system as a grand means of throwing masses of floral beauty round particular spots from June till October, in a way that cannot be equalled by anything else (if we except, perhaps, *Rhododendrons* in spring), I see no reason why every nook and corner should be devoted to it, to the exclusion of all other modes of ornamentation. To a lover of flowers, in the true sense of the word, the Alpine garden is unsurpassed in interest and in its capability to give real pleasure at all seasons. A vivid recollection arises in my mind of an Alpine or rock garden, with which I was once intimately acquainted, I could go blindfold and find the rocky nooks where flourished the Dog's Tooth Violet, *Erinus alpinus*, *Iris reticulata*, and many other floral gems. A little more than a year ago I again saw this same garden, but death had been busy amongst its rulers, and the garden had suffered in consequence; the strong-growing species had destroyed their weaker and rarer brethren, and what was once a good collection of plants is reduced to a few common strong-growing kinds. I mention this to show that weakly-growing rare species should not be planted in the immediate neighbourhood of strong-growing common plants, unless a constant watchfulness can be exercised over them; and it is a good plan also to keep duplicates of the choicest species in pots plunged in ashes, where they can easily be attended to. What I chiefly regret in connection with the bedding system is the destruction which it has entailed upon many beautiful old-fashioned flowers. There are, however, symptoms that extreme colourists are seeing the advantage of toning down their reds with flowers less conspicuous in tint. Amongst recent introductions for bedding purposes few are more useful than Violets and Pansies. A continuation of damp weather does not destroy their brightness; they are, in fact, weather-proof. Most of them, in addition to being valuable summer bedding-plants, are especially useful for spring blooming, and they are as hardy as the common Daisy; but they should be propagated annually either by means of seeds or cuttings. Although the seedlings may vary a shade or two in colour, most of them will come true enough for all practical purposes. I do not find that they are at all particular as to soil, provided there is depth enough. They are in this respect much more manageable than the ordinary florist's Pansies. They involve no costly fire heat or trouble in potting; in fact, thousands of them are coming up from self-sown seeds last year in the beds in which they grew. During the last few years *Calceolarias* have in many places done badly, and it is hardly to be wondered at, if they are grown year after year in the same beds without change of soil. Rotation of cropping is as important in the flower-garden as in the vegetable department; and especially is this necessary where the supply of manure is short. Deep cultivation and occasional partial

renewing of the soil, with annual dressings of manure or charred refuse, are important aids to success. In one or two instances that have come under my notice, retaining the spring flowers in the beds till they were required for the summer occupants has had a bad effect upon the summer display. To carry on spring and summer gardening in the same bed involves a large outlay, if both are to be well done; and, unless it is convenient to manure heavily, and to partially renew the soil at rather frequent intervals, it is better to be content with only a few of the beds filled with bulbs and other spring-flowering plants, changing them annually, whilst the others could be filled with cuttings of evergreens that would not exhaust the soil. Where cuttings of the golden Willow and the red Dogwood can be obtained in quantity, they have a not unpleasant effect in close dwarf masses in association with the different kinds of evergreens, and they would retain their freshness well up into the spring, which the evergreens would scarcely do unless changed.

E. HOBDAY.

Good Kinds of Wallflowers.—In the list of Single Wallflowers (see p. 390) I see no notice of a very dark variety, spikes of which I send you, but not the best, which are for seed. It is the only single Wallflower which I grow, and, in consequence, I have kept it true for above fifty years. I must own, however, that common streaked yellow and brown, or the wild dwarf sort of Wallflowers, have much more perfume than this dark kind; nevertheless our garden is well perfumed by it. We have lost a double dark variety, as black as our darkest single, which I got long ago at Peshurst (Porter's Lodge), and remember, about Tunbridge there was a very good double variety in all the little gardens, not so black as the Peshurst one. The small double-yellow (of which I also send blooms) flowers for ten months; it expanded the first week of February this winter, and is invaluable. We got it from Mr. Harpur Crewe.—F. J. HOPE, *Wardie Lodge*.—[The dark Wallflower, here described, is almost black, and large and fine. The yellow kind was not a close-spiked variety, but the flowers, individually, were quite double, and handsome.—ED.]

The Butterwort (Pinguicula).—I had often seen, and greatly admired, this exquisite little plant growing in its native habitats amongst the mountains, and as often tried to grow it, without success, until I imitated exactly the natural conditions required for its culture. The year before last I came across a quantity of it, some of which I brought home along with a portion of the soil in which it grew, and then planted it in a large pot which I placed in water in a cool greenhouse. It flourished admirably under this treatment, and is now a perfect picture, the beautiful dark-purple flowers, larger and more graceful than any Violet, rising from each rosette of pale green leaves, which lie perfectly flat upon the earth. Some of the plants, which have now as many as eight blossoms expanded and in the bud state, are extremely pretty. Its mode of self-propagation struck me as very curious, each large plant, when the season's leaves die off, appearing thickly surrounded with numerous small offsets which the parent plant seems to have the power of scattering to some distance, as I have frequently seen them lying on their sides, an inch away from their birthplace, in which position they take root and form separate plants in a little time. It is not, however, till the third year that they make any display, but they are well worth waiting for, and I strongly recommend all lovers of uncommon plants to give the Butterwort a trial, particularly those who possess that interesting thing—a bog garden. I should mention that I found it growing last time in a kind of loam, but think an admixture of peat is most beneficial. It should not be allowed to get dry, but this is easily prevented, as, the saucer in which the pot stands being once filled with water, will not require replenishing afterwards for several days.—H. S.

Iris stylosa.—This pretty winter-blooming hardy Iris, the name of which appeared not long since in some of our catalogues as a novelty, was described six years ago by M. Clemenceau, in the *Revue Horticole*, as follows:—"The flowers, which continue from December until March or April, are of a handsome azure-blue, on stalks from 6 to 8 inches high, springing from the centre of a tuft of glaucous, narrow, and sword-shaped leaves. The tuft is generally of pretty large size, especially if it has not been taken up and divided for some years. The limb of the petals is of about the same size as in the dwarf Irises of our gardens, but is elevated on the summit of a tube about 4 inches long, which looks as if it were the peduncle of the flower. In addition to beauty of colour and singularity of form, the flowers also exhale a most agreeable scent, and are produced in succession for the space of two or three months. The plant does best in sweet, well-drained, light soil, and should be placed in a sheltered position, if possible. If it is desired to enjoy to the utmost the delicate tints and fragrance of this fine species, a light covering or shelter of some kind should be placed over it so as to protect it

from heavy driving rains, snow, and hard frosts, which are always more or less injurious to the delicate tissues of flowers, even those of the hardiest plants. It is propagated by division of the tufts, the best time for performing which is in spring, immediately after the plant has done flowering. When grown in pots, it forms an excellent room plant or subject for the conservatory or winter garden.

Primula altaica.—I believe that I have at length succeeded in securing this really pretty, but scarce, plant, and I find that it is quite different from the *P. altaica* that has been grown and exhibited for the past year or two. Not long ago Mr. James Backhouse, of York, stated that the lilac Primrose, shown as *Altaica*, was but a single form of the old double lilac, a statement, however, with which I disagree, so far as relates to the single lilac, pin-eyed form, being a sport from the double, as I have in *Lilacina* a true sport from the double lilac, and it is altogether a different and much more beautiful plant than what has hitherto been thought to be *Altaica*. I think that the lilac, so called *Altaica*, is an imported variety that has been misnamed. It is very early, and in spite of the flowers being rough, uneven, and pin-eyed, it is, nevertheless, a delightful denizen of the Alpine garden. In consequence of my notes on Primroses having appeared in *THE GARDEN* a few weeks ago, I have had several communications from a clergyman in the north, who is an enthusiastic collector of hardy plants, and he has very kindly favoured me with a plant of the true *Altaica*, and I find that, in all respects except colour, it bears a close resemblance to its lilac congener, but its blossoms are a purplish-mauve, with a lemon eye. Singularly enough, my correspondent has also sent me plants of a lilac Primrose, the blooms of which resemble the *Altaica* hitherto so called, but, from the leaves of that kind the foliage differs considerably.—ALEX. DEAN.

Southernwood as a Hedge Plant.—Except as an ordinary border plant, we seldom find this little shrub put to any other use in our gardens. There is just a touch of youthful romance clinging to it when called by its common designation of *Lad's Love*, but we elders are apt to forget our earlier sensations, when many years of every-day life have passed over our heads, and, therefore, value plants less on account of their associations than for their decorative or intrinsic worth. Near here there is growing in a cottage garden a dividing hedge of Southernwood, and I think it makes the prettiest fence that I have seen. All who are familiar with its growth know that Southernwood has a dense compact habit, is never coarse, and that the foliage has an elegant and almost feathery appearance, which makes the plant, when grown in the form of a hedge, specially graceful and pleasing. This fence originated by the owner of the garden planting a strong old plant deeply in the soil, and thus inducing an abundance of young roots to break out from all the stems. Afterwards, the plant was lifted and divided, and the young ones planted about 10 inches apart to form the fence. These grow rapidly, and are now 2 feet in height and 9 inches through, and require only an occasional trimming to keep them to the needed dimensions. For gardens, where dividing lines of this character are desirable, I think the Southernwood is unequalled, and, certainly, nothing can be neater or less troublesome.—A. D.

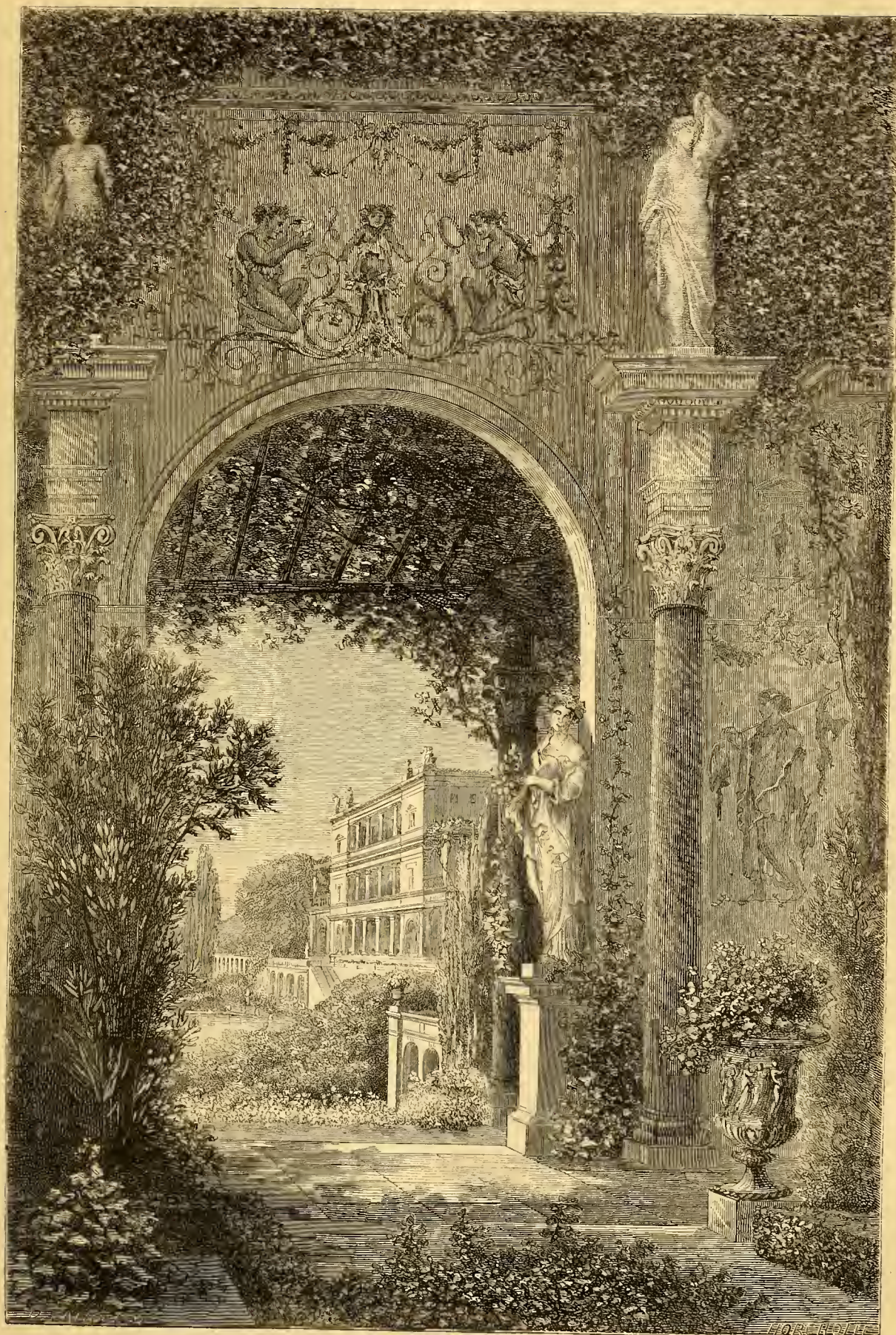
NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The Garland Flower (Daphne Cneorum).—This is one of the most striking of all hardy spreading shrubs now in flower, and, as it forms compact little plants about a foot in diameter, and only a few inches in height, it is specially adapted for small beds or borders in villa or suburban gardens. It has small leaves of a fresh green colour, and bears dense tufts or masses of deep rosy sweet-scented flowers. If taken up and potted, it forms a pretty little decorative plant for the greenhouse or cool conservatory.—J. H.

White Wood Lily (Trillium grandiflorum).—This is a fine old plant, that well deserves more general cultivation than it at present receives. It is perfectly hardy, and succeeds well in a moist peaty soil if shaded from hot sunshine. It varies in height from 6 or 8 inches to nearly 2 feet, and flowers in April or May. It makes a nice decorative plant for the greenhouse or conservatory when grown in pots, bearing pure white flowers at the apices of its three-leaved stems. It is now blooming freely out of doors in Mr. Parker's nursery, at Tooting, treated as a pot-plant.—J. H.

The Wigandia at Mentone.—The most conspicuously beautiful objects in the gardens at Mentone in April, are small trees of the well-known *Wigandia*, grown for its leaves only in the London parks. Specimens of it are already nearly 20 ft. high, somewhat conical in shape, and almost covered with large panicles of fine violet-blue flowers, cup-shaped, and each as large as a two-shilling piece. At some little distance off it reminds one of a well-flowered *Paulownia*, but is far handsomer. For temperate and warm countries, it will prove one of the finest ornaments.—V.

German Iris (Iris germanica).—There are few hardy plants nobler in habit or more ubiquitous than the German Iris, or the Blue Flag as it is termed by cottagers. It is one of the very best of all town plants, even if grown for its foliage alone. It commences growth early in spring, when its sword-shaped leaves are conspicuous for their fresh and lively green colour, and it bears tall spikes of rich bluish-purple flowers in May. There are several distinct varieties of this Iris varying in colour, and also in the profusion with which their flowers are borne, but all are beautiful and deserve to be planted in clumps and masses, both in shrubbery borders and in neglected parts of the lawn.—F. W. B.



AN ANCIENT ROMAN VILLA GARDEN (See page 115).

THE KITCHEN GARDEN.

CUCUMBERS IN THE OPEN AIR.

I TRY to grow large quantities of these every year, but the plants suddenly die off when in full bearing. I am having a bed made just now, in the following manner:—It is about 10 yards long, and 4 feet wide; I have it dug out one spit deep, and the soil thrown on the sides; I shall fill up 3 feet deep with long Grass and Nettles, having mown the brinks of my meadows for that purpose; I shall then cover with a foot of good old Cucumber mould and old cowdung, all well mixed with soot. A bed thus made ought, I imagine, to be a good one. My former beds consisted of about 18 inches of fresh long manure from the piggery, well covered with soil, without the soot; but I shall never try that plan again, although, I think, the chief cause of failure was wireworm. Will you kindly inform me how cultivators generally prepare a first-rate bed for ridge Cucumbers?—W. B. C.

[The culture of the Cucumber in the open air is a subject which has hitherto received but comparatively little attention. Market gardeners in the neighbourhood of London have attempted it; but, we believe, most of them have now abandoned it, the result not having proved sufficiently encouraging for them to persevere in the matter. Cuthill, in his pamphlet on "Market Gardening Round London," says:—"I have seen 14 acres of ridge Cucumbers in one man's ground; they are grown under glass, and hardened off, and planted out 6 feet asunder, and 10 feet row from row; hand-glasses are put over them. When they begin to grow, the ground is well mulched with straw, to keep the earth moist and the fruit clean. Gherkens are sown in the open air at once, in well-prepared ground at the above distances; and I have known one party to cut in one day 200,000 fruit, which were all bespoke by pickle merchants. Ever since the commencement of the Potato disease, however, Cucumbers were not grown round London." This was written in 1855. That Cucumbers form a somewhat uncertain crop in open fields all must admit, and that some localities are unsuited to their culture must also be conceded; but while their produce is in so much demand, not only in London, but in all large towns, even among the working classes, we are of opinion that their culture might be profitably extended. At present it is confined to comparatively small spots in one or two counties, the soil and climate of which seem unusually well-adapted for their growth. Small, however, as the area at present under Cucumber cultivation is, it is reported to furnish to the London markets not less than 600 tons a week, during what is termed the Cucumber season. Of these, upwards of 100 tons have been known to be sent to Covent Garden in a single day. Passengers by the Great Northern Railway on reaching the station at Sandy, in Bedfordshire, or that of St. Neot's, in Huntingdonshire, cannot have failed to have remarked light carts laden with square baskets, piled one above the other, arriving at these stations as the train approached. These baskets are full of Cucumbers about to be conveyed to the London and other markets. In the neighbourhood of the stations just named, Cucumbers are grown by the acre in the open field, many cultivators having as many as 10 acres at one time under this description of crop. The soil in the neighbourhood just indicated is, for the most part, a warm lightish loam or gravel, in every way suited to the growth of this esculent. The ground to be planted is well prepared during winter, and again deeply stirred and otherwise put in good order in spring. The seed is then sown about the beginning of May, where the plants are intended to grow, in rows some 4 feet apart, and the plants stand nearly 2 feet asunder in the row. In favourable seasons they soon push into active growth and cover the ground with vines, which, during the latter end of May, the whole of June, and beginning of July, spread in all directions and come into bearing. During their growth, weeding and thinning their superfluous shoots are well attended to, and if the plants should not entirely cover the ground, or wherever blanks occur, Mangel Wurzel is planted in the vacant spaces. At 2, 3, or 4 yards apart are also rows of Onions, set early in the spring and being allowed to run to seed, serve, in some measure, both for shade and shelter. Where Onions are not

used for this purpose, Rye, sown in the autumn 3, 4, or 5 yards apart, and cut as soon as the vines cover the ground, is employed instead; Peas are also, sometimes, used for the same purpose. In this way the ground is induced to produce two or three kinds of crops at the same time, and if one should happen to fail, one or more of the others, as the case may be, to a certain extent takes its place. By the middle of July or earlier, according to the season, the crop is ready for a first gathering, and from that time to the end of September fruit, varying in length from 10 inches to a foot, green, straight, and solid, though sometimes somewhat unshapely, is continually being cut, sometimes to the extent of 3 tons at a time, and that from little more than as many acres. What an acre of Cucumbers realises in the way of money we are unable to say with certainty; but they are stated to yield a good profit to the grower, even if he should get no more than 1d. or 2d. a dozen for them. At these prices sums varying from £20 to £60 an acre, according to the season, are said to have been obtained for them. When gathered they undergo the process of sorting, the best being generally sent to London, second-rate kinds to the provincial markets, and what are small, crooked, or discoloured are given to pigs. Ripe ones are saved for seed, so that little or no waste is ever experienced with crops of this kind. The baskets in which Cucumbers are sent to market are called "pads." In shape they resemble those used by wine merchants, *i.e.*, square with hinged lids, and they generally hold about two bushels. It has often surprised people who think Cucumbers cannot be grown without a frame, how cottagers were able to produce such fine specimens of them as they frequently do at local exhibitions. There is, however, no difficulty in the matter; indeed, the wonder ought to be, that Cucumbers are not more extensively cultivated out of doors during summer than they are. The cottager selects the warmest corner of his garden for them. When the spot has been fixed on, two or three circular holes are made, 3 feet across and about 18 inches deep. These are filled with garden refuse, mixed with some rough manure, and covered about 8 or 10 inches deep with some of the richest and best of the soil that was thrown out of the holes. In the centre are sown four or five seeds an inch deep, and these are protected by a flower-pot or an oiled-paper cap until they have vegetated. In the fields above alluded to, however, no such trouble is taken. The ground is merely, as we have stated, well stirred and worked, thrown into slight ridges, and the seed sown without any bottom-heat or artificial protection whatever. Thus it will be seen how easy it is to have plenty of Cucumbers, with comparatively little expense in the way of preparation or labour; and that, as a crop, they are remunerative is evident from the fact, that ground which would grow cereals or root-crops in perfection is devoted to Cucumbers, even by large cultivators of grain crops.—M.]

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Spent Hops as Manure.—Spent Hops are a very valuable fertiliser. They may be used as an absorbent in the stable, or be composted with the manure, or piled up until rotten, being frequently turned to prevent dry rot.

Cabbage Growing Extraordinary.—A Virginia farmer, from 300,000 plants, set out in November and December, obtained a spring crop of Cabbages amounting in value to 13,000 dollars (£2,600).

Osborn Dwarf Bean.—This is a decided acquisition to the list of first-class vegetables. While I am always ready to appreciate sterling merit in new comers, I never discard old sorts until I feel confident of the superiority of the new; but, after a careful trial, I can confidently say that this is a Bean that may be relied on. It is of dwarf sturdy growth, an enormous cropper, and, where French Beans are required the whole year round, it will be sure to be the principal sort grown.—JAMES GROOM, *Menham Gardens*.

French Beans.—My ground being of a cold character, I generally lose my first crop of these. How can I obviate such a disaster?—W. J. [For the first out-of-door crop, it would be a good plan, in your case, to have a quantity started in small pots at the end of April or beginning of May. These might be placed in very slight heat, so that they would not be over-tender, and should be gradually hardened off towards the middle or end of May, for planting out. The warmest spot in the garden must be selected for them, such as at the foot of a south wall, and some covering must be provided for their shelter.—Ed.]

Fresh Leaves as Manure.—Can I use these without danger of mildew? I have formed a rockery for sub-tropical plants, and have a bank of very sandy gravelly soil, and one of sandy peat, both, of course, very poor. How can I best enrich them? I have plenty of rotten manure and last year's leaves now well rotted.—H. F. [We would advise you either to work plenty of good loam and well-rotted dung into the soil of your banks, or to cast out the original soil in them and make a fresh bed for your plants of the materials just named. Leaves are only useful as manure when thoroughly decayed, and in that state no danger from mildew need be apprehended.—Ed.]

GARDEN DESTROYERS.

SCARING BIRDS.

The mischief done by blackbirds and thrushes, in the kitchen and fruit garden, is chiefly the work of the young birds of the season, which, having been reared in the neighbouring coverts, and acquired their full vigour and activity, on the nourishing food afforded by innumerable slugs, worms, and insects, carried to them by the old ones from gardens and fields, now come to claim a change of diet, and repayment for their services from a share of our fruit. As they are insatiable in devouring it, we are compelled to defend ourselves as well as we can. Nets are useful safeguards, so far as they can be used; springs or nooses of hair or wire are good, but especially twigs, with birdlime, may be resorted to. Nor ought the young blackbirds and thrushes so captured to be thoughtlessly killed and thrown away. They make truly "a dainty dish," either roasted by themselves, or with pigeons, or as an addition in a pigeon pie. The parent birds are not so easily taken, and being in the moult during the fruit season, nourish themselves rather on worms and slugs in the Turnip fields, and are not much seen in gardens. With the first frosty nights of September, a migratory movement towards the south takes place among all the young yearling blackbirds and thrushes, whilst numbers again betake themselves to the hedges and furze coverts near the sea-coasts, and westward especially, where frost is least felt in autumn, and wild berries are most plentiful. The great object, therefore, which gardeners should try to effect, is to scare away the intruders during the season of Strawberries, Cherries, Currants, &c., in July and August. A gun may be occasionally fired in earnest, but its use is always attended with as much danger to children and others, as to the birds. But low-priced squibs and crackers may be lighted and thrown down early in the morning with excellent effect, and every now and then through the day. The very smell of the gunpowder, and smoking of the paper from the exhausted fireworks are alarming to the enemy. In winter time the presence of a pair or two of blackbirds is beneficial to a garden (and more will never stay, so quarrelsome are they), and their song in spring, in concert with that of the thrush, is as delightful there as in the shrubbery or woodlands. Be it observed, above all, that steel traps for birds, in gardens, are things that can never be tolerated. They are instruments of barbarous cruelty even when used for rats. I have known a gamekeeper, who had felt constrained to use them largely, to keep down rabbits, yet speak of them with horror and disgust. At the present season sparrows are in disgrace with gardeners. Let the commonest and cheapest crackers be tried, with assurance of success. If known to be in demand for gardens, these petty fireworks could be made at very small cost. Touchpaper (that is, common brown paper soaked in strong saltpetre-water, and dried) may be readily provided by the gardener himself. Pieces of it, thrown down among his Gooseberries and Currants, would go on smouldering and smoking for an hour, when lighted for the purpose. By such simple means the bird grievance may be much abated in every garden. Turnip fields and Mangolds are greatly benefited by blackbirds and thrushes, which live under the foliage of the crop in August, consuming slugs, beetles, caterpillars, worms, and wireworms. Let them be driven, therefore, as much as possible out of gardens and into the Turnip-fields rather than be killed. R. C. E.

ORIGIN OF THE PHYLLOXERA.

WHATEVER may be the opinion as to the influence of food and climate on man, there can be no doubt that, according as one descends the scale of creation, those influences become more and more apparent, and when, at last, one arrives at those little beings, which I have more especially in view, aphides and the like, we should beware of trusting too much to the classification of entomologists, and considering a plant safe from the ravages of such or such an aphid, because it may have been classed as *A. sambuci*, *A. rosæ*, or *A. dianthi*. Boisduval, in his excellent work on entomology, describes forty-nine species of *Aphis*, mostly classed according to the plants which they infest. I have seen it in some cases, and firmly believe it to hold good in all, that any one of these species, driven to it by starvation, will take to almost any other plant, get naturalised on it, and after the first viviparous generation (and these occur every

eight or ten days) will assume a totally different aspect from what it had in its native habitat. Go, for instance, to the first Elder hush and shake off into your hand a few of those black bloom-covered aphides, looking like very small black Plams, which cover the shoots with their closely packed bodies, and carry them (though, mind, I do not advise it) to your greenhouse, where rows of *Fuchsias* display their clean and shining foliage, and pour out your aphides on one of their leaves. Now, the *Fuchsia* is a plant generally free from aphides, and consequently not a favourite with them. Yet, if you return in a fortnight or so, you will find every *Fuchsia* infested by aphides of a light greenish-white colour, shiny and waxy-looking, much smaller than *A. sambuci*, and very like those of the *Carnation*. It has always been my opinion that the *Phylloxera*, in France, is neither a new creation, nor an importation with foreign Vines, but a parasite of some plant either growing as weeds, or cultivated between the Vines of the first Vineyards attacked; the plants, in question, having at that time either been no longer cultivated, or, if weeds, more effectually rooted up than usual, their parasites have, from sheer starvation, been driven to the Vine, where they became acclimatised, and finally changed into the actual *Phylloxera* as now known. At the last sitting of the Horticultural Society of France, M. Rivière, of the Luxembourg and Jardin da Hamma, Algiers, in describing the culture of the *Eucalyptus globulus* in that country, stated that in some vast plains planted with young trees, great numbers had been destroyed by the larva of a small beetle inhabiting certain wild plants which had been ploughed up in preparing the ground for the *Eucalypti*. Now, here is a case in point: a tree from the Antipodes, of a nature totally different from any growing in Algeria, and very strongly aromatic, is at once adopted by a creature far more highly organised than any greenfly. Well, the food being once changed, the change in the appearance of the insect is only an affair of time; and we shall have a new pest, the *Eucalyptus* beetle. As of animals, so of vegetables, and I am as firmly convinced as a person can be of anything of which he has not ocular demonstration, that the Potato disease, the *oidium* of the Vine, and many other vegetable parasites, originally came from plants most probably very different from Potatoes and Vines, although their present characteristics might be so peculiar and well defined as to lead botanists to deny that they could possibly at any time have been the parasites of anything else. F. P.

THE NEW POTATO BEETLE.

As, happily, readers of this paper have had no experience with the Colorado beetle as yet, but are anticipating its invasion of their Potato fields during the coming season, they will, of course, be interested in learning the results of observations and experience where this pest has been prevalent for several years past. And first I would state it has been found, as a general rule, that it takes three years for the beetles to attain their strength of numbers and mischief in a locality. That is to say, their first appearance is usually in small numbers, and only in a few fields of a township or neighbourhood; the next year there will be found abundance, and destructive to some fields if not opposed; then the third year, and for several years afterwards, they will be in full force.

Use of Paris Green.

Poisoning with Paris green is found the most effective and practical mode of fighting the beetle. In regard to this remedy there is need of some intelligence and caution. The use of this, or other poison, will not be found necessary the first season of the appearance of the beetles, as they can easily be picked off by hand, when their numbers are few. And also the second year, we found it best to pick off by hand the beetles that appeared early in the season, if possible, before they laid their eggs; as the number of the larvæ was thereby greatly lessened, and it is the larvæ or young insects that do the most mischief, though the mature beetles are not lacking in destructiveness, and when too numerous to be picked off by hand we dose them with the poison. About the first week in July the young larvæ begin to appear; and then successive broods continue to hatch out until frosts come, or the Potato tops are ripe. As soon as these larvæ appear we use the Paris green. Various methods of applying it have been practised. Until last year the majority of our farmers mixed the poison with thirty or forty times its bulk of plaster, flour, or fine middlings—any fine substance that will give it bulk—then dusted the mixture through a perforated tin can, like a kitchen dredging box, on the tops of the plants, where the pests were seen. But this mode of application is liable to cause serious harm to the persons who do the work, as the green is so virulent a poison that a very little of the dust inhaled into the lungs or the nose is apt to cause painful irritation. The eyes also must be protected, and any sore or scratch upon the hands will suffer from the poison if any

chances to reach it. Hence we prefer mixing the Paris green with water, and sprinkling this on the Potato tops. A heaped tablespoonful of the green to a ten-quart pail of water is about the right strength. The green does not dissolve in the water, only mixes with it, giving it a pale green colour, but settling to the bottom if left to stand a few moments. On this account the mixture cannot be prepared in barrels and conveyed to the field, though it is common to convey the water in this way, to save labour, and put in the green with a spoon, for each bucketful. The mode of sprinkling the plants is capable of some improvement. The use of a garden watering-can is the simplest, but not sufficiently economical, unless the plants are in rows and quite badly infested. The more common mode is to take a small broom with a short handle—a common clothes broom will do—and dip this into the pail of liquid, then sprinkle it on the plants. With a little practice an active boy or man will do this work very expertly. The dipping of the broom into the liquid keeps it stirred, so as to prevent the green from settling to the bottom, as it will do to some extent in a sprinkling can. The number of applications of the poison required will, of course, depend on the abundance of the insects, and somewhat on the weather. If the crop is badly infested, and the weather warm, so that the larvæ hatch rapidly, it will be necessary to sprinkle the plants once a week for several weeks. At other times, once in ten days will suffice; and commonly it is not necessary to apply the liquid to all the plants—some being exempt from the beetles and larvæ. The amount of Paris green required for an acre varies from 2 to 4 lbs. The extensive use of this poisonous drug as a remedy for the Potato beetle has, of course, greatly stimulated its manufacture; and, as usual in such cases, there is a great deal of adulteration of the article, and the sale of cheap and poor samples for the pure and genuine. Country druggists are liable to be imposed upon in this way, as well as their customers, especially when their supplies are obtained from brokers instead of directly from the manufacturers.

Precautionary Instructions.

The following is from a circular issued by Messrs. Raynolds, and sent to all who purchase Paris green of them:—As the handling of dry Paris green, especially by persons unaccustomed to its use, is attended with considerable risk and often followed by serious consequences, we make the following suggestions founded on our experience as manufacturers: All packages, whether large or small, should be plainly marked poison. There is great danger in the mixing of this green for Potato bug, owing to the fine dust which arises in the process, which is inhaled, and also rapidly absorbed by the pores of the skin, especially if the person using it should be in a state of perspiration. To guard against this, the hands and face (particularly the nostrils) should be protected as much as possible, and should be carefully washed after working with it, or with any of the preparations of which it is an ingredient. As it penetrates and poisons wood—gets into the seams and crevices of articles made of metal—and even into earthenware that is at all porous; all household utensils, or anything in barn or stable (which cattle or horses could have access to) in which the article may have been mixed, or from which it has been used, should be carefully set aside, and never again used for any other purpose. Malignant sores are not unfrequently caused by scratching the skin when itching or irritated from handling the green. It should be constantly borne in mind that it is a more dangerous and deadly poison than arsenic, and planters and others, when purchasing, should be duly cautioned to exercise the utmost care in using it.

Remedy for the Poison.

The free use of milk as a beverage is recommended, but we have found hydrated per-oxide of iron (a simple harmless remedy), the best antidote. Sores caused by the green should be well covered with it, as with an ordinary salve, and a teaspoonful in a wine-glass of water should be taken twice a day, internally, while working with the green. This remedy can be obtained from any druggist or chemist. The consumption of Paris green has largely increased within a few years, and the article is now applied to such a variety of purposes, that carelessness in its use, or ignorance of its highly dangerous properties on the part of those who use it, cannot fail to produce the most deplorable results.

[The above valuable instructions, published in the *Albany Cultivator*, by Mr. M. B. Bateman, of Ohio, deserve to be borne in mind by Potato cultivators.]

Vine Insects.—The enclosed, my gardener says, eat his Vine leaves during the night. He has not seen similar ones before, and he asks you to be good enough to tell him what they are, and what means you can suggest for getting rid of them?—Westwood. [The insect sent is a beetle named *Otiorhynchus sulcatus*, which is very destructive both in the larval and perfect state, especially the former. Fern growers suffer greatly from it. A careful and persistent search among the earth at the roots for the whitish grubs, is the only effectual means that we know of getting rid of it.—A. M.]

THE PROPAGATOR.

CULTURE OF GREVILLEAS.

AMONG New Holland plants which have been brought into cultivation, those belonging to the family of the Proteaceæ occupy one of the foremost ranks. They are, however, rarely met with in our gardens, notwithstanding the elegance of their foliage, and the beauty and singularity of their flowers. This, we believe, is to be attributed to the difficulty which is experienced in propagating them, and on this subject we shall say a few words. We shall here only mention two genera of the family, viz.: The *Grevilleas* and the *Hakeas*. The genus *Grevillea* comprises a very large number of species, some of which are easily struck from cuttings made in the usual manner, but the greater number of them are propagated with great difficulty, either in this way or by means of layers. These two processes have, consequently, been abandoned, and, instead of them, grafting has been substituted successfully. The stock employed is *Grevillea robusta*, seeds of which are easily procured in abundance and germinate readily. I have grafted, says V. Viviani-Morel in *Revue Horticole*, on this species, *Grevillea Manglesii*, *G. Trobei*, *G. longifolia*, *G. Bauerii*, &c., all of which do well and grow with great vigour when treated thus, and I have no doubt that their culture is thereby rendered more easy.

Hakeas.

The genus *Hakea* succeeds equally well when grafted on the same stock, the grafts uniting rapidly, and with great solidity, the species *H. Lambertii*, *H. gibbosa*, and *H. carinata*, especially, have given most satisfactory results. I have tried *Protea argentea* on the same stock, but it has exhibited little vigour of growth, and appears to maintain its vitality with difficulty. When grafting any of these subjects, I proceed as follows:—If the stocks are not too large, I place the grafts under cloches, otherwise in a glazed frame in the propagating-house, taking care to expose the grafts well to the lighted side of the house. Side cleft-grafting, appears to be firmest and most solid method, but veneering or ordinary cleft-grafting may be also employed. The most suitable time for operating seems to be in April and May, but, as these plants are always in a state of growth, except during winter, I think they might be grafted, without any disadvantage, from the time they begin to grow in spring until October. By grafting early in the season, however, handsome and well-grown plants will be formed by the time that autumn arrives.

Orchids from Cuttings.—About midsummer some few years ago we had a grand flower show, which was largely supported by plants from our establishment, both in the competing classes and for exhibition only. Amongst our Orchids we showed a fine specimen of *Aërides odoratum*, which was a little one-sided. We had many larger plants of the *Aërides*, but they were too heavy to move; therefore, in order to make perfect our one-sided specimen, the head gardener unscrupulously cut the very finest branches laden with flower-spikes off the plants left at home, and ingeniously fixed them in the pot in which the show specimen was growing; the result was the finest plant of *Aërides odoratum*, perhaps, ever seen. All went well, and we staged our *Aërides* in the class of the best Orchids in the exhibition. When admitted, after the judges had finished their work, I observed that our specimen was awarded the first prize, a circumstance at which I was pleased; but dare not go near it for fear that the inserted pieces would look shrivelled, and that our dishonesty would be discovered. We brought home our plants at night and next day I was surprised to find that the recently cut branches did not shrivel in the least, nor have they since. They took to their new quarters most kindly, and grew quite as well as if roots had been attached to them when put in. The gardener, however, informed me that had the branches been severed and inserted before the blooms were fully expanded they would have shrivelled, but that when the flowers were mature, no visible signs of the fraud could be detected.—F.

Water Pressure in Fountains.—A reservoir 20 ft. square and 10 ft. deep is filled with water and connected by means of a 2 in. pipe with a circular basin 9 ft. in diameter and 4 ft. 6 in. in depth, 150 yards away; how high would the water rise in a $\frac{1}{2}$ in. jet, the difference of level being 12 ft.?—W. S. [The size of the lower circular basin has nothing to do with the question, the pipe leading from the reservoir and terminating in the jet instead of opening into the lower basin. From the well-known law of hydrostatics, the water from the jet will rise to nearly the same height as that in the reservoir.—Ed.]

THE INDOOR GARDEN.

CURCULIGO RECURVATA.

THIS plant is one of the most graceful of those generally grown for indoor decorative purposes, and it so nearly resembles some of the Palms in habit, that it might easily be mistaken for some member of that family. Its value for ornamental purposes consists in its long lance-shaped leaves being of a fresh green colour, and gracefully recurved on all sides. As a table plant it has few equals, and deserves more extended culture for that purpose alone. Its variegated variety is still more handsome, each leaf being boldly striped with creamy-white or pale yellow. A pretty little specimen of this plant occupied a prominent position in Mr. Bull's collection of plants

pots filled with moist fibrous peat, with the addition of a little turfy loam, but they must not on any account be allowed to become dry at the root. In a general way, however, planting out will be found to be the best plan, as it is less troublesome to the cultivator, and gives better results in the long run. When planted out in a cool peaty compost, and trained on the roof of a partially-shaded greenhouse, Lapagerias (both red and white) seldom fail to make luxuriant growths, and to flower abundantly. For corridors, connecting the house with the conservatory, such plants are peculiarly well adapted, and never fail to bloom well if liberally treated with regard to moisture when making their growth. There are several distinct varieties of the rosy-flowered form, differing from each other in size, colour, and markings. The white-flowered kind is, however, the greatest favourite with many, and it never looks better than when trained overhead, so that one can view its pearly whiteness against the deep green foliage of the plant itself. At one time it was



Curculigo recurvata variegata.

suitable for table decorations, shown the other day at South Kensington. This variety grows well in an ordinary plant-stove, or in a warm greenhouse; and, in order to exhibit its brilliant variegation to advantage, its foliage should be carefully sponged occasionally with clean soft water. Young plants of this *Curculigo* should be potted in a compost, consisting of loam and peat, to which should be added sufficient well-washed sandstone grit to keep the whole in a porous state.

LAPAGERIAS.

THOUGH the rosy and white flowered Lapagerias are amongst the most beautiful of all cool greenhouse climbers, they are not, as a rule, well grown by amateur cultivators. They do well enough in

thought that Lapagerias were difficult to propagate, inasmuch as cuttings of them, taken off and inserted in the usual way, would often keep fresh for a year or more, and, at the end of that time, be no nearer rooting than when first put in. Seed, however, if it can be obtained, is found to germinate freely; and shoots, a yard or more in length, twined round the top of the pots, or inserted in the border and covered with soil, form roots at some of the points, and soon make nice little plants. Some make a slight incision at each joint—an operation which, it is thought, hastens the production of roots. In this way Mr. Speed, of Chatsworth, raises plants of Lapagerias as readily as he does Geraniums, his specimens being planted in a deep cool border, kept constantly moist, in one of the Camellia houses, in which the plants themselves grow with extraordinary vigour, and soon cover the light wire trellises with deep green foliage and rosy or white flowers, according to the variety thus treated. B.

FENCES.

By JAMES GRIGOR.

MANY varieties of trees and shrubs have been recommended for hedge fencing, all of which are no doubt more or less suited for the purposes of inclosure; but, as there are some kinds so eminently adapted beyond others, it becomes necessary to distinguish which they are, and to insist upon their being adopted accordingly. Their adoption, however, must depend upon certain circumstances, viz., the character and situation of the soil. As in all other things, Nature has observed a beautiful adaptation amongst trees and shrubs with reference to the food they imbibe, and the peculiar habitation they affect; and it really requires no great discernment to follow her correctly throughout this interesting distribution.

The Hawthorn (*Cratægus Oxyacantha*).

Of all the trees and shrubs suited to the climate of Britain, none has been found so eligible for hedge fences as the common Hawthorn. It is true that in mountainous and exposed situations, where a combination of circumstances operate against vegetation, it refuses to grow with that vigour which characterises it throughout the plains and cultivated uplands of England. Its province, however, might be easily extended beyond its present limits by using as its forerunner lines or strips of Scotch Pine (*Pinus sylvestris*) planted on each side of the site intended for the Hawthorn hedge, but not too near to rob the part to be sheltered of its nourishment. The Hawthorn, when properly treated, is a very fast grower, and, under most circumstances, is considered to be very ornamental. As a fence, it is smooth, stubborn, and long-lived. It is easily reared; and in this respect, at least, it has the advantage over either the Holly, Crab, or Sloe. As is well known, it is a deciduous tree, shedding its leaves in winter, and, therefore, better suited to protect crops than to shelter cattle, though, in this last respect, it is by no means to be rejected; for though it is not equal to the Beech in warmth, it has a decided advantage over that tree, as a fence, in becoming an impenetrable barrier to all sorts of cattle. It should not be intermixed with other sorts of trees, for, though growing tolerably well with the Holly and Beech in some soils, the treatment in an essential point, viz., trimming, which is insisted upon in its proper place, is not applicable to all.

Soil and Situation.—The soil it delights in most is a hazelly loam, or, if not too retentive of water, a good clay bottom. At the same time, it will grow well on sand, if free from iron, and on almost every other description of land except chalk and pure gravel. Even on these, artificial means will enable it to grow freely. By displacing the gravel and chalk, and filling up the trench to the depth of 3 feet with loam, I have found that such sub-soils will not hinder it from reaching to the height of 5 feet in six years. On wet soil it is soon covered with Lichen, a sure indication that it is not in a thriving state.

The Preparation of the Soil.—This is, perhaps, the most important process connected with hedge fencing, though it is one which is the least of all attended to. Nothing can repay the planter more satisfactorily than the previous management of the land, and I have adopted it as a rule whenever called upon to form a fence, if the proprietor should object to go to the expense of having the land trenched at least to the depth of two feet, and well manured, to decline the undertaking altogether. This trenching and manuring I hold to be necessary under all circumstances, whether the "hedge and ditch" form be adopted or the sets planted on the level surface of the ground, or on a slope. If practicable, the land should be trenched several months before the time of planting, and immediately manured, so that the manure and the soil may be completely incorporated when the trench is opened up for the reception of the plants. The trench should be at least 2½ feet in width. It is delightful to witness the vigour and rapidity of growth which a hedge will assume after the soil is prepared in this way, the plants generally maintaining a uniformity of action, such as an unprepared bed never displays. It is the grossest thoughtlessness to suppose that the Hawthorn, any more than Wheat or Turnips, will rise luxuriantly unless excited by the richness of the soil, either naturally, or by the application of artificial means. Amongst other advantages, I may mention that well-prepared soil, compared with that which has not been manured, will save all the expense of protecting the fence for about two years, an item which must be very heavy in districts where young Fir poles are scarce. Hence the necessity of commencing the work in a proper and reasonable way.

The Construction of the Bed in which the Plants are Placed.—This is of essential importance, and ought to be regulated by local circumstances. If, for instance, the soil be dry, a ditch will not be required to drain the land; but if wood to protect the fence cannot be had, of course a ditch becomes necessary. If the soil, again, has too much moisture, a ditch is to be preferred even in

cases where wood is plentiful. The mode in which the sites for hedges are formed at present throughout England is in many cases highly objectionable. What is called the "hedge and ditch plan" is one of the best, though in many cases imperfectly executed. It is effected by digging out a ditch parallel to the line on which it is intended to place the fence, 5 feet in width at top, 3 feet in depth, and 1 foot wide at bottom: the soil out of this channel is thrown upon that side where the hedge is to be planted, thus forming a sort of ridge for the plants to grow on. Now, with regard to this plan it is to be observed that it is advantageous only either in soils which have too much moisture, or wherever wood for paling to protect the hedge cannot be procured conveniently. This should be invariably borne in mind, and I repeat it now, because it has become common to proceed with a ditch under all circumstances. If posts and rails can be had, it is very plain that there can be no propriety in forming a ditch where there is no superfluous moisture to draw off. And again, if formed only for a fence to the hedge, there can be no necessity for keeping it open for an indefinite time after the hedge has arrived at maturity. In wet soils, as already observed, such a ditch is indispensable; but wherever the soil is favourable, it is rather a hindrance to the growth of the hedge, which it must of course limit to draw its nourishment from one side only, as well as drain off a part of the moisture from its already contracted resources. It follows, therefore, that at the end of three or four years, when the hedge will require no further protection, the ditch should be filled, and the land brought into cultivation. I have already described the usual way of forming hedge and ditch; but the plan is susceptible of a great improvement, which is as follows:—Suppose a plane surface; after the preparation of the soil, described elsewhere, insert the plants in an upright position with the roots inclining to the field side; at 12 inches behind the line thus formed by the plants, commence the side of the ditch, the mould from which should be thrown over the line of the plants, in order to form a bank to protect the fence on the inner, or field side. At this rate, you have a ditch on the outer, and a bank of earth on the inner side, which latter, if topped with small branches or brushwood, will form a protection to the hedge as long as necessary. One of the common plans is to insert the Thorn on the brink of the ditch, which is often washed in with rain; and again, the plants are not unfrequently placed on the top of the mound, instead of the surface, level with the adjoining land. It is moreover to be observed that the ridge or bank on the inner side must not be put close upon the roots, for access to air is indispensable to the proper performance of their functions. This is no doubt the reason why hedges buried under a high mound of earth succeed so indifferently. The plan pursued throughout most parts of England, of forming a ridge or bank of soil, and planting the Quicks on the top of it, is so thoroughly absurd, that one wonders how men conversant with the usual operation of the elements should have ever thought of it. No hedge can prosper if planted in this way. The rain comes, but it washes down the sides of the bank only; the sun shines upon it, but as there is no moisture in the ridge, his influences tend rather in this case to hinder vegetation; frosts loosen the surface, and the soil moulders away from the roots, which, in the course of time, are exposed for the searching winds to operate upon. Hence it is that throughout England there is not a single good close fence founded on this plan; the result being that even after ten or fifteen years' nursing the hedge has to be patched and mended with dead branches. In fact, if such a fence were to be kept clean, as all fences should be, this necessary operation would, in the course of a year or two, cause it to fall to pieces; for the roots of rank herbage, Brambles, &c., which surround it, bind the bank together, so that the weeds and rubbish may be truly said to form a part of the system. Added to this is the great width of the bank, raised, too, by impoverishing the soil on each side, which are in themselves sufficient reasons for rejecting this injurious though common mode of preparing sites for fences. The object of every planter and improver is to form at once an immediate and durable fence, and for this purpose there ought to be a more liberal provision made for the necessary expenses at its first formation. Under all ordinary circumstances, where the soil is not too damp, my plan has been, after trenching and manuring, to plant on the plane surface of the ground, in which cases the roots have the full benefit of the soil on both sides, the full benefit of the rains from heaven, and, instead of being baked by his rays, the full benefit of the sun also. In four years such a fence is strong and impenetrable, requiring no protection, and, if assisted by manuring its weak parts during its progress to maturity, presenting a beautiful, regular, and complete appearance.

Time for Planting.—The best season for planting is immediately after the fall of the leaf in autumn; for at that juncture a tree is at complete rest, and has not commenced to prepare the necessary secretion for its support during the following spring and summer. Let it prepare it therefore in its new station. There is a

slight perspiratory action going on from the bark of trees even in winter, so that the more humid the atmosphere is the less will a plant suffer by being removed. Autumn, then, is, on this account, also the more eligible season. It is not to be denied that many hedges are planted and succeed tolerably in the months of February and March; but, it is equally certain that, in many seasons, during these months the atmosphere is so cold and dry as materially to affect vegetation. I am confident the latter part of October and the commencement of November is the best time both for the Hawthorns themselves, and for getting the best plants to be had at the nurseries.

The Choice of Plants.—This is a subject on which a variety of opinions prevail, some maintaining that it is better even to sow the Haws in the line where they ought to remain. This mode, as also the planting of one or two year's seedlings, can never find general favour with planters, on account of the length of time exhausted in protecting the fence, and consequent expense of cleaning; for a hedge which grows but slowly requires a great deal more attention than a strong one, which rapidly covers the soil, and gets the mastery over the weeds. Generally, the age of plants used for fences is four years, either one-year seedlings, which, after being transplanted, have stood three years in lines, or two year's seedlings, which have stood two years in the nursery lines. The size, however, is of more importance than the age, and the thickness of the stem is to be looked to, and not the height of the plant. Those of the thickness of a man's finger, or such as are an inch-and-a-half in circumference, are to be preferred to any other; and the oftener they have undergone the process of transplantation in the nursery the better will they be furnished with fibrous roots, a consideration which should be always borne in mind. There is a plan, not often practised by respectable nurserymen, but very common with market gardeners, of lifting a large quantity of the Whitethorn at a certain time and binding them in bundles about the size of a sheaf of Corn. Those bundles are taken to market with their roots exposed to the sun and wind at certain periods for a whole day, and if left unsold are taken home to undergo the same treatment till disposed of. Such plants are said to have "stood the market," and are quite worthless. Akin to this process is the nurseryman's practice of counting up several thousands of Hawthorn plants, binding them in hundreds or in parcels of two or three hundreds each, and laying them so bound into the soil to await a customer, it may be, for several months. A great proportion of the plants so treated must die, because in covering them up the soil does not get to the centre of the bundle, which usually falls a prey to the searching winds of spring. Plants which are so lifted before they are actually required should have the full benefit of the soil by being laid in thinly, so that the roots may not in any case touch or rest against each other. Of course, plants which have been lifted carefully, with few of their roots injured, are to be preferred to those which are in other respects better suited. A small plant, with its root uninjured, is better than a strong plant, as to size, with an indifferent root.

The Preparation of the Plants.—This consists in cutting off the tops to within 2 inches of the ground mark, so that when set they will appear this length above the surface of the soil. This is the only operation connected with hedge-fencing which I cannot exactly reconcile with physiological principles. Experience has always convinced me that the plants thrive better when so treated, though it is generally thought that the branches and leaves are required to assist in renovating the roots which suffer by transplantation. Be this as it may, it is unquestionable that plants which are headed-down in the way recommended, shoot out much more vigorously than those which are planted with their tops on. The roots should not be tenched with the pruning-knife at all, for the removal of every healthy root, and especially the spongioles, which are most apt to be removed, is the loss of as many life agents. Plants, indeed, under favourable circumstances, have the power of forming new spongioles, but this is by no means a reason why those roots which are already formed should be displaced. It is also important that, previous to planting, the Quicks should be sorted, as near as possible, to a uniform size; so that no plant may have the advantage over another in rising exuberantly to the detriment of its weaker neighbours, as is always the case when different sizes are used. Nurserymen in general make it a point to assort the plants in a proper method; but it is as well that planters should know the importance of getting them as near as possible of an equal size and description.

Planting.—In this operation the first thing to be done is to stretch a line, so that it may run along the centre of the prepared ground. Close to this line, which will form one side of it, a perpendicular trench is to be opened with the spade, sufficiently deep and roomy to hold all the roots of the plants, which are to be placed 6 inches apart from each other, and as deep as they had been in the nursery lines. In cases where the plants are very strong, the space between each plant should be 8 inches. Over the roots a sufficient

portion of mould is to be placed with the hand in order to keep them firm in their places, when an additional quantity is to be filled in with the spade. The line of plants is then to be trod gently, yet firmly, with the foot, when the remainder of the soil may be levelled in about the stems of the plants, and the surface finally smoothened with a garden-rake. The plan of planting with the dibble is highly improper, because it necessarily gathers all the roots together into a small compass; indeed, careless labourers will cut off the roots rather than take the trouble to put them all into the hole formed with the dibble. The opening of a trench with the plough is also to be condemned on account of its forming a firm smooth surface at the bottom, through which the roots can with difficulty penetrate. It is, besides, impossible to do the work with any degree of neatness where the plough is introduced; but the chief consideration is, that where it is used the hedge will not grow so well as in those cases where the spade is adopted.

Protection.—This should follow as a matter of course. Many a well-formed and carefully planted hedge is ruined for want of being guarded from the attacks of cattle browsing upon them; and many more are retarded by the fences set around them being either incomplete, or allowed, after any accidental inroad upon them, to remain without being mended. The nature of the protection will depend entirely on local circumstances. In all cases where wood is plentiful, posts and rails are to be adopted. The posts should be 4½ feet in length, pointed or sharpened at the end with an axe, and driven into the ground with a mallet at the distance of 4½ feet from each other, and to the depth of 15 inches. Various other contrivances have been adopted with wood, in order to protect hedges, but in no form has this material been used to such advantage as in the shape of posts and rails. Common hurdles, indeed, have, in some instances, been known to protect a hedge until it has arrived at maturity, but in general they are deficient in strength and firmness, while their cost is not less than that of the other. Mere brushwood loppings of trees or old hedges, and all sorts of wattled works, however perfect in themselves, are not suited to resist cattle unless placed on the top of a bank, and this bank should be only adopted in conjunction with a ditch, as I shall notice presently. With the exception, then of the posts and rails, and the various modifications of this kind of hedge-fencing, I do not hesitate to pronounce all other sorts of protection to a hedge, when used on the plane surface of a field, as inefficient, and a source only of continual trouble and expense. The other kind of protection to a newly planted hedge has been already adverted to, and consists of a ditch dug out on one side, and a bank formed on the other with the soil taken out of the ditch. This bank should be topped with any sort of strong underwood most convenient to be had, but the most effectual resistance to cattle is formed of the loppings of old Hawthorn hedges, Blackthorn, or Slea.

Cleaning.—When a hedge is planted, it should have the full benefit of the soil, and no weeds should be allowed to grow. Weeds rob the soil of its nourishment, choke the young plants, and prevent the rains from getting at their roots. The bottom of the hedge should be regularly hoed with a common hoe (for slovenly gardeners with a Dutch hoe leave half of the weeds around the stems of the plants), and the weeds raked off as soon as the hoeing is completed. There is no operation performed so abominably throughout England as that of hoeing. Whether it be Turnips, Cabbages, or hedge-bottoms, the same slovenly uniformity is observable throughout; and I almost despair of ever seeing this necessary work executed so well as it ought to be. The Scotch, who rather excel in forming hedge-fences, very much neglect the cleaning department. The English, again, clean not at all; indeed, the weeds and herbage, according to the present system, form a part of the hedge, and if they were regularly removed, the fence would be in danger of falling to pieces. It is impossible to lay down rules as to the periods when the hoeing and raking should be performed. It may be mentioned, however, that so soon as the weeds appear, they should be destroyed, and the timely execution of this work will save a great deal of expense and trouble. Nothing in the whole circle of gardening or agriculture has a better appearance than neatly kept hedge-bottoms, and nothing more bespeaks prevailing order throughout a garden, a farm, or an estate. Ivy and Honeysuckle are to be treated in this case as weeds, and should be wholly eradicated. They overcome, and ultimately smother, all hedge-plants within their reach.

Pruning or Trimming.—A hedge should not be pruned till the end of the third year, when it will require to be shaped and moulded to a certain degree of uniformity. The branches and leaves should be left untouched for this period, in order to strengthen the stems. No hedge can have strong stems unless the branches from those stems are allowed to grow, and the leaves on those branches to elaborate the sap fit for the support of the plant. This assertion is abundantly proved by every plant in a hedge which is

allowed to shoot up into a tree; such plants, in the course of a few years, having stems many times thicker than any of the others which are regularly shorn of their foliage. In trimming the Hawthorn, the hedge-shears should be discarded altogether, for they do not make a clean cut, and it is besides a tedious, and, consequently, an expensive method. The only implement which expert hedgers use is the hedge-bill, of which there are several varieties; and it is astonishing what beautiful work a dexterous hand executes with this tool.

The Sloe (*Prunus spinosa*).

This plant is by some called the Spring Plum; by others, the Sloe Thorn; but, most generally, it goes under the name of the Sloe or Blackthorn. In situations where the soil is loamy and not overcharged with moisture, this shrub is found to answer very well for the purpose of fences. It grows rapidly, has formidable spines, and is very lasting. It has no claim upon our attention, however, beyond the Hawthorn, whilst it falls very short of having all the recommendations applicable to that tree. The great fault of the Sloe is its suckers, which it sends up in such profusion as to threaten the usurpation of whole fields in its neighbourhood. The plants should be invariably grown from seed, in which case few or no suckers will rise from the roots. The fruit are ripe in October, when they should be gathered and laid in a heap, mixed with sand, in the open air, and turned over several times during winter until the pulp is decomposed. Advantage should be taken of open weather during January for the purpose of sowing them, which should be done in beds, with a covering of an inch-and-a-quarter in depth. When two years old they should be transplanted into rows to remain for one year, when they will be fit to be removed into hedge-lines as recommended for the Hawthorn, to which reference is made for all necessary instructions. The Sloe being deciduous, it is to be planted chiefly to divide arable fields.

The Crab or Wild Apple (*Pyrus Malus*).

When strong plants of this tree are used, they will form a fence even in a shorter time than the Hawthorn. They should be selected of six or seven years' age, the tops cut off to within 4 or 5 inches of the root, and planted at a foot apart. In rich, well-prepared soil, a bush of shoots will rise from each stool, many of which will measure 3 feet in length and be robust in proportion; but it has one great disqualification which alone prevents it from being in general use—its liability to be attacked by caterpillars. So fond are these insects of fastening upon this tree that I have often seen the leaves for hundreds of yards completely eaten off by them; and when this takes place before the hedge has arrived at maturity, the danger is almost irreparable. It often happens that for several years a fence of this description may remain unattacked; and, on the other hand, it as frequently occurs that for two or three years successively they become a prey to those insects. In planting a hedge of this description it is very important to ascertain that the plants used have been raised from the true wild Crab; for such as are raised from the seeds of cultivated Apples, and even cultivated wildlings, are found to be almost thornless, and, consequently, unfit for the purposes of defence. Reckoning the cost of the plants at 1d. each, a price at which they may be had at any nursery, the expense of forming the hedge complete, without fencing, would be 1s. 10d. per perch, being 10d. more than the cost of a Hawthorn fence for the same space. For the information of those who are desirous of raising the plants, I annex the process:—When the Crabs are gathered, which will be in October, they should be carried to a rot-heap in the open air and mixed with mould to hasten decomposition. If turned several times during winter, the pulp will be so completely rotten that the seeds will be found detached from it sufficiently to ensure germination when sown, which should be attended to during open weather in the month of March. They should be covered to the depth of an inch, and, when two years old, transplanted into nursery-lines, there to remain for a similar time, when they should undergo another transplantation for one year previous to their being planted finally out. Thus they will be five years old. At the end of three years the hedge formed of such plants should be pruned or switched with a hedge-bill into a regular form, as recommended for the Hawthorn, and at four years old it will be strong enough to stand unprotected as a fence. In grounds near to dwellings, or of an ornamental character, unfrequented by passengers, it would confer great beauty if a strong plant was left every twenty yards to shoot up into a tree, to be grafted with one or other of the ornamental Siberian Crabs, or some of the smaller cider Apples which have little or no shade.

The Holly (*Ilex Aquifolium*).

For home districts, and especially for grazing grounds, no tree presents so many qualifications for a hedge as the Holly. Being a close-growing shrub, and an evergreen, it forms a most desirable

shelter for cattle pasturing in fields surrounded by it; and, as it grows much better than the Hawthorn under hedgerow trees (which are absolutely necessary around grazing lands), it ought in every case to be adopted in enclosing meadows and pastures not overcharged with moisture. It is, besides, a much more beautiful object than the Hawthorn; and, being recommended near to dwellings, it is important to recollect that it is a tree which does not exhale any perceptible vapour. Added to these are the following important considerations:—First, its keeping itself almost free from weeds, for from the closeness of its branches at bottom, it excludes the air so effectually that nope can grow; secondly, its not being liable to the attacks of any insects; and, thirdly, its not being resorted to by birds. The reasons why it has not been so generally adopted as it deserves are—first, a prevalent idea that it is a slow grower; and, secondly, the high price of the plants. A strict compliance with the rules laid down for the preparation of the soil and for the choice of plants, will obviate the first objection; and the other may be modified considerably by every one raising the plants for himself, agreeably to the instructions detailed.

Soil and Situation.—Let no one be deterred from planting the Holly from an idea that the soil is not suitable for it, providing it is not bog land, or soil absolutely saturated with wet. It certainly triumphs over more varied localities than the Hawthorn; it is found flourishing on dry gravelly land, as well as on strong clay. Sand, and sandy loam, are the soils it delights in most, and, when it meets with these, it shoots up luxuriantly.

Preparation of the Soil.—As in the case of the Hawthorn, and all other hedge trees, the site intended for the Holly should be trenched and manured several months before the time of planting. The trench in this case I would recommend to be a yard in width, and at least a yard in depth. It matters not what sort of manure be used, for, by the time the soil is turned up, all sorts will be pretty well reduced to a certain quality. The chief thing is to have the soil loose and fertile, and, to accomplish the latter, nothing can be better than well-rotted farm-yard manure. By the deep trenching recommended, the soil will be raised about half a foot higher than it was before, but it will afterwards sink down, so that none of it should be removed.

Site for the Plants.—The plane surface, with a fence on either side, is best; but where the materials for fencing cannot be procured, cast a ditch on one side, and raise a mound on the other with the soil taken out of the ditch, and if the soil should be insufficient for that purpose, top it with dead branches such as can be got in the neighbourhood. The bank raised must not be immediately over the roots of the plants, for a certain degree of air is necessary to their free development; the side of it, therefore, should be 15 inches away from the plants.

Time for Planting.—The best season for planting is from November till March; for, though the Holly and all evergreens are often removed during summer, the most eligible season must be that in which there is the least chance of their being affected by evaporation. The particular day to be chosen is when the atmosphere is humid, and the elements still; for, though some may think these unnecessary precautions, they will assuredly tell well on the first year's growth of the plants. It must be remembered that the Holly is rather a shy plant to remove; hence the necessity of choosing the cloudiest weather for the purpose.

Choice of Plants.—No plants should be used except those which had been transplanted the previous year; in which case every plant will be furnished with an abundance of fibrous roots, and, though they may not look so well as those which had stood in one place for two or three years, yet their certainty of growing overbalances every other consideration. Plants of six to ten years of age should be preferred to younger ones, for young plants are proverbial for the slowness of their growth, but, when they get to about eight years of age, they commence to grow rapidly. They require no preparation, either by pruning the root or the top. Where the distance is not great, balls of earth may be carried with the plants, and this precaution will still further ensure their vigorous growth even during the first season.

Planting the Holly.—This is accomplished by setting the line, and opening a straight trench or furrow with the spade, as recommended for the Hawthorn. In this trench the plants should be set upright and close to the side of the trench, so that a straight line may be formed by them. The distance between the plants should be at least a foot, and, in cases where they are very bushy, 15 inches apart will be close enough. They should be planted about half-an-inch deeper than they stood before, and the soil, laid immediately to their roots, should, if possible, be pulverised. In order that they may stand firm and upright, they should be trod gently immediately after the roots are covered, and, during this operation, the best opportunity presents itself for adjusting such of

the plants as do not fall in exactly to the straight line. By taking hold of the top and treading the root at the same time, any plant may be easily made to assume its proper position.

Pruning and After-management.—For the first two seasons the hedge will require no pruning, but, after the third year, such parts of the sides as become broad and irregular had better be clipped into uniformity. I say clipped, meaning by the hedge shears, for the Holly is too thick, and its leaves too numerous, to allow of its being trimmed with a hedge-bill. I have been long anxious for such an opportunity as the present to enforce the necessity of taking the management of fences out of the hands of ignorant, though well-meaning, labourers, who have little idea of beauty and order, and who are very unfit to perform the nice operation of managing hedges. But the question is, who else are to look after them? Gardeners are not always on the spot, and even if they were, a great many of them are void of education on this head, and, I may add, as careless as labourers. A Holly hedge is considered at maturity when it reaches the height of 6 feet, beyond which it should not be allowed to grow, unless in special cases; for, if higher, the expense of clipping is very much increased. It should be perfectly straight, broad at bottom, and gradually tapering to the top, somewhat in the shape of a narrow letter A. The time for clipping is October, and it is not necessary that this should be performed oftener than once every year.

Cleaning.—This is all-important in hedge fencing, as it is in every other department of agriculture. Hedge fences are too often nurseries for weeds, which are allowed to ripen their seeds, ready at all seasons to be disseminated throughout the adjacent fields. I need scarcely add that the soil, of itself, will no more produce weeds than it will in like way produce foreign timber trees, so that, if every one would be careful to cut them off before they got to maturity, we should have much less labour and trouble in cleaning. Not one man in twenty understands what it is to hoe and rake the ground in perfection, for, according to the present practice of those who presumptuously call themselves gardeners, at least one fourth part of the weeds are allowed to remain untouched, and very generally to ripen and disseminate their seeds. Holly hedges are much easier to keep free from weeds than any other sort of fence, on account of the plants growing so close to the surface of the soil, and thus choking the herbage. Few or no weeds will be found under the hedge, but the outsides should, of course, be kept as clean as that part which is shaded by the branches. Under ordinary circumstances, the hoeing and raking would not be required oftener than three times during a season, viz., in May, July, and September; but, during wet summers, favourable to the growth of weeds, an additional cleaning would be required.

Mode of Growing the Young Plants.—I annex the nursery culture of this tree on account of its being comparatively an expensive plant to procure of nurserymen. I do this in order that every person may rear the plant for himself. It is known to everyone that the Holly is a most plentiful bearer of seed, being in most seasons literally clad with beautiful scarlet berries which, with the branch, are generally called "Christmas." These berries are perfectly ripe in November and December, when they should be gathered, and after being mixed with sand, laid in a pit in open ground till the December following; that is, for twelve months, when they should be sown during open weather. When in the pit, they should be turned over frequently so as to hasten the rotting of the pulp in which they are encased. The soil in which they are sown should be free sandy loam, shaded if possible from the south, so that the sun may not dry up the beds. For the sake of weeding them conveniently, these beds should not be more than 4 or 4½ feet wide, the soil should be made soft and fine by raking it, and the depth to which they should be covered is from a quarter to half an inch. I do not approve of sowing the seeds immediately after their being gathered, because, first, there is the loss of one year of the soil which they occupy; second, there is the cleaning of the space for a like period; and thirdly, the soil lying undisturbed so long gets so firm as to materially hinder the growth of the tender plants when they do appear. The young plants will begin to spring in May and June, and should be kept perfectly free from weeds. At the end of the second season, during the months of November and December, the plants should be removed into lines about a foot distant from each other, and the plants placed about 4 inches apart. Here they should remain for two years, when they should be again removed into lines 18 inches apart, and the plants placed about 6 inches from each other; in those lines they are to remain for a similar period. The plants will now be six years old, and if they have grown freely, they will be fit in another year to take their place as fence plants. With this view, therefore, they should be again removed into lines 20 inches or 2 feet apart, and placed in those lines about a foot distant from each other, here to remain, as stated, for one year. When lifted, such

plants will have large bushy roots, and nothing but the grossest carelessness will prevent them from forming in a short time a beautiful and durable fence.

The Beech.

This tree grows rapidly on all prepared soils, and forms a very beautiful fence. In rich soil, it retains a great proportion of its leaves in a withered state during winter; and is, on this account, excellent for nursing early Grass on such lands as are set apart for feeding and fattening different kinds of live stock. Its only defect is a want of that rigidity so striking in the Whitethorn and Crab; hence it cannot in all cases be safely trusted where cattle are grazing, unless it be protected by a ditch next to the field where they usually are. This circumstance, however, is capable of being turned to good account in soils naturally too damp for it, where a ditch would be required as well for the drainage of the land as for a protection to the hedge. In fencing such land, then, let a ditch be dug out on the field side as already detailed, 5 feet in width at top, 3 feet in depth, and 1 foot wide at bottom; the soil from the ditch is to be thrown over the line intended for the hedge (not as a bank on which to plant it, as is usually done, but for a fence to it), and the hedge itself is to be planted parallel with the ditch at about 9 inches from the edge of it. With regard to this tree, it may be stated that in the colder and more exposed tracts of arable and pasture lands, as well as on those which are too damp for the Hawthorn, it is better adapted than any other tree. Thus it becomes, on the one hand, a link between the Hawthorn and the Furze, and, on the other, between the Hawthorn and the Willow, Poplar, &c. In order to give a higher degree of rigidity to a Beech fence I have, in several instances, planted a double line of plants, and I have no doubt that this plan will obviate the defect alluded to, but as yet my hedges have not been long enough planted to prove this position. Between the parallel lines I leave a space of 18 inches, so that the stems of the plants, when grown up, form a sort of strong frame-work on either side, which I am persuaded no description of cattle will be able to break through. Between each plant in the lines a space of 15 inches should be left; and, as pointed out with regard to every other tree, no weeds should be allowed to rise amongst the plants or near to them. The time to clip is the month of October, and the form to which hedges of this description should be moulded is the same as that recommended in the case of the Hawthorn. From the facility with which it may be reared, its quickness of growth, and the valuable protection it affords to cattle in pasture lands, this tree certainly deserves to be planted more universally than it has hitherto been. From the nature of the young shoots, the hedge-bill cannot be advantageously employed in trimming the Beech; yet it may be remarked that no tree so well repays the expense of clipping, for during summer time it is, of all others, the most ornamental.

The Hornbeam and the Elm.

These trees are sometimes used for fences; but neither of them has anything to recommend them in preference to the Beech. Indeed, the Hornbeam is, in many respects, so like the Beech that, at a distance, it is often mistaken for it. One consideration in favour of the Beech over both these trees is, that nurserymen sell the plants at a few shillings less per thousand than they charge for Hornbeam, and at a considerably less price than what is demanded for Elm. —*Journal of the Royal Horticultural Society.*

Cowan's Heating Apparatus.—A number of gentlemen, at the invitation of Messrs. Treuch and Murray, of Trafalgar Square, visited Hatfield, the seat of the Marquis of Salisbury, on Friday last, to inspect the system for heating hothouses, Vineries, and large ranges of buildings generally, with which our readers are already familiar. Mr. Bennett, the gardener at Hatfield, spoke enthusiastically of the plan, and stated that he heats twenty-one houses by it at less cost than nine are heated in another part of the grounds in the old manner. A number of questions were asked by gentlemen present, and explanations given by Mr. Cowan; and the general opinion expressed was entirely in favour of the new method. It was mentioned at the luncheon which followed the inspection that a company will probably be formed for purchasing and working the patent. Our own opinion is strongly in favour of the system, and so is that of many others; nor is it any wonder that this is the case, considering that a good many large ranges are effectively heated by it already. If such is the case in the infancy of the system, we may expect even more remarkable results by and bye. Mr. Cowan is already manufacturing boilers proved to produce a better result than those hitherto used, and we entertain no doubt that there is a great future for Cowan's system, provided the new company secures the inventor's assistance permanently. This system of heating will have many applications apart from its horticultural uses.

WORK FOR THE WEEK.

Flower Garden and Pleasure Ground.

THIS season, the month of May has certainly been uncertain, a registering thermometer, on the night of the 16th, having indicated 8° of frost; while, on the 20th, there were 2°—facts which afford sufficient evidence of the danger of putting out tender plants until something like a decided change has taken place; this desideratum appeared to be, to some extent, realised on the 23rd, when the wind changed from north-east to south-west, accompanied by a slight fall of rain and a considerable increase of temperature. In some situations, the soil of the flower-beds will be found to be in so desiccated a condition as to render planting, as yet, impracticable; but where, fortunately, this is not the case, no further delay should take place in furnishing beds with plants, as it must be borne in mind that the season for floral display in the open air is necessarily of short duration; and, on this account, it is also necessary to plant tolerably thick, in order that the beds may become, as soon as possible, effective. Immense numbers of plants are, consequently, required for this purpose. So much, indeed, is this the case, that, in most establishments, it has become necessary to discontinue the practice of potting off separately the various species of plants used for bedding out, recourse being had to boxes, seed-pans, &c.; and most varieties appear to succeed equally well, when turned out of such boxes and store-pans, as when turned out of small pots. Amongst plants which it is quite unnecessary to pot off separately, may be mentioned the various varieties of *Calceolarias* which should be struck during the month of October in store pots, well drained and filled with soil composed of river-sand and leaf-mould, and placed in a cold pit or frame, which should be kept close until the cuttings have become fairly rooted, when, being nearly hardy, they may be planted out in a trench or in a turf pit, so that they can be protected during severe weather, and they will generally be found to be in a fit state to move into the flower beds or borders by the middle of May. Spring-struck cuttings of *Verbenas*, *Ageratums*, *Colenses*, *Iresines*, *Alternantheras*, &c., should also be shaken from the store-pots, and at once planted in the beds and borders where they may be required. Old plants or autumn-struck cuttings may also be used if required; but, in all instances, spring-struck cuttings are best. In all cases, however, water liberally as the planting proceeds, and this must be repeated more or less frequently, in accordance with the state of the weather. Keep a few plants of each of the sorts used in pots or store-pans in order to be in readiness to replace failures, which may occasionally occur even under the best management. A few plants of the various sorts of *Tricolor* and other *Pelargoniums* which may be employed as bedders, and which are not of rapid growth, should be planted out in the reserve garden in order to furnish cuttings for the following season, and to obviate the necessity of taking cuttings from beds before they can well be spared for that purpose. In many instances, *Roses* are suffering severely from the attacks of aphides and leaf-rolling caterpillars. The latter should be carefully picked off and destroyed, or the leaves containing them should be pressed, so as to crush the pests to death; whilst diluted tobacco-water should be used to syringe the plants infested with aphides, or they may be well dusted with Pooley's tobacco-powder in the evening, and syringed with rain-water the following morning. Plantations of *Roses* should also be liberally watered and mulched with good half-rotted manure, more particularly those plants which have been recently removed. Remove seed-pods from *Rhododendrons* and other American plants, the blooms of which, on account of the great drought which has, in many localities, been experienced, have faded sooner than usual this season; and, by attending early to this matter, increased strength will be given to the plants, to enable them to make growth for the following year. They ought also now to have a thorough flooding of water, and valuable specimens may afterwards be mulched, in order to enable the soil to retain moisture; for mulching, the mowings of the lawn, &c., offer a suitable material. Many *Conifers* and other ornamental trees have this season suffered severely from the effects of recent frosts, and a very destructive maggot also inflicts, about this time, serious injury upon the tender shoots of the *Pinus insignis*, *P. Nordmanniana*, *Douglas Fir*, and other *Conifers*. This should, therefore, be carefully looked for and destroyed. *Squirrels* are also exceedingly destructive to all the *Pinus* tribe. The present season affords no excuse for weeds on gravel walks and drives, and advantage should be taken of heavy rainfalls to apply a heavy roller on the following day, as few things can add more to the beauty, or make gardens and pleasure grounds more thoroughly enjoyable than clean, firm, dry, and level walks.—P. GRIEVE, *Culford Gardens*.

Hardy Flowers.

Hardy annuals, if coming up too thickly, will now require thinning, and perennials sown in the open border should likewise receive

attention in this way, taking care in the case of choice kinds to re-plant the thinnings. Specimens of herbaceous plants in pots should not be allowed to suffer from want of water, and they should receive attention in the way of staking and removing dead blooms. Any seeds of perennials unsown should now be either sown in pots or in the open ground. See to the staking of border plants, and, if desirable, in particular cases, to form perfect specimens, this is best attained by judicious thinning—a remark specially applicable to such plants as *Helianthus rigidus* and *orgalis*, some *Delphiniums*, *Asters*, *Achilleas*, *Tanacetum crispum*, &c. Many perennials used for spring-bedding, such as *Myosotis dissitiflora*, *Cheiranthuses*, *Daisies*, *Primroses*, and *Pansies*, will now have to be removed to make room for the summer occupants of the beds; and in doing so the stock should, if necessary, be increased by dividing the tufts, while of such plants as the *Iberises*, *Double Wallflowers*, *Alyssum spinosum* and *sexatile* cuttings should be inserted in sandy soil on a north border, and, if conceivable, they may be covered with a handlight, to facilitate rooting. The most attractive hardy plants in bloom during the past week have been the *Oriental Poppy*, the large scarlet blooms of which are highly conspicuous, various kinds of *Iris*, notably the dwarf *I. cristata*, of which I have seen fine specimens blooming profusely both on a warm border and in pots. The white blooms of the *Florentine Iris* are also just now conspicuous in most gardens, and so are the scarlet flowers of *Geum chilense*; *Czackia Liliastrium* is also producing its delicate white blooms somewhat freely; *Jacob's Ladder* (*Polemonium caeruleum*) and its varieties, are likewise at present nicely in flower; and I noticed a distinct dwarf species, called *Polemonium humile*, with lilac-blue flowers, which promises to be a useful plant for rock-work or front margins of mixed borders. A very pretty dwarf hardy bulb, called *Hyacinthus amethystinus*, is just now in perfection. The fine and continuous-blooming *Erodium Mancsavi*, is also in flower, but this, like many other plants, is not blooming so freely this season as usual.—T. SPANSWICK.

The Kitchen Garden.

The rainfall during the last six months has been much under the average, but the land has never been in a more workable or healthier condition for growing crops than at present, neither is there now any lack of moisture. The loose friable texture of the surface has, in the absence of heavy rains, acted as a check upon evaporation; and the soil, consequently, remains in a moist condition, although no great amount of rain has fallen in this neighbourhood, at least for months. The advantages to be derived from a frequent stirring or aëration of the soil cannot be overrated. The hoe at this season is the most useful implement in the garden; its frequent use not only renders watering less necessary in dry weather, but destroys, almost in the germ, the annual weeds which are always ready to spring into active growth, and which, if neglected even for a short time, give so much trouble to eradicate. Vegetable seeds of all kinds have never germinated better than they have done this season; and, as a consequence, it is more than usually necessary that thinning should be timely attended to. I believe, however, that it is a mistake to thin out any crop all at once; for, in our changeable climate, singling out plants that have previously stood thickly is calculated to give too great a check to the growth. Root crops, such as *Carrots* and *Parsnips*, should have their drills hoed through at short intervals, leaving the plants standing in little patches. The final singling is best done in showery weather, or just before rain is expected, so as to settle the young plants that are left for a crop in their position. As a rule, medium-sized roots are more esteemed, in private establishments, than large coarse ones; therefore, severe thinning is hardly necessary, unless very large roots are required for some special purpose. About 6 inches in the row may be taken as giving a fair space for development in the case of *Carrots*, *Chicory*, *Salsafy*, and *Scorzonera*; 8 inches for *Parsnips*, *Beet*, and *Turnips*; and 4 inches for *Onions* (I am assuming that in no case are the drills less than a foot apart); whilst *Carrots* and *Parsnips* should have 15 inches. A good sowing of *Walcheren* and *Veitch's Autumn Giant Cauliflower* should now be made without delay, if not already done, for autumn use. If the land is very dry, the drills may be soaked with water before sowing the seeds, and then covered with light rich soil. Having a somewhat difficult soil to manage, I have for years made up, in the winter, a heap of compost, in which burnt earth largely predominates, for the purpose of covering small seeds; and so satisfied am I of its advantages, that I intend never again to be without it. The young plants are more vigorous, and less liable to be attacked by the fly. Cauliflowers that are now ready to plant out should have a cool position, where the land has been well-worked and manured; plant in deep drills or trenches, and mulch with manure. *Tomatoes*, that have been standing under temporary shelter, should now, even in late backward districts, be planted out. Vacant spaces on south walls should first be filled up, but, as the demand for *Tomatoes* is increasing, all bare places on east

or west aspects should also be utilised. We have grown them this way for years; their ripening, with us at least, is more a question of thinning and stopping than of aspect. Of course they will come earlier on a south wall than on any other aspect, but the later ones are none the less useful. They may also be planted in any warm corner, and trained to sticks, with a very fair amount of success; but, as I before stated, success is a question of keeping the growth thin, and regularly stopping each shoot one point beyond the clusters of blossom. Where there is a demand for Endive, a small sowing may now be made on a north border. On some soils, early sown Endive is very liable to "bolt;" I have generally found the broad-leaved Batavian rather more trustworthy in this respect than other kinds; but, as the season advances, there will be less difficulty about this; and, after all, so far as salad-making is concerned, really good white Lettuce forms the principal requisite for a good summer salad. There is, however, a frequent demand for Endive in the kitchen, independent of salad-making, therefore, it is necessary to get it forward as early as possible. Vegetable Marrows should be planted out on hills about 6 feet apart, where a liberal allowance of manure has been worked in; a few evergreen branches may be placed round them for a few days for shelter. Gherkin Cucumbers may, also, be planted out under hand-lights. For the last few years, instead of raising the plants in pots, I have simply prepared the ridge, and sown the seeds under hand-lights, putting in more seed than I required plants, and removing the weakly ones as they appeared; I have thus secured fine healthy plants that have borne better and nearly as early as when I formerly took a good deal of trouble in raising the plants in pots. The main crop of Potatoes should now be earthed up. I hear the severe frost of the 18th instant has done a good deal of damage in low-lying districts. Basil, Sweet Marjoram, and Summer Savory, that have been sown in boxes, if well hardened off, should now be planted out, on a warm border, 6 inches apart. There is always a large demand for these herbs; therefore, it is important that early attention should be given to them. Chervil, also, is much in request. A little sown once a fortnight for the next few weeks, on a north border, will make sure of a supply. The following are good Peas for present sowing—viz., British Queen, Ne Plus Ultra, Veitch's Perfection, and M'Lean's Best of All. The two first-named grow at least 6 feet high; the two latter rarely exceed 3 feet. A selection may be made to suit each requirement. Tall Peas should, if possible, be at least 12 feet apart, with other crops between the rows. Sow in trenches that have had 4 or 5 inches of manure forked in the bottom, and the soil stirred to a considerable depth.—E. HOBDAV, *Ramsey Abbey.*

SOCIETIES AND EXHIBITIONS.

ROYAL HORTICULTURAL SOCIETY.

MAY 27TH.

THIS meeting was an unusually uninteresting one, a circumstance, doubtless, owing to the fact that the great show is fixed to take place on Thursday and Friday next, an occasion for which the best plants are, as a matter of course, reserved. Cut specimens of *Puya chilensis* were shown in flower, from the Scilly Isles, where it grows and blooms as freely as a Yucca. It is, doubtless, too tender to succeed outside with us, even in sheltered positions, but planted out in a cool conservatory or greenhouse it would be quite at home. Mr. Lawe, of South Lodge, Enfield Chase, exhibited *Lilium Humboldtianum* in bloom. It has lance-shaped leaves, eight or nine in a whorl, and eight or nine blooms borne together on a lax terminal spike. The flowers, individually, are large, with slightly reflexed segments of a bright orange or vermilion colour, marked at the base with dark spots. The same exhibitor also had a plant of the dark crimson-flowered *Lilium concolor*, with remarkably large and richly-tinted blossoms. Mr. Barr also furnished some interesting Lilies, among which the bright yellow-flowered *Lilium monadelphum* was conspicuous. Messrs. Veitch & Sons also had a plant in bloom of *L. monadelphum*. Messrs. Haage & Schmidt, of Erfurt, showed half-a-dozen plants of double Cinerarias, which promise to be useful, not only for general decorative purposes, but especially for supplying cut flowers of a more durable character than those of the single varieties. The same firm also sent a collection of cut flowers from their strain of dwarf or Pom-pouze varieties of Cinerarias. Mr. Cook, gardener to N. Solomon, Esq., Cliffe Lodge, West Hill, Wandsworth, staged a large purple erect-flowered *Gloxinia* named Madlle. Albani. It appears to be a profuse bloomer; but, in point of form and colour, is no advance on many other seedlings now in cultivation. A plant of *Angelonia grandiflora* was shown by Mr. Lawe. Mr. Watson, St. Albans, exhibited two fine Cucumbers, named Watson's Antagonist; also one of his Patent Portable Heating or Evaporating Stoves, adapted for warming the small conservatories now so frequently met with in connection with town and suburban residences. It is similar in appearance to an "Arnott," and so constructed that piping may be attached to it if desired. Several species of *Eucalyptus* were shown in the form of cut branches, two of them, viz., *E. polyanthemus* and *E. montana*, being hardy, and forming trees 40 to 50 feet high at

Kew and Coombe Royal, Devon, respectively. Mr. Berkeley stated that the aromatic foliage of *E. globulus* had been found extremely valuable in the treatment of wounds.

Certificates were awarded to the following, viz. :—

Puya chilensis (Dorrin).—A robust Bromeliaceous plant, bearing thick erect spikes of pale greenish-yellow flowers, surrounded by copious bracts of a dark brown colour.

Cineraria hybrida fl. pl. (Haage and Schmidt).—A new race of double-flowered forms, which promise to be extremely valuable for indoor decoration.

Odontoglossum Alexandra var. *Rothschildii* (Richards).—A fine variety, with sepals suffused with soft rose, and profusely speckled and blotched with purple. It is one of the most highly-coloured forms in cultivation.

MANCHESTER HORTICULTURAL EXHIBITION.

MAY 22.

THIS exhibition was the seventh of the series of great shows which has made the northern metropolis so famous for its floral gatherings. It is here, in the midst of the unceasing hum of millions of wheels, that we find those possessing wealth spending it without grudge or stint in the cultivation of plants and flowers. Here, too, toiling artisans spend so much of their spare time in the cultivation of Auriculas, Pinks, Pansies, Carnations, and Polyanthus, as to make Manchester pre-eminently the home of the florist. The tens of thousands who labour hard, and almost incessantly, at desk and bench, testify by their presence each succeeding Whit-week at the gardens at Old Trafford, that they also admire and derive pleasure from the contemplation of the beautiful forms and exquisite colours there displayed. Other places in different parts of the country get up their yearly floral displays, yet, most of them provide other attractions in addition to such as are exclusively connected with gardening. Manchester admits nothing else except horticulture, pure and simple; and as these exhibitions cost large sums of money, it was seen from the first that unless they met with the support of the public in great numbers, so as to make them thoroughly self-supporting, they could not exist; and that it would require a greater length of time during which the shows should be kept open than had been attempted before, and which was only rendered possible by the possession of a building such as the society has, in which to preserve the more tender subjects shown; and by the offer of prizes on a scale of liberality which would remunerate exhibitors for their time and additional expenses. How the project has succeeded, and even surpassed the expectations of its best wishers, is evidenced by the displays made each succeeding year, and the goodly sum that goes to the coffers of the society, and enables it yearly to step out further in its laudable work. There are few things more gratifying than to be able to accomplish several desirable objects through the use of a single means. The society has done, and is still doing much to educate, refine, and elevate the tastes of the people, to foster and encourage the pursuit of horticulture, and also to furnish the society with increased means to extend its usefulness; but let us give merit where merit is due. It is to the able and most courteous curator, Mr. Findlay, these gatherings owe their origin. It was he, and he alone, who induced the society to run the financial risk—and risk it was—in an experiment, the success of which was looked upon as doubtful by far the greater number of those best able to form an opinion as to probable results. That the good fortune, so well merited by the society, may continue must be the earnest desire of all who wish well to horticulture. After an almost unprecedented dry spring, the morning of the show was ushered in by rain, which, although not in quantity, still had a most threatening appearance, that continued all the day. But lovers of flowers in the neighbourhood of Manchester are not to be deterred by untoward appearances; and, consequently, they turned out in such numbers as testified the estimation in which they hold the rich treat provided for them. The attendance and receipts were even in excess of those of last year. Entering the exhibition building, the general effect was striking in the extreme. There was a little falling off in large-flowering plants; but this was made up for by the magnificent display of Orchids shown, and which reminded us of Chiswick and "The Park," when Mylam, Williams, Filcher, Franklin, Woolley, Baker, and others, used to astonish lovers of these plants with their productions. Ferns, Palms, and new and rare plants were in quantity, so judiciously arranged as to leave nothing wanting. —Twelve Stove and Greenhouse Plants in flower: In this class Mrs. Cole & Sons, Withington, had a fine collection, conspicuous in which was a very large plant of the bright rose-coloured *Azalea Trotteriana*, splendidly flowered; also *A. Conqueror*, somewhat smaller, but equally well grown; good plants of *Aphelexis humilis rosea* and *A. macrantha purpurea*, a large well-flowered *Anthurium Scherzerianum*, and others. Messrs. Thomas Jackson & Sons, Kingston, who stood next in point of merit, had a well-bloomed even group, noticeable in which was a splendid plant of *Erica tricolor*, a good well-flowered *Hedera tulipifera*, a moderate-sized good *Erica Cavendishii*, the white-flowered *Draconophyllum gracile*, *Aphelexis macrantha*, well done, evenly flowered down to the pot; *Ixora coccinea* and *Stephanotis floribunda*, nice and fresh, but the flowers insufficiently open. Mr. Lingard, gardener to H. Sampson, Esq., Bowdon, who was third, had a nice but smaller collection, fresh and evenly flowered, his best plants being *Azalea Beauty of Europe*, *Erica ventricosa densa*, *Hedera tulipifera*, *Erica Cavendishii*, and *Ixora coccinea*.—Sixteen Plants, eight foliage and eight in flower: Here, again, Mrs. Cole & Sons were first with a couple of well-flowered large plants of *Azalea Iveryana* and *A. Duc de Nassau*, a splendid bush of *Erica Lindleyana*, a nice *Acerophyllum venosum*, an immense plant of the variegated New Zealand Flax, a well-coloured *Croton variegatum*,

and a magnificent *Cocos Weddelliana*, fresh and vigorous. Mr. George Cooper, nurseryman, Irongate, Derby, who was second, furnished, amongst others, a magnificent plant of *Statice profusa*, scarcely at its best.—Sixteen Orchids (amateurs): In this class Mr. Hubberstey, gardener to O. O. Wrigley, Esq., Bridge Hall, Bury, was first with plants whose equals have not been seen for some time, and taken as a whole, it is doubtful if ever they have been surpassed; they were large, fresh, and magnificently flowered. Amongst them were *Dendrobium Schroderii*, with some twenty-four good spikes of lovely white and orange flowers, one half of which was fully open, the others coming on; *Cattleya Mendelii*, with thirteen flowers; *C. Skinneri*, profusely flowered and finely coloured; *Saccolabium præmorsum*, with nine good spikes; *Odontoglossum Alexandræ*, very fine, bearing thirteen spikes; the bright yellow *Anguloa Clowesii*, with twenty flowers; *Thunia Bensoniæ*, with some twenty strong spikes; a large mass (finely coloured) of *Dendrobium cærulescens*; *Odontoglossum Phalenopsis*; the old, but indispensable, *Calanthe veratrifolia*, profusely flowered, and others equally good. Mr. Mitchell, gardener to Dr. Ainsworth, Manchester, who was second, showed, amongst a number of good plants, *Phalenopsis grandiflora*, in remarkably fine condition; *Vanda suavis*, with four large spikes; *Saccolabium guttatum*, carrying ten good spikes; *Odontoglossum roseum*, very fine; *Aërides Fieldingii*; and an intensely high-coloured form of *Cattleya Warneri*. Mr. Johnson, gardener to E. Wrigley, Esq., Broad Oak, Bury, was third, his best plants being a magnificent example of *Phalenopsis amabilis*, *Oncidium sarcodes*, with spikes 4 feet long; the splendid new *Odontoglossum vexillarium*, bearing enormous flowers; and the seldom shown *Vanda Batemanii*. Eight Orchids (amateurs).—Here again Mr. Hubberstey was first with a grand plant of *Cattleya Warneri*, carrying seventeen highly-coloured flowers; the large plant of *Odontoglossum Phalenopsis*, exhibited at Kensington last year, bearing a hundred flowers; *Dendrobium Devonianum*, literally a mass of blossom, 2 feet 6 inches through, yet spoilt in effect by being tied up to sticks; and a huge mass of *Dendrobium nobile*. Mr. Williams, gardener to J. Broom, Esq., Didsbury, who was second, had good plants of *Aërides Lobbiæ*, with ten spikes, several of which were nearly a yard in length; *Epidendrum prismatocarpum*, in splendid condition; and *Cypripedium villosum*, large and finely coloured. For a single Orchid, Mr. Mitchell was first with a grand plant of *Phalenopsis grandiflora*. In the class of fourteen Orchids (nurserymen), Mr. B. S. Williams, Holloway, and Mr. R. S. Yates, Sale, Cheshire, were equal first. Mr. Williams contributed fine plants of *Aërides Fieldingii*, *Dendrobium Infundibulum*, *Cypripedium barbatum*, *Odontoglossum Alexandræ*, and *Lælia purpurata*. Mr. Yates furnished a magnificent plant—the finest in the show—of *Lælia purpurata*, with some sixty flowers on it; *Cattleya Warneri*, very fine; *C. labiata*, *Odontoglossum citrosum*. In the class of ten Orchids (nurserymen), Mr. B. S. Williams, who was first, showed, amongst others, a large plant of *Vanda tricolor*, a good *Cypripedium barbatum superbum*, and *Anguloa Clowesii*. Messrs. Rollisson & Sons, Tooting, were second with the singular *Angræcum sesquipedale*, *Cattleya Acklandiæ*, large and finely coloured, and others.

Heaths.—Of these, Messrs. T. Jackson & Sons, of Kingston, had an even well-flowered group, conspicuous in which were the lovely pink flowered *E. ventricosa grandiflora*, *E. coccinea minor*, *E. tricolor speciosa*, and *E. Cavendishii*. Mrs. Cole & Sons, who were second, furnished a magnificent plant of the rare *E. aristata superba*, and a good *E. ventricosa rosea*.

Ferns.—As usual at Manchester, these were shown in great quantities, and in splendid condition. Mr. Hubberstey, who was first for eight, had noble examples of *Gleichenia flabellata*, 8 feet through; *Davallia Mooreana*, *D. tenuifolia*, *Dicksonia antarctica*, and the seldom seen *Goniophlebium sub-auriculatum*, with elegant drooping fronds 7 feet in length. T. M. Shuttleworth, Esq., who was second, showed, amongst others, fine plants of *Gleichenia diarpa*, and *G. speluncæ*, *Brainea insignis*, *Cibotium Schiedei*, and a magnificent example of *Todea superba*. From Mr. J. Lunt, gardener to J. B. Mason, Esq., Cheetham Hill, came a splendid *Cibotium regale*, at least 12 feet across, in the finest health; also *Alsophila excelsa*, equally fine; and several *Adiantums*. In the class of Tree-ferns in pairs (nurserymen), Mr. B. S. Williams was first with a couple of well matched *Dicksonia antarctica*, fine in both head and stem. Mr. Shaw, Bowdon, who was second, had smaller, but well grown plants. In the corresponding class for amateurs, Mr. Hubberstey was first with *Dicksonia antarctica* and *D. squarrosa*, the latter, probably, the finest plant of its kind in the kingdom. Mr. E. Barrow, who was second, had a pair of good plants. These Tree-ferns, standing, as they did, at intervals amongst and overtopping the flowering plants upon the slightly raised banks of the annexe, had a fine effect.

Roses.—These were exhibited in magnificent condition by Messrs. Turner, of Slough, and Lane, of Berkhamstead. The twelve shown by Mr. Turner, being marvellous examples of good cultivation, deservedly received the liberal prize (£25) which was awarded to them. One scarcely knew which to admire most—his *Juno*, with enormous blush flowers, evenly studded over the plant; or his splendidly bloomed *Charles Lawson*, which stood near it. Messrs. Lane, who were second, had smaller, but well-flowered, plants. For fifty Roses in 9-inch pots, Mr. Turner showed a collection in every way well done.

Azaleas and other Plants.—Near these were also Mr. Turner's twenty *Azaleas*, in 12-inch pots, magnificently flowered; and, when viewed from the raised banks of the annexe, the effect was as fine as anything of the kind could well be imagined. The light upright posts that supported the canvas roof had all been draped with Ivy, which gave them almost as good an effect as that produced in the principal exhibition

building by living plants, which are fast covering the permanent pillars. *Pelargoniums* were not numerous; but the want of numbers was made up by the quality and size of the plants shown. Mr. C. Rylands, Ormskirk, who was first, had immense well-flowered plants of *Rose Celestial*, *Desdemona*, and others. Mr. Turner showed smaller, but well-flowered, plants. Flanking each side of the annexe, near the centre, dividing and toning down the blaze of flowering plants, stood two magnificent collections of hardy evergreen shrubs and trees, exhibited by Messrs. Caldwell & Sons, nurserymen, Knutsford, and Mr. Shaw, Bowdon, who both obtained prizes in the order in which their names stand. These consisted of enormous plants of the best varieties of *Holly*, *Yews*, *Retinospora plumosa variegata*, variegated *Box*, *Arancaria imbricata*, and *Euonymus aureus variegatus*; the latter, in Mr. Shaw's group, being at least 10 feet high and 6 feet through. Messrs. G. and W. Yates, nurserymen, Manchester, had also quite a bank of miscellaneous plants, comprising a magnificent *Anthurium Scherzerianum*, that appeared identical with the Southgate form of this plant. It was by far the best plant, as to colour and size of flower, of any in the show. Associated with it were a number of nice well-flowered *Azaleas*, *Dracophyllums*, *Aphelexis*, *Heaths*, *Boronias*, and fine-leaved plants. At the bottom of the annexe were the *Rhododendrons*, of which Mr. R. S. Yates, of Manchester, showed splendid plants, large and finely flowered. Messrs. John Waterer & Son, Bagshot, were second, with smaller, but well-flowered, plants of splendid varieties. At the foot of these *Rhododendrons*, and forming an interesting and appropriate margin, were three collections of eighty Alpine and herbaceous plants, shown by Messrs. Rollisson, Shaw, and G. & W. Yates, who obtained prizes in the order named. At intervals were placed pairs of standard *Hollies*, *Bays*, *Pyramidal Yews*, and *Tree Box*, which served to relieve and set off the smaller plants to good advantage. Succulents were well represented by Messrs. Rollisson, and Shaw. Of hardy Conifers, Messrs. Caldwell had large well-grown plants, the most noticeable being *Retinospora pisifera*, *R. plumosa aurea*, *Thuopsis dolabrata*, and *T. dolabrata variegata*.

New Plants.—For these, Messrs. Rollisson were first with *Hypolepis Bergiana*, the beautiful *Ficus Parellii*, *Anthurium crystallinum*, a species of *Pandanus*, and others. Mr. B. S. Williams, who was second, had a grand plant of *Cyathia Burkei*, *Amaryllis virginalis*, *Masdevallia Harryana*, *Adiantum gracillimum*, *Bentinkia Coddapana*, *Dracæna Shepherdii*, *Anthurium crystallinum*, and the new *Pelargonium Captain Raikes*, a most striking, profuse flowering, decorative plant. In the class of six New and Rare Plants (amateurs) T. M. Shuttleworth, Esq., was first; he had a fine plant of *Dracæna Shepherdii*, *Plectocoma Andersonii*, *Alsophila elegantissima*, &c. Mr. Hubberstey, who was second, had *Odontoglossum vexillarium*, *Sarracenia Drummondii rubra*, and others.

In the competition for Mr. Bull's splendid cups for twelve new plants (amateurs), T. M. Shuttleworth, Esq., Howick House, Preston, was first with a well finished collection. Among nurserymen Mr. B. S. Williams was first; and Mrs. Cole & Sons, second.

Miscellaneous Subjects.—Messrs. Rollisson were first with splendid plants of *Filmy Ferns*, consisting of *Todea intermedia*, a yard across; *T. superba*, and *T. pellucida*. Mr. Williams, who was second, had *Todeas* and *Trichomanes*, smaller plants, but very distinct. Palms were well shown, and, as usual, were very effective, forming a good background for Orchids.

Cut Flowers.—These formed quite a feature, and one not by any means ineffective. In the nurserymen's collections of eighteen varieties, Mrs. Cole & Sons were first with enormous bunches of *Vanda Teres*, *V. insignis*, *Calanthe veratrifolia*, *Stephanotis*, *Ixoras*, *Dipladenias*, *Musa coccinea*, *Nymphæa Devoniana*, *N. dentata*, and others of equal merit. Messrs. G. & W. Yates were second with a nice lot of smaller bunches, effectively arranged. In the amateur's class, Mr. Johnson was first with a splendid lot, including *Phalenopsis grandiflora*, *Cypripedium Stonei*, *Cattleya Mossiæ*, *C. Warneri*, *Odontoglossum Phalenopsis*. Mr. G. Windham Binns, who was second, had a nice collection. These cut flowers were all shown in boxes such as are used for Roses. Ball bouquets in threes were well shown, not the huge clumsy things so often seen in the south, but elegantly arranged and not too large. Mr. C. S. Turner, of Liverpool, was first with three in every way charming. Mr. R. S. Yates, who was second, had three somewhat larger but light, elegant, and well-arranged. For a wedding bouquet Mr. Yates reversed the position by getting first, his production being perfection both in arrangement and quality, and elegance of the flowers used. A number of cases of skeleton leaves and flowers were shown by Mr. Kay, of Withington.

Outside the building were at least two acres of hot-houses, boilers, garden-pots, implements, and appliances of every conceivable description, from all parts of the kingdom, showing at once the estimation in which this gathering of people connected with horticulture is held by those who supply such requisites.

Cheap Heating of Hothouses.—A good deal has been said in favour of the great Yellowstone region, as an immense national park; but there is one advantage not yet mentioned, namely employing the hot springs and geysers towards maintaining a perpetual heat in immense hothouses, on a scale of the Alexandra and Sydenham palaces, where boilers would be entirely obviated, and expenses be greatly lessened.—*Cultivator*. [A few years ago there was some intention of utilising the hot springs at Bath in this way.—Ed.]

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE NEW SCHOOL OF HORTICULTURE AT VERSAILLES.

THE famous and once Imperial kitchen garden at Versailles is at last turned into a school of gardening. It is the most suitable spot that could have been obtained about Paris for the purpose, the scheme seems to have been carefully considered, and, in all ways, worthy of success. Recently, on visiting some of the pleasantest suburbs round Paris, and those which only a few seasons ago presented scenes of what seemed irreparable desolation, we were agreeably surprised at the great change that had taken place for the better; not only were traces of the destruction wrought by the war unseen, but the gardens and fields looked better cultivated and better kept than they were before the war. And now, disorganised as the country is in the struggle for a stable government, it is gratifying to see such minute attention bestowed on the new school of gardening. The programme of this excellent national institution has just been published, and reads as follows:—The School of Horticulture, established in the Royal Kitchen Garden of Versailles, is placed under the jurisdiction of the Minister of Agriculture and Commerce. Only out-pupils are admitted; the instruction given is entirely gratuitous; and the course of study continues for three years.

Conditions of Admission.—The candidates must not be less than seventeen, or more than twenty-seven, years old at the time of entrance. Applications for admission, drawn up on stamped paper, should be addressed to the Minister of Agriculture and Commerce, so that he may receive them by the 20th of September, at the latest. No notice will be taken of any application sent in after that date. Each application must be accompanied by (1) a certificate of the candidate's birth, as a native of France; (2) a certificate of good character, signed by the local authorities; (3) a medical certificate, to the effect that the candidate is sufficiently strong and healthy to undertake the occupation of a gardener. On receipt of these documents, which should be legally drawn up, the Minister, if everything is satisfactory, will authorise the candidate to present himself for an examination, of which he will send him due notice.

Entrance Examination.—Every candidate must undergo an entrance examination in the following elementary subjects:—(1) Reading; (2) writing and spelling (from dictation); (3) numeration, and the first four rules of arithmetic. Credit will be given to the candidates for any technical knowledge which they may possess. This examination will be held in the school on the 1st October, which is the date fixed for the commencement of the academical year, and the entrance of pupils. Every candidate who shall pass this examination in a satisfactory manner, is at once placed on the list of pupils, and has, thenceforth, right of entrance into the school.

Course of Instruction.—The main object of the course of instruction pursued in the School of Horticulture at Versailles is to train up skilled and intelligent gardeners, possessing all the theoretical and practical knowledge that is necessary in horticultural operations. It embraces the following subjects:—(1) The cultivation of fruit-trees in the open air and under glass; pomology; (2) the cultivation of forest and ornamental trees, comprising nursery work in general; (3) the cultivation of vegetables in the open air, and by forcing; (4) the cultivation of flowering plants, in the open air and under glass; (5) elementary and descriptive botany; (6) the principles of landscape-gardening and garden architecture; (7) elementary instruction in physics, meteorology, chemistry, geology, and mineralogy, as applied to horticulture; (8) the elements of zoology and entomology, in their relation to horticulture and arboriculture; (9) arithmetic and geometry, applied to gardening purposes, such as the measuring of surfaces, finding cubic contents, laying down plans to scale, &c.; (10) line drawing, and sketching plants and implements; (11) lessons in the French language and book-keeping. The practical instruction is supplied in a systematic course of manual labour, which embraces every operation of gardening. The time is so divided between these two branches of instruction, that all the pupils will take part in the work of the garden every day, and thereby acquire the knowledge and manual dexterity which are so indispensable. In addition to the instruction imparted in the school, the pupils will be taken

from time to time to visit the principal horticultural establishments, in order to familiarise them with the best examples of practical horticulture and arboriculture.

Examinations at the end of the year and on leaving the school.—At the end of every academical year, a general examination will take place for the purpose of classifying the pupils. Those who fail to pass, through this examination, into a higher division, will cease to be members of the school. Those pupils who pass a satisfactory examination on leaving the school, will receive, on the recommendation of the examiners, a certificate of merit from the Minister of Agriculture and Commerce. Moreover, those pupils who distinguish themselves most at the final examination, may (if their acquirements, and fitness in other respects, point them out as deserving of the favour) receive an appointment, for one year's practice, in one of the leading French or foreign horticultural establishments. An allowance of 1,200 francs (£18) is attached to each of these appointments, the number of which is not to exceed three every year. It must be understood, however, that these appointments cannot be claimed as a right by those pupils who come out among the first at the final examination. A nomination to one of them will depend on whether the examiners have formed a judgment of the pupil, in the course of the examination, as to whether he is a person likely to make a good use of this complementary means of improvement; preference being given to those pupils who manifest a desire for further knowledge, and an earnest devotion to their profession.

Bursaries.—Bursaries, six in number, and each of the value of 600 francs (£24), will be annually given to those pupils whose names stand first on the entrance-list, to help to defray their expenses while they remain at Versailles. Holders of these bursaries will receive them in monthly payments of 50 francs (£2). The institution will also receive pupils sent from the departments, towns, and agricultural or horticultural associations, whose expenses are defrayed by the department, town, or association to which they belong. All the pupils, whether holders of bursaries or not, go through the same course of study, practical work, and examinations, and are amenable to the same internal regulations. In the school, all the pupils stand on the same footing, and are subject to the same rules.

Discipline.—Special rules are framed for regulating the hours of attendance in the school, the employment of time, the course of out-door operations, and the maintenance of order in the establishment. To each rule is appended the penalty incurred by its infringement. Every year, the course of theoretical instruction is suspended for two months (from August 1 to October 1). During this time, leave of absence may be granted to those pupils who ask for it; but the director has the power of limiting the periods of absence, or refusing them altogether, in order to enable him to have always a sufficient number of hands to keep the gardens in order, or to carry out any works of importance or urgency. Any pupil, who does not return at the expiration of his leave of absence, is looked upon as having left the school; his name is erased from the roll, and cannot be replaced without the sanction of the Minister of Agriculture and Commerce.

THE SPECTATOR ON HINCKSEY AND ON GARDENERS.

"THEY (the students) might just as well dig their poor neighbours' gardens, or mend worn-out roads, as do anything else, and thus find out what manual labour is like, besides helping to spread æsthetic tastes, which Mr. Ruskin, with, we fear, a little too much sanguineness, holds to be of a civilising kind. Gardeners, we sometimes fear, are just as little civilised as any other labourers, though they do produce and admire flowers, and get some vague notions of colour—say, about half as accurate as those of a Turkish weaver or Japanese potter, or Cashmere shawl seller—and a conceit with which their is nothing, thank God! on this earth to compare. Talk of the vanity of a poet, or a certificated schoolmaster, or a farmer of Tennyson's sketching, they are humble men compared with a gardener who has raised a new plant, or done anything in the least noteworthy in the way of Orchids, or won a prize at the county flower-show. He feels as if he had made the plants, and wonders, not always inaudibly, why Providence was so stupid as not to consult him before Eden, with its muddle of climates, was finally laid out. Whether flower-growing and road-making, however, civilise or not, Mr. Ruskin thinks they do, and has pressed his view of them with such zeal and energy that he has found followers, and actually induced a few of the undergraduates, with springy spines and good lungs and strong wrists, and some vague sense of the enthusiasm of humanity, to dig hard in poor people's gardens just outside Oxford, and re-cut a convenient, but neglected, road, and do a good turn at once to their neighbours and themselves."

NOTES OF THE WEEK.

— In the York nurseries, the great Siberian Lady's-Slipper (*Cypripedium macranthum*) has recently been finely in flower. It has large self purple-crimson blossoms, and, being perfectly hardy, promises to be a grand addition to Lady's-Slippers. Hitherto, all attempts to cultivate it have proved almost universally failures.

— WE have received from the Rev. Mr. Ellacombe a bloom of *Glossocomia ovata*, taken from a plant of this Bellwort, now in blossom at Bittou. It is a hardy downy perennial, a native of Northern India, with ovate heart-shaped leaves, and bell-like flowers, more singular than beautiful, which emit a peculiar odour.

— THE Court of Queen's Bench has decided that green Tea, "faced" or painted with gypsum and Prussian blue, even though the operation be done in China, is adulterated; and that persons selling such Tea are committing an offence within the meaning of the statute.

— THE *Botanical Magazine* for this month, contains in addition to *Lessertia perennans*, a purple-flowered African Leguminous plant, *Grevillea fasciculata*, *Calanthe curculigoides*, and *Saxifraga florulenta*; a good representation of *Crocus cancellatus*, a native of Greece and Asia Minor. Its bulbs are coated with coarse network in such a way as to distinguish it from most other kinds of *Crocus*, and the flowers, which are white, slightly streaked with reddish-purple, are large and striking.

— AMONGST *Gentians* grown in Messrs. Backhouse's nurseries at York, *G. verna* has produced 2,000 blossoms simultaneously—a magnificent "sheet" of dazzling blue. *G. imbricata* has also flowered. *G. pyrenaica* is now in bloom; the blossoms being vivid purple—a rare and perhaps unique exception in colour in this genus. *G. bavarica*, darker than *verna*, and, if possible, more brilliant, is now both in flower and bud. The rare *G. Froelichii*, with sky-blue flowers, like those of *G. Pneumonanthe*, but in dwarf tufts, is progressing, as is also the white variety of *G. acaulis*.

— MR. PRINCE, of the Observatory, Crowborough, Tunbridge Wells, states, that upon reference to his meteorological journal for the last thirty years, he does not find any record of such a continuance of frosts in May as in the present season. Vegetation has consequently suffered severely. The young foliage of the Oak, Ash, Chestnut, Hazel, Sycamore, and even the Bramble, has been very much injured. The Potato haulm is cut down to the ground, and at least half of the crop of Cherries, Plums, Pears, and Gooseberries has been destroyed, as well as the leading shoots of out-door Vines.

— At a special court of Common Council, held the other day at Guildhall, the Chairman of the Markets Committee brought forward a report, recommending that the premiums of £300, £200, and £100, agreed to be given by the Court to the authors of the best designs for the proposed new fruit and vegetable market, upon the site of the old market in Farringdon-street, should be given respectively to the designs sent in under the titles of "Estelle," "Wholesale and Retail," and "Anchor." They also recommended that the sum of £50 should be given to "Plan," "Well-studied B," and "Westminster," the authors of three other plans, upon condition that the designs became the property of the Corporation. In answer to a question put by one of the members, the Chairman explained that, although these plans were accepted, the Corporation was not in any way bound to carry out either of them, but might use portions of each, as they considered most expedient. After a short discussion the report was agreed to, and the premiums ordered to be paid. Twenty-four designs had been received, and the estimated cost of the building, according to the three selected, was respectively £65,750, £88,000, and £68,890.

— SILENE HOOKER, a distinct dwarf species of *Catchfly*, with large flesh-coloured flowers, the petals of which are finely divided, is now in blossom on the rock-work at Kew, where a strong plant of *Cyclobothra pulchella* is also producing pretty yellow flowers. Several plants of the true Alpine *Forget-me-not* are also nicely in bloom; and the flowers of several species of *Allium* are conspicuous, particularly those of *A. pallidum*, a low-growing kind, about 9 inches high, the white blooms of which are borne in abundance. We also noticed, too, *Onosma taurica* labelled *Anosma taurica*, a fact which shows that even at Kew botanical spelling is not always to be trusted. In the herbaceous grounds several highly interesting plants are now in bloom, notably the pretty dwarf species of *Dianthus* called *brachyanthus*, with light rose-coloured blooms, a plant alluded to by us on several previous occasions, but one which has not, so far as we have observed, yet come into commerce; a nice tuft of *Geranium subcaulescens*, with pretty blooms of a fleshy-rose colour; and *Orobis atropurpureus*, an old species too seldom seen. The true Official Rhubarb is also in flower, but its value as a decorative plant consists in its distinct-looking noble foliage rather than its flowers. Some *Ferulas*, planted out in a bed near the museum,

appear to have received much benefit from a mulching of manure, a practice well worth attention in the case of other plants in dry seasons on light soil.

— PERHAPS the gayest perennial now in flower in the York nurseries is *Lithospermum Gastoni*. Imagine masses of from fifty to one hundred stems, from 4 to 8 inches high, forming a tuft only 12 to 18 inches across, and each stem bearing from three to six lovely sky-blue flowers, as large as a sixpence, and some idea may be formed of the beauty of this plant. It only shows its real character, however, when very strong, that is, after having been established some two or three years at least.

— It is expected that the forthcoming anniversary dinner of the Gardeners' Royal Benevolent Institution, which is to take place on the 2nd of July, under the presidency of Mr. Alfred De Rothschild, will be a great success. The committee, we are informed, have arranged that three persons, who have been subscribers to the charity for over fifteen years, and who have otherwise in every way complied with the regulations, should be added to the pension list this summer, without election. Other candidates, less eligible, must, therefore, wait until they can be admitted in the usual way.

— "BEDDING OUT," which, on account of the unfavourable weather, has been deferred to an unusually late period this year, has been carried on in our metropolitan parks and gardens with vigour during the past week. In the sub-tropical garden at Battersea numerous tropical plants have also been planted out, such as *Wigandias*, *Cannas*, *Aralias*, *Solanums*, &c., and already appear to have started into growth in their new quarters. Plants of *Cannas*, which have been in the beds all the winter, have also, notwithstanding the lateness of the season, attained a height of upwards of 2 feet.

— DR. MOORE, of Glasnevin, who has just returned from Florence and Vienna, has brought us some very interesting information as regards that fine plant *Dampier's Glory Pea*. This, as everybody knows, is a plant most difficult to cultivate to anything like a vigorous flowering condition. In the Schœnbrunn Gardens, at Vienna, he was surprised to see many plants of it, fine pyramids, 4 feet high, full of flower. These have been obtained by grafting *Clianthus Dampieri* on the old and more easily grown and vigorous *C. puniceus*. In this way the *Dampier Glory Pea* grows with a vigour worthy of its noble blooms. Dr. Moore was informed that plants of this *Clianthus* were a good deal used for indoor decoration.

— At a recent meeting of the scientific committee of the Royal Horticultural Society, Dr. Voelcker stated the results of his investigation of the soil of a London square in which Messrs. Veitch had twice planted *Planes*, which in each case had died. He found, on examining the clear watery solution from treating the soil with distilled water, that the soil contained one-tenth per cent. of common salt, and two-tenths per cent. of nitrates. He did not doubt that it was owing to the place having been constantly used in the way of nuisances that the presence of salt and nitrates was due. In the same way rabbits kill hedges, and it is well known that it is years before Grass will grow on their runs.

— THE Society of Arts has in consideration the organisation of a series of provincial exhibitions of an industrial character, to be held in the centres of the manufacturing districts. As the proposal was only made at a meeting the other day the plan is, as yet, by no means complete, but a principal part of it seems to be that the special industries of each locality should be, as far as possible, illustrated in its exhibition. The experience of the Horticultural and Agricultural Societies, and of the British Association, goes to show that much may be hoped for from a migratory arrangement like that proposed, while there can be little doubt that such exhibitions, if properly carried out, might do a great deal in assisting the growth of that technical instruction, the absence of which is so great a hindrance to the British workman in his struggle with Continental rivals. We understand that the idea of a building suited for such exhibitions originated with Mr. Wm. E. Rendle, well known for his various inventions in horticultural buildings.

— At a late field-meeting of the Woolhope Naturalists' Club, the effects of the late frosts upon vegetation were everywhere noticed. In low grounds, frost-bitten Cowslips were gathered; and, on heights, the sward was parched, and the culms of the short Grass blanched and dead. Even the hardy Bilberry (*Vaccinium myrtillus*) had its young leaves nipped into a browner shade than usual, and its growth stunted to little more than half its usual height—except, indeed, in a few places where the plant was sheltered by masses of rock. The Rock Bedstraw (*Galium saxatile*), which ought, at this season, to have covered the surface with its delicate white flowers, was visible only to a close search; and the only wild flowers which seemed wholly unaffected were the pretty Mountain Pansy (*Viola lutea*), the bright yellow lip of which adorned the sward wherever there was half-an-inch of soil to afford it foothold, and stunted specimens of the Dog Violet (*Viola canina*).

THE FLOWER GARDEN.

THE GREAT SPOTTED IRIS IN THE GARDEN OF THE ARCHBISHOP OF CANTERBURY.

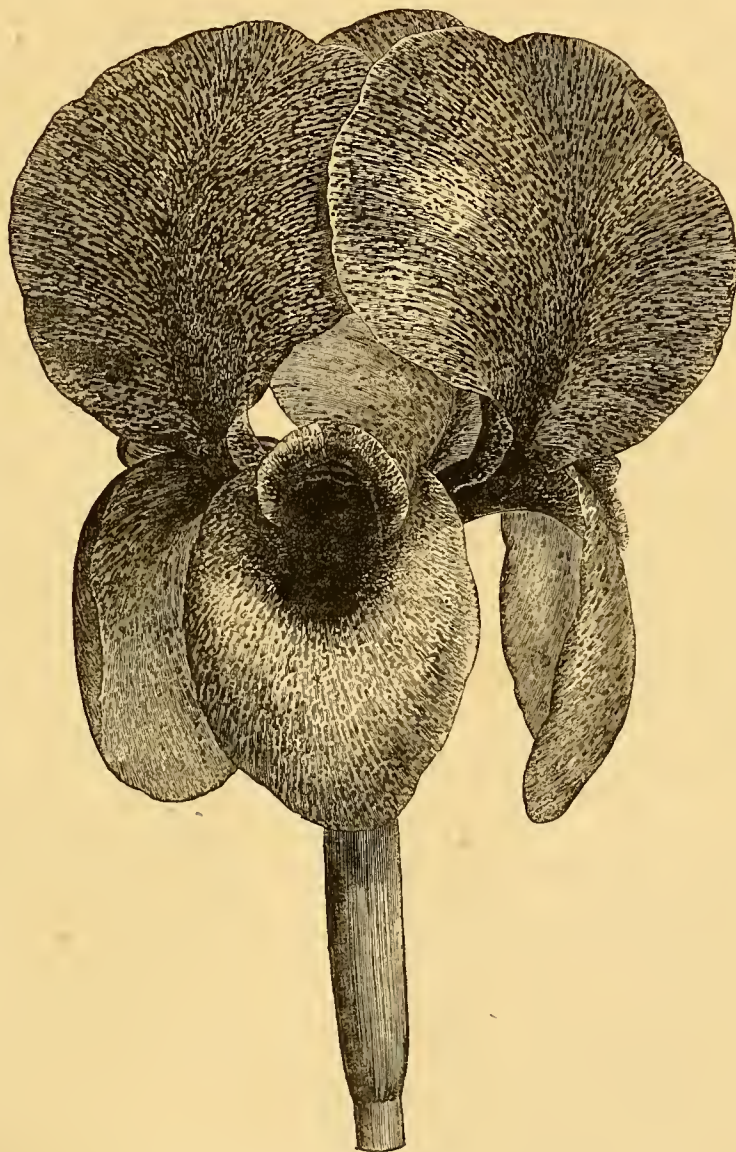
THIS plant (*Iris susiana*) has long been one of the most interesting known to European cultivators; its blooms are among the most striking flowers in our gardens, and it was well-known and figured so long ago as the time of Parkinson, yet it has never become a commonly grown plant, and to see it in flower is a rarity. The reason of this has always seemed to us to be

the fact of its being somewhat difficult to cultivate.

We supposed it to be somewhat tender, and it is usually grown in a frame or pit, or greenhouse. Even treated thus, however, it is usually a delicate-growing subject, and seldom flowers. Its fate eventually, is usually to be forgotten and neglected, and, finally, to disappear from the garden altogether. We had several times tried to establish it under hand-lights in warm borders, but always failed to cause a healthy growth. Looking round the Archbishop of Canterbury's garden, at Stonehouse, a few weeks ago, we saw some wide-spreading and healthy tufts of *Iris*, with here and there a blackish-looking bud, seemingly different in aspect from *Irises* usually grown in borders, and, on examination, these proved to be tufts of our old friend *Iris susiana*! Last week we received fully expanded blooms, the largest we have seen—a single flower being three times the size of that depicted in the annexed illustration. A non-botanical member of our staff at first sight mistook the quaint and huge blossom for a bonnet! This plant has been grown for a good many years at Stonehouse as a common border flower, receiving no more attention than do the masses of German *Iris* in cottage gardens. The soil is chalky, and the situation very near the sea, but by no means so favourable for vegetation

as many other parts of England. The important fact then, to bear in mind is, that *Iris susiana* may be treated as a perfectly hardy plant in many parts of the country, as well as the Isle of Thanet; a dry bottom and free soil are, no doubt, essential to success. The fact that this species may be grown in the open air with the many others that are now obtainable, is another reason for growing *Irises* more frequently. Lilies have become very popular of late; the *Irises* deserve to be equally so, for they are the noblest hardy flowers of the early summer. Many superb kinds are never seen in our gardens, though as easily grown as the common German kinds now in

blossom in London back-gardens. The best way to grow a choice selection in a garden of any size, is in a large isolated bed, oval or circular in outline. It should be rich and open in texture, and well drained for the sake of a few of the more delicate species; most of the kinds grow freely enough in stiff coldish soil. The plants vary in size from *I. pallida* and *I. ochroleuca*, 3 or 4 feet high, down to some not half-a-foot high, as *I. cristata*. They vary strikingly in colour and markings too, so that an attraction of no mean order is a well-planted and well-arranged mass of *Irises* alone. A few of the finer Lilies, however, may be placed among them with good effect, and round the margins, in early spring, bulbous flowers may be dotted. W. R.



The great Spotted Iris (one-third the natural size).

SAXIFRAGES.

By J. C. NIVEN.

The None-so-Pretty Group.

WHEN I entered upon the task of analysing the Mossy section—which I completed in my last article (see p. 419)—I was sanguine enough to think that, having so far progressed, I should have got through the most difficult part of my subject. Here, however, when I contemplate the array of species and varieties which naturally associate themselves together under the old-fashioned title which I have given above, I find confusion quite as predominant in this as in the Mossy group; true, their numbers are less, but in this respect only is my task lighter.

The None-so-Pretty, or London Pride, is a plant familiar to all from childhood; what happy associations connected with the morning of life and first attempts at posy-making, the very mention of the name calls to mind; it is so, at least with me, and no doubt will be the same with many of my readers. It seems almost too bad, after the above charming title, to even hint that the classical term applied to this group is Robertsonia, and that along with it I purpose allying the *Miscopetalum* section, which Engler, owing to some minute structural peculiarity, has banished

to a far-removed part of his "Monograph;" and, by way of a stepping-stone from my last section—which, in outward appearances, presents such a striking dissimilarity—I will import the old meadow Saxifrage, in the granulated fleshy roots of which, as well as in the power of producing axillary buds, we have, if not a sort of relationship, at least a pretty close analogy to those bud-bearing species, which I enumerated at the close of my last article as peculiar to Southern Spain and Northern Africa.

S. granulata of Linnæus is a thorough lowland representative of the Saxifrages, a native of Britain, and by no means rare; it will

be familiar to many of my readers in its wild state. It is generally met with along the marginal line between woods and meadows, where it appears thoroughly to enjoy the partial shade of the trees, and also the root shelter of the adjacent herbage. Its lower leaves are reniform and deeply lobed. It is in the axils of the first formed radical leaves that the granulated buds or bulbils are formed, and wonderfully pretty they are with their blunt fleshy coral-like scales. The stem rises to a height of 12 to 15 inches. The flowers are large and scattered, and have very much the aspect of those of the previous group, supported, however, on more erect and sturdy stalks.

S. granulata fl. pl.—The only instance, within my knowledge, of real duplication that occurs in the genus; exceptionally, we meet with ten petals in place of five, but here we have a perfectly double flower, pure white, formed of a dense mass of petals, added to which the arrangement of the flowers in the inflorescence is far more compact than in the single form, and the whole habit of the plant is dwarfer. What its origin is I cannot discover, nor is there, I believe, any record of its having been met with wild; be this as it may, it is a most desirable plant for garden culture, and by no means as frequently seen in the front rank of the herbaceous border as it ought to be. There is also a variegated form of *granulata*, but so undecided and evanescent is the variegation that the mere mention of the fact will suffice.

S. bulbifera of Linnaeus, as a species, claims a very close relationship to the preceding, but differs, first, in the general development of the plant being on a smaller scale, and second, in the bulbils being formed in the axils of the leaves above the ground, even in the leafy bracts of the stem; again, it affects mountains rather than meadows. This species may be at the present time in cultivation, but I have not seen it for years. It is a native of Sicily, Corsica, and Sardinia, and also the Carpathian Mountains; it is by no means either so beautiful or permanent a plant as its granulated congener, the less permanent character originating from the fact that the plant is liable to die off before the bulbils have reached sufficient maturity to retain their vitality for another season.

S. rotundifolia enjoys a good old Linnaean and most appropriate specific title, the round-leaved Saxifrage. By the casual observer the leaves would be at once pronounced round, but, really they are reniform, the lower ones supported on long hairy stalks, the margins are irregularly notched, those on the stem are almost lobed; the inflorescence is a leafy branching cyme, rising to a height of 12 inches; the flowers are white, dotted over on the inner surface with minute pink spots, so minute that they are unobservable at a distance, but charming in their exquisite delicacy, when the flower is closely examined. This, and the succeeding species, are distinguished from those in both the Crustaceans and Mossy sections, by an important structural peculiarity, in the fact that the ovary is superior, a distinction, whose value my botanical readers will readily understand; geographically speaking, this species appears to enjoy a wide range in South Europe, and also in Asia Minor. It is a free grower in any ordinary garden soil, where it forms dense compact tufts of a good perennial character.

S. rotundifolia var. *reniformis* has, as the name at once indicates, more markedly reniform leaves than the typical plant; it is also a stronger grower, and appears to be very partial to moisture. In the flowers, no special distinction is noticeable—so far, at least, as I have been able to detect; but the plant is altogether more hairy, and has a sufficiently distinct aspect to retain it as a variety, though certainly not to raise it to the specific rank which we sometimes find assigned to it.

S. repanda of Willdenow is by Engler recognised only as a variation of *rotundifolia*. Here, I think, Willdenow's older name is well worthy of being retained in its specific entirety. The leaves are double, and sometimes treble, the diameter of the round-leaved Saxifrage, of a thick fleshy substance; the marginal notches are obtuse and blunt-pointed; the flowering stems are foliaceous, much branched, many-flowered, and rise to a height of 2 feet, or even more, thus giving, in their giant stature, associated with the large fleshy leaves, quite a distinct contour to the plant; added to which, the entire surface, including both stem and leaves, is suffused with long hairs; the flowers are larger, and the pink markings are more conspicuous. It is a native of southern Italy, Sicily, Greece, and the Caucasus, where it abounds in the low mountain valleys.

S. angulosa of Schott—referred, also, by Engler, to the round-leaved form—is a very distinct-looking plant; its leaves are somewhat obliquely reniform, the margins indented with irregular rounded crenatures; it is dwarfer in growth, and more slender, as well as constitutionally more delicate, than any of the preceding. It has not yet flowered with me; so, in retaining its specific identity, I am guided by the general appearance and habit of the plant.

S. taygetea of Boissier possesses such individuality of character, that it is simply astonishing that Engler, in place of merging it into

a mere form of our typical species, did not for once in a way break through the rules respecting nomenclature, and give it the characteristic title of *soldanellaefolia*; Boissier's name, under many orthographical variations, having now been recognised for some time, I have retained it, and may here state that it means the Saxifrage of Mount Taygetos, one of the old classical hill tops of the Peloponnese. Our plant is a dwarf compact grower, the leaves small, quite round, glabrous and fleshy, and supported on long foot-stalks, the margin undivided and perfectly smooth; the flower-stem is leafless, about 5 or 6 inches high, unbranched, except at the summit; the flowers have broader petals than any of the previous species; the markings almost altogether absent, and each individual petal is concave. As a species, I feel sure all who cultivate it will agree with me that it is essentially distinct, and well deserving a more characteristic name than it possesses.

S. umbrosa of Linnaeus.—This is, undoubtedly, the genuine None-so-Pretty or London Pride; the former name originating in the charming simplicity of its flowers, and the latter in its power to grow and flourish under the adverse circumstances which the smoky atmosphere of London, and, indeed, all our large cities present. Often have I stopped to admire great patches of it growing luxuriantly under circumstances so unfavourable that even the ordinary weeds had died out and left it in its proud position as complete master of the situation. One special attribute it has, is that years will elapse before it shows any indication of having exhausted the soil; and another is that, growing naturally—as its specific name indicates—in shady localities, it will thrive better in a north aspect, where no direct ray of sunshine penetrates, than it will on a warm sunny bank. To give a detailed description of a plant so well known would be a complete waste of space. I must, however, point out one important character that distinguishes it from another species, *S. Geum*, with which it is very often confused, and to which it is very closely allied; in *umbrosa*, the leaves are broadly oval, gradually tapering into the foot-stalk, and devoid of hairs. It is a native of Ireland, where it grows abundantly, especially in the southern districts; it is also found in England and Scotland, but is both local and rare. The only other recorded localities is the south of Spain and, strange enough, the north of Africa. Possibly, being such a common plant, collectors have passed it over as not worth taking; hence, its limited representation in our large Saxifrage herbaria.

S. umbrosa var. *serratifolia*, sometimes also called *Melwillii* and *acanthifolia* is a form in which the margins of the leaves are much more deeply indented than those of the old typical plant; further, they retain the same character very constantly in cultivation.

S. umbrosa var. *Oglevieana* is an especially distinct form that I have cultivated for years, in fact, so long that I cannot remember the source whence I obtained it; it is a compact grower. The leaves are narrow, very irregularly and deeply notched; the margins incurved, and remarkable for the broad light-coloured midrib, which, being about the same width as the blade portion at each side, gives a distinct variegated appearance. The flowers are produced in dense panicles, about 8 inches high, the primary and secondary stems of the inflorescence, as well as the buds being of a beautiful red colour; the petals also are pinkish. I was under the impression at one time that this was no more than a stunted form, and, with a view to test it fairly, planted a nice tuft under most favourable conditions for a vigorous growth, but produced no change whatever. I was, however, delighted with the result in the beautiful appearance of the plant when in full bloom. I should much like to get further particulars as to its origin, and possibly some of my readers may be able to enlighten me thereon. I ought to state that I have seen it under the specific name of *Ægilops*, and, further, that no notice or description of it is given in Engler's "Monograph."

S. umbrosa variegata forms an exceedingly pretty plant, where it retains its variegation; this it does in some soils and situations with considerable constancy. Should it tend to revert back to the normal type, care should be taken to plant it in very poor soil—a corner of the rockery, filled with gravel, will answer the purpose admirably. If planted in rich garden soil, it is almost sure to revert to the green or normal state with the first season's growth.

S. Andrewsii of Harvey, would, at first sight, be readily taken as a spatulate variety of *umbrosa*. The leaves are, however, more erect and sharply notched along the margin by a series of minute cartilaginous and rigid serratures. The appearance of the plant leads one to look upon it as of hybrid origin, and this is confirmed the more when, on examining the flower, we find that the ovary is, what is technically termed, half-inferior, thus incorporating a very important structural character into this group which it does not otherwise possess. I am disposed to agree with Engler, that it is a hybrid between

lingulata and umbrosa, but how about its origin? Found by Mr. Andrews in one of the wild glens in Kerry, where no single Crustaceous Saxifrage grows; whence then could have originated the structural variation of that section. If it be a true species, how is it that it has never been found since, at least never that I have heard of? Surely it was not the very last representative of a now extinct indigenous specific type? I have, on several occasions, saved seeds of it and sown them, but was only once successful in raising three weakly seedlings, one of which only weathered the first season and died soon after; not, however, before it unmistakably showed its close relationship to the true umbrosa.

S. Andrewsii var. *Guthrieana* has shorter and narrower leaves, and more evident signs of its Crustaceous origin; it is, I believe, a seedling therefrom, that originated in the neighbourhood of Edinburgh, thus indicating the parentage more pronounced on the one side as compared with the result of my experiment, where the tendency was to revert to the other parent. There is a very beautifully variegated form of this, that, were it a freer grower, would become a most useful plant, but it is rare one sees a healthy vigorous plant of it. That these very opposite sections do hybridise the one with the other is confirmed, in the fact that I have a very interesting cross between *Cotyledon* and *umbrosa*, which shows intermediate characters between the two in every respect, except the position of the ovary, which retains, singularly enough, the character of the pistil-bearing plant.

BEDDING PLANTS WITHOUT POTS.

ALLOW me to inform your readers how I have managed to raise enough and to spare of first-class bedding plants. About the 10th of August I had everything in readiness for propagating them. All were to be inserted in boxes 12 inches wide, 36 inches long, and 9 inches deep. These were crocked, and over the crocks were put the riddings of leaf mould, consisting of Beech nuts, &c., which made good drainage. Next was put a good layer of ordinary soil, which does well for *Pelargoniums*, *Verbenas*, *Agatheas*, and similar plants; these materials were levelled and pressed, and half-an-inch of sand was put on the surface, the whole being about half-an-inch below the edge of the box. The sand was then moistened through a rosed watering pot, giving just enough to prevent the soil filling the holes made by the dibble when inserting the cuttings. Good strong cuttings were then taken from the plants in the beds, with which a hamper was filled and carried to the propagating shed. The two lower leaves of the cuttings were then removed, as well as any blooms that happened to be on them; a clean cut was made immediately below a joint, and the cutting was ready. A good large dibble was then used for making the holes, the cuttings were inserted, the soil made firm, and a good watering given. They were placed in a shaded situation until roots were emitted, when they were fully exposed to the weather until frost began to make its appearance, when they were placed in empty Melon and Cucumber frames until the Grapes were cut from the Vines, which was about the end of November. Temporary stages were then made in the Vineries, and the boxes placed on them. Air was then admitted, both night and day, when the weather was favourable, and no fire-heat was used, except in the severest weather. Thus situated in very dry soil, they retained excellent health until the beginning of February, when they became too thick (I mean the *Pelargoniums* and *Verbenas* which we took out of the boxes); and, having only a limited supply of pots that would suit them, we treated them as follows:—We got several balls of twine, like those used by shopkeepers; also a quantity of Moss from the woods, and soil. We then took a small handful of Moss, and flattened it out on the palm of the hand; on that we put a handful of soil, and on this the plant; then a little more soil, and then tied the whole up in such a way as to keep both soil and Moss firmly round the plant. The boxes were re-filled with the "mossed plants," retaining the drainage, of course, and putting the plants low enough to have the balls below the edges of the boxes. A layer of soil was then put over them to hide the Moss. I need hardly add that, thus treated, room could not be found for more than half the number of plants that were formerly in the boxes. Fortunately, we had a small glass-house used in the summer time for "succession plants" for the greenhouse, in which were good shelves and a good stage. Into this we put the

rest of the plants, keeping each variety to itself, and placing a little soil over the Moss to keep the balls moist. Whenever we watered them, we did so with a roseless pot, and kept all wet off the leaves. Thus situated, they grew and flourished without artificial heat until they were put out to harden, and were ultimately placed in the flower garden and borders. We left *Königa*, *Cerastium* (the latter we propagate by means of cuttings and not by division), *Agatheas*, *Lobelia*, *Gnaphalium*, *Verbena venosa*, &c., in the cutting-boxes, but *Verbenas* and *Geraniums* we mossed, and with excellent results. Our *Calceolarias* we treated in a different way. In the end of September, we procured some boxes that were well drained, and filled with soil in which leaf-mould preponderated; and, on the surface, was put a layer of sand. When taking off the cuttings from the parent plants, we took good care to select such as were in good condition. They were immediately prepared and inserted in the boxes; and, having given them a liberal watering, we placed them in a shady place, and not, as some recommend, under the scorching influence of the sun. Thus situated, they remained until it was time to place them indoors, when we set them in the greenhouse just alluded to, shading them when the sun was shining brightly. About the beginning of February, they became too large for their boxes, so we prepared some frames, placing fresh leaves in the bottom of them. We then trampled them firmly down, and level. Over this, which was put in for drainage, was placed a compost of rotten leaves, well-decomposed stable or Melon dung, and a fourth-part of Melon loam; these were levelled but not trampled upon. The plants were then taken out of the boxes with as much care and with as good balls as possible, and were planted in the frames, the operation being carried on on a fine day. A hole was then made with the hand, the plant inserted, and the ball covered over with the material, pressing the whole gently and giving copious waterings. The plants remained there and were covered in frosty weather, until more room was required, when they were, indeed, in splendid condition; they were then put into frames in fresh soil, given more room; and here they remained until they were planted out the other day, when each plant would yield, without injury to itself, from eight to twelve cuttings. Everyone ought to know that a cool place is the best for *Calceolarias*, giving them a liberal supply of water, when they want it; indeed, they should never be allowed to get too dry. I hope that cultivators who have been in the habit of growing *Calceolarias* in pots in Vineries will give this mode of treatment a fair trial.

JOHN BRENNAN.

Loughgall.

New and Improved Pæonias.—Any one who is not acquainted with the numerous magnificent varieties of herbaceous Pæonias which now exist, cannot form anything like a full idea of the beauty which has been developed in this genus of hardy plants. Vulgarly is the idea which has long been associated with the effects of the Pæonia; and, as regards the old, roughly-formed, and glaring-coloured varieties, emitting odours anything but pleasant, the association may be correct, especially when such old varieties were misplaced in choice selections of plants. But there is a race of Pæonias new in cultivation which, for perfection of form and delicacy of colouring, vie with the queen of flowers herself, and many of them are sweet-scented. They embrace all the delicacy of colouring which lies between the pure white, the pale pink, the delicate blush, the brilliant rosy-purple, the crimson, and various other effective and pleasing colours. Such varieties as *Alice de Julvecourt*, which has guard petals of the most delicate pink, with the centre petals of a beautiful blush-white, slightly flaked with crimson-purple. The flowers are as double and compact as the finest rose, and the blooms of great size. Then there are such as *Léonie*, of a delicate peach, with splendidly double flowers, symmetrical in form. And there are such as *Caroline Allain*, with beautiful blush guard-petals, and the centre sulphur, tipped with white. We were more astonished with a boxful of cut blooms of these and such as these, and with a bed of them that we saw in Mr. Parker's nursery, at Tooting, London, than with any hardy plants we have ever seen; and, as they become known, predict for them great popularity. For planting in shrubby borders, or singly or in groups in odd nooks on Grass, nothing could be more effective. They bloom from the middle of June to the end of July, and grow well in any ordinary garden soil moderately enriched with manure. They are easily increased by division. The following twenty-four varieties may be relied upon as

very effective, and combine a great variety of delicate colouring:—Alice Julvecourt, Comte de Cassy, Anthusa, Caroline Allain, Charles Binder, Beauty de Vellicante, Decandolle, Faust, Festiva maxima, Isabella Karlitzy, Jeanne d'Aro, Léonie, Madame Furtado, Madame Vilmorin, Magnificent, Monsieur de Rousselon, Madonna, Marquis de Lory, Modest Guerin, Pulcherrima, Standard de Grande, Rosamond, Sidonia, Virginia, Triumphe de Paris, Versicolor, Whiteji.—*The Gardener.*

Cure for Weeds on Walks.—Where paths are very bad, the best plan is to hoe them up, and then rake off the weeds as far as possible. Then a good dressing of salt or sulphuric acid may be given; the former thickly strewn over the surface, the latter in the proportion of 1lb. to 20lb. of water—but it ought to be prepared in a glazed earthenware pan, and the ground just wetted with it, using the rose from a watering-pot; but the acid should not touch the Grass edgings, or any plant growing by the side of the paths, as it kills wherever it touches. It not only destroys any growing weeds, but also the seeds that have not yet germinated. In a day or two afterwards well roll the walk, and it will have quite a fresh and bright appearance. In all small gardens the paths should be kept free from weeds by means of hand-weeding.—Q.

Roses for Town Gardens.—The selection of "Thirty-two Roses for Town Gardens," given in *THE GARDEN* (see p. 438), has afforded me much interest. I was, however, somewhat surprised to see Charles Lefebvre and Madame Victor Verdier included in the list, as, from the remarks of Mr. Reynolds Hole, in alluding to these two Roses (Vol. I. pp. 159, 251), it would appear that they are to be classed among the doubtful kinds, being delicate or variable sorts. Referring still farther to back numbers of *THE GARDEN*, I find that Mr. Hobday (Vol. II. p. 551), in recording his own experience, speaks very hopefully of the chances of the suburban roseist, provided the latter makes up his mind to aim rather at a selection of varieties than a collection. What does Mr. Hobday say to the list under notice, which would seem in any case to admit of a little variation in regard to colour among the Hybrid Perpetuals? Will he kindly say whether or not there would be any objection to adding the following, viz.:—*Crimson*, Senatenr Vaisse, Alfred Colomb; *carmine*, Victor Verdier; *pink*, Comtesse de Chabillant, Madlle. Thérèse Levet; *blush*, Madame Rivers, Caroline de Sansal; *white*, Madlle. Bonnaire.—M. R.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

The Canadian Bitter Root (Lewisia rediviva).—Scores, if not hundreds of buds, are set on this handsome and curious hardy plant in the York nurseries, promising a grand display shortly.—J. H.

Butterworts.—Your correspondent, who is so much and justly pleased with *Pinguicula vulgaris* (the wild English Butterwort) when well grown, can scarcely fail to be delighted with *P. alpina*, which, in general appearance, closely resembles it, though rather smaller in all its parts. The flowers are white tinted with lemon colour and a trace of pink. In moist shady crevices of rock-work (not overhung with other vegetation), and in a soil composed of peat and loam, it is a very pretty object.—DELTA.

Poet's Narcissus (Narcissus poeticus).—This is one of the most useful of all the Narcissi, and deserves to be planted in great clumps in neglected parts of the grounds, where it will soon establish itself if left untouched by lawn-mower or scythe. Its pure white sweet-scented flowers are well adapted for cutting, and come in very usefully for vases or large bouquets. There are several varieties of this Narcissus, varying in the depth of the purple or saffron rim to the flat cup, and one form has double flowers nearly as white and as fragrant as those of a *Gardenia*, qualities which make it a valuable addition to cut flowers.—B.

Myosotis dissitiflora.—This has flowered most luxuriantly with me this spring, producing such a mass of bright sky-blue blossoms as to be for a time literally unrivalled. I had the whole of my stock (about 2,000 plants) put out early in the winter on a south border, and they occupied about five rods of ground. One half were seedlings, the other half divided old plants; but, although these latter did fairly well, the seedlings did much better, so much so, in fact, that I shall not save old plants any more. Seed should be sown early in July, and, if properly shaded and watered for a few weeks, an abundance of strong plants will be ready in November for planting out.—A.

Primula altaica (Lehmann).—A strange error seems to be prevalent regarding this Asiatic *Primula*. The true plant is closely allied to our wild *P. farinosa*. It has nothing whatever to do with the wild *Primrose*, either in shape of leaf or blossom. It bears a head of many flowers, each about half-an-inch across, of a very pale pink or flesh colour, changing to nearly white, on stems about 6 inches high. Its leaves are narrower even than those of *P. farinosa*; narrower, perhaps, than those of any other known species of *Primrose* in proportion to their length, and are entire or absolutely dentate, and taper downwards into a petiole. I greatly doubt its having ever been introduced even into Europe in a living state.—Jas. Backhouse, York.

The Male Orchis as a Border and Pot Plant.—A correspondent of the *Irish Farmer's Gazette*, speaks as follows of this plant:—"I had great success this spring with *Orchis mascula* in pots; some of them had three and four spikes, fully 12 inches high. They were better than *Hyacinths*, and remained three times as long in flower; they are about the most easily managed things I know of." Is not this encouraging, and how many more even finer subjects have we at our doors, the cultivation of which would be equally easy, as, for instance, the fragrant *Gymnadenis conopsea*, with its tall purple spikes; *Orchis latifolia*, in its varied forms; *O. Morio*, the Bee Orchis; the white *Habenarias*, &c., all of which we have reason to know are capable of being wonderfully developed under cultivation.

THE FRUIT GARDEN.

STRAWBERRY CULTURE IN THE BLACK FOREST.

THE principle of association in the raising and disposal of fruit and vegetables would appear to be gaining ground in Germany. A short time ago we gave an account of the doings of an Asparagus growing company, an association of well-to-do farmers, gardeners, and land-owners, in the neighbourhood of Brunswick. Again, the reader's attention is called to an instance of successful co-operation in the case of the inhabitants of a poor village. Staufenberg, the village in question, is situated between Gernsbach and Baden, in the Black Forest, and the special culture which has raised its inhabitants to their present comparatively prosperous condition is Strawberry growing for the market. Of the two hundred peasants and others who divide the neighbouring land between them, the largest occupier does not cultivate more than 8 or 9 acres, and it therefore will not surprise us to hear that 1 ton is usually about the largest quantity of Strawberries raised by any single individual. Last year, being an exceptionally fine one for Strawberries, the crop probably averaged a ton to each grower, which, at the ordinary price of 50s. to 66s.—say 58s.—the cwt., would bring him in the nice little sum of £58. From this must, of course, be deducted the rent, labour, value of manure, carriage, and expense of sale: but, even then, a handsome balance remains. The gathering has to be done either late in the evening (after sundown) or—which is the preferable time—quite early in the morning (before sunrise), otherwise the Strawberries would not arrive at their destination in a marketable state. An association, established on Schulze-Delitz principles, and consisting chiefly of the different Staufenberg growers, undertakes to forward the fruit, by train, to Frankfort-on-the-Main and other towns, and also to effect the sale of it. Only a small portion of the produce is disposed of as table fruit; by far the greater quantity is sold to confectioners and dealers in preserved fruit, and finds its way, candied or preserved, or in the form of jelly, syrup, wine, &c., to all parts of Germany. The chief sorts of Strawberry cultivated are the Large Red, the so-called Brown Italian, the common and large Annas, also—finest of all—the Cinnamon Strawberry. A northern aspect, unsuitable for many other cultures, is the one preferred for Strawberries, and land so situated in the neighbourhood of Staufenberg has, therefore, greatly risen in value. The fruit grown on southerly slopes, which ripens first, can be most profitably disposed of to retail purchasers in Baden, Rastatt, Karlsruhe, and Wilbad. At the last-named place the association has erected a handsome wooden building for the sale of its produce, and every evening during the season the forest paths leading to it from Staufenberg are frequented by a little army of fruit-carriers.—T. S., in *Field*.

Watering Pines.—Permit me to add, to what I have already said on this subject, that since I last wrote we have shifted 500 Pine suckers from small pots into fruiting ones, and that amongst them were a few which had been grown under drip. The soil about these was, therefore, much moister than that in the case of such as were more favourably situated. The balls of the moist plants were sodden and half pasty; what few roots they had were black and lifeless, while the balls of those which were not extremely dry, but sufficiently so to allow the loose soil to be rubbed off gently with the hand, leaving the rootlets prominent and ready to penetrate the new soil, were a mass of fine, fresh, white, vigorous roots. These plants will at once start into growth, and by September will have matured a fine head; they will have their pots literally filled with healthy roots, ready to rest for a couple of months, and then start into growth, and fruit early next year, with every certainty of brilliant results. The half-rooted few will be only getting into growing condition six weeks hence; by the autumn they will not be more than half developed, and, after dwindling throughout the winter, they may probably, through good treatment, be induced to fruit imperfectly about the month of August next year. The difference between wet and comparatively dry treatment will thus be apparent.—J. Mun.

Heavy Strawberry Crop.—A market gardener located near Lawrence, Massachusetts, recently assured the *New York Tribune* that last season he sold more than 2,800 dollars' (£560) worth of Strawberries from 2 acres of ground. His method is as follows:—In the spring of the year he plants on well-prepared soil in hills 2 feet apart. The variety chosen is Wilson's Albany. The beds are kept cultivated during the season, and all runners and blossoms are carefully clipped away. The next season the crop is taken, and although the present year was in many places unfavorable for Strawberries, yet on this particular plot nearly 6,000 quarts per acre were gathered. After bearing one year, the beds are ploughed up, and other crops planted. Meanwhile other beds are coming to a bearing condition.

MR. HANBURY'S GARDEN AT LA MORTOLA,
NEAR MENTONE.

AMONG the many gardens which dot the shores of the Riviera, there is none more interesting to the lover of a varied collection of plants than this. Thoroughly sheltered on the north by mountain ranges, the district is as favourable for vegetation as any along the shores of the Mediterranean. The garden we are about to describe, and which is the happy home of a most numerous collection of plants, is perfectly protected in its greater part, but in part, also, is carried out on a little promontory into the iris-dyed sea; and hence cool and fresh breezes temper the great heat of summer. So many lovers of gardening are satisfied with a few carefully-selected kinds of plants, that it is at all times a relief to find a garden in which we see some evidence of the infinite variety of the vegetable kingdom, and some flowers other than those that come before us every day. We have never seen a garden in which the claims of variety are more fully recognised than here, or one from which we derived more pleasure and instruction. The first objects which struck our attention here (as one might be struck by seeing Tree Ferns in an Essex marsh) were some magnificent blooming specimens belonging to an order which we generally know in its most humble representatives, the Borage tribe. These were the

Giant Echiums,

plants which seem to be of the highest importance to cultivators, as possessing beauty in a high degree, and being, withal, utterly distinct in aspect from anything we now cultivate under glass or out of doors. Among the various tribes of hardy flowers that adorn our gardens, none are more attractive to the lover of plants than the Borage or Forget-me-not Order. By the stream-side (home of the common Forget-me-not), in the wood, where the blue of the wood Forget-me-not (*Myosotis sylvatica*) rivals that of the Blue-bell; on high mountains where the beauty of the mountain species (*M. alpestris* and *M. dissitiflora*) claims our admiration as much as the Gentians themselves; in the shady shrubberies where the creeping Forget-me-not (*Omphalodes verna*) loves to run wild, and shows its blue eyes in early spring; in the hill copses, where the many kinds of *Symphytum* show their iridescent bells—in all these places we are familiar with their beauty in its many forms. The plants to which we now call attention are, in aspect, as distinct from any of these as it is possible for plants of the same order to be; and yet the individual flower is, in shape and colour, much like those of our garden favourites above-named. The Echiums form bushes 2 to 4 feet high, and from these are sent up the most superb spike-like columns of bloom, quite as striking, in their way, as the flower-stems of the Grass Trees of Australia, or of vigorous Yuccas, seen in full bloom, with this difference in favour of the Echiums—that their spikes are made up of flowers of the finest blue. The spikes are sometimes more than 3 feet long,

each crest-spike being made up of innumerable small ones, on which the flowers open in succession, but in such order that the whole of the column-like spike is for many weeks a mass of blossoms. The species grown here are *Echium arborescens*, *E. fastuosum*, *E. giganteum*, and *E. candicans*, all being blue but the last, which is white. Here they grow quite freely in the open air, and send up flower-spikes freely, too. These are never crowded together, however, but each spike is isolated sufficiently to be seen to good effect. The white kind was in many cases confined to one stem and one great long spike of flowers; whereas the blue species form sturdy bushes. These plants come from the Canary Islands, and well deserve good cultivation with us for conservatory decoration. Indeed, there

are no plants more likely to form a wholly new attraction at our flower shows than these; light, airy, greenhouse treatment would suit them perfectly. Mr. Winter—Mr. Hanbury's able gardener—propagates these fine plants easily by seed sown in April, and also the more branching kinds by cuttings, at will.

Succulent Plants in the Open Air.

As the Gum trees of Australia are quite at home in Southern Europe and in California, so the succulents of the Cape and other hot countries find an equally congenial home here at Mentone. Almost every kind grows well that has been planted out, and the result is a collection of succulent plants of the most extensive and interesting character. Most effective in their way are the nobler kinds of Agave—*A. Ixtili*, *A. picta*, *A. ferox*, *A. Cantala*, *A. Rumphii*, *A. laxa*, *A. applanata*, *A. filifera*, and *A. Bouchei*. Other succulents, most conspicuous, are—*Mesembryanthemum edule*, which has yellow and magenta flowers, and many other species; *Opuntia*, many species; *Euphorbia arborescens*, 10 feet high; *Kleinia nerifolia*, large bushes, lately in flower; many other species of *Kleinia*, *Cereus*, *Aloe*, *Haworthia*, *Crassula*, *Cotyledon*, *Rochea*, and *Gasteria*. *Kleinia tomentosa* flowered first in Europe in this garden, and was figured from this specimen in the *Botanical Magazine*. At the end of April, undoubtedly the most beautiful of all these plants are the *Mesembryanthemums*, so much neglected in England. We treat them, where they

are grown at all, as a number of weedy things of "botanical interest." No Gentians, or Roses, or Passion-flowers, possess a more refined and yet brilliant glory of colour than do these, scrambling over the edgings and hanging down the walls to a length of 10 feet or so. By trimming them in and repressing them, we effectually destroy their beauty; by allowing them to hang down freely and gracefully, as is their natural habit, from baskets or pots, we may add many a new and brilliant charm to our greenhouses. And, as scores of the species will thrive in sunny windows, they are, it need scarcely be said, of high importance for the garden in the house. The flowering qualities of some of the Aloes make them worthy of a place in our greenhouses, though they rarely get this, and only



Iris susiana as a Border Plant (see p. 477).

appear to attract notice from their foliage; yet the flowers of *Aloe ciliaris* are as showy as a *Tritoma* here, and many other kinds are worthy of culture for their flowers alone. Some of the finer variegated *Agaves*, like *A. picta* (as fine, in its way, as the variegated American *Aloe*), deserve extensive culture with us.

Walls, and how they are Embellished.

We have long advocated the adornment of walls, and enumerated the many plants that thrive perfectly well on them in our cold and wet climate, and here we have an opportunity of seeing how much may be made of walls in a climate where their surface is almost scorched by a blazing sun. In consequence of the ground being terraced here and there, there are a good many walls which have earth behind them, and in such cases a hole made through the wall, and leading to the earth behind, is all that is required for the establishment of some vigorous trailer, which will soon drape the wall with verdure and flowers. The *Mesembryanthemums* would quite suffice for the adornment of every kind of wall here if no other plants existed suited for the same purpose. One kind alone, the crimson form of *M. edule* hangs down the wall for many feet, and bears vividly-coloured flowers, each flower as large as a full-sized Rose. The great majority of this fine family will grow in like positions, or between the stones in a rude terrace wall, so that all desiring to adorn walls and like surfaces with plants in warm and temperate regions need not hesitate as to how to begin. The common Caper (*Capparis spinosa*) grows here on the walls as it does in many other parts of Southern Europe—and what more attractive than its handsome cups of brush-like stamens? But there is another race of plants from the Cape rarely seen on walls, and which are probably quite as useful for their embellishment as the *Mesembryanthemums*, and these are the various species of *Pelargonium*; both the species and the varieties are at home on walls; but, as many of the fine species are worth a place in our gardens it is, of course, these that have the place of honour; grown in this way and allowed to form bushes, as is their wont, they have a charming effect when in flower. Thus this spreading mass of our old friend, the Citron-scented *Pelargonium* (*P. citriodorum*), which spreads forth at the top of a low terrace-wall and falls some distance down its face, and is in full bloom, reminds us of the specimens of fancy *Pelargoniums* which are seen at our shows. In marked contrast with it is the deep and rich hue of *P. triste*. Here, too, is the original *P. zonale*, parent of a numerous race—itself very much less attractive than many of the species which have never come into general cultivation. All our varieties of bedding, show, and fancy *Pelargoniums* might, in this climate, be grown on walls, if it were so desired. Thus we see that both in warm and cold districts all such surfaces may be turned into interesting and beautiful flower-gardens, and the plants that may be grown upon them are innumerable. What is true of walls in the open air, applies, also, to those under glass, and where they are not designed to bear creepers, it is much better so to form the wall by leaving interstices and hollows in its surface, that plants can root in with facility. This is, sometimes, now done, as at Baron Rothschild's, at Ferrières. Some adopt the rustic mode of forming the surface of the wall. There is a plan in use here, and, also, in many parts of Italy, even in humble houses, which deserves notice. The low wall which encloses a small terrace, or even a small open landing outside of the windows, is frequently made hollow so as to allow space for a trench of earth from 3 to 4 feet deep and about 2 feet wide; this, filled with good soil, forms a capital border in which to plant anything that may be desired. On the top of a wall so planned a very graceful garland of vegetation may soon be established, while creepers may be allowed to fall freely down the face of the wall.

Plants of Economical and Medicinal Interest.

The garden is remarkable for having a number of plants possessing interest, besides that of their beauty, some of which are not to be seen even in our botanical gardens. They are, for the most part, recently planted, but thriving, and will soon form a feature of much interest to the botanist. Henceforward, doubtless, we must include the Australian Gum trees

among medicinal plants; a little way off—towards Nice, and at the mouth of the Var—some of the commonest species were planted, with the result of making a spot habitable that was previously fatal to human life. There are seventeen species of Gum trees cultivated here; if one species possesses the astonishing properties attributed to it, it is probable the allied kinds have it too; and, on all accounts, the family deserve the attention of cultivators in temperate and warm countries, as the wood is very fine in many cases, the growth rapid, on the part of healthy trees, picturesque, and graceful. A tree of *E. globulus*, planted here in March, 1869, is now 48 feet high. Among the more interesting plants grown are the following: *Catha edulis*, used by the Arabs for chewing; the Chinese Pepper, *Xanthoxylum alatum*, *Z. Bungei*, from Peking; *Pentzia virgata*, a plant recommended at the Cape for sheep-fodder; *Pistacia vera*; *Myrica sapida*, a new fruit, like an *Arbutus*; the Purple Guava, which ripens its fruit well here in December; the Loquat, which fruits in May; the Edible Passion-flower, which ripens in July; the Kumquat, or small China Orange; the Chinese Quince (*Cydonia sinensis*); *Casimiroa edulis*, yet young; *Diospyros Kaki*, a Chinese fruit, much spoken of lately; the Bergamotte (*Citrus Bergamia*); *Citrus Bigaradia*; the West India Lime; the Pomme d'Adam, the Chinese Pomeloe; and many other plants of like interest, but more commonly met with in botanic gardens; *Argania Sideroxylon*, the Argau tree of Morocco, may also be seen here. It is a spiny evergreen tree, with a trunk of considerable size, but of low stature. It gives off branches at a few feet from the ground, which incline downwards till they rest on the earth; at length, at a considerable distance from the stem, they ascend. A tree mentioned in the *Journal of Botany* for April, 1854, measured 16 feet only in height, while the circumference was as much 220 feet. The fruit is an egg-shaped or roundish drupe, dotted with white. The culture of the plant for the sake of its oil has been recommended in Australia and certain parts of Cape Colony subject to droughts.

Miscellaneous.

Some remarkable specimens of the Shanghai Palm (*Chamaerops Fortunei*) are here, with stems from 12 to 18 feet high. These, much higher than we are accustomed to see the plant, are not the products of Mentone, but were imported from China by Mr. Hanbury, coming on the deck of a steamer to Marseilles. Specimens of *Cycas revoluta*, which grew in Mr. Hanbury's garden at Shanghai, accompany these. There are two remarkable specimens of the Date Palm, calculated of the age of 120 and 140 years respectively. A graceful and interesting plant here is *Nandina domestica*, which, in habit, reminds one of some of the herbaceous *Aralias*, but is more slender and graceful; it is one of the most favourite plants of the Chinese, occurring in cottage gardens everywhere about Shanghai; it bears bundles of bright scarlet berries. Another great favourite of the Chinese, *Olea fragrans*, is here also. Of *Acacias*, twenty-five species are grown in the open air, *A. cyanophylla*, *ovata*, *lophantha*, *speciosa*, *nematophylla*, and *brachybotrya*, being the best. Australian plants are well represented, *Banksia marcescens* being in flower. The *Polygalas* we are familiar with in greenhouses in England, thrive here admirably, most noticeable among them being a curious, almost leafless one, called *P. virgata*, a beautiful kind, which, so far as the habit and shoots are concerned, resembles the Spanish Broom; this plant is well worthy of culture in our greenhouses. The single yellow *Banksian* Rose is in its glory here, throwing off long and graceful shoots from walls and trees, up which it is a good plan to let it run. It seems to possess quite as good claims for general cultivation as either of the double kinds; indeed, some would probably think its showers of golden cups, each full of stamens, prettier than the double kinds. These all grow to perfection here, and so luxuriantly that they usually defeat the attempts to train them primly to walls and other surfaces. This is all the better, as the long, slender, and gracefully-curved shoots made during the previous summer are now chains of blossoms. The *Banksian* Rose, with all its flowering branches primly trimmed to a wall, is a very much less attractive object than when these are allowed to spring forth in a free and natural manner. As it is most difficult to grow anything like a verdant or closely-

woven turf here, from the great drought in summer and the scarcity of water, such Grass as there is is dotted full of Anemones of various sorts, and other wild flowers of the district; and thus, instead of a lawn, we have a pretty wild flower-garden. Many scraggy occasionally-mown spots in the rougher parts of English pleasure-grounds would look all the better for being treated in a somewhat like manner. A *Bougainvillea* of extraordinary richness of colour (*B. Warszewiczii*) was, though a young and small plant, full of flower; its merits are probably not yet known to English growers of these plants.

W. R.

THE INDOOR GARDEN.

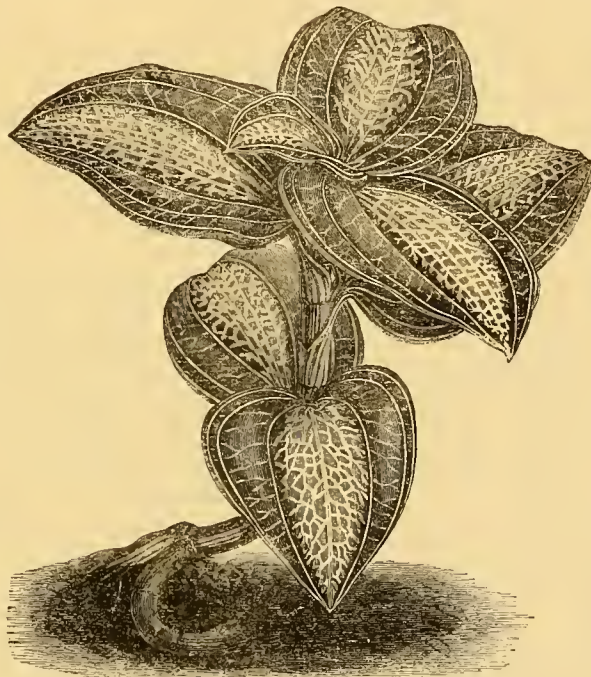
VARIEGATED ORCHIDS.

WHILE by far the greater number of cultivated Orchids are grown solely for the sake of their beautifully coloured, singularly varied, and often fragrant flowers, and present nothing remarkable in their foliage, there are two genera of terrestrial kinds (*Anætochilus* and *Physurus*) the leaves of which are richly coloured and highly ornamental, while the flowers are quite insignificant. The two genera are very closely related to each other, although they belong to widely distant regions, the *Anætochili* being indigenous to the East Indian Islands and Continent; while the *Physuri* are natives of tropical parts of South America, and especially of Brazil. All the species of both have short rhizomes, very short stems, and alternate leaves, more or less oval in shape, often heart-shaped at the base and pointed at the apex, on very short foot-stalks, which embrace or clasp the stem. The flowers are arranged in clusters or terminal spikes. They are of a white or reddish colour, and are undeserving of notice, in an ornamental point of view. The difference between the two genera consists chiefly in the colouring of their leaves and the distribution of their habitats. The leaves of the *Anætochili* are generally more velvety, and their veinings are mostly of a golden-red colour—rarely white. The leaves of the *Physuri*, on the other hand, are distinguished by their brilliant green colour and their silvery veinings. The native countries of each have been already mentioned. *Anætochilus Lobbianus* (of which we give an illustration) is one of the finest of the genus. It is a native of Java, and was named after Mr. Thomas Lobb, who introduced it into Europe. Its leaves are oval, pointed at the apex, velvety, of a very dark green colour round the margins, while the central part is of a yellowish-red. The whole of the upper surface is traversed by a net-work of veinings of a brilliant golden-yellow colour. The under surface is red. The plant is also known in gardens under the names of *A. xanthophyllus* and *A. latimaculatus*. Of other *Anætochili* a descriptive account of the most ornamental species will be found at p. 180 of our current volume. Of the genus *Physurus*, these are the finest species in cultivation:—*Physurus pictus* (Lindley)—also known as *Anætochilus pictus argenteus* (Hort.) *Physurus pictus reticulatus* (Reich. fil.)—and *Microchilus pictus* (C. Morren). This is a native of Brazil, and is distinguished by its lance-shaped, brilliant green leaves, with silvery veinings. *Physurus argenteus* (Hort.) (*P. pictus holargyrus*—Reich. fil.), is a kind which is sometimes confounded with *pictus*, from which, however, it is distinguished by the oval-

pointed shape of its leaves, which are also heart-shaped at the base. They are of a deep green colour, marked with fine large silvery veins, and a net-work of numerous small secondary veinings of the same colour. All these plants require the same treatment, that is, they should be grown in pots, the lower half of which should, for the sake of securing perfect drainage, be filled with broken crocks, while the rest of the pots should be filled with a compost of peat, charcoal, and Sphagnum, the surface being covered with a layer of living Sphagnum. The plants, after being potted, should be placed under a bell-glass or cloche, in a warm house, where the temperature during summer should range from 70° to 78° Fahr., and in winter from 55° to 60° Fahr. A moist atmosphere is indispensable, and this should be maintained equally and constantly during the summer, but in winter, when the plants require some rest, the supply of moisture should be considerably diminished. The plants should at all times be kept well sheltered from the direct rays of the sun, and the inside of the bell-glass or cloche, under which they are placed, should be carefully wiped out every morning and evening, otherwise the condensed moisture, accumulating on the glass, will drip on to the leaves, making

holes wherever it touches. As the principal object in cultivating these plants is to bring the foliage to its full perfection of beauty, the flowers should be pinched off as soon as they begin to appear. This will throw more vigour into the leaves, cause them to grow closer together, and vastly improve the lustre and richness of the colouring. It is also favourable to the multiplication of the plant, as it causes numerous shoots to spring from the axils of the lower leaves, and also from the rhizome. These shoots, when detached and planted, will form each a new plant. They should, of course, be potted in the same compost, and subjected to the same treatment which has been above described for full-grown plants. Of variegated Orchids in general, the following is a list of some of the more remarkable, viz., *Anætochilus argyoneurus*, A. Bullenii, A. Dayii, A. Domini, A. El Dorado, A. intermedius, A. javanicus, A. latimaculatus, A. Lobbii, A. Lowii, A. L. virescens, A. Nevilleanus, A. petola, A. querceticolus, A. Reuwardtii, A. Ruckerii, A. setaceus, A. s. cordatus, A. s. grandifolius, A. s. inornatus, A. striatus, A. Turnerii, A. Veitchii, A. xanthophyllus, A. zebrinus, *Cypripedium barbatum* (several varieties), C. concolor, C. Dayii, C. Harrisianum, C. Hookera, C. nivenum, C. pardinum, C. purpuratum, C. superbiens, C. venustum, *Dendrobium japonicum variegatum*, D. nobile variegatum, *Goodyera Dawsoniana*, G. discolor, G. Domini, G. macrantha, G. Ordiana, G. picta, G. pubescens, G. rubro-venia, G. Veitchii, G. velutina, *Microstylis discolor*, *Oncidium Papilio*, *Orchis maculata superba* (many other species), *Ophrys* (many species), *Phajus maculatus*, *Phalænopsis Schilleriana*, *Physurus argenteus*, P. a. pictus, P. fimbrialis, P. maculatus, P. nobilis.

W. M.



Anætochilus (xanthophyllus) Lobbianus (natural size).

TYERMAN'S HARE'S-FOOT FERN.

(*DAVALLIA TYERMANII*)

NEARLY all the Hare's-foot Ferns are beautiful, being elegant in habit, and they are also well adapted for cutting and for grouping either in bouquets, vases, or as dinner-table decorations. This, which is one of the most distinct species in the whole group, has been named, in compliment to the

late curator of the Liverpool Botanic Gardens, Mr. Tyerman. It is easily distinguished from its congeners by its silvery rhizomes and dark glossy fronds, which are of good substance, and, like those of many other species of the genus, last for a considerable time after being cut. It grows well in the ordinary temperature of the tropical Fernery or plant-stove, in an open and well-drained compost of peat, fibrous loam, and coarse sand. It does better in a basket or flat earthenware pan than in a pot, as its rhizomes have in that case liberty to develop themselves fully, and they are also seen to much better advantage than when crowded together. It likes to creep among lumps of rough peat and nodules of moist sandstone. It has been imported from West tropical Africa, and ought to be grown in every select collection of stove Ferns.

B.

LARGE SCARLET-FRUITED SOLANUM.

(SOLANUM BETACEUM.)

AMONG easily-grown ornamental plants of large size which are employed for forming groups, *Solanum betaceum* is particularly valuable. It is a native of Brazil, and forms a handsome bushy shrub 16 feet or more in height, and as much in circumference. The leaves are of a deep green and the flowers of a pale blue. In September the plant is covered with a multitude of scarlet fruit, as large as a hen's egg, and presents, all through the winter, a magnificent appearance in well-grown specimens. It requires the heat of a temperate house to ripen the fruit. The plant is easily raised from seed, which should be sown in pans on a hot-bed, and, as they germinate very rapidly, the seedlings may be potted off in about eight days, and removed into the open air for the summer about the beginning of May. The fine foliage and blue flowers of the plants will add much to the attractions of gardens during the season. At the approach of winter, and before the appearance of frost, the plants should be re-potted in pots of suitable sizes, and removed into the plant-house. The soil used should consist of two-thirds peat soil and one-third free loam. During the winter water should be very sparingly given. Some idea of the beauty of this plant may be entertained from the account of a specimen given by M. Tellière, in the *Revue Horticole*. This, he states, was over 16 feet high, and bore 1,200 fruits of a brilliant scarlet colour, and each as large as a hen's egg. The *Solanum betaceum* appears to be hardly known in this country, but it is well worthy of cultivation, either for summer or winter ornamental purposes. Seed of it is not expensive, and may be obtained, we believe, from M. Loise-Chauvière, nurseryman, 14, Quai de la Mégisserie, Paris.

W. M.

Green-leaved Dracænas.—It may not be sufficiently well known that this section of ornamental Dragon trees is much harder than the crimson or creamy variegated kinds. This is a fact, however, and it ought to make the green varieties very popular as decorative plants for rooms, windows, and other situations in the house. The best species are *D. congesta*, *D. rubra*, *D. gracilis*, *D. heliconiæfolia*, *D. Draco*, and *D. latifolia*, all of which have fresh green foliage more or less elegantly recurved, and are invaluable either to the amateur or professional floral decorator. I have often thought that if seedlings were raised from home-saved seeds a still harder race of *Dracænas* might be obtained. *Apropos* of this, I may mention that a plant of *D. latifolia* now bears a great panicle of large greenish-white flowers, in the succulent-house at Kew, and it is by no means unusual for many of the other species to bloom in this country; and, with a little care in fertilisation, some interesting and useful hybrids might possibly be obtained.—B.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Agapanthus umbellatus as a Balcony Plant.—I have two large plants of this that have been established in small tubs for years, and each of them is this season throwing up about a dozen spikes of bloom. They succeed perfectly in any good rich compost, but require a liberal supply of water at the root, especially during hot dry weather.—J. H., *Sydenham*.

Boronia megastigma.—This is the reverse of attractive, so far as bright colours are concerned; but its blooms are very fragrant. I selected a plant of it some months ago from a list of new plants, but when it first opened its flowers I was disappointed with it. It is one of those plants that do not captivate at first sight, but its graceful habit of growth and delicate perfume make it a favourite.—B.

Sobralia macrantha nana.—Of all the varieties of *S. macrantha* we have ever seen, this, received direct from our Mexican collector, is by far the finest. It flowers profusely when only 12 to 20 inches high (one of our flowering stems is only 11 inches high), and the labellum alone of the plant now in bloom with us is 10 inches in circumference, altogether it is one of the most charming *Orchids* imaginable. Every plant of it that we have is the same, the tallest stem being only 23 inches, and this a solitary exception out of 15 or 20 stems.—Jas. Backhouse, *York*.

THE GARDEN IN THE HOUSE.

BOUQUETS FROM FIELD AND GARDEN.

IN reviewing the flower-painting of this year's exhibition of the Royal Academy, it was observed by THE GARDEN in the notice of Miss Nutrie's "My First Bouquet," that the fashionable "cauliflower" bouquets of the present day might be occasionally supplemented by a freer style of grouping, in which the foliage of each flower should play a part, however subordinate. The excessive formality of the present orthodox form of presentation or hall-room bouquets, exhibits a kind of close packing in which the delicate graces of flower-form are entirely submerged in consequence of this close, even tight, juxtaposition. The end sought in this kind of grouping, appears to be a method of packing together (according to price) an abundance of rare, and, consequently, expensive flowers, all of which must be got into the same lump. This system, of course, necessitates the use of such flowers as are more or less rare, and there is, perhaps, no other way of making up a bouquet that shall be fairly worth, in intrinsic value, from 5s. to 5 guineas. The cut flowers of which the bouquet is composed are, probably, worth all the money, at their respective market prices; and, for certain occasions, bouquets so manufactured, may be deemed appropriate, even necessary; but as works of art they are utterly valueless. A few elegant Grasses from the meadow, combined with a selection, at any season, of flowering branchlets from the shrubbery or common garden border, and a free-handed and tasteful grouping, without crowding, and with a well-balanced proportion of natural foliage, may be made to form a composition, such as a painter might desire to transfer to his canvas, while he assuredly could never wish to dip brush in colour for one of the expensive bouquets of the "cauliflower" type. Such has long been a favourite theory of the writer in the matter of flower grouping; and the other day he found it gracefully exemplified on the drawing-room table of a friend, by a graceful half-wild bouquet from field and garden, formed with the free grace and uncrowded arrangement which, as nearly as may be, illustrated his views. It is needless to state that a lady's fingers and a lady's taste were the joint authors of the composition. In the arrangement, each flower and Grass of the gathering had been made to find its seemingly proper place, unjustly by its neighbour, and so freely and easily located in its basket-work receptacle, supported on three slender canes of Bamboo, that even its foliage had room to display its graces and modes of growth. With the permission of the lady flower-grouper herself, a drawing was at once made for this journal, a reproduction of which, in the form of a careful wood-engraving will be found on the opposite page. The central object was a small spray of Guelder Rose, with two or three of its spherical masses of snowy flowers, surrounded and supported by their own leaves. There was also a Rose, perhaps one of the first of the season in the garden where it was gathered; and there were some smaller Scotch Roses, accompanied by sprays of their miniature foliage. There was also, it will be seen, a flower of white Pink, with buds, and with leaves which have room to display their delicately slender forms and the pale glaucous hue of their dainty green. A common Corn-flag towered in the centre; and on the left was a single Iris, backed by its blade-like leaves. Grasses of several kinds shot upward, crowned by their feather-like inflorescence, which added a pleasing lightness and careless grace to the composition. The effect was heightened as regards colour by two sprays, not more, of *Pelargonium* flowers, gathered with their leaves; and additional grace was secured both by drooping Grasses, and by two or three kinds of Fern, one gracefully-weeping frond being allowed to droop negligently to the table, the slender extremity of which curled itself fantastically, as with a set declaration against primness, trimness, or any kind of slavish formality. The value of our native Grasses for arrangements of this kind is well shown in this case. Ferns themselves cannot show so airy a grace or such delicacy of form. Many graceful wild Grasses may be gathered in our hedgerows, and many beautiful hardy Grasses, not natives of this country, are as easily grown in any cottage garden as the hardy flowers of which this charming bouquet was composed.

H. N. H.



A JUNE BOUQUET OF BRITISH GRASSES AND HARDY FLOWERS.

DRAWN BY NOEL HUMPHREYS.

THE KITCHEN GARDEN.

FERTILISERS AND THEIR PROPERTIES.

By THOMAS BAINES.

SCIENCE has done much during the present century for horticulture in the way of manures; yet, even amongst the most learned in such matters considerable difference of opinion has existed; what one has pronounced to be an established fact, another has pulled to pieces, as a conclusion based upon mistaken observations and insufficient data; this applies more especially to combinations or mixtures of manure; for instance, by one we are told that the man who allows lime to be mixed with farm-yard manure simply wastes both, and throws his labour away into the bargain; then, by another, we are informed that this is a mistake, that the combination answers admirably—sound alike in theory and practice. In the use of manures quite as much depends upon the nature of the soil as upon the particular crop for which we are manuring; and this difference of soil exists in almost every locality; nay, further, it frequently happens that two pieces of land, only separated by a fence, are so different in this respect that the particular manure adapted for a given crop upon one may be anything but the most suitable to use for the other under a similar crop. Let me not be misunderstood; I should be extremely sorry to in any way disparage the importance and benefits conferred upon horticulture by means of chemical research, when confirmed by actual experience, but without this all-important confirmation, I look upon practice handed down from generation to generation as a safer guide to follow than the chemist in his laboratory, who is unacquainted with the nature of the soil for which he prescribes a particular manure. Plants, in relation to the food that sustains them, stand in a somewhat analogous position to animals; what is food for one is poison for another, with this important difference, that if distasteful the animal will refuse it; not so the plant, which has not the power of rejecting, however unsuited or inimical may be whatever is contained in the soil in which its roots are placed. This is a fact well known to anyone who has observed the beneficial effects of dressings of salt upon marine plants, such as Asparagus and Seakale, heavy enough to have caused death if applied to others different in their nature. In the numerous subjects the gardener cultivates, the opportunity exists for combining science with practice, through the exercise of careful observation, but, it is not always that this very necessary element is brought to bear; often, there is the same yearly application of identically the same kind of manure, for all, and every variety of crop that has been used for time immemorial. There are innumerable gardens where stable-manure, leaf-mould, and other vegetable matter has been used until the whole body of soil has become a mass of humus incapable of growing many things. Vastly preferable to stable manure for general use in the garden, is such as is obtained from the farm-yard, viz., a mixture of that of horses, cows, and pigs, all carried away together as it is made; not only does this contain from the first the elements necessary to maintain the soil much longer in a fertile state, but there is so much less waste in the process of fermentation, consequent upon the mixture never heating to a degree that will expel the ammonia. Yet even the mixture of manure just named admits of being much improved by the regular addition in the preparation of an absorbent, such as ordinary loam, peat, charred garden refuse, or burnt clay; if any of these are used in the proportion of one-half, or one-third, a given quantity of this manure, so prepared, will do at least one-third more good than the usually half-exhausted stuff applied to most gardens. In many places there does not exist the means or convenience for obtaining the manure fresh as it is made, or for preparing it in the above manner; but there is no reason why such provision might not be made. By the use of such, we should hear much less seldom of gardens being worn out. Again, the quality of manure is considerably improved by the position in which it is placed whilst being prepared. The old method was to throw it into a hole, which, being a downhill movement, was, of course, the easiest to begin with; but there was the after difficulty of getting it out again, without taking into account the waste occasioned by

the accumulation of surface-water in such places, in brewing the strength out of it. A manure heap should always be on, or above, the surface level, and so placed that there can be no accumulation of water, and where the little that does run from it can be collected in a tank made for the purpose. Liquid-manure is required for most things, and this will be found to be sufficient, and much less labour, than the especial preparation of horse droppings. In the preparation of manure, as collected together, it is impossible to make it too solid. Excessive fermentation never will take place, unless it contains too much air, which cannot occur if the whole mass lays perfectly close. The extra strength of manure, made and allowed to accumulate in cattle boxes, where the animals run loose, treading it down as closely as possible, is due more to its losing nothing by fermentation through the solidity which the whole mass attains, than by its protection from rain. The Cheshire farmers in the neighbourhood of Manchester know this, and profit by it. When in the autumn they have selected the ground for their next year's Mangolds, Turnips, and Potatoes, they commence drawing large quantities of manure, principally from Manchester, placing it upon the highest point of land on which they intend to use it, and, instead of laying it loose and high, they make the heap a low oblong square, sloping down to nothing at both ends, so that they can draw each load with the horses as it comes right on to the top. The feet of the horses and the wheels of the carts make the whole mass so close that it never heats, so as to injure it. To every two loads of stable manure, of which this principally consists, one load of fine ashes from the dust yard is added. This acts as an absorbent; and manure so treated loses little in bulk from the time it is put together until it is carted on to the land, and will cut out almost as solid as clay. This, in itself, is sufficient proof, without any chemical test that the manure loses little of its natural strength, a fact still further confirmed by the enormous crops obtained by moderate dressings. To secure the best results in the cultivation of any particular plant, it is not only necessary to select such manures as, by their natural constituents, are best suited to the requirements of the species of plant we wish to grow, but also such as are rich in the particular element in which the soil happens to be deficient; this latter can only be determined by analysis of the soil, or by its apparent nature confirmed through actual experience; consequently, this only admits of being treated from a general point of view. For most descriptions of soil and of crop, good farm-yard dung stands unequalled; but, as I have already attempted to show, it may be applied to a particular piece of ground until it produces not nearly the effect it ought to. Highly concentrated ammoniacal manures, of which we may take good Peruvian guano as the type, are much more suitable for crops, such as Turnips, Beet, Carrots, Parsnips, Cabbages, Lettuces, or anything of a similar character (wherein the object is to build up the substance of the plant quickly without the introduction of any more fibre into it than can be avoided) than they are suited for such things as Peas, Beans, French Beans, or anything of which the seed is the edible part; nevertheless, they are all excellent substitutes in part for solid manure, where such happens to be deficient. Where the soil has become almost effete, and reduced to humus, causing the crops to run too much to haulm and leaf, liberal dressings (not mere sprinklings) of lime will be found advantageous, with an alternate application of common salt, more especially if the land is very dry, the nature of the salt helping to retain moisture. The most enduring of animal substances, bone, horn, hoof-parings, hair, and woollen rags, are amongst the best and most lasting manures, and are not near so much used in gardens as they ought to be; all these, except bones, may, with advantage, be applied to any description of soil. Bones do not answer well on very dry light land; for, unless they are dissolved, their decomposition on such soils is too slow.

What are the Advantages of Double Cropping?—About this season gardeners in many places are in the habit of double cropping, which, in my opinion, is a bad practice. I should be glad to learn what are its advantages. Shade might, perhaps, be afforded between rows of Peas or Beans, but then the benefits derived from

summer showers, which are needful, would be, in a great measure, denied. Then there is a great interruption to the ordinary operations. In removing Pea sticks, for instance, even with the greatest care, injury will occur to the other crop, which is always inferior to one not so confined; then the soil has to be loosened up again, making three loosenings in the season. All this is too much where sufficient strength to work the garden is not allowed. Double cropping might be admissible in cottagers' gardens, where space is limited; but, when a gardener has four or five acres of land to attend to, with only some three men to do the work, to double crop part of the kitchen garden is too much. What think your readers?—A SUBSCRIBER.

MULCHING IN THE FRUIT, FLOWER, AND KITCHEN GARDEN.

At this season of the year, mulching (*i.e.*, covering the surface of the ground between growing crops with some loose material to prevent evaporation) effectually will save much labour in watering, and to a very considerable extent make up for poverty in the soil. Materials for mulching are generally plentiful in most gardens; decayed hot-bed manure is one of the best, and when this cannot be had, short Grass is generally plentiful. Most fruit and vegetable crops are benefited by mulching, but some more so than others. The Raspberry, for instance, which delights in a somewhat moist soil, and is a shallow rooter, should always be mulched in dry situations. Our soil is dry and thin, and not well adapted to the Raspberry; but by mulching thickly, we always secure great crops of fine fruit. In fact, the weight of the fruit is nearly doubled in consequence. Celery, too, is mulched thickly with short Grass as soon as planted, and it seldom requires more than one or two good waterings. Let the weather be ever so dry, the surface under the Grass is always moist. The mildew which affects the Pea in dry summers, is greatly checked, or altogether prevented, by good mulchings along the rows, and extending outwards from the sides about 18 inches. Brussels Sprouts, Broccoli, Cauliflower, &c., which often hang fire after planting in a dry June, make marvellous progress with their roots under a good layer of short Grass. Potatoes, though they, too, are much benefited by the same means in dry seasons, are better without it, as a rule, in case of wet setting in in autumn, and thereby aggravating the disease; but this is the only exception. The health of Gooseberry and Currant bushes is greatly promoted by mulching, and indeed all kinds of fruit-trees, especially stone-fruits; and newly-planted trees of all descriptions are often saved from perishing by a good top-dressing of rotten litter, and such like, during summer and winter. In the flower-garden, mulching is not so admissible, but we generally practise it with Calceolarias, and the disease is unknown with us, though we have to contend with a dry caky soil. The Iris, too, should be mulched; it is a moisture-loving plant, and will thrive if mulched where it will sometimes not do any good otherwise. In Vine and Peach borders, whether inside or outside, mulching is almost indispensable. In some places where they are raked painfully smooth and neat, sometimes they get so rent with the drought during summer, that a man has to go over them every week to fill up the cracks. Good Grapes are seldom to be found under such circumstances. A mulching, 4 or 5 inches thick, of rotten litter and leaves is best for Vines, and a border so dressed need never offend an eye not painfully sensitive on the score of neatness. Large plants in pots, such as Figs, pot Vines, Pines, orchard-house trees, &c., should also be mulched when practicable, as roots are often near the surface, and are apt to suffer from irregular attention in watering. Apart from the advantages of mulching in a labour-saving respect, and as a conservator of moisture, it keeps the soil about the roots at an equable temperature, by preventing radiation in cold weather, and the bare soil from the roasting effects of the sun in warm weather—a condition of things very unfavourable to vegetable life generally.—*Gardener.*

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Early Peas.—Our first Peas were Ringleaders, which were gathered here on the 21st ult., and Laxton's William the First came in on the 26th. The latter is a green Marrow of the first quality, and a decided acquisition.—R. G., *Burghley.*

Large Rhubarb.—Is this anything extraordinary in the way of Rhubarb: the stem (cut off close to the ribs of the leaf), 20 in. long, and 9 in. in circumference; weight 3 lbs. 13 oz.? If so, I have just cut a stem agreeing to this description.—JOHN MARTIN, *Chilham, Canterbury.*

Potatoes and the Late Frosts.—The frost caught us napping the other day; but we, nevertheless, learn something even by disappointment. American Potatoes are not of the best quality, far from it, but that is not their only fault. I grow Climax because it grows large and early; also, Early Rose, but it is most tender, all of it here having suffered, while the good old Lapstone Kidney is not touched, and is the prince of Potatoes, when of the true kind.—R. GILBERT, *Burghley.*

GARDEN DESTROYERS.

SCARING BIRDS.

Your correspondent, "R. C. E." (p. 465), in his remarks on scaring birds off fruit-trees by means of squibs and crackers, has, I fear, not given us gardeners an effectual remedy to get rid of our feathered enemies. We have all heard of catching birds by putting salt on their tails, and I am surprised that "R. C. E." has not alluded to this plan. The four-and-twenty young birds and thrushes baked in a pie along with pigeons is, however, not a bad idea; and half-a-dozen pies of such dimensions, in the course of the season, would help to thin the young generation of these birds. These pies, however, would not be supplied with young birds, caught by means of twigs loaded with bird-lime, or with springes or nooses of hair or wire; on the contrary, the gun, traps, or nets would have to be resorted to in cases of necessity. I am not sure that young blackbirds and thrushes do all the mischief in our fruit-gardens; for the old ones, whether moulting or not, I have found quite as bad and more daring. I believe the thrush is entitled to more lenity than the blackbird in the fruit season, for it is not nearly so daring or ravenous as a fruit eater, and it destroys incalculable numbers of slugs and grubs in spring and autumn. "R. C. E." alludes to a tender-hearted gamekeeper who was horrified at the barbarity of catching rabbits with steel traps; he must, I should think, have been the very first of his profession to show such qualms of pity. Such a man, of course, would never think of catching hawks, weasels, cats, or birds of any kind by such means; and he must have been a valuable servant on account of the heads of game which he reared for his employer. If squibs and crackers, and pieces of touch-paper, and similar petty fireworks, will help to scare away blackbirds and thrushes in the fruit season, the time will soon arrive for the trials to commence; and those who put their trust in "R. C. E.'s" recommendations must keep their powder dry for the occasion. W. TILLERY.

Receipt for destroying Thrips.—Dissolve 8 lbs. of the best soft-soap in 12 gallons of warm rain water; then, when the water is cold add a gallon of strong tobacco juice. Indian Azaleas are very subject to this pest, and if the plants can be dipped in this mixture, or, if too large, syringed with it twice, at the interval of two or three weeks, it will quite clear them of it. After dipping or syringing the plants with this mixture, and before it dries on the foliage, it is safest to syringe them again with clean soft water; thus all the dead insects will be washed off and the foliage made clean. Fumigation with tobacco is a good check against the thrips, if repeated at intervals of three or four days, but nothing is so effectual as dipping in the above mixture.—T.

Poke-root for Destroying Insects.—Dr. F. C. Renner, of Frederick County, Maryland, writes to the Department of Agriculture at Washington, that several years ago he collected some Poke-root (*Phytolacca decandra*) for medicinal purposes, and placed it at various places about the house to dry. After several days he observed that there were many cockroaches lying dead, and upon examination found they had been partaking freely of the Poke-root. Some of the root was placed near their haunts, and the result was that it rid the premises of those insects. Since then he has communicated the remedy to others, who have tested it with satisfactory results. We have not yet had an opportunity of trying the efficacy of the root as an insecticide, but shall test it in the spring. Should any of our correspondents have experimented with it, they will oblige us by giving the result of their experience before we venture to recommend it for general use.

NOTES AND QUESTIONS ON GARDEN DESTROYERS.

Rhubarb Leaves a Care for Crickets.—A large bakehouse at Turvey, Beds., was, some years ago, infested with crickets. As hot weather came on the nuisance became very serious, for crickets were to be found in every possible crevice. The baker was advised to lay some Rhubarb leaves about the place. The light of the next morning revealed nibbled leaves and myriads of dead crickets; and this was the last of them in that bakehouse.—E. RANSOM.

Fern Insects.—What is the name of the pest which has affected the Fern, a piece of a frond of which I enclose? I cut it off a Stag's-horn in the conservatory of a friend. The frond is smothered, as you will see, with the insect, and is the only plant so affected; small black ants also seem to take great interest in such plants, for the Fern in question is covered by them all day?—G. E. P. [Your Fern frond is covered with the tortoise scale also called black turtle scale (*Coccus testudo* of Curtis). The best modes of getting rid of it are described in the recent papers in THE GARDEN by Mr. Baines (see p. 90, Vol. V.).—A. M.]

THE ARBORETUM.

ROSA INTERMEDIA.

THIS very singular species (or variety) was raised by M. André Leroy, nurseryman, of Angers, from seed which he received from China, and, if not particularly remarkable for beauty, it has, at least, the merit of being quite unlike any other known species or variety of the Rose. At first sight, when in flower, it might be easily taken for a Rubus, or Bramble, of the Fruticosus section. It is a very vigorous-growing climbing shrub, with cylindrical branches, covered with smooth shining bark, leaves very coarsely toothed, and exceedingly numerous, fragrant, pure white flowers with yellow anthers, borne in a large cluster of terminal cymes, as shown in the illustration. This plant, though not devoid of interest as an ornamental subject, claims attention in a scientific point of view. The specific name (*intermedia*), is most appropriate, as, from its organic characteristics, it is undoubtedly belongs to the genus *Rosa*, while, from its general aspect, and especially in the disposition of its inflorescence, a superficial observer might be inclined to refer it to the genus *Rubus*. The habit of the plant is shown in the accompanying illustration.

SKIMMIAS.

THE genus *Skimmia* was founded by Thunberg on a single species (*S. japonica*), which, for a long time, was the only one known in cultivation. Now, however, we are acquainted with at least five species, which we shall proceed to describe, beginning with

***Skimmia japonica*.**—This plant is very ornamental on account of its berries, which remain on the shrub a year or more, rendering it one of the handsomest subjects for winter decoration. In general appearance and in its fruit, it resembles *Ardisia crenata*, with which, however, it has no family relationship. It is a dwarf Japanese shrub, with small, persistent, leathery leaves, narrowed to a point almost from the base; flowers, hermaphrodite, arranged in spike-shaped terminal clusters, with four (rarely five) petals, white or slightly greenish, and with a very agreeable perfume, resembling that of Orange-blossoms; stamens, four (five in the flowers with five petals); filaments, white and thin, inserted in the middle of the yellow anthers; ovary, small, surmounted by a thickly three-lobed style; fruit, the size of small Peas, of a very brilliant coral-red colour when ripe, and continuing for a very long time before they fall. Flowers in April and May. As the fruit continues persistent for such a long time, it frequently happens that plants may be seen bearing flowers and fruit together.

***S. oblata*.**—This species appears to be intermediate between the two preceding ones. It is also from Japan, and is equally hardy. The female plant has persistent leathery leaves, slightly arched, on short stalks, sometimes nearly sessile, frequently of two forms—the one from 3 to 5 inches long and about 2 inches broad, the other oval, broader, and much shorter, of a very deep green, almost black, colour; flowers, fragrant, terminal, in a short thyrsoid cluster, with four (rarely five) spreading distant petals, which are red on the outside before expanding, and white afterwards; stamens, rudimentary, being reduced to small white filaments; ovary, large, surmounted by a stout broadly four-lobed stigma.

***S. fragrans*.**—This plant is also from Japan, and is very hardy.

It exhibits this peculiarity, that although the flowers begin to show before winter, they do not, however, begin to expand until the following spring. The flower-buds, however, do not suffer in the least from the winter's cold. The male plant is a very hardy vigorous-growing shrub; leaves, persistent, thick, leathery, slightly arched, sometimes slightly twisted, from 5 to 6 inches long and nearly 2 inches broad, of a deep shining green colour. Inflorescence, terminal, in a broadly thyrsoid cluster, 5 inches or more in length, and 3 to 4 inches in diameter, broadly rounded at the apex, and with numerous dichotomous ramifications; flowers, fragrant, white or faintly yellowish, with four (rarely five) oboval nearly erect petals; stamens, equal in number to the petals, with white filaments supporting large yellow anthers; ovary, rudimentary.

***S. Veitchii* (Nob.), *S. oblata* (Hort.).**—This species, which is the finest of the genus, in its habit, and especially in its foliage, is also from Japan, and, like the preceding, is very hardy, bearing our winters without injury. It is a dioecious shrub. The female (which alone we have seen) is very vigorous-growing, with oval or oboval-elliptical, very thick, leathery leaves, not arched, abruptly rounded at the apex, of a light green or slightly yellowish colour, with very thick violet-red leaf-stalks, and with a yellowish mid-rib, from 3 to 5 inches long (sometimes more) and over 2 inches broad; flowers in a terminal spiked-shaped cluster, with four (rarely five) oval petals, which soon fall, and with the odour of *S. fragrans*, but not so strong; stamens, reduced to white filaments; ovary, large, surmounted by a four-lobed stigma, the lobes of which are less spreading than in the preceding species.

***S. Laureola*.**—A dioecious shrub, with very fragrant yellow flowers. As distinguished from all the other species which we have studied, in this the sepals, petals, and stamens are five in number in each flower. It is a handsome ornamental shrub, with persistent leaves, and in winter requires the shelter of a conservatory, where it flowers about the end of March. The following is the description of this species given by Siebold and Zuccarini:—"An elegant shrub, about 4 feet high, exhaling a citron-like odour; flowers of a pale yellow, very fragrant, in a dense terminal corymb; berry, oval, smooth, very large. Native of the mountains of Nepal."

As may be seen from the preceding descriptions, all the *Skimmias* are from Japan, and are very hardy, with the exception of *S. Laureola*, which is a native of Nepal, and cannot withstand frost. These plants, when they become more common, will render important services to horticulture. Although they accommodate themselves to various kinds of soil of a sandy-clay nature, it is best to grow them in heath-soil when they are young. They are very easily propagated, as few plants are more readily raised from cuttings. All that is required is to take cuttings of well-ripened wood, and place them under cloches, where they will strike root in a very short time. The species which fruit may also be multiplied by means of seeds. According to Siebold and Zuccarini, the Japanese and Chinese class the *Skimmias* amongst poisonous plants, the native name, *Sikimi*, signifying an "evil fruit."—*Revue Horticole*.

HEDGES FOR EXPOSED SITUATIONS.

THERE are few plants suited to withstand the rigour of severe winters sufficiently to form fences in high situations; and those which are adapted for this purpose are to be considered chiefly as the forerunners of the Beech and Whitethorn. There are, indeed, certain situations, though few, where it would be an act of folly to be at the expense of planting any fences with the view of sheltering, and ultimately reclaiming, the land for cultivation. Rocky surfaces,



Rosa intermedia.

such as cannot be subjected to the plough, belong simply to the province of the planter. Thin gravelly districts, where herbage refuses to take root, are also to be left to be covered with ligneous vegetation, as are all those lands lying on rock, or which otherwise have such a retentive sub-soil that the water stagnates upon them. At the same time, the mere altitude of lands ought to form no barrier to the introduction of hedge-plants, so long as we have a few prepared to take their station in the shape of fences in any situation; the chief thing to be considered being, whether or not the soil purposed to be enclosed is likely to become fit for tillage.

The Scotch Pine.—Of all the trees suited to the climate of Britain, this tree is, perhaps, the most serviceable. If the cold and wintry uplands of the north are to be brought into cultivation, it will be by the aid of this tree, either in hedges or strips, or in larger masses as nurseries to other trees. In no soil does it refuse to grow. In peat, sand, gravel, granite, and all thin soils, it rises rapidly, and forms a strong rough fence in the course of six or seven years. In the neighbourhood of Thetford and Newmarket, in Suffolk, where the soil is miserable, it is quite common as a hedge tree; but in those places it is pruned in the same way as the Whitethorn, which is certainly disadvantageous; it being well known that of all trees the Pine is the most impatient of the knife. It is only where a better tree, as a fence, will not grow, that I am led to recommend the Scotch Pine, and this I do, as already stated, because it is admirably adapted for ameliorating the climate in exposed situations previous to the introduction of others. My plan with this tree is as follows:—The soil requires no preparation whatever. The plants to be used should be four years old, and they can be had of nurserymen for 4s. or 5s. per 1,000. Those plants I insert in a straight line at 2 feet apart from each other, so that, when they get up, the stems may form the chief part of the fence. Planted at this distance, there will be very little room for branches between the trees in the lines, but they will push out luxuriously on each side and produce sufficient spray to keep the plants in a healthy state. The tips of the strongest side-branches should be cut off, so as to induce smaller ones to break forth, but no regular system of pruning should be adopted. Another parallel line is to be formed and planted in like manner, about 6 yards distant from the other: this distance I adopt, so that the roots of the trees may not impoverish or reach the soil in the centre, which, at the proper season, should be planted with the Whitethorn or Beech after the ground is trenched in the usual way. Between the parallel lines, at considerable distances, there should be cross lines planted so as to break any currents of wind, which are oftentimes hurtful in open avenues of this description. If the soil is tolerable, and the climate permit, the Whitethorn-hedge may be introduced three years after the planting of the Pines; but in the more exposed places, it should be deferred for a year or two longer, when the screen on either side will be in a more complete state to protect it. At the end of the three years, the Beech may with every prospect of success be introduced.

The Furze.—In very cold elevated districts, where others will not thrive, this shrub makes a beautiful and useful fence—beautiful from its having such a profusion of bloom, and useful because it is cropped in winter by sheep, and the clippings eaten by cattle and horses. It is short-lived, however, and is subject to be killed down during severe winters. It is apt, also, to become bare and unsightly at bottom. In forming a hedge of this shrub, the plan pursued at present throughout most parts of England with regard to the Whitethorn is to be adopted. A bank of earth is to be raised 5 feet wide at bottom, 3½ feet high, and 20 inches wide at top. At the proper season, which is in March, a drill is to be drawn on the top along the middle of the bank, and the seeds sown therein, and covered to the depth of 1 inch. In the course of two years the plants will begin to grow luxuriantly, spreading downwards on each side over the bank, so as to almost cover the whole of its surface. This fence should be regularly clipped once a-year, between November and March, and, of course, the particular time will be regulated by the demand for the clippings as fodder.

Hedges for Situations where the Soil is damp and boggy.

For this section Nature seems to have given us no trees or shrubs remarkable for their stability or rigidity. They are all soft-wooded, without prickles, open growers, but compensating for these deficiencies in the quickness of their growth. With such materials it is clear that an open ditch is an important and indispensable accompaniment.

The Elder.—This tree is remarkable for the ease with which it may be cultivated, its rapidity of growth, and the cheapness attending its formation into a fence. Trenching the ground in this case may be dispensed with, for, if the soil is dug over one foot deep, the roots will find their way into any damp soil. Even rooted

plants need not be used, but cuttings or truncheons inserted instead of them. A ditch should be cast as a fence on one side, and the soil taken out of the ditch should form a bank on the other. This hedge should be trimmed with a hedge-bill at the end of the first year, and every subsequent year, as recommended for the others. In such parts as have failed, fresh plants with roots should be inserted in the ensuing autumn, and at the end of three years the bank may be removed.

The Lombardy Poplar and the Black Italian Poplar.—Both these trees are admirably fitted as fences in moist soils. Plants one year old, which are generally about 4 feet in height, may be had at the nurseries at 1d. each, and these will form a tolerable hedge the first year. If the soil is dug over and manured several months previous to planting, strong cuttings may be inserted about a foot apart, and these will make shoots varying from 3 to 5 feet in height during the first season. At the end of the second year, during the month of November, the top of the fence should be regularly reduced with a hedge-bill to the height of 5 feet. This will strengthen the sides of the fence, and, consequently, increase the stability of the stems. A very good plan is to tie rods of wood to the young trees at 2 or 3 feet from the ground, until they have become sufficiently strong of themselves to resist the pressure of cattle. When properly attended to, by keeping them free from weeds, and trimming them regularly every autumn, those fences become highly useful and ornamental, and are at once amongst the cheapest and readiest of any that can be raised. The form of the hedge should be the same as that of the Hawthorn, only a little wider at bottom, and trimmed up in a wedge-like shape, as already explained, under the head of Whitethorn hedges.

The Alder.—As a hedge plant, the Alder is not so good as the Poplar; but as it is the most aquatic British tree that we have, it is worthy of being mentioned here as suitable to a class of soils and situations in which the Poplar will not grow freely. It delights in wet swampy lands, and will grow tolerably even in the water. The plants for fences should be four years old, not more, because when older they are generally devoid of branches at bottom. They may be set at a foot apart, and treated in every respect like the Poplar, trimming the fence with a hedge-bill, and keeping it at the height of 5 feet. The Alder will make a strong branchy fence, though not very close, and if pruned regularly as directed, it is susceptible of a neatness in appearance much beyond what is generally believed of it. Few have the courage to keep it in subjection, being a tree of extraordinary exuberance, and striving for the first few years to put forth a leader, or, in other words, to assume its tree-like shape. Afterwards, however, it seems to get reconciled to the form of the fence, which is to be accounted for by its producing, after repeated prunings, smaller spray or branches, which are more equally supported with nourishment and become luxuriant all over.

The Goat Willow.—As everyone knows, the Willow generally is a quick grower, and delights in moist land; but it by no means follows that every Willow is alike suited for fences, for very few of them are rigid enough to resist any pressure. I have, therefore, selected the species which possesses the requisite quality in the highest degree; and, as it is not always known by the name of the Goat Willow, I may mention that it is called the Black Sallow, and in the north of England the Sangh. In spring it puts forth beautiful yellow catkins or blossoms before the leaves appear; those flowers are gathered by children on Easter Sunday, under the name of "Palms;" and it may help some persons to the right species, when I inform them, that the first time bees are seen abroad in the spring is when on their way to the flowering branches of this tree. The best and cheapest way to form a fence of this tree is to procure a number of straight shoots, two or three years old, about 6 feet in length, and insert them in the soil to the depth of 15 inches, and at the distance of 18 inches from each other, crossing the rods at right angles. This will form a pretty good hedge even the first year; and by trimming it with the hedge-bill, as recommended for the others, it will be strong enough at the end of the second season to be left unprotected as a fence.—*Journal of the Royal Agricultural Society.*

BLASTING TREE STUMPS WITH DYNAMITE.

DYNAMITE consists of the explosive and, in its pure state, unmanageable liquid well known as nitro-glycerine, admixed with a very fine infusorial earth until a soft pasty mass is formed, which is inclosed in vegetable parchment so as to form cartridges about an inch in diameter by 6 inches in length. The advantages of this explosive material, in addition to its immense power, consist in the fact that it is not acted upon by water, and is practically far more safe than any other explosive agent known. Set on fire by a light it burns rapidly, like a paste made of wet gunpowder, but without giving off so many sparks or opaque smoke. A cartridge placed on

the section of a tree trunk may be smashed by blows of a sledge-hammer without exploding, nor is it capable of being exploded by any ordinary concussion; hence it may be safely carried about without any very special provision for safety. To ensure the explosion of dynamite, it must be fired with a detonating fuse, when it explodes with enormous power—ten or twelve times greater than that of gunpowder. Practically its detonation is effected by attaching a specially-prepared percussion cap on to the end of a fuse, of greater or less length as may be required, and firing the latter—the length being adjusted so as to give time for the operator to reach a place of safety. Fired thus on the ground in the open air, a single cartridge gives rise to a very loud sharp report. One experiment was performed on the stump of a huge Oak, above 6 feet in diameter; the auger holes for the separate cartridges, which should have been employed so as to enable the cartridges to rend the stump piecemeal had not been made; consequently, a heavy iron crowbar was employed to make a hole under the roots, and in this the cartridges were placed. When fired, the entire mass of tough Oak timber was rent and fissured in every direction, and the explosion of a few more cartridges rendered its entire removal a comparatively easy task. As the soil under the stumps is of less resistance than the tough Oak roots, the cartridges should not be fired in that position; but auger holes should be bored into the timber, into each of which a single cartridge should be placed, and in this way the root broken up in detail. With regard to economy of the use of dynamite, it may be roughly estimated that the cost of grubbing up and removing Oak stumps cannot be taken at less than 20s. each, which considerably exceeds in most districts the value of the wood for fuel. The dynamite cartridges are sold at 2s. per pound, and weigh each about 2 ounces. The value of the caps and fuse required is almost nominal. Hence, if one or even two dozen cartridges were required to blast a stump, the saving of expense and labour would be very great; but, in fact, with ordinary stumps and cartridges properly applied, a much less number would be required. The chief advantages claimed for the use of dynamite over gunpowder are the great economy of labour in boring—labour, not powder, being the great expense in blasting operations. With dynamite, smaller and fewer bore-holes are required, and as it requires no tamping (loose sand, clay, or even water being sufficient), there is thereby almost perfect immunity from accidents, as well as saving of time and expense. Great facility and efficacy in blasting under water and in damp situations; the absence of smoke; perfect safety in the handling, transporting, and storing of it. Although thousands of tons of dynamite have been used, there is no accident from it on record whilst in transit or storage, and none have occurred except through unwarrantable carelessness.

The Plaited-leaved Guelder Rose (*Viburnum plicatum*).

—This is a marvellous improvement on the common Guelder Rose, and deserves a place in the conservatory in April and May. The *Viburnums* are not easily forced early. There are few hardy plants that need more heat or longer time to induce them to flower out of season. In this respect they resemble the common *Syringa*, or Mock Orange. Place either of these in heat with *Lilacs* or *Laburnums*, and they will take almost three times as long to open their flowers as either; but, when they do open them, they remind one of summer rather than early spring. The blooms of *V. plicatum* are especially pure and beautiful; the leaves, too, are exquisite, and very different in form from those of the Guelder Rose. Mounted singly, the flowerets are admirable for the making of bouquets and in trusses, exquisite in vases or in baskets, while in pots the plants themselves look well either in the conservatory or drawing-room. In the open air, again, they are most useful, coming in on the heels of the Wild Cherry and the May, and when the profusion of white-flowering trees and shrubs is on the wane. Hardly any plants are more serviceable in shrubberies than *Viburnums*, and none of these are equal to *V. plicatum*.—D. T. FISH.

New Avenue Trees.—For avenue planting, those two near relatives, the Cucumber tree (*Magnolia acuminata*) and the Tulip tree (*Liriodendron tulipiferum*) combine many excellent qualities. They are rapid growers, beautiful in foliage or flower, of perfect form; hardy, excepting in the extreme north, not particular about soil or situation, and comparatively free from insects and diseases. They are readily grown from seeds, gathered and sown at once in the autumn, or, as some prefer, preserved moist until spring. When two years old, they are generally sufficiently large to plant out with a protection, or, if intended for the street, they may be cultivated in nursery rows for three or four years until they are tall enough to be beyond the reach of animals. A long line of either of these trees forms a magnificent sight when in bloom; and, for shade combined with beauty, will satisfy the most fastidious. One of the greatest

mistakes in street-planting is the selection of improper trees; for instance, a first-class tree, such as we have named, for a narrow street, and a small slow-growing species for a wide avenue. Each are equally out of place, and never look appropriate, no matter how handsome the individual specimens may be. The *New York Tribune* recommends these trees for avenues, and they seem to us equally suitable for the purpose here, both trees growing admirably with us. There are fine specimens of the Cucumber tree at Dropmore, and in many other English gardens.

Pear-leaved Guelder Rose (*Viburnum pyrifolium*). This very handsome shrub, which is hardly known outside the precincts of some botanic gardens, deserves to be extensively planted in pleasure-grounds and shrubberies, on account of the beauty of its broad corymbs of innumerable white and slightly fragrant flowers, the attractiveness of which is still further enhanced by the feathery appearance of the long projecting stamens, each tipped with a large yellow anther, which contrasts pleasingly with the pure white of the petals. The leaves are opposite, deciduous, oval in shape, very finely toothed, shining on the upper surface, smooth on both sides, and borne on short slightly winged stalks, not quite half-an-inch long. The plant is a native of North America, and is perfectly hardy, bearing our winters uninjured. It is easily multiplied from seed, which should be sown in peaty soil, and which germinates readily, especially if it is sown soon after it is gathered.—M.

Remarkable Trees near Maidstone.—Of these a few were mentioned by Mr. Kingsford, in a lecture which he delivered the other day before the East Kent Natural History Society:—A Walnut tree, he said, planted by his grandfather 100 years since, is in girth 1 foot from the ground, 10 feet 6 inches, the longest limb from the trunk being about 40 feet, the height about 50 feet. A Mulberry tree, 50 or 60 years old, 1 foot from the ground measures 5 feet 6 inches, one limb is 31 feet, and the tree about 40 feet high. Another Mulberry tree, nearly 100 years old, split down, so that one half remains, measures round 1 foot from the ground, 6 feet 9 inches, and in height is 30 feet. A variegated Holly, 100 years old, now laden with berries, is in girth 1 foot from the ground 3 feet 9 inches, and 30 feet high. Two old Benrre Pear trees, little better than pollards, now both more than 100 years old, stand in the orchard; one is 9 feet and the other 8 feet 3 inches in girth.

An Old Post.—A few years ago I stayed with a friend over night toward the upper end of Long Island. In the morning, while looking about the premises, I was attracted by the venerable appearance of a Locust gate-post near a still more venerable barn. Kicking away the earth, I took my knife to examine the condition of the post at that most trying point for testing the durability of timber—between "wind and water." "How does thee find the wood?" queried my friend. "Perfectly sound; no evidence of decay, either above or below the weather line. How long has it stood here?" "The farm was settled by Hollanders nearly or quite 200 years ago, and has always been in the family. My grandfather remembers the post when he was a boy, and it was then considered an old one. We have authentic data for more than 100 years at the least. It has outlasted three generations already, and for ought that now appears may last as many more. We consider the Locust the most durable timber grown on the island." This testimony to the extraordinary lasting qualities of the wood of the Locust (*Robinia Pseud-acacia*) is contributed by ex-president Peters to the *Tribune*.

NOTES AND QUESTIONS ON TREES AND SHRUBS.

The Double Variety of Scarlet Currant (*Ribes sanguineum*).—I wonder this is not more generally grown than it is. We have a plant of it now in great beauty, the flowers resembling drooping racemes of tiny Daisies. They also hang much longer on the branches than the single ones, and are now most effective, while the others have run to seed. I also notice that the seed on the latter is much more plentiful this year than usual, owing, I suppose, to the flowering season being warmer than usual.—D. T. F.

To Protect Young Trees from Hares and Rabbits.—Tar the stems from the ground to the height of about 20 inches. If the plants are wanted for ornament, the following plan is better, if the extra expense be no objection. Instead of applying tar to the tree itself, stick three or four stakes round each plant at the distance of 9 inches or a foot from it, then tie a bit of fresh tarred line round the stakes at the distance of 9 inches from the ground. The tar (which is applied to the trees to protect them from hares and rabbits) should be mixed with an equal portion of manure, of about the same consistence as the tar, or perhaps it will injure some of the trees.—VANESSA ANTOIRA.

Growth of American Forest Trees.—Mr. Fletcher Carr, a well-known authority on the comparative growth of forest trees, gives the subjoined schedule of measurements, made twelve years after planting: "White Maple, 1 foot in diameter and 20 feet in height; white Willow, 1½ feet in diameter and 40 feet in height; white Ash, 10 inches in diameter and 20 feet in height; yellow Willow, 1½ feet in diameter and 40 feet in height; Lombardy Poplar, 10 inches in diameter and 40 feet in height; Chestnut, 10 inches in diameter and 20 feet in height; black Walnut and Butternut, 10 inches in diameter and 20 feet in height; while the different kinds of evergreens will make an average growth of from 18 to 20 inches in height annually."

THE LIBRARY.

DOMESTIC FLORICULTURE.*

THIS volume will not only prove a welcome addition to the amateur's library, but will also contribute towards the progress of domestic floriculture generally. The book is well got up, and is illustrated with about 200 engravings on wood. Room, window, and balcony gardening is minutely gone into, followed by chapters on Propagation; Soils for Potting; Mannres and Stimulants; Pots and Potting; Watering Plants; Ventilating and Heating; Insects which infest Window Plants; Gardening in Close Cases; Wintering tender Plants in Frames and Windows; How to grow Hyacinths in Water; Instructions for the Growth of Bulbs in Windows; Hanging-baskets for the Window and Balcony; Orchids for the Sitting-room; the Window Garden in Winter; Calendar for Window-gardening Operations. The second part of the work treats of Bonquets; Wreaths and Vase Decorations; The Arrangement of Fruit; How to Dry Flowers and Ferns for Winter Decoration; How to Colour or Dye Flowers and Foliage for Winter; Fern-frond Designs; How to Skeletonise Leaves and Seed-vessels; Leaf Printing; Church Decorations; Flowers for Cemeteries; and the third part consists of a very select descriptive list of Plants and Flowers suitable for all sorts of domestic ornamentation. We give below one of the illustrations from the chapter on the "Window Garden in Winter," a balcony-garden many may have noticed in Portman Square, which represents a pretty balcony-garden of Ivy and Yuccas. The following somewhat lengthy extract on church decorations will show the way in which such matters are treated:—

The first recollection we have of church decorations dates back to the time when it was considered sufficient to fill the ancient font at Christmas with an armful of Holly and Ivy, and to stick a few sprigs of Laurel, Holly, or Box in gimblet-holes bored in the tops of the old-fashioned high-backed pews. All the decoration our church received was then done by a grumbling old sexton in a couple of hours; but now the case is widely different, for we have Easter decorations, and harvest decorations, in addition to the time-honoured display usually made at Christmas, and each of these occupy fully a week, while most of the materials are in readiness (thanks to our fair friends at the Rectory) even before that time. Beautiful flowers, evergreens, and silver Immortelles may be used for Christmas or Easter; while for the harvest thanksgivings we can also use Corn, autumnal foliage, and fruits tastefully arranged. The decoration of temples with beautiful flowers dates back for centuries, while it is at the present time practised in nearly every civilised country in the world. In Mexico and Peru it is customary to place the most beautiful Orchids and other choice flowers on the altars and shrines; and the custom is also popular in various parts of India. Wreaths of Ivy and other evergreens are very useful in Christmas decorations, and are easily made on thick twine or cord. Small sprays or little branchlets are preferable to single leaves, as they go further, and are not so stiff and formal as those made with leaves stripped from the stems. To make a wreath, take a branch or spray of foliage, and

commence at one end of your cord. Lay the branch along the cord pointing towards the end from which you start, and just loop it round with a bit of thin twine. Now add another spray and loop it in the same way. This last loop should also just catch the base of the first spray or branch, so that by tying in this way every branchlet is looped round twice, and thus firmly secured in its place. Clusters of white Immortelles or scarlet berries alternately are very effective in wreaths of dark-green foliage. The twine used for tying should be

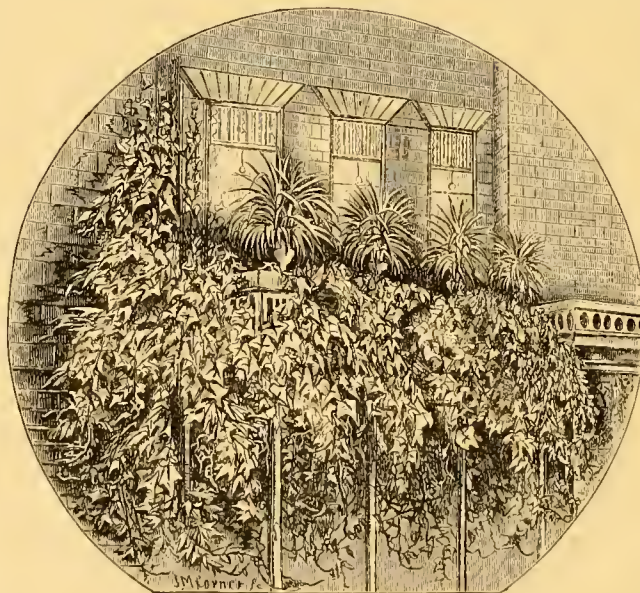


cut into lengths 6 feet long, and should be looped round the stems without cutting. Longer lengths than this will be awkward to draw through the noose. Green and variegated Ivies, Hollies, and Euonymus, make nice wreaths, as also do sprays of Portugal Laurel, Aucuba, Juniper, Thuja, Yew, Tamarisk, and Box. Light and graceful wreaths look well twined spirally round columns, or carried round the tracery of Gothic arches, or the mullions of large windows. For the altar-cloth nothing looks better than a simple cross of silvery Immortelles and Grasses. This should be large enough to stand out clear and bright; but the size will be regulated by the dimensions of the cloth itself. We have seen many devices tried for the decoration of the pulpit, but nothing is better than a bold cross or the monogram IHS (see illustration) either in white Immortelles or scarlet berries. Texts tastefully formed in foliage and berries look well on scrolls or shields; while neat wooden shapes may be used for initials, monograms, and pleasing geometrical designs, such as crosses of various shapes, circles, or stars. Any carpenter or model-maker will make them in a few hours. Some make these designs by gluing leaves and berries on pasteboard shapes. If the cloth is crimson or dark blue the Everlastings stand out clear and bright, and are then very effective. The flowers used in Easter or harvest decorations should be of graceful form, bright or distinct colours, and should be arranged so that the individual beauty of each blossom is seen in addition to the general effect.

All kinds of Lilies are very suitable, especially *Lilium speciosum* and its varieties. The foliage and flowers of the chaste Trumpet Lily (*Richardia æthiopica*) are unsurpassed for the altar, and last a considerable time after being cut from the plant. A good specimen of this plant, or two or three small ones placed together,

look remarkably well arranged on the font, especially if the latter is in a prominent position. Both flowers and foliage look remarkably well along with statuary or architectural details. If the pulpit, font, and pillars, are of white stone, they look well draped with the Virginian Creeper and Ivy, both of which should be allowed to droop unrestrained in elegant festoons of bright glowing crimson and green; while clusters of Apples, bonquets of Wheat and Oats, or bunches of Grapes, may be introduced here and there with good effect. The silvery or pale rosy plumes of the Pampas Grass and *Arundo conspicua*, mixed with branches of the Purple Beech, or the feathery foliage of the Sumach, when tinged with crimson in autumn, are very effective; and stems of *Arundo Donax* or Japanese Maize may also be used for variety. All these are bold and distinct, and look well massed in a picturesque manner along with the glowing scarlet flowers of the Scarborough Lily (*Vallota*),

the Guernsey Lily (*Neine sarniensis*), or the delicate pink flowers of the Belladonna (*Amayllis*). Group all your foliage and flowers as naturally as possible, and do not attempt anything in the way of unmeaning designs. Ladies, as a rule, do these kinds of ornamentation better than any one else, and seldom fail to make pleasing arrangements. It is as well to be careful in the use of yellow flowers, as many of these have a glaring or gaudy appearance, not in keeping with the quiet rich softness of colouring and peaceful



Balcony Garden in Portman Square.

* "Domestic Floriculture, Window Gardening, and Floral Decorations." By F. W. Burbidge. London and Edinburgh: W. Blackwood & Sons.

harmony of arrangement which should at all times prevail within a sacred edifice.

This is, we believe, the first book in which an attempt has been made to embody a really useful amount of information on this subject—one that is every day growing in importance. It is abundantly illustrated by the author's own pencil, and from other sources, and is a noteworthy addition to our garden literature.

THE EXHIBITION OF AMERICAN PLANTS IN RUSSELL SQUARE.

THE Rhododendrons which have so long adorned our London botanical and horticultural gardens have now come to Bloomsbury, and Russell Square this year has the good fortune to display the great annual Rhododendron exhibition of Messrs. John Waterer & Sons, of Bagshot. Far back, in old days, the Rhododendron ponticum, a native of Asia Minor and the Levant, was a well-known and familiar plant; and its generic Greek name, handed down from remote ages, has since been applied to relatives much more handsome, from America, India, and elsewhere. Amongst other traditions connected with the Rhododendron, is the supposition that the illness of the soldiers of Xenophon's army arose from their having eaten honey which had been collected from the Rhododendrons of the locality; although some writers apprehend that the cause of the mischief was the *Azalea pontica*, or the *Oleander*, the latter of which would seem to have shared with the Rhododendron the appellation of the Rose Bay. It seems singular that, notwithstanding its European origin, this Rhododendron ponticum should not have been introduced into this country till 1763, and that it should have been preceded by an American species, *R. maximum*, in 1730. The two Swiss species, *ferrugineum* and *hirsutum*, were introduced in 1752 and 1656 respectively; and other kinds, of more or less importance, appear to have reached England between these dates, and the introduction from North America of *R. catawbiense* in 1809, which was destined to be the precursor of our present garden treasures. Nothing further would seem to be specially worthy of comment, till we come to the period of the arrival of the great Indian tree Rhododendron (*R. arboreum*) in this country. This was indeed a great and valuable acquisition, but unfortunately too tender and delicate in its constitution to stand the severity of our climate unprotected. According to Loudon, this species was introduced in 1817. The original one, with flowers of a vivid scarlet, was subsequently followed by other varieties with rose-coloured and pure white flowers, and hybrids soon began to find their way into our collections. By and bye, through the patience and energy of hybridisers, the glowing colours of the Indian species began by degrees to appear amongst the seedlings which had been raised by careful selection and hybridisation of the best forms of Rhododendron *catawbiense* with *R. arboreum*, and the result may now be seen in the wonderful and dazzling effects of colour, form, and foliage which decorate our gardens and shrubberies. Many attempts have also been made to produce hybrids between Rhododendrons and hardy *Azaleas*, which did not, however, meet with any considerable success. The next era in the history of the genus was the introduction of numerous new and distinct varieties from the Sikkim-Himalayas, by Dr. Hooker, about 1850, and of the Bhotan species, by Nuttall. These, with the yellow, or rather orange, flowered *R. javanicum*, and other species from the East, though forming charming conservatory plants, are, with one or two exceptions, not suited for outdoor culture. To the improvement of our hardy Rhododendrons none have paid greater attention than the Messrs. Waterer, from whose fields of them at Bagshot and Knapp Hill, pleasure-grounds everywhere have been enriched with kinds brilliant in colour and hardy in constitution. Those who have seen the increasingly magnificent displays at the Royal Botanic Gardens, Regent's Park, and Bagshot, for these last twenty-three years, need scarcely be reminded of this. In Messrs. Waterer's present exhibition, all the varieties shown are perfectly hardy, and have all, large as their number is, been recently lifted from the open ground. Many of them have heads from 25 to 30 feet in circumference, and balls of earth weighing from 12 to 16 cwt. Some idea may therefore be

formed of the labour and expense involved in bringing them from Bagshot to London, and planting them in their present well arranged beds. Few plants have attained the popularity which, from its first introduction, the Rhododendron has commanded. Nor is this surprising when we consider that it possesses qualities which render it essentially "everybody's" plant. In the first place, its perfect hardiness is a quality which can scarcely be too highly valued. As a proof of this, it may be remarked that many of the plants in the present exhibition have been subjected to the temperature of some of our severest winters without sustaining injury. Of its decorative uses it is unnecessary to speak; suffice it to say that for the flower garden or pleasure-ground, its presence either in clumps, shrubby belts, or as single specimens, is indispensable; as a striking object on Grass, nothing can be more suitable than a fine well-grown Rhododendron, which, even without flowers, forms a pleasant object, and would, even were its inflorescence insignificant, still retain its value as a hardy, fine-foliaged evergreen. For planting as undergrowth and cover, it is of the utmost value, withstanding, as it does, the severest weather, always presenting a cheerful and pleasing appearance, and not being liable to sustain injury from hares or rabbits. It is, likewise, well adapted for forcing for the decoration of the conservatory. Many of the early-flowering sorts, in fact, if potted and placed in the greenhouse, will furnish an ample and early supply of bloom, without any forcing whatever. As town plants, many varieties will be found to be invaluable, as they not only seem to withstand smoke better than most evergreens, but flowers are also freely produced if care be taken that they are planted in fresh well-prepared earth. It is a mistake to suppose that a peaty soil is necessary for the growth of Rhododendrons and other American plants; on the contrary, they will succeed in almost any district, with a little careful preparation. It may not, perhaps, be out of place to remark that many other plants, usually associated with Rhododendrons, possess invaluable decorative properties, such as hardy *Azaleas*, *Andromedas*, *Kalmias*, *Ledums*, and similar ornamental shrubs; but nothing, perhaps, is more interesting than a collection of hardy Heaths. There is scarcely a month in the year during which they are not, more or less, in flower, and, therefore, they should form a prominent part in gardens of even limited extent. Russell Square, in which so much floral beauty may now be found, has been courteously lent by the Duke of Bedford and the Commissioners of the square for the occasion. It is 7 acres in extent and is one of the most agreeable and best kept open spaces in London. The tent, a double span-roofed one, is 220 feet in length, and consists of 22,000 feet of canvas. Some idea of the extent of the exhibition, and of the interest which it possesses for admirers of American plants, may therefore be obtained. During these last ten years or so, Messrs. Waterer have, by means of carefully selected parents, and patient crossings and inter-crossings, raised many beautiful kinds, among which, however, none are more striking than Kate Waterer, a charming new variety with bright rosy-pink flowers, blotched and spotted in the upper petals with greenish-yellow. The leaves, too, of this kind are large and fine, and, altogether, it is a valuable addition to the rosy-blossomed section. Strikingly pretty among older varieties are clumps of Lady Eleanor Cathcart; but in this department, amid so much floral splendour, it is needless to particularise. The novelty of the show in Russell Square has led us to speak mainly of that; it should be added, that Mr. Anthony Waterer has his usual magnificent display at the Horticultural Gardens, Kensington; and in Regent's Park is another Rhododendron show, furnished from the nurseries at Great Berkhamstead, by the Messrs. Lane. These displays are rich in interest, both as regards novelties and older kinds.

A FINE specimen of botanical phraseology is found in the Charter-house examinations for 1873, under the head of Botany, where the scholar is told to explain the following terms:—"Malva has a gamosepalous calyx, a polypetalous hypogynous corolla, polyandrous monadelphous epipetalous stamen, and a superior syncarpous pistil." Surely our scientific men can invent some less alarming mode of teaching what is usually considered the agreeable science of botany, than by questions of this character.

WORK FOR THE WEEK.

Flower Garden and Pleasure Ground.

THE planting of flower beds and borders should now be nearly completed, and, as soon as the confusion and litter of empty pots, &c., can be fairly got rid of, the Grass and gravel walks should be well swept and rolled, and the garden, in all respects, put in good order. The plants in the various beds should also have all necessary attention in the way of pegging down, staking, training, &c., and should all be well supplied with water, while the weather remains dry, and until they have become somewhat established. It is always advisable to put stakes to Dahlias as soon as they are planted; and Hollyhocks, Delphiniums, Phloxes, and other tall-growing herbaceous plants, should now have their stems somewhat thinned out if found necessary, and those selected to remain should be neatly tied to stakes. Bulbs of Tulips, Anemones, Ranunculuses, &c., should now be taken up and carefully stowed away; and a commencement should at once be made in the propagation or increase of spring-flowering bedding plants by inserting under hand-glasses cuttings of Pansies, Pinks, Wallflowers, and other plants, while the best varieties of Primroses, Polyanthus, Aubrietias, Forget-me-nots, &c., may be at once increased by division and planted in shady situations in the reserve garden. The season in many localities is decidedly unfavourable as regards the Rose garden, on account of the drought as well as the cold weather, which prevailed so long, and caterpillars and aphides now greatly abound, both of which should have immediate attention, as already directed. Ornamental trees and shrubs have, in many cases, suffered severely from the late frost. Wallnuts, even now, have the appearance of being quite dead, their young shoots, some 6 or more inches in length, being killed back to the old wood; and this, it may be feared, will greatly check the progress of young trees. In the meantime, it might be an advantage to have the dead shoots at once removed. Remove rival leaders from young trees of the Cedar of Lebanon, Deodar, and other Coniferous trees, where they exist, retaining the strongest, and such as are most favourably placed. Where an undue tendency exhibits itself towards lateral extension, this should also now be checked by stopping, or even cutting back, strong growing lateral branches. In the hardy Fernery, many specimens will soon be in their greatest beauty, and should, therefore, have their share of attention. The fresh green fronds of various species are frequently disfigured by slugs and snails, both of which should be carefully searched for and destroyed. Vigorous specimens of *Osmunda regalis* should have an abundant supply of water.—P. GRIEVE, *Culford Gardens*.

Hardy Flowers.

Vigorous perennials, such as *Lavatera thuringiaca*, *Althæas*, *Heracleums*, some Larkspurs, *Polygonums*, various members of the Composite family, &c., have, during the past week, made rapid growth, and will therefore require further attention in the way of staking, as will also plants of medium height, such as the hybrid Phloxes, *Pyrethrums*, *Pentstemons*, &c. Seeds of any choice plants just arrived should be sown at once, either in the open air or in pots, selecting for the latter such as are delicate or diminutive. Plant out annuals raised in pots as soon as they are strong enough to handle, and make fresh sowings in the open ground of such kinds as *Collinsias*, *Nemophilas*, *Eschscholtzias*, *Silene pendula*, *Candytufts*, *Malopes*, &c., for successional blooming; attend, also, to the thinning of those previously sown. Pot off seedlings of perennials raised in pots as soon as they are fit, using for the purpose a sandy compost, and put three seedlings into what are known as thumb-pots, placing them round the edges. In the case of strong-growing kinds, however, one seedling in a pot will be quite sufficient. Seedlings of the commoner perennials should, however, be pricked out into the open border, selecting a shady spot or one over which a shading may be easily placed, until they have become established. Continue to propagate, by means of cuttings, such plants as it is not practicable to divide. Keep a sharp look-out for the seeds of early-blooming plants, and gather them as soon as ready. Where a stock of plants is kept in store-pots, these should be plunged in sand or ashes in the open air. The splendid weather which we are now experiencing has induced a large number of plants to come into flower, while some of those that have been in blossom for several weeks past have made considerable improvement; the display usually made by the Iris tribe has, however, been greatly impaired by the coldness and dryness of the past month. The undermentioned plants, among others, are particularly striking at the present time, viz., the pretty dwarf *Hutchinsia alpina*, a mass of white bloom; *Æthionema orientale*, a showy Cruciferous plant about 18 inches high, which bears an abundance of light rose-coloured flowers; the single and double white Sweet Rockets or Dames Violets are also very showy plants at the present time; the last, an old variety, is but too seldom seen, its pure white flowers, which are produced in abundance, forming a fine contrast with the purplish-

red blossoms of the common form; *Achillea umbellata*, usually grown for the sake of its silvery foliage, is producing white blooms in such quantity as to make it a desirable plant for floral display. Several forms of *Aster alpinus* are blooming freely, and the beautiful blue flowers of *Linum narbonneense*, borne in great profusion, are now particularly conspicuous. The blooms of several hardy bulbs now add considerably to our outdoor display, particularly those of the Martagon Lilies, *Alliums* (of different sorts), *Muscari comosum plumosum*, and *Scilla peruviana*. Plants of *Veronica pinguifolia*, a dwarf shrubby species, are now clothed with pretty white flowers. *Tropæolum polyphyllum*, a valuable plant for trellises, rock-work, banks, or fronts of houses, has also just commenced to produce its showy pale orange blossoms.—T. SPANSWICK.

Cool Orchids.

Potting may still be continued, for it should be borne in mind that success is more likely to be the result of potting plants individually, just as they require it, than when subjecting the whole collection to the operation at any one time. The pots should be at least half full of crocks, and the best compost to employ is one composed of turfy-peat, fresh living Sphagnum, and sufficient coarse grit to keep the whole porous. A little fibrous loam may be added with advantage in the case of strong growing kinds. Give air freely in hot weather, and shade during bright sunshine. Syringe freely morning and evening, and keep the floors, shelves, and benches constantly moist. Plants on blocks, as *Sophranitis*, *Oncidium cucullatum*, *Lælias*, *Barkerias*, and others should be plunged overhead in a tub or pail of tepid water daily, so as to moisten the whole mass thoroughly.—F. W. BURBIDGE.

Hardy Fruit Garden.

What relation there can be between east winds and aphides it would be difficult to say; but if not cause and effect, as many affirm, assuredly the two are coincident, or seem to be so. Aphides are plentiful this season, and not a moment must be lost in clearing the trees of them. There are two general methods of doing this—the one poisons, the other removes them bodily, either by hand-picking or washing. It is astonishing what can be done by picking if begun in time. The garden engine, if skillfully used, is at once prevention and cure; it prevents the aphides from getting a footing, and washes them off clean if they do. The use of poisons, whether tobacco-water, quassia, Foxglove, or Laurel-tea, or Gishurst, or other compounds, is to kill the insects as they feed, and render the leaves so nauseous and poisonous that they will not eat them. The great point is to be prompt with both remedial and preventive measures. It is of no use to let the aphides destroy the leaves before we remove them. By killing the first insects we save our trees. They, however, appear in successional swarms; so it will not do to rest in security after one or two raids; our eyes must be on the trees throughout the growing season, and we must be ready at a moment's notice to renew the struggle with our insect enemies. If white bug appears on Apples, touch the infested parts with turpentine, keeping it, of course, off the leaves, fruit, and young wood. Caterpillars, also, often infest Apples, and will be found in bunches which often include some of the young fruit, that will speedily be devoured by the young grubs, if not removed. The Gooseberry caterpillar is also abroad. Select a dewy morning, or an opportunity after a shower, should one fall, to dust the leaves over with a half-and-half powder of air-slaked lime and Hellebore, peppering the caterpillars as heavily as possible. Within a week, or less, engine the bunches clean with a stream of water. It will be safer, however, not to gather any green Gooseberries for tarts or bottles from the poison-dusted trees; Foxglove tea is equally effective, and about equally poisonous. Hand-picking, if adopted in time, is better than either, or a 6-inch thick dressing of spent tan in winter is a sure preventive. It either smothers the larvæ by keeping them in, or kills them with the tan left; either way, it is a perfect cure, or rather a complete antidote against Gooseberry caterpillar. The Gooseberry crop is a very general failure this year, which will, doubtless, prove a serious sanitary and monetary loss to the country. The temptation will, therefore, be strong, in many cases, to let the caterpillars have their way; this, however, would be to invite the loss or deterioration of next year's crop as well as this; and it is, therefore, to be hoped that special care will be taken to keep the bush-fruit clean; and thus prepare it for yielding a good return in the, it is to be hoped, more genial weather of next spring.—D. T. FISHER, *Hardwick*.

Kitchen Garden.

At this season, in many places, the kitchen garden is subordinate to the ornamental department, but neglect now, either in keeping down weeds or in performing the necessary operations of sowing and planting successional crops, will certainly entail disappointment in time to come; therefore, make every possible effort to keep pace with

the season. Celery trenches should be prepared at once for the main crop. In dry porous soils—what is termed the bed system is an excellent plan, especially for autumn use; open a trench 4 or 5 feet wide, any length desired, casting the earth to each side in about equal proportions, place 6 inches of rotten manure over the bottom, fork it in, and cast on a little fine soil; the planting is best done in dull showery weather, or, failing that, in the evening or early morning. For the convenience of earthing up, plant the rows across the trench, 1 foot apart, and the plants 9 inches apart in the rows. As I have already stated, this is an excellent system for dry porous soils, as it economises both land and labour; but in heavy retentive land it is better to plant in single rows 4 feet apart, or double rows at 6 feet intervals. This mode of planting offers facilities for banking up the earth to throw off heavy rains; there is, also, a freer circulation of air amongst the foliage than would otherwise be the case, and, consequently, less tendency to decay, which, where quality is a first consideration, will compensate for the larger space occupied. On heavy soils, Celery trenches should not be made too deep, especially for winter use. Early Celery now in trenches must have unremitting attention as regards watering, as any check from drought would cause it to bolt, and be useless. Liquid-manure should also be given as often as it can be obtained. The time may come, perhaps, when the sewage, that is now worse than wasted, may not only be rendered innocuous to health, but be made available for vegetable culture. Until that time arrives, a very serviceable liquid-manure may be made suitable for any crop by dissolving from 1 lb. to 1½ lbs. of guano in a barrel of water, which may be given with good effect once or twice a week, in dry weather, to such crops as Celery, Cauliflowers, Lettuce, Radishes, &c.—not a mere dribble, but a thorough soaking. To ensure whiteness and delicacy of flavour, all Lettuces should be tied up a week or so before they are required for use; even the Cabbage varieties are improved by it. Sow for succession, thinly on a cool north border, once a fortnight, in drills 1 foot apart, to be thinned—the larger Cos and Cabbage Lettuce to 1 foot, and the smaller varieties (like Tom Thumb) to 8 inches apart in the rows. Mulch between the rows with short manure; then, when it becomes necessary to water, the moisture will be retained. The same treatment is also beneficial to Radishes, as regards ensuring quick growth, and, consequently, mild crisp roots. Sow small saladings once a week; and, after watering, cover the bed with Rhubarb-leaves, laid down flat on the soil, to keep the soil cool and moist without an incessant use of the watering-pot. As there are usually plenty of Rhubarb-leaves at this season, any small seeds it may be necessary to sow in dry weather may be advantageously covered with such leaves till they come up.—E. HOBBS.

SOCIETIES AND EXHIBITIONS.

ROYAL HORTICULTURAL SOCIETY.

JUNE 4TH.

THIS exhibition may be classed amongst the best of the year, nearly all the classes being well contested, and Mr. Anthony Waterer's exhibition of Rhododendrons certainly added greatly to the attractions of the occasion. Stove and greenhouse plants, Ferns, and Orchids were well represented, and new plants were never, to our knowledge, shown in better condition. The show of fruit was hardly so large as we had anticipated, but what was shown was good, more especially that in the classes for Strawberries, Peaches, and Grapes, while Pines were of average merit.

Stove and Greenhouse Plants.—Of these, Mr. Ward staged a fine group, consisting of a fine *Erica tricolor impressa*, fully 4 feet across; a fresh *Genetyllis tulipifera*, with a profusion of richly-coloured flowers; and a finely grown and well bloomed plant of *Ixora amboynensis*, with foliage in beautiful condition and immense trusses of bright orange flowers; the specimens of *Aphelaxis macrantha purpurea* and *Erica Cavendishii*, were as perfect as could be desired, and a well-bloomed plant of *Bougainvillea glabra*, shone conspicuously, on account of its novel colour. In the nurserymen's class, Messrs. Jackson had a finely finished group, the most notable specimen in it being a *Stephanotis floribunda*, about 4 feet by 4, and a superb specimen of good cultivation; the same collection also included fine plants of *Anthurium Scherzerianum* with brilliant scarlet spathes; and remarkable examples of *Dracophyllum gracile* and *Ixora coccinea*. Mr. B. S. Williams was second, with a remarkably fine group, in which were two magnificent Azaleas, and a large *Anthurium Scherzerianum*, with about fifty spathes. In class 1, Mr. Ward had a fine *Erica depressa*, *Aphelaxis macrantha rosea*, a very large-flowered variety, well worth growing for show purposes on account of its novel colour. This group included three fine Heaths, viz., a splendid plant of *Erica Cavendishii* nearly 5 feet through, and one of the finest plants of the soft rosy-flowered *E. tricolor Kingstonsii* that we have seen, while *E. Candolleana* was a perfect example of how an *Erica* should be grown and flowered for show purposes. Mr. Wheeler, of Stamford Hill, was second with a very fine group, in which were fine specimens of the sombre-tinted *Erica depressa*, *E. Cavendishii*, and a good *Clorodendron Balfourii*. The eight stove and greenhouse

plants shown by Mr. Baines, for the "Davis Prize," were models of good cultivation. Where all are good it is difficult to particularise, but the plants of *Dipladenia amabilis*, *Ixora coccinea*, *Bougainvillea glabra*, and *Ixora aurantiaca*, deserve especial note. Mr. Kemp, gardener to the Duke of Northumberland, was second with a nice group; and Messrs. Cutbush & Sons third. There appeared to have been some little misunderstanding, the latter exhibitor having staged two plants of the same species; but, after reading the rules, we are not aware that such a course is prohibited. For six *Dracaenas* Mr. Bull was first with well-grown plants of *D. Fraserii*, *D. Baptistii*, *D. Goldiana*, *D. Chelsoii*, *D. amabilis*, and *D. Mooreana*. Mr. J. W. Wimsett was second with a group of fresh well-coloured plants.

Ferns.—These were well represented, and the first award for eight went to Mr. T. Shuttleworth, of Preston, who had a noble plant of *Todea superba*, about 2 feet across, and remarkably fresh; *Gleichenia rupestris*, the bright green *G. flabellata*, and two fine pots of *Leucostegia immersa*, and *Davallia Mooreana*, one of the noblest of all Ferns when well grown. In the nurserymen's class, Mr. B. S. Williams was deservedly awarded the first prize for *Gleichenia rupestris*, *Adiantum Farleyense*, *Dicksonia fibrosa*, a species similar to *D. antarctica* in general habit, but quite distinct; and a fine *Cyathea dealbata*, a kind well known on account of the silvery hue presented by the under sides of its ample fronds. In the class of twelve hardy Ferns, Messrs. Ivery & Sons were first, with well-grown plants; Mr. Stone, gardener to C. Walton, Esq., being second, with nice plants of *Adiantum pedatum*, *Oncoclea sensibilis*, *Osmunda regalis*, and others. Mr. R. Parker, of Tooting, was third, with fresh healthy plants, in good condition.

New Plants.—Mr. Bull, who was first, had fine specimens, among which were a splendid plant of *Phyllotaenium Lindenii*, with immense heart-shaped leaves and conspicuous ivory veins. This is one of the finest of ornate Arads, and one which deserves a foremost position in every stove; also, a well-coloured plant of *Croton majesticum*, with long pendant crimson and yellow-tinted foliage. *Anthurium crystallinum*, with fine velvety green foliage and broad silvery veins. This is a worthy companion to the Arad first mentioned, and far superior to its allies on account of its dwarf dense habit. Mr. Bull also had *Pritchardia grandis* *Campsidium filicifolium*, an elegant climbing plant, with fresh crisp pinnate leaves; and *Dracaena amabilis*, in the way of, but superior to, the now well known *D. Guilfoylei*. The group also included *Kentia Moorei*, a dark green pinnate Palm, which promises to be extremely valuable when better known; a plant of *Dipladenia Brearleyana*, bearing several of its brilliant crimson salver-shaped flowers, *Aralia Veitchii* and *Croton Wisemannii*, the whole forming one of the best-grown groups of novelties ever staged. In the class for six new plants, Mr. Bull obtained the only gold medal awarded, with a fine *Pritchardia grandis*, one of the finest of all fan-leaved Palms; *Croton spirale*, a dark bronzy-green species, the foliage of which is curiously contorted or twisted like a fanciful corkscrew; *Croton majesticum*; *Maranta Leopoldina*, the latter a bright green-leaved species, having regular oblong blotches of a dark glossy green colour on each side the mid-rib; *Dracaena Goldiana*, a kind with large ovate foliage marbled with silvery-grey in a manner not unlike some varieties of *Phalaenopsis Schilleriana*. The most attractive plant in the group, however, from a gardener's point of view, was, undoubtedly, a fine well-flowered plant of the new *Dipladenia Brearleyana*, which has flowers fully 5 inches across, of the most vivid crimson-scarlet when fully developed, the youngest flowers being of a pale rosy tint. In the competition for Mr. Bull's prizes, awarded for new plants sent out since 1871, Mr. J. Wimsett was first in the nurserymen's class with excellent specimens of *Maranta Mackoyana*, *Dracaena Fraserii*, a deep leaved species; *Curculigo recurvata variegata*, recently figured in our columns, and others. In the amateurs' class for new plants sent out by Mr. Bull since 1871, Mr. T. Shuttleworth, of Preston, was first with a unique specimen of *Cyathea Burkei*, a kind figured in THE GARDEN at p. 271, Vol. IV.; *Demonocrops palembanicus*, one of the most elegant of pinnate-leaved Palms; a splendid specimen of *Vriesia reticulata*, and good plants of *Dracaena Fraserii* and *D. Shepherdii*. Mr. J. Croucher, gardener to J. T. Peacock, Esq., Sudbury House, Hammersmith, had a well-grown group, to which the second prize was awarded; Mr. J. Coombe, gardener to Col. Wilkinson, Highgate, was third with a nice group of smaller plants. Messrs. James Veitch & Sons certainly deserved the thanks of the society and horticulturists generally, for the magnificent group of new and rare stove and greenhouse Palms, Ferns, Orchids, and other decorative plants, which they contributed. This group was remarkable alike for the beauty of the individual specimens, and for the artistic and natural manner in which they were arranged. Among new Orchids included in it we remarked *Cattleya gigas*, a noble species, now shown for the second time; *Dendrobium Bensoniae*, remarkably well bloomed; *Cypripedium argus*; a splendid panful of *Masdevallia Harryana*, the brilliant crimson flowers being contrasted with the pearly *Odontoglossum Alexandrae*, *O. Pescatorei*, and the elegantly fringed sweet-scented *Dendrobium Devonianum*. Other novelties consisted of *Ficus Parcellii*, *Lomaria zamioideis*, *Begonia Chelsoii*, and *B. vesuvius*, *Paulinea thalictrifolia*, *Geonoma gracilis*, *G. Martii*; fine cut specimens of *Fremontia californica*, with deep green lobed foliage and bright golden flowers, each as large as half-a-crown; a figure of this fine tree will be found in THE GARDEN, Vol. III. p. 55; a plant of *Darlingtonia californica* had fine highly-coloured pitchers, and the same may be said with regard to *Cephalotus follicularis*.

Orchids.—These were very fine, and in good condition. Mr. B. S. Williams, who was first in the nurserymen's class for twelve species, had a fine plant of *Orchis foliosa*, bearing about twenty fine flower-spikes; *Cattleya Mossiae*, well-flowered, and suggestive of the fine plants staged by Mr. Bullen some years ago; *Cypripedium barbatum superbum*, with

about forty fine flowers; *Cattleya Warnerii*, *Lælia purpurata*, and others. Mr. W. Bull was second, with smaller, but well-flowered plants, conspicuous among which were *Odontoglossum Rozellii*, with two spikes, a charming species, and one deserving of general culture; *Cypripedium Parishii*, *Cattleya Mendelii*, the pretty little *Palumbina candida*, and others. Mr. E. Morse had a dozen well-grown and nicely-bloomed plants. In the amateur's class, Mr. Ward was first, with a group in which were fine specimens of *Cattleya Mossiæ*; *Odontoglossum Phalaenopsis*, with about twenty flowers; *Phalaenopsis grandiflora*, with seven or eight fine spikes; a good *Cypripedium Stonei*, with four good spikes; a fine *Odontoglossum Alexandræ*, and others equally well-grown. Mr. F. Rutland, gardener to the Duke of Richmond, was second, with a nice group in which were a fine *Cattleya Mossiæ magnifica*, a remarkably flat-petalled deeply-tinted variety, *P. Mossiæ superba*, a variety with pale crisped petals and a richly-veined lip; *Cypripedium caudatum*, bearing five large and richly-tinted flowers, the tail-like petals being of extraordinary length; and a plant of the old *Dendrobium nobile*, fresh as could be desired and well bloomed. Mr. J. Douglas, Loxford Hall, was third with a small but really select and well-flowered collection, in which were *Cypripedium villosum*, *C. Veitchii*, *Masdevallia Harryana*, with ten large and richly-tinted flowers; a nice plant of the chaste *Dendrobium Bensoniæ*, well-bloomed; and a well-grown plant of the old *D. formosum*.

Foliage Plants.—In the class of nine, Mr. J. Hudson, Champion Hill, Camberwell, was first with a fine group, in which were *Zamia villosa*, a graceful and permanent plant, well worth culture; a splendid *Croton pictum*, remarkably well-coloured; *Areca sapida*; and one of the finest plants of *Stevensonia grandifolia* we have ever seen exhibited. Mr. T. Shuttleworth had eight fine foliage plants, including a fine large form of *Sarracenia flava*, *Gleichenia dicarpa*, *Coccos Weddelliana*, *Nepenthes Rafflesiana*, *Dicksonia squarrosa*, and others. Mr. Donald was second, with a well-grown group. Mr. W. Cole, of Ealing Park, was third, with nice plants, among which were *Chamaerops humilis gracilis*, *Croton pictum*, *Lomaria gibba*, *Pandanus elegantissimus*, one of the best of green-leaved Screw Pines, and *Yucca aloefolia variegata*.

Roses.—Messrs. G. Paul & Sons, of the Old Nurseries, Cheshunt, had a nice group of eight plants, well flowered. Conspicuous amongst them were *Souvenir d'Elise* (a fine cream-coloured Tea) and *Madame Margottin*, a good and well formed sulphur-tinted variety of the same class. Associated with these were also *Miss Ingram*, one of the best of the light-coloured kinds, and *Dupuy Jamin* and *Marie Rady*, both rich-coloured varieties worth attention. Mr. Chas. Turner, of Slough, also had a nice collection.

Pelargoniums.—Fancy kinds were well represented. Mr. James, of Isleworth, had six perfect specimens, including *Princess Teck*, white and rose; *Lucy*, rich deep rose; and *Ellen Beck*, a beautiful soft rose. Second, Mr. Ward, who also had fine plants. Third, Mr. D. Donald, Leyton. In the class for large-flowered kinds, Mr. Ward was first with fine plants. Second, Mr. James with smaller well-bloomed plants. Third, Mr. J. Wier, the Elms, Hampstead. In the nurserymen's class for fancy *Pelargoniums*, Mr. Charles Turner, of Slough, was first with a fine group.

Succulents.—First, Mr. J. Croncher, gardener to J. Peacock, Esq., who had a fine group, including *Echinocactus visnago*; *E. Cummingii*, with very showy golden-yellow flowers; *Echeveria pulverulenta*, one of the most remarkable species in the genus; *Agave laticincta*, and the still more rare and valuable *A. eusiformis*, belonging to the *A. striata* group. Mr. C. Pfersdorff, also had a nice healthy group.

Miscellaneous Subjects.—Messrs. Downie, Laird, & Laing had a fine group of Ferns, Palms, Succulents, and bedding plants. Mr. Robert Parker, of Tooting, staged a fine collection of hardy herbaceous plants, British Ferns, and cut blooms of Iris and other hardy flowers. Mr. Parker also obtained first prizes for collection of *Pyrethrums*, Hardy Perennials, and *Pæonies* in pots, as well as for a fine collection of cut flowers, neatly arranged in pots of wet sand. Messrs. Hooper & Co., of Covent Garden, staged a splendid collection of *Ixias*, *Sparaxis*, *Anemones*, *Lilies*, *Iris*, *Ranunculus*, and other hardy flowers. Mr. Voise exhibited two or three forms of his improved garden frames. Mr. Charles Noble furnished *Spiræa palmata*; Mr. Bull a group of *Crotons*, Ferns, and *Cycads*; Messrs. Ivory & Son a collection of British Ferns in fine condition; Messrs. Standish *Tuberose*s, *Pinks*, and *Bouvardia Humboldtii corymbiflora*, and other plants for cut flowers. Mr. Cutbush *Ivies* in small pots, neatly set up in boxes; Mr. B. S. Williams, Holloway, had a group of decorative plants and *Orchids*; Mr. Bull received a first prize for twenty fine foliated plants; second, Messrs. Rolison, for *Platycerium grande* and *Adiantum Farleyense*. Messrs. Carter had a fine bank of *Crotons*, Ferns, Palms, *Cycads*, and other decorative plants. Mrs. Murdoch, of Milford, Godalming, exhibited three cases of skeletonised foliage and seed vessels, which were very much admired. Messrs. Backhouse furnished a plant of *Sobralia macrantha nana*, which is similar in habit to the form called "Wooleyii," the flowers are, however, slightly larger, and the leaves appear to be more lance-shaped than those of that kind. Mr. R. Dean had a fine collection of double *Stocks*, the colours varying from white to the deepest crimson; also a plant of the Irish Butterwort, *Pinguicula grandiflora*, a delicate little Alpine gem, with apple-green leaves, and bright purple flowers nearly as large as those of the old *Streptocarpus Rexii*. Messrs. Jackson, of Kingston, had a fine basket of *Saxifraga nepalensis*, with oblong leaves, margined with a row of pearl-like dots, and bearing large panicles of snowy-white flowers, fully 2 feet high.

Fruit.—In the class for two Queen Pines, Mr. T. W. Bond, gardener to G. A. Smith, Esq., Weybridge, Surrey, was first with nicely swelled fruit, weighing 4 lbs. 10 ozs. each. Second, Mr. J. Gray, Grange Park, Alresford, Hants.—Two smooth *Cayennes*—First, Mr. Jones, Royal

Gardens, Frogmore. Second, Mr. J. Miles, both having fine fruit.—One Pine of any variety—First, Mr. J. Tomkio, Peamore Gardens, near Exeter. Second, Mr. T. W. Bond, Weybridge, Surrey. Third, Mr. F. Rutland, who had a nice Prickly *Cayenne*.—Six Peaches—First, Mr. W. Coleman, gardener to Earl Somers, Eastnor Castle, Ledbury, with fine Noblesse. Second, Mr. J. Brown, gardener to Earl Howe, Gopsall, who had Royal George. Third, Mr. G. Sage, Ashridge Gardens, Berkhamstead. —Six Nectarines—First, Mr. J. Maher, Stoke Court, Slough, with Hunt's Tawney. Second, Mr. W. Gardiner, Stratford-on-Avon, with Violette Hâtive. Third, Mr. J. Stephenson, gardener to T. Barker, Esq., with Imperatrice.—Figs, one dish of twelve fruits—First, Mr. G. T. Miles, gardener to Lord Carrington, with fine well-ripened Brown Turkey. Second, Mr. W. Coleman. Third, Mr. J. Gray, Grange Park, Alresford.—Fifty black Cherries of any variety—First, Mr. G. T. Miles, with Black Circassian. Second, Mr. T. Jones, Frogmore, with Black Tartarian.—Fifty white Cherries—First, Mr. Jones, with Early Biggarreau. Second, Mr. G. T. Miles, with Elton.—Strawberries, twenty-five fruit—First, Mr. D. Pizzey, Fulmer, near Slough, with fine fruit of Sir Charles Napier. Second, Mr. J. Douglas, Loxford Hall, with Sir Charles Napier. Third, Mr. George Sage, Ashridge Gardens, with President.—Twenty-five Strawberries of the British Queen or Dr. Hogg type—First, Mr. J. Douglas, with British Queen; the finest fruit shown. Second, Mr. G. Sage, with British Queen. Third, Mr. D. Pizzey, with Marguerite.—Grapes, three bunches, Black Hamburgs—First, Mr. J. Douglas, with magnificent and well-finished examples of good culture. Second, Mr. J. Johnson, gardener to the Marquis of Aylesbury, Savernake, Marlborough. Third, Mr. W. Bones, gardener to D. McIntosh, Esq., Havering Park, Romford. Equal third, Mr. W. Coleman.—Three bunches of white Grapes—First, Mr. J. Douglas, with fine Canon Hall Muscat. Second, Mr. G. Parkhouse, gardener to T. Holman, Esq., Hawkhurst, with Bowood Muscat.—Three bunches of Frontignan Grapes—First, Mr. J. Douglas, Loxford, with fine well-ripened fruit. Mr. E. Clarke, gardener to Mrs. Hall, also had fair examples, to which a third prize was awarded.—Three bunches of Buckland's Sweetwater Grapes—First, Mr. W. Cole, Ealing Park, with three fine well-ripened bunches. Second, Mr. J. Douglas, with slightly smaller bunches; but well-coloured and perfectly ripened. Third, Mr. A. Johnson, with large clusters, not fully ripe.—Three bunches of Muscat of Alexandria Grapes (open)—First, Mr. Maher, who had fine clusters. Second, Mr. J. Douglas, with good bunches.—One green-fleshed Melon (open)—first, Mr. T. Jones, Frogmore, with Jobson's Hybrid Melon. Second, Mr. J. Douglas. Third, Mr. W. Coleman, with Gilbert's Victory of Bath.—Melons, scarlet-fleshed—First, Mr. D. Pizzey, with Scarlet Gem. Second, Mr. F. Bates, Appleby Hall, Atherstone, Scarlet-flesh. Third, Mr. J. Gray, Grange Park, Alresford, with a fine highly netted fruit unnamed.—In the miscellaneous classes, a first prize was awarded to Mr. T. Jones, Frogmore, for a fine collection of Apples of marvellous firmness and colour for the season. Second, Mr. C. Ross, gardener to C. Eyer, Esq., Welford Park, Newbury; this last collection also included some fine examples of *Uvedales St. Germain* Pears, of large size and good colour; and Mr. G. Sage obtained an extra prize for a fine cluster of Bananas weighing 74 lbs., and quite as fine as the best imported specimens.

Vegetables.—For Messrs. Carter & Co.'s prizes for six dishes of Peas, including the following varieties—Carter's Extra Early, Premium Gem, McLean's Blue Peter, Carter's White Gem, and Carter's First Crop—there were two exhibitors. First, Mr. G. Pragall, gardener to G. Digby, Esq., Castle Gardens, Sherborne, who had nice plump well-filled pods. Second, Mr. G. Brown, gardener to Edwin Mackenzie, Esq., Tawley Court, Henley-on-Thames.—Mr. G. T. Miles obtained an extra prize for a splendid box of Tomatoes. Some extra large *Asparagus* came from M. Lherault, of Argentueil, near Paris. Some of the sticks of this were quite 2 inches in diameter, and about a foot in length.

First-class Certificates were awarded to the following:—

Vanda limbata (Williams).—This is a welcome addition to a well-known genus. In habit the plant is intermediate between *V. tricolor* and the old *V. Roxburghii*. The flowers are borne ten on a spike, and have long slender white peduncles, the sepals and petals being of a deep chocolate-brown, slightly netted, while the oblong blunt lip is of a lively rosy-lilac colour.

Double Zonal Pelargonium (Emilia Laxton).—A free-growing plant which deserves to be grown for its vivid scarlet flowers, especially as they last so long after being cut.

Dendrobium amoenum (Bull).—This at first sight resembles a small-flowered *D. transparens*, but is quite distinct. The flowers are small, of a white colour, the segments tipped with rosy-lilac. The lip is tinged with yellow, and the flowers are deliciously perfumed like Violets. Though not showy it well deserves culture for its odour.

Macrozamia plumosa (Bull).—This is a fine decorative plant belonging to a well-known class of *Cycads*, invaluable for stove or warm conservatory culture.

Tacsonia insignis (Backhouse).—This is a fine climbing plant for a warm greenhouse, having dark-green heart-shaped leaves, woolly beneath, and great rosy-crimson flowers nearly 6 inches across. It is one of the finest of its class.

Gloxinia Queen of England (Lovell).—A large white variety marked with deep crimson in the throat.

Sarracenia Stevensii (Veitch).—This is a fine new hybrid raised by Mr. Stevens, at Trentham. It is the result of a cross between *S. purpurea* and *S. flava*, and in form resembles the last named kinds, with the deep red or purple markings of *S. purpurea*.

Clematis purpurea elegans (Cripps).—A bright violet-purple variety, of fine form, and well deserving of culture as a novel variety of a popular class of hardy or half-hardy decorative plants.

Pellaea sp. (Backhouse).—A dwarf-growing species, not yet determined, but none the less valuable as a garden plant.

Pellaea mucronata (Backhouse).—This, like the last, is from the Yosemite Valley. Its fronds are about a foot long, very much divided, and of a pale blue or glaucous tint. It appears from the robust plant sent, to be of free growth, and will, it is to be hoped, prove a useful addition to hardy Ferns.

THE GARDEN.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

THE SPECTATOR ON GARDENERS.

A WRITER* in the *Spectator*, in favouring the public with his own special views on the student's gardening and road-making at Hincksey, goes out of his way to fling a few ill-natured gibes at gardeners in general. The evidently self-satisfied writer deals with his subject after this fashion—"Gardeners," quoth he, "we sometimes fear, are just as little civilised as any other labourers." This sentence ought to have been indited without the assumption of the editorial "we." It exhibits such ignorance of the subject that the excellent journal in which it has been allowed to appear ought not to have been involved in the unripe opinions of a correspondent, by his assumption of that magniloquent "we." The writer in the *Spectator* ought to be informed that, in reference to gardening alone, there are both gardeners and garden labourers. The "gardener" of the present day, though he oftentimes uses the spade with his own hands, is a man carefully trained to his craft—a man who has been taught the nature of soils, the general effects of climate and temperature on vegetation, and not only the names, but the natures of many kinds of plants, which careful teaching and careful study have enabled him to store valuable knowledge to such good effect that he is always able and ready to impart, to such gentlemen as the correspondent of the *Spectator*, many items of information in a domain of science in which the greatest among us are continually interested. The "labourer" is the uneducated assistant of the gardener; he is to the gardener what the stone-breaker and the carter are to the road-maker. The great road-makers—the MacAdams and the Wades—are as unjustly stigmatised, when twitted by this learned critic as being "just as little civilised as other labourers," as the Paxtous, Kents, Browns, and Reptons are by that same flippant pen. This self-confident essayist goes on to inform his readers, that gardeners "get some vague notions of colour—about half as accurate as those of a Turkish weaver or Japanese potter, or a Cashmere shawl seller." It would be well, if possible, to make this writer understand, that the profession of a gardener has nothing whatever to do with that kind of appreciation of colour which is, or ought to be, required in textile fabrics, nor in that superficial knowledge of it which is useful to a seller of shawls; nor has he anything in common with the Japanese potter, who, as a rule, makes use of few harmonising tints, requiring, as he does, all the brightness of positive colours. The gardener, in his own domain, is a colour-student after a superior fashion to that followed by the potter or shawl weaver. By his knowledge of hybridising, the gardener has produced a whole paradise of new flowers of thousands of delicate gradations of hue, many of which tones and shades he has found the means of defining in words which often convey the idea of the new colour with felicitous accuracy. Let the rash writer of the article on the Hincksey experiment study a gardener's catalogue, say, of Roses only, and he will find accurate definitions of a hundred tones of rose-hues, described with a clearness that should alone convince him that the gardener is often an intelligent student of colour. Let him visit many of our gardens and he will find plants so well arranged, as regards colour, that he may even cease to think of the Japanese potter as his ideal artist in this respect. As regards the production, by the horticultural art, of new and beautiful flowering plants from parents that were originally little better than weeds, the writer in the *Spectator* twits the gardener by ejaculating, "He feels as if he had made the plants." And so he has! Nature is the mother of all; but, by the gardener's art, she has succeeded in producing beautiful results, which, but for his knowledge, his perseverance, and his skill of hand, might never have been born. Here and there, in long lapses of time, some honey-hunting insect carries the fertilising pollen from one flower to another

of congenial race, and seed may be produced from which a new and beautiful species may arise to embroider the wild carpet of Nature; but the result produced may be inferior to either parent, or a weakling that soon dies out and disappears for ever. The gardener, on the other hand, has reduced chances to laws; he produces hybrid plants almost at will, casting all worthless results aside, and carefully preserving the one, two, or three gems selected from thousands of his seedlings. The writer on Hincksey then proceeds to scatter broadcast accusations of "conceit." He takes, as his deepest incarnations of inveterate conceit, the "poet" and the "certificated school-master," and proceeds to state that their conceit is far surpassed by that of a gardener "who has raised a new plant or done anything in the least noteworthy in the way of Orchids, or won a prize at the county flower show." In reply to this sweeping rhodomontade about conceit, one confesses at once not to have been aware, till so informed by this writer, that Homer, or Shakespeare, or Milton, or Tennyson, were to be accepted as typical examples of intense conceit; nor that our great certificated schoolmasters, Arnold and his compeers, were representatives of an intense kind of conceit which was yet surpassed by that of the "gardener." To those accusations against the gardener, intended by our "ready writer" to be so pitilessly crushing—namely, his raising of a new plant, his noteworthy success in the difficult culture of Orchids, and his winning a prize in open competition as an adept in his art—the natural reply appears to be that, to almost any other kind of mind than that of our ready writer, these achievements in an art "which does mend nature" would necessarily appear to be such as ought to awaken a just and honest pride in every enthusiastic gardener. If the gardener were an aristocrat in feeling, or cared much for the reflex of hereditary honour, he might claim to be a living representative of the most ancient and important craft in the world—the craft that has transformed the land of a great part of our planet from a waste to an earthly paradise—a craft honourable and useful, which brought to perfection many kinds of esculents, sweet and good for the nourishment of man, ages before the calling of the newspaper correspondent was heard of, or even the art of writing invented. In taking leave of the worthy essayist, on the intolerable conceit of poets, schoolmasters, and gardeners, may one of the delving craft be allowed to inform him that we, the delvers, have always thought that the caterers for the press are not sufficiently honoured in our country, and that while we are justly proud that Charles Lawson, the gardener, was twice Lord Provost of Edinburgh, and that the great palace of glass won for the gardener Paxton a world-wide fame and a title which, though no worshippers of titles, we honour in that of the late Sir Joseph Paxton, we, nevertheless, sincerely regret that a similar share of honour has not fallen to the equally hard-working labourers of the press.

A GARDENER.

WE have received a number of letters with reference to the note on "Gardeners and the Hincksey Diggings," quoted in our last issue, with the general tenor of which we heartily agree. With reference to "conceit," it is pointed out that even if some of the younger and less-experienced of the craft do manifest a little of this quality, there is surely a vast difference between being "conceited," in consequence of originating a new, and it may be most valuable or ornamental plant or fruit tree, and exulting because of excellence in coarse or brutal pursuits. We know some gardeners who have benefited the country at large by their productions, and who are in no sense more conceited than men of any other class. Pure conceit is impossible with a man of high intelligence, but all such men must have a consciousness of their own power, and, it may be, take a harmless pride in their work. Conceit is common enough in all classes among young and untravelled persons, and many young gardeners have had no opportunity of seeing anything but what is found in their immediate neighbourhood. Our own opinion is, that the "*Spectator*," and also some recent novelists, do scant justice to gardeners, the truth being that they are generally the most intelligent men in their rank in life, and frequently remarkable for great knowledge and skill. They can afford, therefore, to disregard the sneers of the novelists, who usually know nothing about them. Besides, the Rev. Mr. Hole, himself a gardener, has painted the gardener as he is, and the "*Six of Spades*" contains the truest sketches of the gardeners of our own time ever written.

NOTES OF THE WEEK.

— VARIOUS correspondents write to us about the size of the Iris figured in last week's GARDEN, supposing that our proportions were wrongly given. This was not the case; the flower sent to our office by Mr. Connell, the gardener at Stonehouse, was more than 9 inches in diameter.

— By far the handsomest Coleus leaves we have seen are some just received from Mr. Cannell, of Woolwich. They have deep brilliant and delicate colours, one side of the leaf being laced or edged with green, the other with yellow, and one half of the leaf in some instances is a deep claret, the other rosy-crimson, while some of the younger leaves are wholly carmine.

— THE graceful and curious *Aphyllanthes monspeliensis*, familiar to those who have gathered plants on the Maritime Alps, is quite hardy in the neighbourhood of London. There is a tuft of it in the Botanic Gardens, Regent's Park, much stronger than we have ever seen in its native country; the fine grass-like tuft is studded over with blue flowers, which appear in succession.

— THE Rev. Harpur Crewe sends us some blooms of the new hardy *Geranium arenarium*, it is one of the best perennials yet introduced. We first saw it in M. Boissier's garden near Lausanne, and it was first grown in England by Messrs. Backhouse, of York, who, we believe, sent out plants of it under the name of the old, and not rare, *G. Lamberianum*. M. Regel named it *G. Backhousianum*, not knowing that it had been previously described.

— WE hear from a correspondent at Lincoln, Nebraska, that fruit prospects in that country are excellent this year. In the counties along the right bank of the Missouri, fruit trees are said never to have been in fuller bloom than at present. Apples, Pears, Plums, Cherries, and Peaches, promise an abundant crop. These river-side counties, at present, are those in which most of the fruit of Nebraska is grown. The inland parts of the State, however, are beginning to dispute this special pre-eminence of the eastern counties. The soil is well adapted for fruit, and orchards and vineyards are being planted everywhere.

— Two handsome blue-flowered species of *Pentstemons*, named respectively *P. glaucus* and *P. heterophyllus*, are now in flower on the rock-work at Kew. The blooms of the first, though small, are produced in tolerable abundance, while those of the latter, a very distinct foliage kind, are about the same size as those of *P. crassifolius*. Both these species are deserving of a place in all good collections. Among other plants, now in flower at this spot, is a fine specimen of *Saxifraga corymbosa*, with a pyramidal spike, about 18 inches high, thickly studded with pretty white flowers. *Saxifraga Willkommiana*, a kind somewhat resembling *S. granulata*, is also in bloom, as is likewise *Lotus Salzmanni*, a silvery-leaved species, with large clear yellow flowers.

— IN a recent report of the United States Commissioner of Agriculture, it is stated that the wild Potato plant was growing in great abundance in that portion of Northern New Mexico lying between Fort Wingate and Fort Defiance. The Navajo Indians inhabit this section, and the native Potato forms one of their chief articles of diet in winter. The women dig the root with whatever implements they can get, often using a strong smooth piece of wood with a wedge-shaped end. The plant grows on low rich spots, and by spring the earth is torn up in every conceivable direction, in the search for Potatoes. The tubers are quite small, one-half to three-quarters of an inch in diameter, of good taste, and somewhat like boiled Chestnuts.

— MR. E. J. LOWE, of Highfield House, Notts, has stated in reference to the leafing of the Oak and the Ash, that during the past thirty years in no instance has the Ash been in leaf before the Oak. It must be mentioned that certain individual trees were selected as subjects of observation inasmuch as some Oaks will be very late and some Ash trees will be much earlier than others, and *vice versa*. It is quite possible to find certain individual Ash trees in leaf before certain individual Oaks, yet this is owing in most part to geological condition. Trees on the Bunter are in leaf (as a rule) earlier than those on the Keuper formation, and as the great North fault, as it is called (of about 100 yards), passes across my estate I have peculiar opportunities of studying the effect produced. Trees growing so near to each other as to have their branches mingled together will nevertheless have their roots growing in distinct strata, geologically the one being 100 yards higher than the other, causing one of the trees to be leafless until after the other has become fully in leaf. The Ash is but a few days later than the Oak, and the range in thirty years in coming into leaf is also limited (at this time of the year) to a few days, while the range of the common *Ribes* coming into flower (some three months earlier) is nearly fifty days. The Beech, which usually comes into leaf on the 28th of April, was this year in leaf on the 25th

of April (the range being from the 24th of April to the 6th of May), but the subsequent cold weather so retarded vegetation that the Oak was later by three days than usual.

— A CORRESPONDENT sends us a short distorted Cucumber, which he says pushed up from the root, but does not send the root showing the connection between the two! Have any of our readers witnessed a similar case?

— ALTHOUGH the season has been unfavourable for Irises, they are blooming beautifully just now in various establishments round London. At one or two places the flowers of *Sparaxis* and *Ixias*, from bulbs planted out in early spring, are also conspicuous.

— ACCORDING to the *San Francisco Bulletin* there have now been planted in California probably not less than a million trees of the *Eucalyptus globulus*, or blue Gum tree, which is so famous for draining damp soils and destroying malaria.

— MR. MARK FIRTH, who recently built and endowed a block of almshouses in Sheffield, at a cost of upwards of £40,000, last week purchased the Page Hall estate, situate near Sheffield, for £25,550. It is Mr. Firth's intention to set apart a portion of the estate as a public park and present it to the town of Sheffield.

— THAT botanically very interesting and rather imposing hardy plant, *Megacarpaea polyandra*, is in flower just now both at the College Botanic Garden and Glasnevin. A Polyandrous cruciferous plant is a singular anomaly, and, as such, *Megacarpaea* has a special interest for the systematist and botanical student.

— ALL interested in fine-foliaged hardy plants should, when visiting Kew, make a point of seeing a plant of *Polygonum sachalinense* in the herbaceous grounds near the museum. This vigorous and handsome plant is just now a very imposing object, 7 or 8 feet high, clothed with large bright green foliage, in which there is a graceful tendency to droop.

— THE lady visitors to the Jardin d'Acclimatation do much injury to the flower-beds by gathering and carrying off the choicest specimens. The following graceful appeal has been suggested for use in consequence:—"Les fleurs qui ont des crinolines sont priées de faire grâce à celles qui n'en ont pas." Is it possible to veil an order more delicately?

— THE tallest of the many kinds of Iris now in flower is *Iris ochroleuca*. It is one of the species that will grow freely on the margin of water, like our common Flag (*I. pseud-acorus*); and is, therefore, worthy of the attention of those who take an interest in water-plants. It may be seen both at Kew and the Botanic Gardens in the Regent's Park.

— ALTHOUGH the *Spergula* is admitted to be unfitted for the purpose of forming a good turf by itself (no one kind of plant ever can form a perfect turf), its value as a component part of lawn-turf does not seem to be well known. In Mr. Mongredien's garden, at Forest Hill, there are little patches of *Spergula* here and there in the lawn, the effect of which is very good indeed.

— THERE is now about to flower in Mr. Mongredien's interesting garden at Forest Hill, an Australian plant, usually supposed to be tender—*Lomatia longifolia*. It is planted out in a *Rhododendron* bed, and has lived through the winters of the past eighteen years, being cut to the ground twice during that period; it sometimes ripens fruit. A *Camellia* has stood twenty years as a bush on the lawn of the same garden.

— THERE is a harrowing description of a "man-eating plant" going the rounds of the papers. It is said to be a native of Madagascar, and to trap men and women as the *Dionaea* does flies. We quote one of the least sensational paragraphs of this "strange story." "The retracted leaves of the great tree kept their upright position during ten days; then when I came again one morning, they were prone again, the tendrils stretched, and nothing but a white skull at the foot of the tree. The indescribable rapidity and energy of its movements may be inferred from the fact that I saw a smaller one seize, capture and destroy, an active little lemur, which, dropping by accident upon it while watching and grinning at me, in vain endeavoured to escape from the fatal coils."

— MR. ALBERT GRANT is resolved to tread still further in the path of popularity opened up by him in his gift of Leicester Square to the public. He has, according to the London correspondent of the *Scotsman*, had an interview with the Prince of Wales, to obtain His Royal Highness's countenance to the project of purchasing, decorating, and throwing open to the public all the square gardens—eighty-four in number—in the metropolis. He believes that by so doing he will not only make these gardens—in many cases languishing—more healthy and more ornamental, but by allowing the public to traverse them, increase the facilities for that open-air exercise which the Londoner has in many cases but little opportunity of indulging in.

THE FLOWER GARDEN.

CULTIVATED GENTIANS.

At this season, when the mountain pastures of Europe are dyed with the unrivalled blue of the Vernal, the Bavarian, and other Gentians, we may appropriately call attention to the various cultivated species, so little seen in gardens generally. *G. acaulis* has here and there escaped extermination in old gardens, and is, indeed, beginning to be duly esteemed in many of the new; but many of the rarer species are as yet too frequently confined to botanic gardens or choice collections. Of this very extensive genus, De Candolle has described, in his "Prodromus," no fewer than 153 species. These are very widely distributed, a large proportion of the number being indigenous to the tropical regions of South America, especially in the Peruvian Andes, while others are natives of Mexico and other parts of N. America, Kamtschatka, Tierra del Fuego, the Falkland Islands, Patagonia, the Himalayas, Ceylon, Van Diemen's Land, Siberia, and various localities in the Alpine districts of Europe. Five species are natives of Britain. Of all these, at present, there are not more than some two dozen species in cultivation, and only a few of these are generally to be met with in gardens. All, however, are well worthy of culture, for the sake of the great variety which they present, and the rare beauty of many of the species. In the hope of directing more particular attention to these plants, we have drawn up the following descriptions of the best kinds grown by our nurserymen, including the British species.

Gentiana acaulis (Gentianella).—This is one of the finest and most commonly-grown species, forming dense carpets, 2 or 3 inches high, of ovate-lance-shaped leathery shining leaves, which, in the summer time, are covered with a profusion of large, erect, bell-shaped flowers, often 2 inches long, of a brilliant ultra-marine or sapphire colour, and continuing in bloom for a long time. It grows well in a deep moist loam, and is an excellent subject for the rock-garden, borders, or edgings. A few years since M. Anjubault of Mans, stated, in the *Revue Horticole*, that he obtained the finest flowers by putting his plants in a spent hot-bed exposed to the sun, watering them frequently, and cutting away superfluous shoots. *G. alpina* is a variety of this species, with shorter and broader leaves, and flowers half the size of those of *G. acaulis*, and usually of a lighter blue. *G. excisa* also very closely resembles this species. Native of the Alps and Pyrenees. Propagated by division of the tufts or from seed. Grows well in rich gravelly loam.

G. asclepiadea.—A tall handsome plant, with simple, Willow-like, erect stems, swollen at the joints, growing from 15 inches to 2 feet high, and bearing numerous flowers on a considerable portion of their length. The flowers, which appear in summer, are rather large, bell-shaped, of a deep purplish hue, with dark dots inside, and are borne in pairs, numerous, axillary, and nearly sessile, forming spikes of considerable size. The leaves are ovate-lance-shaped, sessile, about 2 inches long and $\frac{3}{4}$ inch broad at the base. Native of the mountains of Central and Southern Europe and the Caucasus. A good plant for borders or the margins of shrubberies, in almost any soil, but thrives best in a rich, fibrous, deep, and moist sandy loam. There is also a variety with white flowers.

G. bavarica.—This beautiful species very much resembles the British *G. verna* in its habit, size, and flowers, but is somewhat taller and has blunter and smaller Box-like leaves, suffused with a yellowish tint. It grows in dense tufts about 3 inches high. The flowers, which appear in summer, are large, and of a most exquisite, brilliant, velvety, and intensely deep Prussian blue, sometimes tinted with purplish-crimson. For beauty of colour, the flowers of this species bear the palm above all others. Native of Alpine meadows in

Central and Southern Europe. The author of "Alpine Flowers" informs us that he found this plant growing in spongy places, in which the foot sank to the ankle in water at every step, but our own experience has taught us that, in cultivation, these conditions are absolutely fatal to it, and we have seen it in its highest perfection on the unrivalled rockery of Mr. James Backhouse, at York, growing in a compost of peaty loam and grit, with no greater amount of moisture than is dispensed to the surrounding plants. Multiplied by division of the tufts, or from seed, if it can be ripened.

G. Burseri.—A very rare tallish species, growing from 1 to 1½ feet high, with dense heads of yellow flowers, which are sometimes spotted with purple; corolla, with six divisions; divisions of the corona, triangular; leaves, oblong-elliptical, the upper ones acuminate or pointed. Native of the Eastern and Central Pyrenees. Grows well in rich, fibrous, gravelly loam. A variety of this species, named Villarsii, found in the Provençal Alps, has the divisions of the corona truncate, and the flowers dotted with purple.

G. cruciata.—This species has somewhat erect spreading leaves, arranged at right angles, or cross-like, on simple ascending stems, which are from 6 inches to 1 foot in height. The flowers are axillary and terminal, blue, and produced in whorls, which have a capitate or head-shaped appearance. Native of dry pastures in Central and Southern Europe and Siberia. It has a four-angled creeping root, or rhizome, split into connate bundles of four, and fibrous or hairy at the top. In growing this plant, the fibrous loam should be plentifully mixed with small pieces of broken limestone.

G. gelida.—A vigorous-growing species, forming dense tufts or carpets a foot high, with bent ascending stems, and ovate lance-shaped blunt leaves, closely set. Flowers very fine, nearly two inches long, in very large heads of a brilliant blue colour. Native of Alpine districts in the Caucasus and Armenia. Grows well in rich moist loam, and is multiplied by division, or from seed, which it produces abundantly.

G. imbricata.—This species is distinguished by the densely overlapping elliptical-acute leaves which cover the stems of the plants. It grows from 6 to 8 inches high, and bears short-tubed flowers of an azure-blue colour. Native of the Swiss Alps, Carniola, Carinthia, and the Southern Tyrol. In cultivation, this plant requires an admixture of rich loam with small pieces of broken limestone.

G. lutea.—This is the largest species of the genus, and sends up stout stems 3 to 4 feet, or more, in height. Placing it side by side, with *G. verna*, *G. acaulis*, or any of the dwarfer species, few would believe that it belongs to the same family. It possesses none of the concentrated beauty of the species hitherto described, but is, nevertheless, a striking plant, well adapted for the back part of borders or the margins of shrubberies, and might be effectively introduced into groups of such plants as *Nicotianas*, *Wigandias*, &c. The flowers, which are of a pleasing yellow, are of a large size, and are produced in axillary, umbel-like, whorled cymes, on the upper part of the stem. The leaves are very large, ovate-oblong or ovate-acute, and grow in opposite pairs. Native of the Alps of Central and Southern Europe. In cultivation it is very indifferent as to soil, but grows best in a rich deep loam. This plant, independent of its horticultural uses, possesses no inconsiderable value in an economic point of view, as it furnishes the "Gentian-root" of commerce, so highly esteemed in the tonic preparations of the chemist.

G. Andrewsii.—A very singular species, with erect smooth stems about a foot high, bearing terminal clusters of inflated purplish-blue flowers, each an inch long. These flowers never expand, as the lobes or divisions of the corolla are united at the edges, so that the flowers have the appearance of small cones. Leaves, ovate lance-shaped, pointed, rough on the margins. Native of North America, from Carolina to Lake Huron. Grows well in rich moist soil, and is multiplied by division of the tufts.

G. angustifolia.—A rare and beautiful species, with erect, slender stems, from 6 to 15 inches high, each bearing a single, large, terminal, azure-blue flower, 1½ inch in length, and of a narrow ob-



Gentiana verna (natural size).

conical shape, spreading at the mouth. Leaves, linear, obtuse, smooth at the edges. Native of North America, from Carolina to Canada. It should be grown in moist and very sandy loam and peat, in rather shady situations.

G. ciliata.—Another rare and beautiful species, with flexuose, almost simple, stems about 1 foot high, bearing large, solitary, azure-blue, deeply fringed flowers, from 1 to 1½ inches long. Leaves, linear, obtuse, roughish at the edges. Native of the Alpine regions of Central and Southern Europe, and the Caucasus, in dry pastures. It requires to be planted in a mixture of rich fibrous loam and broken limestone, in sunny fissures of rock-work; or may be grown in well-drained pots, using the same compost. In all cases, it should be kept rather dry in winter. Young plants flower freely when only 2 or 3 inches high.

G. crinita.—A handsome biennial species, with an erect stem, branching in the upper part, and from 1 to 2 feet high. It blooms late in autumn, bearing large blue-fringed flowers nearly 1½ inches long. Leaves, lance-shaped, heart-shaped at the base, pointed at the apex, and roughish at the edges. Native of North America, from Carolina to Canada, in moist pastures and woods. It should be grown in rich moist loam, either on rock-work, or in pots, or borders.

G. frigida.—An exceedingly pretty dwarf species, with erect slender stems, 2 or 3 inches high, bearing usually a single erect large terminal flower, of a creamy-white colour, marked with a few purplish dots. Leaves, linear-spathulate or spoon-shaped, obtuse, and smooth at the edges. Native of the Alps of Upper Styria and the Carpathian Mountains. A Siberian variety, *G. algida*, has solitary flowers, each 2 inches long. It should be grown in a mixture of rich loam and broken limestone.

G. punctata.—A robust erect-growing species, with stems from 1 to 2 feet high, bearing terminal clusters of large yellow flowers, irregularly spotted with purple; each flower 1½ inches long. Leaves, elliptical, shortly pointed, five-nerved, smooth at the edges. Native of the Alps of Southern Europe, and the Carpathian Mountains. Soil, &c., as for the preceding species.

G. purpurea.—A vigorous-growing species, with purplish-green stems from 1 to 1½ feet high, bearing from three to eight terminal flowers in a whorl, in addition to several solitary axillary ones. Flowers, large, purplish, marked with dots in lines inside; tube striated with greenish-yellow. Root-leaves, ovate, five-nerved; stem-leaves, broadly lance-shaped. Native of the Alpine regions of Central and Northern Europe. Suited for borders in rich sandy or gravelly loam.

G. pyrenaica.—A very distinct and beautiful dwarf species, with short tufted stems, about 3 inches high, blooming in summer, and bearing large solitary brilliant purple flowers, pale green on the outside, each 1 inch in length. Leaves, imbricated, linear-lance-shaped, pointed, rough and cartilaginous at the edges. Native of the Pyrenees, Hungary, and the eastern parts of the Caucasus. This species has somewhat of the appearance of *G. verna*, but is of freer growth. It does well in rich sandy or gritty loam.

G. septemfida.—A curious species, with erect simple stems, 6 to 12 inches high, blooming early in summer, and bearing clusters of cylindrical flowers, of a blue and white colour inside, and greenish-brown on the outside, and having, between each of the larger roundish segments, a smaller one finely cut. Leaves, ovate lance-shaped, three-nerved, decussate, crowded. Native of the Caucasus. Suitable for rock-work or choice borders, in fine sandy loam.

British Species.

G. verna.—One of the most charming plants of the genus, forming dense tufts, 1 to 3 inches high, which, in spring, are covered with a profusion of large brilliant blue flowers, each an inch or more across, and frequently showing a white centre. Leaves, ovate, somewhat acute, those of the root crowded; stem-leaves in about three pairs. Native of a few localities in Northern England and Western Ireland, but very abundant on the Alps of Central and Southern Europe. It is an excellent subject for the rock-garden, choice borders or for pots. Mr. James Backhouse, of York, who grows all the cultivated species of *Gentian* to perfection, has given the following valuable directions for the culture of *G. verna*:—"It grows freely on very choice sunny banks, in deep, rich, fibrous loam, mingled with pieces of limestone, gravel, and a little 'cocca refuse.' Rapid drainage, and as rapid and constant a supply of percolating moisture are essential to full vigour. It grows freely in pots, in the above-named mixture, if kept moist all summer, or in an ordinary garden border, in loam mingled with gravel."

G. Pneumonanthe.—A handsome sub-aquatic species, growing in marshes and on moist heaths and pastures, with erect stems, 6 to 12 inches high. The flowers, which appear late in summer and in autumn, are large, 1½ inches long, or more, of a deep blue colour within, with five greenish dotted belts on the outside, and are

produced in opposite pairs in the axils of the upper leaves, with a terminal one between the last pair. There is a variety with white flowers. Leaves, smooth, upper ones nearly linear, lower ones oblong lance-shaped, all obtuse and rather thick. Native of England, various parts of Europe, and Siberia. The proper place for this plant is in the artificial bog, but it may be also grown on rock-work or in the choice border, if planted in deep and very moist soil.

G. Amarella.—An annual species, flowering in the end of summer and in autumn, with erect, slender, and much-branched stems, from 3 to 4 inches to nearly a foot high. The flowers are numerous, of a pale purplish-blue colour, and are sometimes disposed in a loose, oblong, leafy panicle. Lower leaves, oval, spoon-shaped, upper ones ovate lance-shaped. Native of most parts of Britain. This plant grows well in rich sandy loam, in an exposed sunny position.

G. campestris.—Another annual species, much resembling the last, but is usually rather stouter, more branched, and more crowded with leaves and flowers. It seldom grows more than 6 inches high. The flowers, which appear in the autumn, are of a violet-blue colour, and the mouth, which is divided into four segments, is margined with a very conspicuous blue fringe. Leaves, elliptical-oblong, somewhat pointed. Native of Britain, and more common than the last-named species. Easily grown in ordinary garden soil.

G. nivalis.—This is also an annual species of very dwarf dimensions, with slender, erect, leafy stems often only 1 inch (but more frequently 2 to 4 inches) high, and more or less branched, each branch bearing a single blue flower, much like that of *G. verna*, but considerably smaller. Leaves, ovate, pointed, roughish at the edges, the lower ones more frequently ovate and disposed in rosettes. Native of Britain, but only found on the higher Scotch mountains; common on the mountain ranges of Central and Northern Europe. It grows best in a mixture of rich loam and broken limestone.

The preceding enumeration comprises all the best species of *Gentian* at present in cultivation. The culture of most of them presents no very great difficulty, although in a few cases, perhaps, beginners may meet with disappointments. A little attention, however, to the requirements of the plants as to soil, position, the suitable degree of moisture, &c., is sure to be repaid by satisfactory and successful results.

W. M.

VIOLETS.

In order to have Violets from November to June, now is the time to make preparations. The Violet is propagated exactly like the Strawberry, and, like that plant, it flowers well according to the vigour of the stools, this vigour depending upon the planting of early offsets or runners, and their treatment during the summer. Everyone who has a garden and a two or a three-light wooden frame may have Violets throughout winter and spring. We have been gathering bunches, two or three times a week, of the Neapolitan chiefly, and there are none better from November to June, from a three-light frame. I will describe the frame culture first. Here we have a frame for the purpose, in which the plants are both grown and flowered, it being heated with a 2-inch lead pipe in connection with another house. In such a frame, of course, no hot-bed is necessary, as the little heat required during cold weather in winter can be supplied by the lead pipes. In many places, however, the frame will be required during summer for other purposes, and the Violets must then be grown on a shady border and transferred to the frame in September. Whichever plan may be adopted, the summer culture is the same, and consists in securing good runners early in summer by pegging down the offsets at a joint and pinching them beyond that, and, when rooted, transplanting them to the bed or frame, as the case may be. Some never take the trouble to layer young plants, but simply divide the old stools into single crowns, and plant them in the frame or bed at once. This is the quickest and most convenient plan; but young plants from offsets produce the finest flowers. During summer, the plants must have abundance of water, and, if they are not in a naturally shaded situation, they should be shaded in dry sunny weather and syringed often. By September they will be nice stocky plants; and, if they have been grown in the open border, they must then be transferred to their winter quarters. If a heated frame cannot be spared for them, a hot-bed, consisting of spent fermenting materials, should be prepared, and on this the frame should be set. Six or 8 inches of nice light rich soil should be put in, and the

Violets planted as closely together as they will bear without crowding. The more plants the more flowers. Care must be taken to lift the plants with good balls, and above all, it must be seen that the heat of the bed is not above 65° or thereabouts. A permanent but very gentle heat is what is required; therefore avoid making the bed of rank materials. In fact, an old spring hot-bed that has stood all summer is generally the best place for a Violet frame in winter, or an old spent hot-bed turned over again, and squared up for the purpose will do. All that is required is just sufficient heat to keep the Violets growing and flowering gently all the winter; and any slight stimulus will do this, with the assistance of linings round the frames and mats at night in cold and frosty weather. The frame should have a rather sharp slope to the south, so as to receive as much sunshine as possible during the winter months. Nothing like forcing should be attempted to get the plants into flower early. A mild greenhouse temperature, with gentle dewings in bright afternoons, and a little ventilation always, is all that is needful to bring well-grown plants into flower by the middle of October. The less the plants are pushed the longer they will continue to flower. As regards varieties, I know none to surpass, and few to match, the Neapolitan for scent and a profuse flowering habit, especially for early blossoming. There are beautiful double varieties now well worthy of cultivation; but they do not open their flowers freely during the winter, and, consequently, have little scent. The Czar is a good useful kind, well scented, and with long flower-stems, which make it useful for bouquets. Plenty of it should be grown out-of-doors, in clumps of a convenient size, for transferring to 7 or 8-inch pots in autumn, and forcing in the conservatory or any other house with a genial temperature. Presuming that the frame and pot plants, which I shall refer to shortly, have kept up the supply of flowers till late in spring, a succession must be looked forward to from the outdoor stock. These should consist of the Czar, Common Russian, and any other single and double varieties that are found to succeed; and they should be planted in south, north, east, and west aspects, in shady places, and, in fact, anywhere where they will grow. This will ensure an abundant supply of flowers till late in the season with very little trouble. The Violet will grow in almost any soil, but it shows a curious partiality to some soils and localities. It delights in a somewhat rich light soil, yet it must not be too light; too much leaf-mould, for instance, it does not care for. A compost in which the staple is a stout friable loam suits it best. Very heavy soil is not unsuitable, but it should be lightened with leaf-mould and sand. In light soils well-rotted cow manure is an excellent stimulant. It is advantageous to have plants also in pots, as they can be used for house decoration effectively; and a few pots set about the conservatory always gives an agreeable perfume to the house. Pot plants are propagated in the same way as the others. The young plants are potted about the end of May or beginning of June, or even later, in 4½-inch and 5-inch pots, and plunged in the border during the summer, and watered and kept clean till October, when they should be stowed away in a cold frame, and either plunged in ashes or set closely together, as a protection to the roots from frost or drought. From the frame they may be taken in batches, as wanted, and pushed into flower in a warm greenhouse or pit, always keeping them near the glass, and where they can have the benefit of the ventilation. The insects which trouble the Violet most are green fly and red spider. The first is generally the result of a close unhealthy atmosphere, and is most easily got rid of by gentle smokings. Red spider is caused by strong sun and by dryness at the roots; hand-dusting with sulphur is the best remedy; but it is easy to prevent its occurrence by maintaining a damp atmosphere by syringing the house.

J. S. W.

IRISES.

I HAVE never seen the magnificent species of Iris, figured in your last number (*I. susiana*), flower out of doors except in very light sandy soil, though, I believe, it grows naturally in a strong loam, and it is quite rare to see it living in a border at all. Mr. Atkins, of Painswick, grows it well in pots, but it is

by no means an easy plant to flower; and, as for standing forcing, as I have seen stated by old writers, I do not believe it possible. I should much like to know how the *Iris iberica* and others of the same section (*Onocyclus*) can be grown in this country, as they seem to be almost universally failures. I am going to try them this year in a frame planted in strong soil, which they certainly will not live in out of doors in my garden, and roast them in the summer as much as possible. This will come nearer their natural condition of life as far as I can learn. While on the subject of Irises, I want to know whether any of the following species are, or have been, in cultivation in England, as I should much like to get them:—

Iris caurina, from Canada, near Virginica, but distinguished by its simple flower-stalk.

I. Hartwegi, from California, where it grows on the Sacramento Mountains. Resembles *I. tenax*.

I. Tolmiana, a Californian form of *I. sibirica*; possibly the same as the Japanese one. I lately saw a very fine variety of this species at Bitton, with crimson bracts, from Japan.

I. decora (Wallich).—Himalayas; same as *nepalensis* of Don, not *nepalensis* of Wallich, which is only a variety of *I. germanica*, I believe.

I. kumiaonensis (Wall.), *longifolia* (Royle), figured in illustrations of Himalayan plants. A fine species.

I. sulcata, fasciculata of Jacquemont. Himalayas.

I. aurea (Lind.).—Cashmere; a fine golden-flowered plant, possibly a variety of *I. sambucina*.

I. gracilipes (A. Gray).—From Japan; a small delicate plant.

I. Tigridia (Bunge).—Altai Mountains.

I. paradoxa (Steven).—A splendid species from Eastern Caucasus, figured in Regel's "Garten Flora." Belongs to the same group as *iberica*.

I. sicula (Todare).—From Sicily.

Xiphion palestinum.—Grows on Mount Tabor, Hermon, and other places in Syria. A very fine species.

X. Histrio (Boiss.).—Lebanon. Near *Iris reticulata*. [This flowered on a border, with an east aspect, at Kew last January.—ED.]

X. Aucheri.—Syria and near Aleppo. A curious species, near *scorpioides*.

Any information about these, or any other rare species of this beautiful and much-neglected genus, the synonymy of which is in most awful confusion, will be very gladly received by me.

W. J. ELWES.

THE IVY-LEAVED TOAD FLAX.

(LINARIA CYMBALARIA.)

I FIND this elegant little plant exceedingly useful for decorative purposes. Though originally a native of Italy it is now very general in England, and will thrive in the most exposed places on old walls and crumbling ruins. I first met with it in the Island of Anglesea, North Wales, where it almost covered a low wall facing the sea, for very nearly a quarter of a mile, where it was occasionally washed by the salt spray in winter, and as I never since saw finer specimens of this "Wandering Jew" (that being its local name in North Wales), I conclude marine air agrees best with it. I was making a rough kind of rockery at the time, and rather at a loss for plants in such a wild, "out of the way," sort of place as this is; my rockery, too, was to stand on a lawn, where very few shrubs or flowers would grow in consequence of its being so near the sea; therefore, I was perfectly charmed to meet with this pretty Toad Flax, and, carrying off a large basketful of it, I placed it in nooks between the Ferns, and likewise on a piece of rock-work I had especially devoted to sea-shore plants. Both places seemed to suit it equally well, and its change of quarters did not effect it at all. By June, its lovely mauve flowers, and graceful leaves had covered nearly all the stones I wished to hide, and in the autumn I removed a large patch of Moss, entirely covered with *Linaria*, from off the walls of Penmaen Priory, and put it in a hanging basket in my sitting room. It grew beautifully, and came into bloom much earlier than the out-of-door plants did. It climbed the sides of the basket, and its beautiful tendrils hung down covered with blossom. Everyone admired it, and would scarcely believe it was only a "common weed," as some people term all wild flowers. The yellow Toad Flax is a showy plant, but very unlike the Ivy-leaved. I removed some of it, together with Foxglove, into my garden, and their bloom contrasted well during the month of July, backed by a low Privet hedge, but the Foxglove faded away, long before the "Butter and Eggs," as it is called, disappeared.

Berry Grove, Liss, Hants.

H. E. W.

THE GENUS TRITOMA.

This important genus comprises fourteen species, all of which have been well described by Mr. J. G. Baker, in the *Journal of the Linnean Society*, of whose annotations on these striking autumn-flowering plants we translate an abstract. At the present time, scarcely half-a-dozen species belonging to this genus are in cultivation. It would be difficult to overrate the value of Tritomas as late-flowering plants. They are called Kniphofia by Mr. Baker; but, as they are more popularly known as Tritomas, we prefer to give them that title.

Tritoma (Kniphofia) Uvaria.—This is the most showy and commonly grown species, growing from 3 to 4 feet high, or more, and producing a dense spike of flowers, which is often more than 6 inches long. The flowers are tubular, about $\frac{1}{2}$ inch long, and are, at first, of a brilliant scarlet, but ultimately fade into yellow, so that the flower-spike presents, at the same time, a crown of flowers, the upper ones of which are of scarlet, while the lower ones are of an equally fine yellow. The leaves are all radical, from 2 to 3 feet long, and 3 or 4 inches broad. This plant, and, in fact, all the species, grow well in ordinary good garden soil, but thrive best in rich loam or peat and sand. They are all easily multiplied by division of the plants in autumn, taking care to preserve with each division a portion of the fibrous roots. Begins to flower in September.*

T. Rooperi.—A very dwarf species, the flower-stem being less than a foot high. Flower-spike, 3 to 4 inches long, and about 3 inches broad. The flowers in the upper half of the spike are scarlet, while the fading ones in the lower half are of a delicate yellow, affording a pleasing contrast. Native of Caffraria. It flowers later than *T. Uvaria*.

T. Burchellii.—This species grows from 2 to 3 feet high, and bears a rather loose flower-spike, 3 or 4 inches long. Leaves, 2 to 3 feet long. Flowers, from $1\frac{1}{2}$ to $1\frac{1}{4}$ inches long, of the same colour as those of *T. Uvaria*, and which is the prevailing colour of the genus. Native of the Cape of Good Hope.

T. parviflora.—Flower-spike, 3 inches long. Flowers, scarcely $\frac{1}{2}$ inch long. Leaves, linear, about 1.6th inch broad. Cape of Good Hope.

T. breviflora.—Flower-stem, 9 to 12 inches high. Flower-spike, 1 to $1\frac{1}{2}$ inches long, and about 1 inch broad. Flowers, all yellow. Leaves, 9 to 12 inches long. Cape of Good Hope.

T. gracilis.—Flower-stem, 2 feet high. Flower-spike, $2\frac{1}{2}$ to 3 inches long, and 1 to $1\frac{1}{4}$ inches broad. Flowers, whitish. Leaves, 2 feet long, 1.6th inch broad. Native of Natal.

T. triangularis.—Flower-stem, less than a foot high. Flower-spike, $1\frac{1}{2}$ to 2 inches long, scarcely $\frac{1}{2}$ inch broad. Leaves, triquetrous in the upper part, 10 or 11 inches long, linear, about 1.12th inch broad. Cape of Good Hope.

T. Abyssinica.—Flower-stem, 9 to 12 inches high. Flower-spike, 1 or 2 inches long. Leaves, 9 to 12 inches long, linear, about 1.12th inch broad. Native of Abyssinia.

T. sarmentosa (media).—Flower-stem, from 1 to $1\frac{1}{2}$ feet high, or more. Flower-spike, 2 to 4 inches long, and 2 inches in diameter. Leaves, glaucous, smooth, 12 to 18 inches long, and about $\frac{1}{2}$ an inch broad. Native of the Cape of Good Hope.

T. isoetifolia.—Flower-stem, 16 to 18 inches high. Flower-spike, $1\frac{1}{2}$ to 2 inches long, and $2\frac{1}{2}$ to 3 inches in diameter. Flowers, about $1\frac{1}{2}$ inches long. Leaves, 6 to 9 inches long, 1.6th of an inch broad; more herbaceous than those of any other species. Native of Abyssinia.

T. Quartiniana.—Flower-stem, 19 or 20 inches high. Flower-spike, 5 or 6 inches long, and about $1\frac{1}{2}$ inches broad. Flowers, a little more than $\frac{1}{2}$ an inch long. Leaves, 12 to 18 inches long and about $\frac{3}{4}$ inch broad. Native of Abyssinia.

T. Grantii.—Flower-stem, 12 to 15 inches high. Flower-spike, 2 to $2\frac{1}{2}$ inches long. Flowers about $\frac{3}{4}$ inch long. Leaves, 12 to 15 inches long, and about $\frac{1}{2}$ an inch broad. Native of tropical Africa, discovered in the Speke and Grant expedition, and named after Major Grant.

T. pumila.—Flower-stem, 19 or 20 inches high. Flower-spike, 3 to 5 inches long, and about $1\frac{1}{2}$ inches broad. Flowers, $\frac{1}{2}$ an inch or more long. Leaves, 12 to 18 inches long, and $\frac{1}{2}$ an inch or more broad. Native of the Cape of Good Hope.

T. præcox.—Flower-stem, 15 to 18 inches high. Flower-spike, 3 or 4 inches long and 3 inches broad. Flowers, about $1\frac{1}{2}$ inches long. Leaves, 2 to $2\frac{1}{2}$ feet long and 1 inch broad, of a pale green

colour, not glaucous. Native of the Cape of Good Hope. This species is distinguished by its early flowering, which commences in May.

T. rigidissima.—A most distinct species, easily recognisable by the texture, strong veins, and well-marked denticulations of its rigid leaves, which are from 1 inch to $1\frac{1}{4}$ inches long, and about 1.6th of an inch broad. Flower-stem, about as long as the leaves. Flower-spike, very dense, 3 or 4 inches long, the lowest flowers being very much deflexed. Native of Mount Boschberg, Cape of Good Hope.

T. caulescens.—This is the most distinct of all the species of this intricate genus, having a decided stem to the rosette of leaves, like a caulescent Aloe. The leaves are the broadest of all the known species, and the stamens and style are exerted from the perianth from a quarter to half an inch. Native of the Stormbergen Mountains, Albany, U.S.A.

T. Schimperii.—Flower-stem, from 1 to $1\frac{1}{4}$ feet high. Flower-spike, very lax, more so than any other species, about 2 inches long. Leaves, 1 to $1\frac{1}{2}$ feet long, reed-like, smooth, about half an inch broad near the base. Flowers, very much curved, usually yellow, sometimes reddish. A native of Abyssinia, and marked, at a glance, from all the other species, by its long lax raceme.

T. foliosa.—The specimen of this species which Mr. Baker saw in the herbarium of De Candolle was imperfect, wanting the leaves; and Mr. Baker supposes that it may prove identical with *T. Quartiniana* (A. Rich.). Flower-stem, about a foot high. Flower-spike, when fully expanded, from $1\frac{1}{2}$ to 2 inches long; lower flowers, very much deflexed. Native of Abyssinia.

T. comosa.—This species very much resembles *T. pumila* of the Cape, from which it differs mainly by its narrower leaves and smaller bracts. Flower-stem, $1\frac{1}{2}$ to 2 feet high. Flower-spike, very dense, 3 or 4 inches long; lower flowers very much deflexed. Leaves 1 to $1\frac{1}{2}$ feet long, smooth, reed-like, about $\frac{1}{2}$ inch wide near the base. Native of Abyssinia.

T. porphyrantha.—This species is, perhaps, nearest to *sarmentosa*, from which it differs by its very short pedicels, longer purple flowers, and included stamens. Flower-stem, $1\frac{1}{2}$ to 2 feet high. Flower-spike, very dense, about 2 inches long; flowers deflexed, purple, without any tinge of red, 1 to $1\frac{1}{4}$ inch long. Leaves 1 foot to $1\frac{1}{2}$ feet long, reed-like, smooth, nearly $\frac{1}{2}$ inch broad near the base. Native of the "Orange Free State," Cape of Good Hope. None of the last six species are in cultivation, and the descriptions here given are from Mr. Baker's notes on specimens which he examined in the herbarium of De Candolle.

All the species of *Tritoma* are very readily multiplied by division of the plants in autumn, and grow well in ordinary good garden soil. W. M.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Cyclobothra pulchella.—This pretty Californian plant has stood the winter well at York, and is growing as freely as a wild Blue Bell.—Q.

Viola cornuta var. Perfection as an Edging Plant.—This is now in flower in Battersea Park, where it forms dense even edgings of deep green foliage, above which its innumerable lilac flowers stand well out. The effect of this plant, grown in this way is strikingly beautiful.—M.

Gladiolus cardinalis.—This does not bloom well with me. What treatment does it require?—A. [We would recommend you not to separate the corms too much, but to plant them in clusters of considerable size; it will then, possibly, bloom with you.—En.]

Irises as Border Plants.—All who have a mixed garden or herbaceous border should at least have half-a-dozen or a dozen of the more striking varieties of this old-fashioned—but not yet beaten—flower. Some of the more beautiful varieties are almost equal to Orchids, for decorative purposes.—D. T. F.

Corydalis nobilis.—During the past six weeks, notwithstanding the unfavourable weather, a large tuft of this plant in a border has been thickly studded with trusses of deep yellow blooms. It is a plant worthy of universal culture for early summer-blooming, and is deserving of a position on rockwork or in borders, in both of which it thrives perfectly, if planted in good sandy loam.—L.E.

Saint Bruno's Lily (Paradisica Liliastrum).—This beautiful Alpine meadow plant, which frequently fails to attain much vigour in borders, and often dwindles away from the attacks of slugs, has for the last few weeks been in fine condition on Mr. Wilson's rock-garden at Weybridge Heath. It is planted in deep sandy peat, and forms strong tufts, with a profusion of snow-white, Lily-like, and delicately-scented flowers.—R.

Grass Garden Walks.—After having been bothered for years by Grass and weed-grown walks, I determined to conquer the enemy by a masterly surrender. I therefore spaded up my walks, adding enough good soil to raise them to a level with the adjoining beds; raked and rolled them till they were firm and even, and then sowed them thickly with "mixed Lawn Grass seed," scratching it in with a rake, and giving a final going over with the roller, and awaited the result. In a very few days (not over three weeks), I had the pleasure of walking on green velvet instead of gritty gravel; and with the help of a lawn mower, and an occasional cutting down of the edges true with a spade, have had no farther trouble with my walks. Always green and pleasant to the foot and eye, never weedy, never muddy, never wet (being above the garden level), they are perfection.—Cultivator.

* A variety, *T. U. minor*, from the Zulu district of South Africa, has smaller flowers of a pale orange colour, and leaves seldom more than $\frac{1}{2}$ inch broad. It seems to diverge from the type towards *T. sarmentosa*. Another variety, *T. U. glaucescens*, is dwarf in habit, with glaucescent leaves, and bears splendid large spikes of yellow and scarlet flowers.

THE FRUIT GARDEN.

THE KUMQUAT.

(CITRUS JAPONICA.)

This is one of the prettiest and most graceful of all the Orange family, and is well worth cultivation on account of its ornamental fruit alone, especially in collections in which common Oranges are grown. In habit, it closely resembles the little Tangerine Orange, inasmuch as it has finely serrated lance-shaped foliage, glossy, and of the deepest green. The fruit is oblong in shape, and about the size of a pigeon's egg. Its rind is thick in proportion to the size of the fruit, of the brightest orange-yellow, profusely studded or dotted with oil glands; and, when broken, it diffuses a very grateful odour. The pulpy portion is juicy; but differs from that of the common Orange, in having a bitter taste; while the rind itself is sweet and delicately flavoured. This little Orange may be grown in a stove or warm greenhouse, and is valuable as a glossy-leaved evergreen, irrespective of its flowers and handsome little fruit, which look not unlike a richly coloured Coe's Golden-drop Plum.



The Kumquat (Citrus Japonica).

It used to fruit regularly in the tropical house at Syon; and cut fruit-bearing branches have been recently exhibited at South Kensington from Mr. Bateman's gardens at Knypersley, where the plant is still grown for the sake of its handsome fruit. The latter is made into a delicious marmalade or conserve, which is considered by connoisseurs to be superior to that made from any other species of Orange. Like other species of Citrus, it is readily propagated by means of grafting; and it may be grown in a compost of fresh turfy loam, with plenty of water while growing. Our illustration is a representation of a fruit-bearing branch, sent from Knypersley. B.

Forcing Cherries in Pots.—Although the forcing of Cherries in pots is old in practice, there are but few places in England where it is carried out to any extent. This is the more surprising, when we consider the increase of glass accommodation everywhere, and the ease with which they can be managed, by shifting them, as they progress through the different stages, to a proper temperature. It is not in every place that the gardener can afford to give up a whole house to permanent trees, and if he could do so, it is not so easy to find suitable plants for the Cherry-house, without bringing into it troublesome insects. There is also this advantage attendant upon

potted Cherry-trees, that when in bloom there are few plants more sweet and effective. A dozen half-standard Cherries in full bloom make as good a display as a dozen white Azaleas, and stand equally long in bloom. Then, again, a conservatory or greenhouse, where plenty of air can be given, is the very best place for them while setting their fruit—by far the most precarious point in their management. When set they may be moved to a higher temperature, under Peach trees, or to a Vinery just started. By the end of April they will come on in any house, and the last batch may be set out of doors. Some may ridicule the idea of putting Cherry trees in the centre of a dining-table, but, if they saw the effect of a neat-headed tree of this kind covered with blossom, or with ripe fruit, they might be induced to change their minds. Others may say, "Oh! Cherry trees are a great deal of trouble, requiring to be shifted about backwards and forwards." This may be so, but my experience is that there is little got without trouble, and if we compare the labour attending the culture of any ordinary greenhouse plant with that of Cherry trees, there is only this difference, that here we get more return for our trouble; for instead of simply obtaining flowers, fruit follows, and then the only attention necessary until next season is to look to the watering of the roots. The trees are not very liable to insects, the caterpillars and black-fly being their chief enemies, and both these are easily stopped

either by smoking or picking. Cherry trees are forced very successfully in Germany, and mostly in low pits, often furnishing a nice lot of fruit in January. At the Royal Garden at Potsdam whole ranges are devoted to them. I do not remember having seen any in France, Under gentle forcing the trees last good for years; and when planted closely in the form of hedges they can easily be protected by a covering of nets in summer and autumn. Where birds are as plentiful as they are here, no sort of fruit can be got except protection is afforded both to buds and fruit. The May Duke is the only sort fit for pots, and the fruit of this get to be very fine. We generally arrange for the second lot of one year to come first the next.—*Florist*.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

New Bigarreau Cherries.—Two new Cherries of this description are figured in this month's *Florist*. One is named Frogmore Early Bigarreau; the other, Bigarreau Noir de Schmidt. Both are fine-looking kinds; the first, yellow shaded with crimson; the second, a kind as dark as the May Duke.

Wash for Fruit Trees.—Put half a bushel of lime and 4 lbs. of powdered sulphur in a tight barrel, slacking the lime with hot water, the mouth of the barrel being covered with a cloth; this is reduced to the consistency of ordinary whitewash, and, at the time of application, half an ounce of carbolic acid should be added to each gallon of liquid. Mr. Saunders, of Washington, who uses this wash largely, says: "I generally apply it in spring, before leaves make their appearance." The wash is applied not only to the stem of the tree, but, to some extent, to the main branches.

THE INDOOR GARDEN.

THE JAPANESE PRIMROSE AS A POT PLANT.

Its style, size, colour, form of leaf and flower, all fit this Primrose to take high rank as a pot-plant. It also bears moderate forcing remarkably well. The leaves are, if possible, greener and more delicately serrated and prettily arched, when grown under glass. They are also safe from being marred by biting east winds and sharp April and May frosts. The flower-stems rise higher, and the whorls of flowers unfold with more confidence, greater freedom, and to a wider measure. Grown near the glass the colour suffers but little; it, however, hardly reaches to the brilliancy and depth of hue to which it attains in the open air. It is, however, exquisitely beautiful, and any loss of depth of tone in the flowers is compensated for by the greater size and more delicate beauty of the leaves. In size, and also in beauty of leaf it is unmatched among Primroses. It fits in nicely with most other flowers, adding richness and variety to the best of them. The colour, that of the deepest pink, is one that is rather scarce; and the habit of the plant and its bold flower-stems give it a distinguished air even among the choicest species under glass. Single plants are effective, but a row on a shelf forms a feature in the greenhouse or conservatory at once unique and rich. It is also admirably suited for vases, window-sills, landings, or staircases. Among the choicest contrasts I have seen for many a day, was a double row, in a long passage, of the old Saxifraga pyramidalis and the Japanese Primrose. The plants presented the most complete contrast to each other and in the contrast, and from the distinctive simple beauty of each, there resulted a most satisfactory effect. This old Saxifrage is one of the most effective of pot plants. Last year it was associated with blue Lobelias, depending from brackets above and drooping from the base of the shelf below, and the result was even more beautiful. The two plants while contrasting exquisitely in colour, harmonised well in grace and delicacy of flower and habit. The Lobelia threw out streams of blue upon and from the white; the Primula japonica sent a line of the most brilliant pink right through the substance and along the side of the snowy and fluffy Saxifrage.

D. T. FISH.

ANOTHER NEW HYBRID SARRACENIA.

DR. MOORE has raised a hybrid Sarracenia, the history of which is as follows:—The species selected with a view to crossing were *S. Drummondii* and *S. flava*, the latter to be the seed-bearing parent. The pollen was applied, the usual precautions being taken that neither that of the plant operated on, nor that of any other species then in flower, should affect or interfere with the hoped-for result, and before the summer was over Dr. Moore had the gratification of gathering a ripe capsule of seed. This was in 1868, and the following spring the seed was sown in pots well drained and nearly filled with finely-sifted heath mould. The seed was dusted over the surface and merely covered with a thin stratum of damp bog Moss (*Sphagnum*), a piece of flat glass being laid over this, and the pot being placed in an intermediate or moderately warm house. In about a month or so the young plants began to show themselves. The seedlings indicated a good deal of liability to damp off the following winter, but with those which pulled through there was no after difficulty. As far as foliage, pitchers, and habits could indicate, little time was wasted in waiting for evidence of a successful and interesting cross, and early last month the development of flowers still further confirmed it. This hybrid partakes in a remarkable degree of the characteristics of both parents. In the rich veining and exquisite leaf-painting of the upper portion and lid of the pitchers, as also in its purple-coloured flowers, it bears the impress and likeness of the male parent; while in the habit and less persistent character of the leaves it shows maternal traits. It is very probable that cooler treatment than that which is agreeable to *S. Drummondii* will suit it. This hybrid Sarracenia was one of the lions of the recent international exhibition at Florence. We believe the plant is to bear the name of the raiser, and will, in future, be known in collections and plant lists as *Sarracenia Moorei*.

Dendrobium citrinum (Bull).—A plant of this species was recently exhibited at South Kensington, and is remarkable for the near resemblance which its flowers bear to those of the well known

D. heterocarpum. Its habit of growth, and time of flowering, however, serve to distinguish it from that species; and its flowers, although slightly fragrant, are destitute of the delicious Violet-like odour peculiar to *D. heterocarpum*, and the little lilac-tipped *D. amœnum*. Its pseudo-bulbs are 3 or 4 feet in length and rather slender, the flowers being 2 to 3 inches across, and of a pale lemon-yellow colour, the lip being set with brown hairs, as in *D. heterocarpum*. The plant reminds me of one grown by a gentleman in the Isle of Man named Dendrobium Charltonii.—B.

Flowers for Winter Decoration.—What ought to be done this month to secure the flowering, during winter, of Geraniums, Carnations, or other similar plants? I have plenty of glass and only want to know what to do.—H. V. [To this question, Mr. Grieve, of Culford, has kindly furnished the following reply: "Let us suppose," he says, "that our correspondent's collection of Zonal Geraniums, or, rather, Pelargoniums, consists of healthy young plants in 4-inch pots, or, if in 6-inch pots so much the better; they should be shifted at once into pots one size larger than those they now occupy, and may be placed out-of-doors in a somewhat shady situation; but they will succeed better in a cold pit, placing the lights (the glass of which should be slightly obscured by some shading) over them during hot sunshine, and to protect them from heavy rainfall. When the plants have well filled their pots with roots, let them be shifted into their flowering pots, which should be their last shift for the season; the pots for this last shift may be some 8 or 10 inches in diameter. Stake and tie out the branches as may be required, regulating the development of the plants by stopping the ends of the strongest shoots in order to induce a compact and bushy habit. Pick off every truss of bloom as soon as it appears, and turn the plants frequently round. When the pots are well filled with roots, say about the middle or end of August, weak manure-water may be given about twice a week; and about the middle of September the plants should be taken into the conservatory or greenhouse, and up to this time they should not have been allowed to produce a single truss of bloom. They, however, may now be allowed to do so, and will at once commence to flower freely, and will continue in that condition until Christmas is passed, when they will require to be placed as near as possible to the glass; and the temperature should be slightly increased, to say about 50° as a minimum, when the plants will continue to bloom, though somewhat less profusely, throughout the entire winter. With regard to Carnations, there is a section of this family known as the winter-flowering kinds, which should now be growing in the open air under liberal treatment, and should be placed in the greenhouse about the beginning of October, when they will continue to flower throughout the winter. Roses, and other plants, intended to be forced into flower in winter, or early in spring, should now be enjoying comparative rest on the north side of a wall, or similar position, and should be placed in gentle heat early in November to be had in bloom during the following January."]

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Solanum betaceum.—It may interest your correspondent "W. M." (see p. 428), to hear that this plant has been grown in the great temperate house at Kew, for the past eight or ten years under the name of *Cyphomandra betacea*. In habit the plant is not unlike a tall Brugmansia, and its vermilion-coloured fruits are borne freely in clusters of from 3 to 7 inches each.

Epiphyllum truncatum.—What should this be grown in? Any hints, in short, as to its management will be gladly received.—A. SUBSCRIBER. [Epiphyllums succeed in well-drained pots, filled with fibrous loam and sand. They like a sunny position near the glass and plenty of water during the summer months, but in winter they should be allowed to get nearly dry, or they are liable to rot off at the collar, especially if on their own roots. We, however, presume your plants are grafted on either the Pereskia or Cereus.—E. F.]

Plants for a Miniature Rock-garden.—Can you recommend a few plants, succulents, Alpines, or others, which will have a nice fresh green look, and good flowers, grown in pockets in rock-work on the sunny side of a Fernery under glass, which is too hot for Ferns to do well? I want something which will stand through the winter without any heat, beyond what it will get from the Fernery being off the drawing room?—I. S. H. [Mesembryanthemums of different colours will succeed perfectly in such a situation, also Sedum Sieboldii, Lysimachia Nummularia, and some of the Mossy Saxifrages.—Ed.]

Shading by Whitening the Glass.—We have found no mode more simple than skin-milk, with a little powdered whitening mixed with it (say as much whitening as the size of a Walnut), reduced to a fine powder, and thoroughly mixed with two or three quarts of milk. We should advise those trying the scheme to do a piece of glass first. Let it dry, and add to the milk or whitening as less or more shading is required. If it be put on quickly and thinly by one man with a brush, and another follow with a dry duster-brush, merely daubing it quickly with the points of the dry brush, the shading will have the appearance of shaded ground glass, and look neat.

Effect of Coal Gas on Plants.—A small land-holder on the Continent, says the *Moniteur Horticole Belge*, not having a conservatory at his disposal, wintered his plants in a cellar, as is often done. Here, with a little attention, he succeeded in keeping them in tolerably good condition, when an escape of gas occurred from a defective pipe, which was unnoticed for some time. Its effect on the plants was most disastrous, causing the leaves to fall even before they had time to turn yellow. The foliage of Pittosporums in particular suffered, being completely destroyed in about twenty-four hours from the first escape of the gas.—M.

THE GARDEN IN THE HOUSE.

A WELL-ARRANGED DINNER-TABLE.

HAVING just seen a very charming arrangement of choice flowers and elegant plants used for the decoration of a dinner-table in rather a novel manner, I propose to offer a few explanatory notes on the subject. The display was in the dining-room of a city club, the main object of attraction being the decorations on a circular table, about 10 feet in diameter. This table is lighted from above by an elegantly designed chandelier, an arrangement of no small importance, as all shadows are then reduced to a minimum, and thrown equally on all sides, when, as in this case, the design is of a geometrical character. The centre was occupied by a circular bank of fresh green Moss, arranged in two semicircular zinc pans, the latter being designed to prevent the cloth becoming damp or soiled by contact with the wet Moss. This bank was neatly rounded towards the centre, from which an elegant plant of *Thrinax elegantissima* (one of the best of all the Fan-leaved Palms for the purpose) rose graceful in outline, the ends of the fresh green segments drooping on all sides, while the mossy bank at its base served as a cool bed for a few choice exotics. These last consisted of *Gardenias*, whose snowy flowers and glossy green leaves were as fresh as when cut from the plants; and with these some Cactus flowers, of the most brilliant crimson, contrasted most effectively; while side by side with them lay great clusters of the sweetly perfumed and pearly *Stephanotis*, mingled with the refreshing green of *Selaginella Kraussiana* (*hortensis*). This last-named plant is invaluable for purposes of this kind; for when, as in this instance, it is grown in small pots, the latter can be concealed in the Moss, or they can be turned out of the pots and laid on the zinc pans, the earth being concealed with gently arching Fern fronds (as in the present instance), fresh *Sphagnum*, or *Hypnum* Moss. The fresh green spray of this *Selaginella*, and the equally graceful *Lygodium scandens*, had a very fine effect, carelessly rambling on the snowy cloth, or twined gracefully round the slender rising stems of the Palms. At a little distance from this central group were arranged six trumpet-shaped vases, equi-distant, in a circle. These vases were about 2 feet and a half high, and were connected with each other by a graceful arch of wire draped with the fresh sprays of *Lygodium scandens*. All of them were very tastefully filled with Ferns and a few choice Orchids and exotics. The principal Fern used in these vases was *Pteris serrulata major*, around the mid-rib of which a piece of steel wire 6 or 7 inches long was twisted, so that the fronds could then be adapted to any degree of curvature, by which means they were, if possible, rendered still more graceful than is usually the case. Along with these were sprays of *Phalænopsis amabilis*, wired in a similar manner, the individual flowers of which forcibly reminded one of great moths of snowy whiteness; flowers of *Cattleya Mossiæ* had lips resplendent with crimson and gold, while their great windmill-like sepals and petals were faintly suffused with the softest rosy-lilac. Other rare Orchids employed were *Oncidium ampliatum*, with its soft golden-yellow flowers; *Cattleya intermedia*, with pearly segments and a bright amethyst-coloured lip; while the weird-like spikes and long antennæ-like flowers of *Brassia verrucosa* reminded one more of an insect than an Orchid. Outside the circle formed by these tasteful vases were half-a-dozen select little dinner-table plants, veritable models of lightness and grace. These consisted of choice Palms, of which the slender plumose *Dæmonorops fissus*, and *D. palembanicus*, may be mentioned as types; and other elegant plants, such as *Stadmannia Jonghii*, and the fresh feathery-leaved *Jacaranda mimosæfolia* may be taken as excellent examples; other Palms of larger size, say, from 3 to 4 feet high, consisted of the slender-stemmed *Oreodoxa regia* and the graceful *Euterpe edulis*. This arrangement was one of the best we have ever seen, as in no way was the view across the table intercepted, this being too frequently the case where thick bushy-habited plants are employed. The table was laid for sixteen persons, and before each guest was placed a neat little specimen glass with a bowl-shaped vase or finger glass,

the latter being half filled with water in which two or three pips of a double scarlet or pink *Pelargonium* floated along with a spray or two of Fern or *Selaginella*, while the little vases above each contained a choice button-hole bouquet, no two being exactly alike, and variously composed of Tea-Roses, *Erica ventricosa*, rare Orchids, and delicate Ferns.

F. W. BURBIDGE.

A Hint to Window Gardeners.—There are many who grow flowers in windows that do not care to go to the expense of boxes; and, where pot-plants are chiefly grown, boxes are scarcely essential, as the pots can, of course, be set on the sill outside. The pots, are, however, rather unsightly, and, to obviate this drawback, a neighbour of mine has ingeniously contrived to hide them. He procures a board about 8 inches broad, and half an inch in thickness, the length varying according to the width of the window. This board is fixed to the masonry on each side, and can be painted any colour, which will harmonise with its surroundings, and, if desired, it can be fixed so as to project an inch or two from the front of the sill by means of iron heldfasts. This gives mere space behind for the plants. This simple contrivance hides the pots from view in front, and also shades them from bright sunshine, which often ruins delicate-rooted plants. It, also, effectually secures the plant from falling, and is much better, in this respect, than the string or wire generally used for that purpose.—F. W. B.

Ivy for Indoor Decoration.—I do not know a single plant that will stand so much hard usage as Ivy. The only point on which cultivators err is not keeping its leaves clean. If it be well washed two or three times a week, and the soil well watered, it will grow for weeks, and even years, without danger from change of temperature. A vase, not necessarily costly, will answer well for Ivy; and this reminds me of Mr. McNab's excellent plan of growing it in vases. Long shoots of the Ivy were procured, with the young and tender aerial roots very abundant; the lower ends were wrapped in Moss, and then some five or six of these were tightly tied together at the bottom and placed in the vase. The latter was filled within a few inches of the top with water, and the ball of Moss suspended therein. Thus managed, the roots soon commence to grow; afterwards the Moss need not quite reach the water, as the roots will extend down into it, and prove all-sufficient. So many very beautiful varieties of Ivy are now in cultivation that, by selecting kinds that will form a decided contrast in shape and colour, the effect may be materially heightened. The centre of the vase may be filled with cut flowers, or Grasses, or, indeed, nothing would look better than Ferns. The Ivy may be allowed to hang down over the sides of the vase in graceful festoons, or else trained over and around the window, thus making a room appear cheerful and pleasant all the winter through. It is not necessary, and, in fact, I do not believe that Ivy will grow as well in strong light as when it is in a partially shaded position, as it likes shade and an even cool atmosphere. I have known instances where Ivy has been grown in large tubs, and trained up a staircase, thus forming a mass of green foliage from the hall below to the floor above. Planted in a box, and run over a low trellis, it makes a lovely window screen even in towns. Used in any way, in fact, as fancy directs, it is unexcelled as a house plant.—J. H.

Preservation of Wooden Labels.—Thoroughly soak the pieces of wood, of which they are made, in a strong solution of sulphate of iron; then lay them, after they are dry, in lime water. This causes the formation of sulphate of lime (a very insoluble salt) in the wood, and the rapid destruction of the labels by the weather is thus prevented. Bast, mats, twine, and other substances used in tying or covering up trees and plants, when treated in the same manner, are similarly preserved. At a recent meeting of a horticultural society, in Berlin, wooden labels, thus treated, were shown, which had been constantly exposed to the weather during two years, without having been affected thereby.

How to Test Impurities in Water.—A small and simple apparatus for detecting organic and other impurities in water, has been recently brought out by the Water Purifying Company, 157, Strand. The apparatus consists of a neat roan case in which are seven small tubes containing the standard test fluids—ammonia, organic matter, lead (positive and negative tests), carbonate of lime, sulphate of lime, sulphuric acid and iron, with test-tubes and dropping glasses complete. The apparatus has been tried on several occasions with waters of different kinds, and in every instance has been found to answer the purpose for which it is designed.

THE PAPER-REED OF THE ANCIENTS.

(CYPERUS PAPYRUS, OR PAPHYRUS ANTIQUORUM.)

It is not commonly known in gardens that the graceful plant, grown as the Papyrus of the Nile, is really another species, and that the true Papyrus is not in cultivation. Some years since, Professor Parlature, in the "Mémoires par divers Savants Etrangers, Institut Impérial de France," pointed out the difference between the true Papyrus of the Egyptians (Papyrus nilotica, vel ægyptiaca) and the plant which has hitherto been grown in botanic gardens under that name, but which is, in reality, the Syrian or Sicilian species (P. syriaca, vel siciliana). The former has been described and figured by Bruce, in his "Travels," vol. vii, p. 115, and differs so much in appearance from the Syrian plant, that it is impossible, on seeing both, to mistake one for the other. The distinction will be at once perceptible from the accompanying illustration, in which we reproduce M. Parlature's drawings of the two plants. In the Syrian Papyrus, the inflorescence takes the form of a globose umbel, and the involucre is reflexed; while, in the true Egyptian plant, the umbel is of an erect brush-like shape, with the involucre also erect. The Syrian plant also grows to a greater height—from 8 to 16 feet; while the true plant is generally not more than 5 or 6 feet high, and seldom reaches as much as 10 feet. These points of difference are at once patent to any observer. There are, however, several minor distinctive characters which the botanist will appreciate in the following minute descriptions of the two plants, by M. Parlature, from specimens in his possession.

Cyperus syriacus, Parl.

Umbel, decomposed, globose, with very numerous long and slender rays, the upper ones of which are erect; the middle or lateral ones longer, curving downwards; and the lower ones shorter and pendent. General involucre consisting of several divisions, much shorter than the umbel, the outer ones reflexed, pendent; partial involucre, of three (rarely four) linear thread-like channelled divisions, rough on the margin in the upper part, elongated, always much shorter than the rays; spikelets, narrowly linear, somewhat distant from each other; glumes, ovate, obtuse; paleæ, linear-lance-shaped, acuminate, somewhat longer than the seed, or achene, which is oblong, triquetrous, convex-angled on the outside, concave within, obtuse at the apex, smooth, of a tawny colour, about half the length of the glumes. Stem, tall (from 8 to 16 feet), triquetrous in the upper part, obtuse-angled at the base, generally leafless, and merely covered at the base with five or six acuminate sheaths. When leaves occur, they are broadly linear-lance-shaped, acute, keeled, rough with small teeth towards the top. Rhizome, thick, creeping. Native of Syria and Sicily, in shallow and slow-flowing streams. It is also found in Italy, in marshy places, not far from the Gulf of Genoa, between 32° and 38° of north latitude. Flowers from July to September.

Cyperus papyrus, Parl.

Umbel, decomposed, erect, somewhat nodding at the top; rays, very numerous, long, all erect, the upper or central ones longer than the others. Divisions of the general involucre, numerous, much shorter than the umbel; outer ones erect, spreading; divisions of the partial involucre, from four to six, narrowly linear, channelled, rough on the margin in the

upper part, very long—longer than the ray. (Flowers and fruit wanting in specimen.) Stem, from 5 to 6 feet (seldom as much as 10 feet) high, triquetrous, obtuse-angled; covered, for one-third from the base up, with numerous acuminate sheaths. Rhizome, thick, creeping. Found in marshy places in Upper Nubia, near the banks of the White Nile, at about 7° of north latitude; and in Abyssinia, between 9° and 13° of the same latitude. The preceding account of M. Parlature was published in 1854; but, since that time, the true Papyrus has been discovered in Palestine by the Rev. H. B. Tristram, who read the following paper on the subject before the Linnean Society:—

During my travels in Palestine, in 1864, I was pleased to find a Papyrus growing luxuriantly by the shores of the Lake of Galilee, close to the Ain et Tin, on the north of the plain of Gennesaret. Some stems, which I measured, exceeded 16 feet in length. I afterwards found, in the almost inaccessible marshes of the Huleh (the ancient Merom) many acres of the same plant. It is noticed by Dr.

Thomson in his "Land and Book," who gives a fair popular description of the plant under its familiar Arabic name of Babeer, but without knowing that the classical and modern Papyrus is simply a form of the original Babeer. The stems are cut down by the Bedouins for a less noble purpose than they served under the fostering care of the Pharaohs, viz., for the thatching of their huts and roofs, and for mats, and the roots are collected for fuel. I preserved, unfortunately, but one specimen from the Lake of Galilee, and none from Merom. Since the Papyrus syriacus is well known as growing on the plains of Acre and Sharon, I was assured that this must be the same. Feeling, however, some suspicion on the subject, I forwarded my specimen to Professor C. C. Babington, of Cambridge, who assures me that he has no doubt of its being the true *Cyperus Papyrus*, and not the plant usually cultivated under that name, which is the *Cyperus syriacus* of Parlature. I regret that, at the time of my visit, the seeds were not ripe, as Professor Babington informs me that no living specimen of the true *Cyperus Papyrus* exists in our botanical gardens. He also adds that it is only known now to grow in marshes of the White Nile, in Nubia, 7° north, but is lost in Egypt, and that my discovery, though simply a corroboration of the statement of Bruce ("Travels," vol. vii., p. 115,) may be of some

interest. It appears to me that the discovery of this species so far north as the upper end of the Lake of Galilee is important when viewed in connection with our discovery of so many African species of fish in that lake; the more so as the ornithological and mammalian forms which recall the African fauna do not extend so far up the Jordan basin, and it was to the south of the Dead Sea that we obtained most of our African types, as shown by Mr. Lowne in his paper on the flora of the Wady Zuweirah.

Although this famous plant has now become quite extinct in Egypt (the country with which its name is historically connected), it still abounds in the waters of the Upper Nile. In his recent work, "The Heart of Africa," Dr. Schweinfurth thus describes his impressions on first beholding it growing in luxuriance in one of the Nile channels, named Bahr-el-Ghazal: "To me, botanist as I was, the event elevates the day to a festival. Here, at a latitude of 9° 30' N., we are now first able to salute this sire of immortal thought, which, centuries ago, was just as abundant in Egypt, as at present it is on the threshold of the central deserts of Africa. I was quite lost in admiration of the variety of production of the surface of the water, to which the antique Papyrus



True Egyptian Papyrus.

Syrian Papyrus.

gave a noble finish. It strikes the gaze like the creation of another world, and seems to inspire a kind of reverence. Although for days and weeks I was environed by the marvellous beauties which enrich the flora of the Nile, my eye was never weary of the apparition of its graceful form."

The plant is pretty generally known as that which yielded the paper of the ancients, which was made from the inner bark of the stem. This is composed of thin laminae or layers, and these when unrolled and placed together formed a sheet. The layers obtained from near the centre were the best, and each layer diminished in value, in proportion to its distance from that part of the stem. When carefully peeled from the plant, and dressed at the sides, that these might join evenly, these layers were laid close together on a hard flat table, and then other pieces, similarly cut, were laid across them at right angles. They thus formed a sheet of many pieces, and, to

are yet in a wonderful state of preservation. They are generally found thrust into the breast, or between the knees of the mummy, and occasionally they are enclosed in small wooden boxes or in purses. The rolls are always compressed; sometimes their exterior is ornamented with gilding, in which case they are looked upon as of superior value. In the museum of Naples, there are not less than from 1,700 to 1,800 MS. Papyri, which have been dug from the ruins of Herculaneum, and yet only a very small portion of that ancient city has been dug out of the mass of lava by which it was overwhelmed. The writing on many of these MS.S. is very clear and distinct, but it may be doubted whether the paper produced from this substance, even when the art was in its perfection, and the best Papyri of the Nile were employed, ever equalled the paper now made from linen rags in any one quality except durability. In Sicily, the Syrian Papyrus



The Syrian Papyrus on the River Anapus, in Sicily.

promote their adhesion, the whole was moistened with the water of the Nile, and, while wet, pressure was applied. The glutinous matter inherent in the bark was the main cause of the adhesion of the layers. The sheets were afterwards dried in the sun, and were then again pressed, and smoothed, and flattened by being beaten with a wooden mallet. In some cases, when the plants themselves did not contain sufficient juice, or when the water did not dissolve the juice properly, the layers were joined together with paste, made of fine flour, mixed with hot-water and a little vinegar. The ancient Egyptians made their sheets of prodigious length, though narrow. One of those, purchased by the Earl of Belmore, was 14 feet long by 1 foot broad; and Belzoni had a Papyrus 23 feet long by 1½ broad. The quantity of the Papyrus used by the Egyptians in their funeral ceremonies, alone, must have been very great. The Papyri now found in the ancient tombs and mummy caves of Egypt

occurs in great abundance in the river Anapus, near Syracuse. A recent traveller thus describes its appearance in this locality:—

The river Anapus, after flowing through an alluvial plain, which requires draining very much, being in many parts swampy, and emitting the most unhealthy miasmata, falls into the sea at the west side of the magnificent harbour of Syracuse. We ascended the river for some distance in a flat-bottomed boat. Near its mouth the water was pretty deep, but muddy; and a little farther on we found it contaminated and obstructed by heaps of Hemp, which were steeping there. The current was scarcely perceptible; but our progress was impeded by aquatic plants and strong high rushes, which, in many places, so covered the river from side to side, that we could scarcely see the water. At the distance of about an Italian mile from the mouth of the river, we first came in sight of the object of our search, the graceful Papyrus plant, which we saw growing in little clusters, and shooting above groups of Water Lilies on either side of the river. A quarter of a mile higher up, we turned

to the westward, and quitting the main stream, entered the Cyanean branch, which here forms its junction. This branch was still more covered with Reeds and aquatic plants than any other part we had come through; but, unlike the Anapus, its water, when visible, was as clear as a mountain stream in Scotland. In proportion as we proceeded up this branch, which is very winding and deep, we saw the Papyrus in thick groups; and, as we laboured to force our way through the rich vegetable obstruction, which became stronger and stronger, the beautiful feathery tufts of the plant bending with its slim elastic stem, frequently flapped in our faces. At a short distance from the fountain head, the serpentine stream was so completely choked up with a vegetation of surprising tenacity that, having no man to tow us along from the banks, and indeed, no assistance but such as a little boy from Syracuse could render us, we were well nigh giving up our farther progress, for the present, in despair. Persevering, however, by cutting, and tearing, and forcing our little punt through or over this matting of plants and flowers, we at last shot into the clear basin of the Cyanean fountain, well bathed with perspiration and its own waters. This famous fountain, which, coming by the winding course of the stream that flows from it, may be somewhat more than half a mile from the Anapus, is a circular pool, of from 60 to 70 feet in diameter. Its waters, though the bottom of the basin seems formed of black mud, are remarkably pure, and so transparent that you can see the fish which swarm there, and any other object, far beneath the surface, as clearly as though you looked through the medium of a transparent atmosphere. According to our measurement, the fountain was then 32 feet deep;—it was fringed all round with the graceful Cyperus. Nothing remained of the ancient temple of Cyane except some blocks of marble, that had fallen or been thrown into the fountain; even the name of Cyane was no longer known there, the Syracusans calling the fountain and the stream La Pisma. Few spots could be more solitary, and still the limpid water flowed without a ripple, nor were any sounds heard except the occasional twitter of a sort of Reed-sparrow, and now and then the rustling of the high Papyrus, and other aquatic plants, as they were shaken by a breath of summer air, or agitated by the fish gliding among their roots. The Papyri fringing the pool seemed literally to float upon its tranquil waters, their principal root, which is large and bulbous, running horizontally at the surface of the stream, and long slender filaments depending perpendicularly from it, like so many little cables to keep it at anchor. The shaft or stem proceeding from this root was frequently 10 feet high, without measuring the flowing tuft in which it terminated. From some of them which we cut down and carried away with us, we easily made a sort of paper, though I cannot say much of the quality we produced, being hurried and without proper implements. We were obliged to fasten the strips together, to form one sheet, with gum, which may have arisen from the Syracusan Papyrus being deficient in the glutinous quality of those of the Nile, or which is at least as probable, from our not dissolving it properly, or not giving the strata sufficient pressure. Some manufactured Papyri we saw in the house of a gentleman of Syracuse were certainly infinitely superior to our own, though even these would have been a poor substitute for our English writing-paper of the very worst quality. They were specimens of the result obtained by an antiquary called L. Cavalier Landolina, who, a good many years before, had endeavoured to revive the ancient manufacture, confidently anticipating that it would supplant paper, not only in Sicily, but in all Europe.

Our last illustration is from a sketch taken on the Cyanean branch of the river Anapus, and shows the luxuriant growth of the Syrian Papyrus in that district. W. M.

Sociable Plants.—Under this heading, M. Lebas makes the following remarks:—In a state of Nature, certain plants are always found growing singly by themselves, while, others are as invariably found growing together in groups. He thence infers that the former are influenced by some mysterious antipathy against, and the latter by an equally strong sympathy for, each other. He instances the case of the Common Service Tree (*Sorbus domestica*) under cultivation. This, he says, cannot be well grown, if planted by itself, as the plants invariably grow rickety, and always become covered with galls and canker; while, if they are planted among Apple trees, &c., in the same soil, and under precisely the same conditions, they thrive to perfection. He has remarked also, that if seeds of the Service Tree are sown by themselves, the seedlings are always poor and miserable; whereas, if the seed is mixed with Pear seed, the Service seedlings come up vigorously, and often make stronger plants than the Pear seedlings. M. Lebas' account of his experience with the Service Tree is intelligible, on the supposition that these trees grow best when sheltered by others; his experience with the seeds, however, requires confirmation.—M.

THE ARBORETUM.

BRITISH ROSES.

With the public, generally, the favourite Roses must ever be the fine hybrid kinds, and the public are quite right to prefer these for garden culture. We, however, hope that there may be found many to whom the beauties of the wild single Roses will prove attractive, and that our own British kinds may not be forgotten, but planted here and there in half-wild places. We have, therefore, prepared an abstract of Mr. Baker's exhaustive paper on British Roses. It will serve to show what varied beauty there is among our native wild Roses alone.

Key to the Species.

Group 1. Spinosissimæ.—Low erect compact bushes, with crowded and very unequal prickles, the large ones slender and nearly, or quite, straight; leaves, naked or hairy, never more than slightly glandular beneath; sepals, persistent or sub-persistent.—1. *spinosissima*. Fruit, dark purple; flowers, always solitary.—2. *rubella*.* Fruit, bright red; flowers, not essentially solitary; sepals, truly persistent, always simple, thinly glandular on the back; leaves, quite naked, with simple teeth.—3. *involuta*. Sepals, truly persistent, more or less compound, densely glandular on the back; leaves, more or less, often very, hairy, the teeth generally compound.—4. *hibernica*. Sepals, compound, naked on the back, not fully persistent; leaves, naked or thinly pubescent beneath, simply toothed.

Group 2. Villosæ.—Larger bushes, erect or lengthened out and arching; prickles, uniform, scattered, slender, scarcely at all hooked; sepals, persistent or sub-persistent, always densely glandular on the back; leaves, generally very hairy, and inconspicuously or not at all glandular beneath.—Sepals, truly persistent; fruit, ripening early, with no disk. 5. *pomifera*. Bush, arching; sepals, copiously compound. 6. *mollissima*. Bush, erect; sepals, sparingly compound.—Sepals, not truly persistent. 7. *tomentosa*. Fruit, later in ripening, with a distinct disk like that of canina.

Group 3. Rubiginosæ.—Smaller bushes than in the last and next group, erect or arching; the prickles, scattered, stouter downwards, and decidedly hooked, sometimes with a few aciculi mixed amongst them; leaves, thinly hairy or not at all hairy, but always densely glandular over the under surface; sepals, sub-persistent.—8. *rubiginosa*. Very odorous; bush, erect and compact.—9. *micrantha*. Arching bushes without decided Sweet-briar fragrance; prickles, uniform; flowers and leaves small; styles, naked; peduncle, generally acuminate.—10. *pulverulenta*. Prickles, often with a few bristles intermixed; flowers and leaves, larger; styles, hairy; peduncle, rarely bristly.

Group 4. Caninæ.—Larger bushes, always lengthened out and arching; prickles, uniform, scattered, decidedly hooked, and thickened downwards; sepals, deciduous or sub-persistent, usually naked on the back; peduncle, generally naked, and leaves naked, or but thinly hairy, and not at all glandular over the surface.—11. *canina*. The only species.

Systylæ.—Styles, united in a slender column, which is protruded beyond the disk; arching or trailing bushes; prickles, uniform, stout, hooked; sepals, deciduous; fruit, late in ripening.—12. *stylosa*. A high arching bush like Canina, with copiously compound sepals; the style-column shorter than the stamens. 13. *arvensis*. A low trailing bush, with short slightly compound sepals and a style-column equalling the stamens.

Group 1.—Spinosissimæ.

R. spinosissima (Linn.).—Stems, usually quite erect, 1 to 3 feet high, with short stiff compact branches. Prickles, very dense. Branches, often bright reddish-brown. Full-grown leaves, $1\frac{1}{2}$ to 2 inches long, with seven or nine oblong leaflets. Corolla, 12 to 18 lines across when expanded, white, with a yellow throat, rarely variegated with red. Disk, none. Fruit, depresso-globose, dark purple, with a dark purple juice; 5 to 6 lines broad, quite naked, crowned with the erect persistent sepal; changing colour in September in the low country in England. In Britain, extending from the south of England to Caithness, ascending in the north of England to 500 yards above the sea-level, and in the Scotch Highlands to nearly 600 yards, and in Ireland also reaching from the north to the south, with a preference for the sands of the seashore, and inland for limestone. Though it is the only Rose known in Iceland, yet in Scandinavia it is much less boreal in its range than *mollissima* or *canina*, being restricted, like *tomentosa*, to the south-west. It is universally distributed through Central and Southern Europe, reaching the Barbary States, Cashmere, and, through Siberia, to the north of China (Prof. Bunge). Though it varies much, according to its place of growth, in

* This, and *pomifera*, though introduced in the key, have, as will be seen, no fair claim to be regarded as British plants.

luxuriance and the density of its prickles, we do not appear to have in Britain any striking variety. With us, the form with a naked peduncle is much the most common, that with an aciculate peduncle quite rare. Lindley's var. *platycarpa*, is a small Irish form with an aciculate peduncle, his var. *turbinata*, another small form with turbinate fruit, and his var. *reversa*, another small form with slender deflexed prickles and ovate fruit. The form with the flowers variegated with red, *R. Ciphiana* (Sibbald) is the parent of many of the garden Scotch Roses. A plant with red fruit was gathered by Mr. Borrer, in Sussex, and another with ovate-urceolate fruit by Mr. Jackson, in Scotland, and Mr. Robertson, in Durham. Var. *pilosa* (Lindl.) evidently does not belong here, but to *R. involuta*. *R. sanguisorbifolia* is a mere form of this, with nine to eleven leaflets. The principal European varieties are:—*R. Ripartii* (Déség.) with doubly-toothed leaves, more decidedly glandular petioles and stipules, and peduncles usually, but not always, aciculate; *R. consimilis* (Déség.) with glabrous styles, unarmed and glandular petioles, and simply toothed leaflets slightly hairy on the mid-rib beneath; *R. spreta* (Déség.), with less numerous prickles, thinly hairy styles, and unarmed petioles; and *R. myriacantha* (DC. Lindl.) a stunted, compact, erect plant with very long and very dense prickles, doubly-toothed leaflets densely glandular all over beneath, deep-red flowers, peduncle, and usually the calyx-tube, densely bristly and hairy, and simple sepals densely glandular on the back. Other varieties are the Siberian *R. altaica* (Willd.), *R. grandiflora* (Lindl.), and the Himalayan *R. unguicularis*, Bert. Misc.

R. rubella (Smith).—A bush with just the general habit of *spinosissima*, but the prickles more slender and fewer in proportion to the small setaceous bristles. Full-grown leaves $1\frac{1}{2}$ to 2 inches long, with seven to nine leaflets, which are just like those of *spinosissima* in texture, but more oblong and more sharply toothed. Flowers, usually solitary, but occasionally in twos. Corolla, cream-coloured, or often variegated with red, 12 to 18 lines across when expanded; the styles densely villose. Fruit, bright-red, changing colour in England early in September, usually but not invariably drooping, roundish or short ovate-urceolate, 6 to 8 lines long; the sepals fully persistent. Disk, none. This is a plant well-known in botanic gardens. It is very like *spinosissima* in habit and prickles; but the fruit is different, the peduncles are always bristly, the sepals are glandular on the back, and the flowers not always solitary. *R. stricta* of Muhlenberg (a plant attributed to Pennsylvania, no doubt in error, as it has never been gathered in recent times), and *R. Caudoleuca* (Thory), do not appear to differ from it by any tangible characters, and the Himalayan *R. Webbiana* (Wall.) is very nearly, if not absolutely identical with it. There are specimens in several herbaria labelled as having been collected by Winch on the sands of the seashore south of Shields Law on the Durham side of the Tyne; but Winch certainly did not know it clearly, for a plant collected by Mr. Hogg, near Hartlepool, which he called *rubella*, is only ordinary *spinosissima*, and it is probable that some confusion has arisen. I have not seen specimens complete enough to be able to form a clear opinion as to what are the relations to this of *R. reversa* (Walldst and Kit.); but the difference, if any, must be very slight. Dr. Thomsen's extensive suite of specimens from the Himalayas appear to run this by gradual stages into *spinosissima*. My specimens from the Alps are too few to show fairly what may be the case there; and, on the other hand, as will be seen, it comes exceedingly near to some of the varieties of the next.

R. involuta (Smith).—Though *involuta* is the name which has the right of priority, yet the variety called *Sabini* is much the most common, and I therefore take it first.—Var. *Sabini* (Woods). In exposed places, an erect shrub 2 to 4 feet high, with short compact branches, with dense prickles passing down by gradual stages into bristles; in shade or hedges, some times drawn out and arching. Well-developed leaves of the barren shoots, $2\frac{1}{2}$ to 3 inches long; the upper surface thinly grey-pubescent, the lower more so, and often slightly glandular. Flowers, one to three, varying from pure white to deep pink, $1\frac{1}{2}$ or even 2 inches across when expanded. Styles, densely villose. Sepals ascending after the petals fall, quite persistent upon the erect roundish red fruit, which measures 7 to 8 lines each way, and changes colour in the north of England late in September or Early in October, and is only produced very sparingly. Disk, none. Sparsely distributed through Britain, from the Isle of Wight and Sussex, northward to Caithness, ascending to 300 yards in Yorkshire. It appears to reach its maximum of frequency in the north of England. Several stations are known in the north of Ireland. *R. gracilis* (Woods) is not more than a robust condition of this variety with the prickles, like the rest of the plant, abnormally stout, and a little curved.—Var. *Doniana* (Woods). A form found in dry exposed situations, with leaflets more densely hairy than in the last, and consequently greyer-green and softer. Calyx-tube and fruit, densely prickly; Flowers solitary, and sepals hardly, if at all, pinnate.—Var.

gracilescens (Baker). A robust form, gathered in county Antrim by Dr. Moore, with leaves 3 to $3\frac{1}{2}$ inches long, ovate leaflets, thinly hairy on both sides, not at all glandular beneath, with copiously compound toothing, the terminal one 15 to 16 lines long, by nearly an inch broad. Petioles, with few or no bristles and glandular hairs. Flowers, three to six, in a cluster. Bristly peduncles, and naked elliptical calyx-tube.—Var. *Robertsoni* (Baker). Intermediate between *Sabini* and the original *involuta*. Leaflets, with the teeth sharper and less compound than in *Sabini*; glabrous (when mature), on the upper surface, hairy principally on the ribs, and inconspicuously glandular beneath. Calyx-tube sometimes, but not always, naked. Sepals, as compound as in *Sabini*.—Var. *Smithii* (Baker). A stunted erect bush, with leaflets naked when mature on the upper surface, hairy principally on the mid-rib beneath, and scarcely at all glandular, the serrations closer and sharper than in all the preceding forms and but slightly compound. Flowers, solitary, the peduncle and calyx-tube densely bristly, the sepals simple. The only British specimens I have seen well representing this variety were gathered in Arran and near Richmond, in Yorkshire.—Var. *laevigata* (Baker). Peduncle and calyx-tube quite naked, the latter depresso-globose. Leaves, like those of *Sabini* in clothing and toothing. Petioles, villose and glanduloso-setose, but scarcely at all aciculate. Sepals, all quite simple and not glandular on the back. Gathered near Broughton Spa, West Yorkshire, and a similar plant in Antrim and Derry.—Var. *Moorei* (Baker). Prickles, stouter than in any of the other forms. Leaflets, nearly naked above, thinly hairy and densely glandular beneath, the serration like that of var. *Smithii*, the petiole scarcely at all hairy. Flowers, one or more.—Var. *occidentalis* (Baker). Very near *Wilsoni*, but the leaves smaller, slightly hairy beneath. Peduncle, densely aciculate and glanduloso-setose. Calyx-tube, globose, naked, the main sepals not more than half-an-inch long, with one or two setaceous pinnae on each side. Described by Lindley from an Irish specimen still in the Hookerian herbarium, the exact station not known.—Var. *Wilsoni* (Borrer). An erect bush 2 or 3 feet high, with deep vinous purple branches and leaves, and stipules often suffused with the same colour. Prickles, as in *Sabini*. Flowers, one to three, full pink. Fruit, with more of a tendency than in *Sabini* to an ovate pitcher-shape; when well developed, 8 to 9 lines long by half-an-inch broad. Banks of the Menai, near Banger and at Umbra rocks, county Derry. It will be seen by the descriptions that the extreme forms placed here run into one another by very gradual stages. *Doniana* is like reduced *mollissima*, with crowded unequal prickles, whilst *Wilsoni* touches close upon *rubella*, and *Moorei* approaches some of the *Rubiginosae*. It is noteworthy that a plant so widely spread in Britain, and with so many varieties, should be so rare upon the Continent. It is known only in two widely separated tracts—the provinces of Namur and Luxemburg, in Belgium, and upon Mount Salève, near Geneva.

R. hibernica (Smith).—In exposed places an erect shrub 3 or 4 feet high, but in hedges drawn out and slightly arching. Prickles, less crowded than in *involuta*, but running gradually down into setaceous bristles in the same way. Leaves of the barren shoot, 3 to 4 inches long; the upper surface a slightly glaucous green, naked or inconspicuously hairy on the mid-rib, the lower surface thinly hairy on the veins, not at all glandular. Flowers, generally one to three, but sometimes up to a dozen. Corolla, pale pink, 15 to 18 lines across when expanded. Styles, densely hairy. Sepals, ascending after the petals fall, but not fully persistent. Fruit, roundish, about half an inch long and thick, crowned with a decided disk, not ripening till October. The form with hairy leaves occurs in Derry and Down; and, in England, in Cumberland and Cheshire. A form (var. *glabra*, Baker), with sharper teeth and leaves quite naked, has been gathered in Sutherlandshire, Durham, Cumberland, North Yorkshire, Cheshire, and Surrey; and Dr. Moore has found another glabrous form with larger nearly round leaves and blunter teeth than in the type on rocks at 1,000 feet above the sea-level on Ben Evanagh, county Derry.—Var. *cordifolia* (Baker). Prickles, more slender and denser than in the type, the large ones scarcely curved. Leaves, nearly naked below, the teeth more open and blunter than in the type. Northumberland. No one who has once seen this growing is likely to confound it with any other species. The fruit is different from that of *involuta*; but to all the other distinguishing characters taken singly, some of the forms furnish an exception. In general habit, when in flower, the ordinary glabrous English form has just the same sort of resemblance to typical *canina* that *Doniana* has to *mollissima*.

Group 2.—Villosae.

R. pomifera (Herm.).—A robust arching bush 4 to 6 feet high, with a trunk sometimes as thick as a man's arm, with dull purplish glaucous branches and scattered, uniform, slender prickles, 4 to 6 lines long. Well-developed leaves, 5 to 7 inches long, grey-green,

but not softly pubescent on both sides as in *mollissima*, the underside often slightly glandular, the teeth open and copiously compound. Flowers, one to three, pink. Fruit, ripe in August, bright red, globose or broadly turbinate, often, but not always, pendent, densely covered with strong prickles. A stronger-growing plant than *mollissima*, with arching branches, larger and more openly toothed, narrower leaves, not so softly pubescent, and larger flowers and fruit, and copiously compound sepals. It is an old favourite in gardens, but seems to possess no fair claim to be considered British. The English specimens gathered of late years, which we have seen, are from Staffordshire, Cotes Heaths, and Gloucestershire. It is a native of Scandinavia, Belgium, North Germany, the Alps, and Jura, reaching the Pyrenees, Apennines, and Tyrol, and, according to Nyman, Castille, Tauria, and Mount Athos. The corolla is often beautifully gland-ciliated, and in cultivated specimens we have seen it 3 inches across.

R. mollissima (Willd.).—Bush erect, 3 or 4 feet high, never arching, with short ascending branches, bright reddish-purple with a glaucous tinge in exposure. Prickles, scattered, uniform. Fully-developed leaves, 4 to 5 inches long, with seven leaflets, generally a paler grey-green than in any other species, the upper surface always more or less pubescent, the lower more so. Flowers, usually one to three, crimson in bud, deep rose when expanded, rarely white, sometimes gland-ciliated, 15 to 18 lines across when fully open. Sepals, ascending after the petals fall, and quite persistent upon the pulpy globular bright red fruit, which is $\frac{1}{2}$ to $\frac{3}{4}$ inch broad and deep, and ripens before that of any other species, changing colour in the north of England early in August, or even sometimes late in July, and sometimes, but not always, cernuous. Styles, densely villose. Disk, none. From the Humber northward through England and through Scotland, this species appears to be universally distributed, coming next in order of frequency to *canina* and *tomentosa*, to which three species at least 90 per cent. of the Roses of the northern half of our island must belong. *Tomentosa* and *mollissima* often resemble one another so closely, that it is not safe to pronounce upon ordinary herbarium specimens; but the fruit is very different, both in character and time of ripening; and, when growing, the habit of the bushes is different. The following are the most striking English varieties:—*Var. cœrulea* (Woods). Leaves, softer and greyer than usual, with very few glands or bristles on the petiole; the points of the sepals often very leafy. Calyx-tube and fruit, broader than deep, and perfectly smooth, the fruit pendent. Peduncle with fewer and weaker glandular hairs and bristles than usual, and, in extreme cases, quite naked. A common Northumbrian form, and I have seen it also from Argyleshire, Durham, Cumberland, and West Yorkshire. —*Var. pseudo-rubiginosa* (Lejeune). Bracts and veins, deep red. Upper surface of the leaves nearly naked, and the lower only thinly hairy, but conspicuously glandular. West Yorkshire, Settle.

R. tomentosa (Smith).—An arching shrub, 6 or 8, or even 10 feet high, with elongated branches, duller than in the last, and not so glaucous. Prickles, scattered, uniform. Fully developed leaves, 4 to 5 inches long, the upper surface thinly grey-downy all over in the typical form; the lower more so, with often, but not always, a few inconspicuous glands scattered over the surface. Flowers, generally one to three; bright rose-pink, or not unfrequently pure white. Fruit, oval pitcher-shaped, in the typical form, or sometimes turbinate, never pendent, ripening in the north of England through September; furnished with a medium-sized disk, like that of *canina*. This appears to be universally distributed through Britain. I have seen it from Caithness and Sutherland down to Cornwall, and Devonshire, and Sussex, and gathered it myself in the Isle of Wight, and up to 550 yards in the north of England. It is spread over both the north and south of Ireland. The plants called by Dr. Moore, in "Cybele Hibernica," p. 97, *tomentosa* and *scabriuscula*, he has cultivated side by side in the Glasnevin Garden, and found to come true from seed for at least two generations; and yet his *scabriuscula* does not differ from the type nearly as much as the plant just to be described under that name; but is simply a form with white flowers tipped with crimson, and leaves quite as hairy, but rather more glandular beneath than usual. The principal varieties in Britain are the following:—*Var. subglobosa* (Smith). Fruit, quite globose. The leaves, softly grey-downy on both sides, scarcely at all glandular on the petiole or under surface, the serratures often not so compound as in the type. The flowers, in some of the specimens, seven to eight in a cluster, and the prickles stouter and a little curved. Sherard's plant, on which it was founded, was gathered by the Thames-side near Kingston; and I have seen this variety also from the Isle of Wight, Cambridgeshire, Devonshire, Anglesea, Yorkshire, and Northumberland. —*Var. farinosa* (Rau). A small weak variety, with leaves densely grey-downy when young. Petioles, slightly glandular. Serrations, open and copiously compound. Fruit, obovoid, both it and the short peduncle quite destitute of bristles and glandular hairs, and

main sepals only very slightly compound. Gathered in Perthshire, near Blair Athol. This variety and the last are the forms of *tomentosa* most likely to be confounded with *mollissima*.—*Var. scabriuscula* (Smith). The plant intended by Smith under this name differs from the type by having the leaves less hairy; and, consequently, greener and harsher. They are often very nearly naked on the upper surface, when mature, and are hairy principally on the ribs beneath, and scarcely at all glandular. The prickles are straight and slender, and the fruit ovate and usually densely bristly. This is a widely-dispersed variety. Lindley's *var. resinosa* is essentially the same, with deep-coloured flowers, very narrow leaves, and very sharp compound teeth.—*Var. sylvestris* (Woods).—Prickles, stouter than in the type, and slightly curved. The average of the variety, as represented in my fasciculus, differs principally from *scabriuscula* by the leaves being considerably glandular beneath.—*Var. obovata* (Baker). Prickles, uncinat. Leaflets, obovate-oblong, with a sub-deltoid base and very deep and compound upper teeth, grey-green, soon quite naked on the upper surface, thinly hairy and glandular beneath. Durham, by the side of the high-road a little out of Eglestone, going towards Middleton in Teesdale. A connecting link between *tomentosa* and *pulverulenta*.

Group 3.—*Rubiginosæ*.

R. rubiginosa (Linn.).—A bush from 3 to 5 feet high, the main stem scarcely arching, and the branch short and straight. Main prickles, scattered. Well-developed leaves of the barren shoot, $2\frac{1}{2}$ to 3 inches long, with seven leaflets. Flowers, usually one to four; generally full rose, 12 to 15 lines across when expanded. Ripe fruit, sub-globose, measuring about $\frac{1}{2}$ inch each way. The common Sweetbriar of gardens, indigenous amongst the chalk-hills of the south of England, but I have seen specimens from as far north as Perth and Inverness. Messrs. Moore and More do not claim it with any confidence as a native of Ireland.—*Var. permixta* (Déséglise). Leaves in our plant quite without hairs, but as densely glandular on the under surface and petiole as in the type. Styles, quite glabrous. Fruit, oval pitcher-shaped, half as long again as broad, and decidedly narrowed at the neck, densely prickly, the sepals falling before it reddens. Surrey. This recedes from the type towards *micrantha* by the naked styles and shape of the fruit, but in other respects agrees with the type.—*Var. sylvicola* (Déség. et Ripart). Bush, laxer and not so strongly scented as in the type. Prickles, more slender. Leaflets, larger, thinly hairy beneath. Glands, fewer and finer. Fruit, broad oval pitcher-shaped. Styles, hairy. North Yorkshire.

R. micrantha (Smith).—A taller and laxer bush than the last, generally, but not always, without any decided Sweetbriar fragrance. Prickles, scattered and quite uniform. Well-developed leaves, $2\frac{1}{2}$ to 3 inches long, with seven leaflets. Petals, pale rose, the expanded corolla not much over an inch across. Fruit, bright scarlet, oval pitcher-shaped, 7 and 8 lines long by 5 to 6 lines broad, with a decided disk like that of *canina*, changing colour late in September or early in October. This differs from *rubiginosa* by its laxer habit of growth, faint odour, uniform prickles, glabrous styles, and in the character of the fruit and sepals, and may be considered midway between *rubiginosa* and *canina*. In some parts of the Isle of Wight it is as plentiful as *canina*; it is a plant of the Channel Islands; Mr. Borrer gathered it in many places in Sussex, and Mr. Briggs in Devon and Cornwall; and it extends northward to Anglesea, Cheshire, Yorkshire, and to Northumberland. In Ireland it appears to be restricted to the neighbourhood of Cork.—*Var. Briggsii* (Baker). A luxuriant variety, with leaflets 15 to 18 lines long, 10 to 12 lines broad, naked above, less glandular than in the type beneath. Calyx-tube and fruit, shorter and stouter, and, like the peduncle, quite naked. Sepals, more pinnate and scarcely glandular on the back. Devonshire.—*Var. Hystrix* (Leman). A small variety with narrow sharply-toothed leaves, densely glandular beneath, but quite without hairs. Terminal leaflet, cuneate at the base. Peduncle, densely aciculate. Calyx-tube, naked. Surrey, Oxfordshire, and Gloucestershire. In leaves and general habit very like *R. sepium*; but the sepals are glandular on the back, and the peduncle densely bristly.

R. pulverulenta (M. Bieb.).—A taller and stronger bush than *micrantha*, with a similar habit. Prickles uniform, or with a few setaceous bristles intermixed. Well-developed leaves of the barren shoot 3 to $3\frac{1}{2}$ inches long, with seven leaflets. Flowers, usually one to three; pink, 15 to 18 lines across. Fruit, ovate-urceolate, as large as that of *canina*, and with a similar disk, not ripening till October or late in September. This is very near *micrantha*, but is a stronger plant. I have seen it only from four counties in Britain—Somersetshire, Yorkshire, Durham, and Northumberland.—*Var. Billietii* (Puget). Prickles of the main stem decidedly unequal, the main ones as large and as strong as those of

the type, but only slightly hooked. Leaflets, smaller. Fruit, ovate-pitcher shaped, 7 to 8 lines deep. In Britain I have seen this only from Allesley, in Warwickshire.—Var. *cryptopoda* (Baker). Prickles, rather unequal, the large ones hooked and robust. Leaflets, ovate-oblong, the terminal one about an inch long by three-quarters as broad; the upper surface glaucous green, naked; the lower thinly glandular all over, hairy on the main veins. Fruit, sub-globose, 7 to 8 lines each way. West Yorkshire.

Group 4.—*Caninæ*.

Series 1.—*Ecristatæ*. Leaves, not glandular beneath. Fruit, very hard when green, not ripening till October or the latter part of September; the sepals still remaining reflexed after the petals fall, and becoming disarticulated before it changes colour.

Peduncles not bristly; leaves glabrous on both sides.

R. Canina (Linn.)—Var. *Lutetiana* (Leman). An arching bush often 10 or 12 feet high, with elongated arching branches. Prickles, scattered, uniform, falcate, very robust. Fully-developed leaves of the barren shoot, 3 to 4 inches long, with seven leaflets. Flowers, one to four, pinkish, 18 to 24 lines broad. Fruit, ovate pitcher-shaped, 7 to 9 lines long, not changing colour till October in the north, or late in September in the south of England. In the broad sense of the term, as here defined, *R. canina* is universally dispersed through Britain, including Ireland, and is in most districts far more common than any other Rose, or than all the others put together. In the north of England it reaches an altitude of 450 yards. It extends everywhere through Europe, except Lapland and Finland, and reaches the Canaries, Barbary, Persia, and Siberia. Of the varieties here described, *Lutetiana*, *dumalis*, and *urbica*, with intermediates between them, are the most common in Britain, all the others being much less frequent. Of this, the names *glaucescens* and *Afzeliana* refer especially to the plant with glaucous leaves. *R. Malmundariensis*, a modification of this variety with sepals glandular on the back, has been gathered by Rev. W. H. Pearch in Derbyshire.—Var. *surculosa* (Woods). A very robust form, like the last, but with flowers often ten to twelve (I have seen twenty to thirty) in a cluster, flat leaflets broadly rounded at the base and with more open teeth; the young shoot and leaves often suffused with red. Apparently confined to the south of England.—Var. *sphærica* (Gren.). Differs from *Lutetiana* only by its broader leaflets, more rounded at the base, slightly pubescent petioles, globose fruit 7 to 8 lines broad and deep, and more villous styles. A plant gathered at Modoney, in Devonshire, quite agrees with what I have under this name from Besançon and Geneva.—Var. *senticosa*, (Ach.) Fruit perfectly globular, but much smaller than in the last; the general habit of the plant very slender and flexuous, the fully-developed leaves not more than an inch long by 6 to 7 lines broad; the teeth very acute. "It has the aspect of *R. sepium*, but the petioles and leaflets are glandless."—*Déséglise*. Devonshire.—Var. *dumalis* (Bechst). Stipules, more densely gland-ciliated than in the type. Teeth of the leaves, more or less compound, with the secondary serrations gland-tipped. Petiole, more or less covered with glandular hairs, and often a little hairy. Sepals also gland-ciliated, and the flowers sometimes deeper in colour. A very common form, also either green or glaucous; the latter *venosa* (Sw.), and *glaucophylla* (Winch). Specimens gathered in Northumberland and Leicestershire, with sepals glandular on the back; and a plant in Durham, near Darlington, exactly accords with *R. Malmundariensis*, (*Déség.*), with round fruit and numerous flowers in a cluster.—Var. *biserrata* (Mérat) (*R. vinacea*—Baker). Scarcely different from the last, but the serratures open and very compound, the petioles more covered with glandular hairs, and the glands extending a little to the mid-rib beneath. *Déséglise's* plant has globose fruit; my *vinacea* has oblong fruit, narrow sharp-pointed leaves and bracts, branches and stipules suffused with viscid red.

Peduncles not bristly; leaves naked above, hairy only on the ribs beneath.

Var. *urbica* (Leman). General habit, leaves, and fruit of *Lutetiana*; but the grey or green, simply toothed leaves are thinly hairy on the under surface. Serration, sharp and simple. Petiole, densely pubescent, but scarcely at all glanduloso-setose. Fruit, oblong or ovate pitcher-shaped, rarely sub-globose. A very common variety, from which *R. platyphylla* only differs by its larger grey-green leaves more rounded at the base, and large sub-globose fruit.—Var. *frondosa* (Steven) differs from the last by its small flat ovate-oblong leaflets much rounded at the base, and small subglobose fruit. Yorkshire, Sussex, and Isle of Wight. Very near *obtusifolia* (Desv.) (*R. leucantha*—Bast.), but the leaflets are naked above and less hairy below.—Var. *arvatica* (Baker) bears much the same relation to *urbica* that *dumalis* does to *Lutetiana*. Leaflets, obvate-oblong, naked above, hairy on the ribs below. Serratures, copiously compound. Accessory teeth, gland-tipped. Petioles, densely

pubescent, covered with glandular hairs, and the glands often extending to the mid-rib beneath. Bracts, stipules, and sepals, copiously gland-ciliated. Fruit, ovate. A common form in the north of England. I have gathered it in North Yorkshire with sepals glandular on the back.

Peduncles not bristly. Leaflets more or less hairy on both sides.

Var. *dumetorum* (Thuill.) Leaflets, grey-green, softer in texture than in the foregoing forms, and sooner destroyed by frost. Flowers, often deeper in colour than the preceding. Fruit, large, generally ovate-urceolate, not so hard when green, and ripening earlier than in the foregoing varieties, and the sepals often not fully reflexed. Principally in the north of England.—Var. *pruinosa* (Baker). Like the last, but very glaucous, the serrations laxer and compound, the secondary teeth gland-tipped, and petioles slightly glandular. Northumberland, Durham, and Yorkshire amongst the hills. A similar plant has been gathered in Derry by Dr. Moore.—Var. *incana* (Woods). Leaflets, of average size, narrowly ovate-oblong, very glaucous, and slightly downy above, densely downy and with a few inconspicuous scattered glands beneath. Serration, copiously compound, the secondary teeth gland-tipped. Petiole, both pubescent and setose. Peduncle, slightly hairy. Styles, densely villous. Fruit, large and oblong. Sepals, not falling so soon as usual. Gathered in Forfarshire by G. Don.—*R. canescens* (Baker) is a form with similar leaves, but with the fruit and sepals of the type.—Var. *tomentella* (Leman). Branches, green and very flexuous. Prickles, very strongly hooked. Fully-developed leaflets, under an inch long, ovate-oblong, rounded at the base, green and thinly hairy above, hairy all over, and sometimes with a few inconspicuous glands beneath. Flowers, small and very pale. Fruit, small ($\frac{1}{2}$ to $\frac{3}{4}$ -inch long), sub-globose or broad-ovate pitcher-shaped; very late in ripening. I have gathered this in many parts of England, from the Isle of Wight northward to Northumberland, and received it from nearly all my correspondents; and yet it does not seem to have been known to either Woods or Borrer. *Déséglise*, Grenier, and Reuter all classify it with the *Rubiginosæ*; but the glands beneath are so few and faint as to be scarcely visible except with a lens. For a full account of its modifications, see a paper by Crepin in the "Bulletin of the Royal Botanical Society of Belgium," v. p. 26.

Peduncles more or less bristly, and covered with glandular hairs.

Var. *Andevagensis* (Bast.). Differs from *Lutetiana* only by its acuminate peduncles. Not unfrequent, especially in the south of England. A form with sepals glandular on the back, from the Pass of Lanrick, Perthshire, Braemar, and Carnarvonshire.—Var. *verticillanthia* (Mérat). Bears the same relation to *dumalis* that the last does to *Lutetiana*. Not uncommon.—Var. *collina* (Jacq.). The representative of *urbica* in this group. As gathered by Mr. Borrer in Surrey, and Mr. Briggs near Plymouth, this has numerous flowers in a cluster, and flat leaves broadly rounded at the base with moderately open serrations; but the commoner form is, like ordinary *urbica*, less robust, with narrower more sharply-toothed leaves.—Var. *caesia* (Smith). Very near the last, the leaves grey-green, softly hairy beneath and slightly so on the upper surface, the teeth slightly compound. Gathered in Derbyshire, Leicestershire, and Northumberland.—Var. *concinna* (Baker). Prickles, very much hooked. Leaflets, very small, the terminal one 8 to 9 lines long, flat, broad, obovate, thinly downy above when young, hairy all over beneath. Devonshire.—Var. *decipiens* (Damort.). Like *tomentella*, but the peduncle densely bristly; the mid-rib beneath more glandular. Petiole both pubescent and covered with glandular hairs, with several unequal bristles. Sepals, not fully reflexed and densely glandular on the back. Northumberland.

Series 2.—*Sub-cristatæ*. Leaves, not glandular beneath. Fruit, softer when green, in the north of England ripening early in September. Sepals ascending after the petals fall, and not disarticulated till after it turns crimson. Disk, narrower than in the last section. Styles, more densely villous.—Var. *Reuteri* (Godet). Prickles more slender than in the plants of the last series. Habit, leaves, armature, and toothing like that of *Lutetiana*, but the peduncles shorter and almost or quite hidden by the large clasping bracts, the flowers often deeper in colour, and sepals and fruit of the character just indicated. Leaves and calyx-tube, glaucous. Bracts, stipules, and branches in exposure suffused with red. Fruit, moderate or large-sized, ovate-oblong or sub-globose. Sepals, often (but not always) glandular on the back. This appears to be widely diffused through the hilly tracts of the north of England.—Var. *subcristata* (Baker). Bears just the same relation to *dumalis* that the last does to *Lutetiana*. It is not unfrequent through the hilly tracts of the north of England; and Mr. Watson gathered it in Perthshire. A plant like this, but with deep red flowers and bristly peduncles, by the Swale-side, near Keld.—Var. *Hailstoni* (Baker). Prickles, moderately close and numerous, the large ones thickened and falcate, but passing down rather abruptly into numerous stout straight

unequal bristles. Leaves like those of the last form, but the fruit not ripening so early, and the sepals becoming sooner disarticulated, and styles not so densely villose. North Yorkshire. In the irregularity of its prickles, this approaches *hibernica*.—Var. *implexa* (Gren.). Leaves and general habit of *urlica*, with the fruit of this series. Seen only from the neighbourhood of Richmond in Yorkshire.—Var. *coriifolia* (Fries). Combines the general habit of *dumetorum* with the fruit and sepals of this series. Leaflets, greyish-green, and thinly hairy above, paler and softly hairy beneath; the terminal one ovate-oblong, rounded at the base; the serrations simple, blunt, open. Fruit, large and generally round. In Britain apparently rare and confined to the hilly tracts of the northern half of the island. I have seen it from Aberdeenshire, Perthshire, Berwickshire, Northumberland, Lake, Lancashire, and have gathered it myself in North Yorkshire.—Var. *Watsoni* (Baker). Differs from *coriifolia* by its double-toothed leaves, often not so hairy above. Secondary teeth, gland-tipped. Stipules and bracts, not so large, and densely gland-ciliated. Petiole, covered with glandular hairs as well as villose. Stipules and bracts, not so large, and nearly or quite glabrous on the back. Inverness, Perthshire, Northumberland, Durham, Cumberland, and Westmoreland.—Var. *celerata* (Baker). Habit and leaves of *tomentella*, with the fruit and sepals of this section. Seen only in Holywell dene, Northumberland.

Series 3.—Sub-rubiginosæ. Leaves, glandular on the mid-rib, and slightly so on the principal veins; but not over the surface, as in the true *Rubiginosæ*.—Var. *Borreri* (Woods). Prickles, robust and strongly hooked. Leaflets, flat, the terminal one 15 to 18 lines long, broadly rounded or even cordate at the base. Flowers, often numerous in a cluster; the peduncle weakly bristly; the calyx-tube ovate pitcher shaped, generally naked. Sepals, copiously compound, naked on the back, reflexed or spreading after the petals fall, disarticulated by the time that it changes colour. Styles, thinly hairy. This is a plant which has been more misunderstood than any other British form, and which occupies just that intermediate position between ordinary *canina* and three or four of the others, that varieties of the former are liable to be assigned to it by those who have only book descriptions to guide them. The true plant is clearly in its right place in the *canina* group, and is, on the whole, nearer to *tomentella* than to any other variety. I have seen it from Kent, Sussex, Surrey, Middlesex, Hertfordshire, Shropshire, Worcestershire, and Yorkshire.—Var. *Bakeri* (Déséglise). Prickles, more slender and less hooked than in the last. Leaflets, obovate, full green, copiously doubly serrated, the base cuneate, entire, the upper surface naked when mature, the lower thinly hairy, plainly glandular on the mid-rib and main veins. Flowers, never more than three to four in a cluster. Peduncles, very short, naked or weakly bristly. Fruit, naked, oblong or turbinate, ripening early in September. North Yorkshire, hedges at Sowerby, near Thirsk. The variety of *canina* that comes nearest to *pulverulenta*.—Var. *marginata* (Wallr.). Prickles, considerably more slender and less hooked than in ordinary *canina*. Branches, dark purple and glaucous in exposure. Leaves, oblong, glaucous-green above, very pale beneath, and the veins unusually prominent. Flowers, not more than three or four together. Peduncles, faintly bristly. Fruit, obovate or sub-globose, ripening early in September. North Yorkshire, near Thirsk; and similar plants, but with the petiole slightly hairy, gathered in Derry, in the Isle of Arran, and in Carnarvonshire.

Sub-Group.—Systylæ.

R. stylosa (Desv.) var. *systyla* (Bast.).—A bush, 8 to 12 feet high, with elongated arching branches. Prickles, uniform, scattered, the base deltoid, with shorter and less-hooked points than in *canina*. Leaves of the barren shoot, $3\frac{1}{2}$ to 4 inches long, with seven leaflets. Flowers, generally three to six in a cluster, pale pink or rarely white, 15 to 18 lines across when fully expanded. Fruit, broad ovate-urceolate, or sub-globose, $\frac{1}{2}$ to $\frac{3}{4}$ inch long by $\frac{3}{8}$ to $\frac{1}{2}$ inch broad, not ripening till October, the sepals falling before it changes colour. Column of styles, glabrous, generally protruded 1 to $1\frac{1}{2}$ lines beyond the very prominent disk. This is easy to recognise from *R. canina* in the typical form, but is quite connected with it by intermediate gradations. I have seen a form in which the column of the styles was protruded in the central flowers of a cluster, but not in the outer ones, and other specimens with the styles not at all protruded, for the rest quite doubtful between this and *collina*. I have seen this variety from Kent, Sussex, the Isle of Wight, Middlesex, Hertfordshire, Gloucestershire, Somersetshire, and Devonshire.—Var. *Desvianxii* (Baker). Column of styles, protruded as in the last, from which it only differs by its pure white flowers, leaves thinly hairy all over beneath, and more hairy petioles. A plant coinciding with the specimens in Déséglise's fasciculus, gathered by Mr. Borrer at Hartwell, in Sussex.—Var. *opaca* (Baker). Leaves, dull grey-green above, and still more hairy beneath than in the last, quite three-quarters

as broad as long, and rounded at the base. The peduncle shorter and quite naked, the flower pure white, and not much over an inch across, scarcely more than the head of stigmas protruded. Kent, between Chilgrove and Brooms.—Var. *gallicoides* (Baker). General habit and leaves in shape like those of *systyla*, but the prickles of the branches copiously intermixed with bristles and glandular hairs; the leaves only very faintly hairy beneath, and the corolla pure white; the fruit obovoid, naked, $\frac{3}{4}$ inch long by $\frac{3}{8}$ inch broad. Warwickshire, Chesterton Wood, near Myton. A very remarkable variety; and I have nothing from the Continent resembling it. In armature it recalls the *Gallicanæ*, only that it is more densely aciculate and setigerous than any of the plants of that section I have seen.—Var. *Monsoniæ* (Lindl.) A low erect bush, with short ascending branches, with a few glandular hairs, and mixed bristles amongst the prickles. Leaflets, in shape and serration just like those of the type, greyish-green, naked above, thinly hairy beneath. Peduncles and sepals of the type, but the petals of a "beautiful glowing red," and larger than in any British Rose. Fruit, roundish and orange-red, like that of *gallica* in size and shape. A single bush, found by Miss Monro, in a hedge near Watford, in Hertfordshire, and transferred to the garden of Lady Mouson, from which it was spread in cultivation. Mr. Borrer suggests that it is a hybrid with one of the *Gallicanæ*.

R. arvensis (Huds.).—Bush, not more than 2 or 3 feet high when not supported, with long trailing shoots, which are purple and glaucous in exposure. Prickles, scattered, uniform, strongly hooked, the lower part sub-deltoid. Leaves of the barren shoots $2\frac{1}{2}$ to 3 inches long, with seven leaflets, both sides quite naked, the upper deep green, the lower sub-glaucous. Flowers, four to six, if the branch is at all robust. Calyx-tube turbinate, purple and glaucous, usually naked, rarely a little glandular. Corolla, 15 to 18 lines across when expanded, pure white, with a yellow throat. Fruit, sub-globose, naked, measuring about half an inch long and thick, not turning red till October, with a thick prominent disk. This is much more common in the southern than the northern half of England; and though it reaches Kincardineshire, it is a very rare plant north of the Tweed. Our ordinary plant is the *repens* of Déséglise; his *arvensis* is a weak form, with the peduncle naked and flowers usually solitary.—Var. *bibracteata* (Bastard). Shoots, stronger and more assurgent than in the type. Leaflets, 15 to 18 lines long by two-thirds as broad, more pointed than in the type, and more sharply toothed. Calyx-tube and fruit, obovoid. Sepals, a little more compound. Peduncles, rather more spreading than in the type, thinly glandular. Petals, often an inch deep. Fruit, $\frac{3}{4}$ to $\frac{1}{2}$ inch long by $\frac{1}{2}$ inch broad. Seen from Sussex, Devonshire, Cambridgeshire, Essex, and Northumberland. Liable to be called *systyla* by those who know ordinary *arvensis* and not the other species.

From the preceding list, *rubella* and *pomifera* require to be deducted as doubtful natives. In addition, a few other species have been gathered as strays from garden cultivation. *R. cinnamomea* (L.), found by Mr. Sabine, long ago, near Pontefract, is frequent in gardens, and widely dispersed as a native plant in Continental Europe. *R. Incida* (Ehrh.) found by Mr. Borrer near Keswick (Phyt. ii. p. 437), and by Mr. Reeves near Tunbridge Wells, is a common North American Rose, also frequent in gardens. The same plant has been gathered in a sub-spontaneous state in France and Germany, and is *R. baltica* (Roth. and Koch.). The sub-spontaneous Yorkshire and Sussex Roses, mentioned by Mr. Borrer in the "British Flora," 3rd edit. p. 245, do not appear to be essentially different from *R. provincialis* (Ait.); and the *R. arvensis*, var. *Andersoni*, mentioned by Smith, "Eng. Flora," ii. p. 398, I believe to be *R. austriaca* (Crantz.). The two latter are both members of the *Gallicanæ* group.

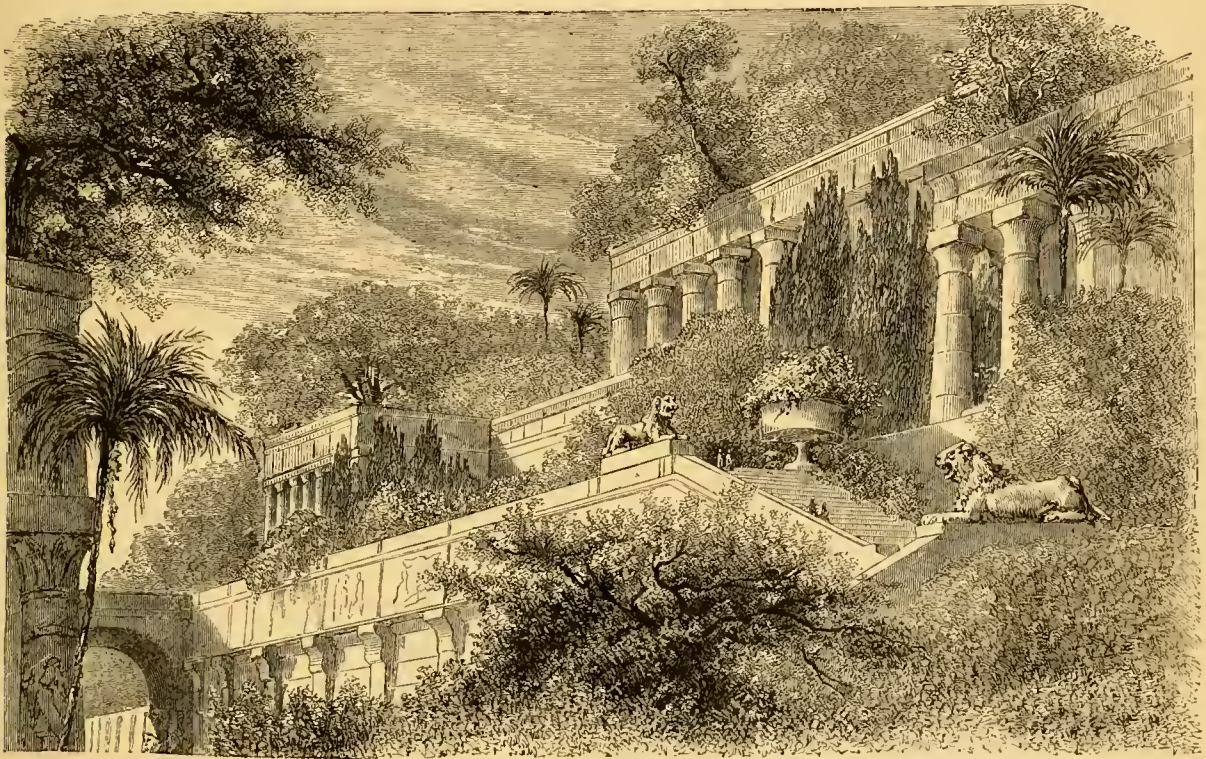
The preceding article is an abstract of an exhaustive paper by Mr. J. G. Baker, published in the *Journal of the Linnean Society*.

Dead Ash Trees.—In the district from Lewisham to Beckenham, Kent, during the last four or five years, there has been an extraordinary number of deaths amongst Ash trees. This failure has not been confined to any particular age of tree, for many of them would measure at least 16 inches in diameter a yard from the ground, whilst others are only a few years old; but, principally, the older ones have suffered the most. There are, at the present time, numbers to be seen standing quite dead; whilst others are reduced almost to skeletons, and cannot last more than one or two seasons. Why this should be in the valley of the Ravensbourne some of your readers may, perhaps, be able to give a satisfactory reason. The cause, whatever it may be, appears to confine itself to the Ash, for all other trees are in a healthy condition. The late May frosts have made the Ashes all look very queer; and many that might have shown some life for a short time longer will, no doubt, be brought to an untimely end.—C. J. Cox, Catford Bridge.

ANCIENT ASIATIC GARDENS.

THE pleasure-gardens of the ancient Asiatics in no way resembled either the flower-gardens or landscape-gardens of our own day. They were not established for mere beauty's sake; indeed, flower-gardening, as we understand the matter, was comparatively unknown. Roses, Violets, and a few other flowers were, it is true, cultivated for the purpose of garland-making, and also for the decoration of banquets. Such flowers as those alluded to, were grown in close juxtaposition with succulent edible vegetables; and Plutarch naïvely informs us that in Greek (so called) gardens the Roses and Violets looked all the prettier for being grown side by side with the Leeks and Onions. In the Roman hortus or garden the chief object was, as, doubtless, in oriental enclosures of similar character, to produce such vegetable supplies, either decorative or edible, as were required for ordinary family use, or public occasions, there being no thought of making such gardens ornamental, any more than mere beauty is sought in the modern Rose gardens of Persia (which frequently

decessors of those public and private groves of the Greeks. In our illustration, which represents an ancient Assyrian garden, it will be seen that the character of the architecture of an Assyrian palace, as far as we are able to judge of it by the interesting discoveries of Layard, Botta, Smith, and others, has been kept sufficiently in view. There is the statue-lined gateway, usually bearing the cuneiform inscriptions which form the mural literature of Assyrian palaces; and there are, also, the great terraces, one over another, on which the foliage is raised far above the level of the surrounding plain; a circumstance which some have imagined may have given rise to the term of "hanging gardens," which an ancient writer has made use of in special allusion to the gardens of Babylon. I have sometimes thought that the Weeping Willow (only recently known to Europe), which was indigenous, from the earliest recorded times, on the banks of the Euphrates, may have assisted in making this term more appropriate, as its slender branchlets, hanging in streaming and delicate verdure



'An Ancient Assyrian Garden.

contain many hundreds of acres) where thousands of Rose trees are grown, not for ornament, but for the manufacture of the famous attar; such gardens being manifestly intended to be simply useful and profitable. It was not the garden that formed the pleasure-ground of ancient nations. The true pleasure-ground consisted in groves of trees, and what the Romans termed a viridarium, or "place of greenery," which was the delight of both Greek and Roman, their public and sacred groves being planted with the greatest care; and this was, doubtless, the case also with the Asiatics who had preceded them. Recent travellers describe the importance attached to groups of trees in regions where vast arid plains occur; telling us that caravans endeavour to arrange their times of travel in such a way that two sets of travellers may not arrive together at the few-and-far-between small groves of trees, which would not afford a sufficient supply of the all-important desideratum of shade for more than a single party, during a brief period of rest. It was, therefore, the supply of shade that probably suggested the first artificial plantations of trees; and we think we may safely state that such plantations were the pre-

over the parapets of such terraces, must have imparted a drooping effect of singular beauty, which one may easily imagine led to the coinage of a name descriptive of its peculiar character.

H. N. H.

Steppe Vegetation.—Just as in the tropics all varieties of vegetation generally show a tendency to assume the nature of trees, so in Asia's temperate zone some steppes are characterised by the extraordinary height to which the flowering herbs grow. When driving in the low Tartar springless waggons through the trackless paths of these herbage plains, it is necessary to stand erect to discover the right course, for, otherwise, the view is intercepted by the high stems of the herbs, which here grow so densely as almost to resemble a wood, and, as the waggon rolls on, these lofty stems bow down beneath the wheels. Some of these Asiatic steppes are plains of Grass-land; some are covered with Salt-wort—a succulent, evergreen, and articulate plant—and others are overspread with far-glistening salt, which, sprouting forth like Lichens, besprinkles unevenly, as fresh-fallen snow, the clayey soil.

WORK FOR THE WEEK.

Flower Garden and Pleasure Ground.

WHERE the planting out of bedding plants is quite finished, which will generally now be the case, little will require to be done for some time except attending to routine operations, such as mowing, cleaning, and the staking and tying up the various sorts of plants which require that attention, and the pegging down of Verbenas, Petunias, and plants of similar growth. Copious waterings should, for some time to come, be given to the flower beds and borders whenever the state of the weather renders that attention necessary. Regulate the growth of climbing Roses, Clematises, Tropæolums, and other plants trained to pillars, ornamental wire arches, and similar devices; and, wherever the embroidered or carpet style of bedding is attempted, this must have unremitting attention in the way of regulating the different sorts of plants employed, an operation which involves stepping and pinching back throughout the greater part of the season. Carpet bedding, as a rule, should be effected without the aid of flowering plants. It should, in fact, be confined to plants possessing remarkable foliage, and of this class there is a considerable variety suitable for the purpose, hardy as well as tender, such as *Ajuga*, *Antennaria*, *Echeveria*, *Semprevivum*, *Saxifraga*, *Veronica*, *Sedum*, *Cerastium*, *Cineraria*, &c., most of which are indigenous to Britain or the South of Europe, and perfectly hardy; together with the highly-coloured tender species from Brazil and Peru, &c., such as the *Alternanthera*, *Coleus*, *Iresine*, &c.; and lastly, but by no means the least useful, is the Golden Feather *Pyrethrum*, now so well known and so extensively used for this and other purposes, such as marginal lines to beds and borders. Keep lawns, Grass walks, and belts free from Plantains, and other broad-leaved plants; and attend to the staking up of all tall-growing herbaceous plants before they become bent or broken down. *Dentzas*, *Lilacs*, *Guelder Rose*, and various other deciduous flowering shrubs, will soon be out of bloom, and may be cut back to any necessary extent; while straggling branches of *Laurel* and other evergreens may now also be cut back. Hedges of *Holly*, *Privet*, and *Box* may now be clipped; and by the constant practice of mowing, sweeping, weeding, and rolling, &c., continue to maintain neatness, and high keeping everywhere, both in the pleasure grounds and flower gardens.—P. GRIEVE, *Culford Gardens*.

Greenhouses and Stoves.

Acacias, *Rhododendrons*, *Heaths*, and other hard-wooded plants, will now be contributing to the beauty of indoor structures. Any appearance of mildew on *Heaths* should be immediately checked by dusting with sulphur; in the centre of large plants mildew often develops itself unnoticed, a circumstance which renders it necessary to keep the shoots in that portion of the plant thin; such prunings may be used for propagating purposes. To *Fuchsias*, one stake only should be placed as a support, the lateral branches being allowed to hang gracefully down. In stoves, a genial moist temperature should be maintained; the syringe should be freely used amongst growing plants, and fumigating frequently practised, in order to keep down insects. *Zamias* and *Palms* making young leaves should never be allowed to receive a check from cold draughts or be in want of water. *Creepers* should be pruned, trained, and luxuriant growths stepped in order to induce them to form good specimens. *Alocasias* and *Marantas* may be kept above water tanks to encourage their growth. Ferns will now enjoy a steady moist temperature and plenty of shade. Sprinklings from the syringe should be occasionally given; but care must be taken to keep the foliage of *Gymnogrammas* and *Adiantums* always dry. Pits and frames, now mostly cleared of bedding plants, may be filled with *Pelargoniums* for late flowering, and other plants. *Verbenas* may be increased in gentle heat, to take the place of early annuals, or other plants that are likely soon to be done blooming. Seed of *Cinerarias* should be sown immediately it ripens, either in gentle heat or in cold frames. Shift *Chrysanthemums* as they require it, and liberally supply them with water. *Heartsease* may be increased from cuttings in frames with a north aspect. *Balsams* and *Cockscombs* should be shifted as they require it, never allowing them to become pot-bound; if a little bottom-heat is given, and at the same time some top air, it greatly improves them.—M.

Orchids.

Syringe freely at least twice a day, viz., morning and evening; and give a full supply of air, especially during close sultry weather. Soft or rain-water is best, and every Orchid-house should be provided with a tank sufficiently large to collect a supply; and, if a hot-water pipe is passed through it, so much the better. Most Orchids require a copious supply of water at the roots when growing, and there are some that can never be allowed to get thoroughly dry without injury. Some species, especially *Indian Dendrobies* and *Mexican Lælias*, on the

other hand, require a season of rest more or less decided. In practice, we find all those Orchids without pseudo-bulbs are incapable of living, for any great length of time, without moisture. To this class belong *Cypripediums*, *Disas*, *Phalænopsis*, and other plants of a similar character; while, on the other hand, all pseudo-bulbous Orchids are more or less inclined to rest at some season of the year. Good drainage is, of course, presupposed, and then it is nearly impossible to over-water, especially if the compost is in a fresh porous condition. Carefully shade from bright sunshine; and keep a sharp look out for insects, especially thrips, as these soon do a deal of damage among *Aërides*, *Vandas*, *Saccolabiums*, and *Cypripediums* during the summer months. Among plants in flower we may notice *Vanda limbatæ*, *V. tricolor*, *V. suavis*, and others; *Aërides Fieldingii*, and the equally beautiful dwarf-habited *A. affine rosenm.* Many *Dendrobiums* are new at their best; and those on blocks should be plunged overhead in tepid water regularly, so as to moisten the roots and mess thoroughly. In some cases this should be done once, or even twice, daily.—F. W. BURBIDGE.

Hardy Fruit.

Strawberries should now have copious waterings with house sewage, sufficient to penetrate the entire mass of roots and soil. Drought is one of the greatest enemies of this crop. I have known experienced growers of forced Strawberries to throw out any pots that had once got so dry that the leaves fell over their sides. Such plants they declared would turn out not to be worth keeping; the fruit, if it swelled, would be comparatively flavourless; and the chances were, that before the fruit had ripened, the entire plant would fall a prey to red spider. Like conditions bring about like results; and out-of-doors dryness is almost as disastrous as within; from the moment plants show flower till the fruit is finished, they should never once be dry. The drain upon them to finish a fine crop is very great; and, therefore, water and food must be plentifully provided; both should also be husbanded, as well as given plentifully. To this end the surface should be mulched with long dung, short Grass, spent tan, or covered with tiles. These appliances serve several purposes; some of them feed the plants with food, all of them help to hinder the food and moisture within the earth from being dissipated, and furnish a more or less clean bed for the ripe fruit. They are, also, an antidote for earth splashes which destroy Strawberries. Strawberry tiles are, perhaps, the cleanest bed; but they have two grievous drawbacks—they are expensive and become too hot, so that the fruit sometimes gets almost baked upon them. Short Grass rots too soon, harbours slugs and snails, and, should wet weather prevail for a week, gives the fruit a musty flavour, and hastens its decomposition. Upon the whole, there are few things better than long stable litter, applied early, so as to have all the ammonia washed out of it before the fruit is ripe. Clean straw and dry Fern leaves form a soft cushion for the fruit and keep the moisture in the soil. Net Strawberries the moment they begin to change colour. Keep the net, say, a yard above the fruit. It will take a little more net to cover the sides, but then the net will last as long again as when lying on the wet leaves or earth. It will, also, keep the birds out more effectually; and the gatherer can go in under without tearing the net off for each dish of Strawberries wanted. Late crops, such as *Myatt's Eliza* and the old *Elton Pine*, will hardly need netting up until the main crops are gathered, if planted on north borders. The more entirely these crops can be grown away from sun, the better their quality and the later the crop. It is not yet too late to make new plantations of Strawberries from the latest of the forced plants. Trench a piece of ground a yard deep; enrich it 6 inches thick with the best manure at command, and plant out *President*, *British Queen*, or *Napier Strawberries* in rows a yard apart, and 2 feet from plant to plant. Keep clean throughout the summer, and gather about a peck from a plant next season. Early forced plants, such as *Black Prince* and *Keen's Seedling*, planted out in March, will yield a second good crop this autumn. Here is another Strawberry hint worth knowing—remove *Black Prince* behind a north wall; after yielding a crop in March, leave them in the pots; remove all blooms that show till the end of August; then top-dress the plants; place them in a cold pit, and gather ripe Strawberries through September and even October.—D. T. FISHER.

Kitchen Garden.

Whenever a crop is done with, manure and dig the land on which it grew, in order to have it in readiness for something else. Nothing impoverishes ground so much, or looks more untidy, than runaway vegetables. In some soils it may be beneficial to dig in the remains of green crops, I have, however, given up the plan believing it to conduce more to clean culture to have all garden refuse either taken to the pigs or placed out of sight, in a heap, to ferment; decomposition in the latter case being assisted by slight dressings of salt and lime. In this way a very large heap of valuable manure soon accu-

mulates. Peas in windy places are, sometimes, apt to partially escape from the sticks which support them; when this tendency is first noticed, if a strand of rope yarn is run along the rows on the lee-side and linked here and there to the sticks, it will turn them back in the right direction, and prevent them from being broken down. Where Peas are not already mulehed, if they exhibit the ast symptoms of distress from heat or drought, mulch immediately with manure, Grass, or anything that is available; one good watering will than place them in a position to perfect their crop. As a rule, it is not advisable to sow late Marrow Peas after the middle of this month. Here, as Marrow Peas are in demand throughout the season, I usually make the last sowing about the 20th. Last year we planted Veitch's Perfection and Ne Plus Ultra on the 26th, and we gathered from them till far into October, but the season was very favourable, and the result may not always be so satisfactory. Nevertheless, in all parts of the country, if the land has been deeply worked and well manured, late Marrow Peas may be sown with a fair chance of success in the middle of June. Sow Turnips to succeed those just up; burnt earth, or ashes from any substance, except coal, has an invigorating influence upon the growth of Turnips in dry weather. The Red American Stone and Orange Jelly are the best Turnips for sowing at this season. Avoid, if possible, the necessity for sowing in freshly-dug land. If the land has been prepared a week or so, the moisture, even in dry weather, will have risen by what is termed capillary attraction, and, by drawing the drills rather deeper than necessary or desirable early in the spring, the seeds may be laid in moist soil, and germination thereby assisted. Continue planting, as opportunity offers and space becomes vacant, such crops as Brussels Sprouts and early Broccoli; provided the land is in good condition, it can scarcely be too firm for Broccoli. Late Broccoli may be pricked out to gather strength before being finally planted out. Make a further small sowing of early Horn Carrots, there is a frequent demand for small young Carrots, which it is always best to anticipate. Sow Spinach once a fortnight in cool damp-bottomed land that has been deeply worked; in dry weather it is sometimes a disappointing crop. We have now an excellent bed of Round Summer Spinach just coming in; it is growing on a piece of land that had in the winter been turned over very deeply for the purpose of eradicating Horseradish. Every season's experience convinces me that the deeper the soil is stirred, the better and more reliable are the crops, and the less are they affected by either wet or dry seasons. The White Silesian or Spinach Beet, is a good substitute for the true Spinach; sown in April or May, or it may be sown now; its young succulent leaves are, in my opinion, at least equal to New Zealand Spinach, and it may always be relied upon to produce an almost unlimited supply. Plant Scarlet Runners in trenches (as recommended for Peas) for a late crop. Earth up and stake those now requiring it. Sow Dwarf French Beans once a fortnight; Windsor or Longpod may be planted for a late crop, selecting a cool moist spot, but not under trees. Topping those now in flower will hasten their maturity, and the same remark is equally applicable to Peas. Keep a watchful eye upon kitchen garden paths, Box edgings, &c., and do not allow weeds to establish themselves nor their seeds to be scattered abroad, to cause double labour in the future. Fire-heat must still be employed in Cucumber-houses, and moisture, both at the roots and in the atmosphere, must be supplied in abundance, especially in hot weather. Only shade as much as will prevent severe flagging.—E. HOBDAV.

In the time of Tulips.—A sufficiently amusing account of a Tulip garden is given in the *Tatler* (No. 218) by a gentleman who overheard its owner and his friends "in very earnest discourse," and thus records his bewilderment at their conversation:—"My curiosity was raised when I heard the names of Alexander the Great and Artaxerxes; and, as their talk seemed to run on ancient heroes, I concluded there could not be any secret in it; for which reason I thought I might very fairly listen to what they said. After several parallels between great men—which appeared to me altogether groundless and chimerical—I was surprised to hear one say that he valued the Black Prince more than the Duke of Vendosme. How the Duke of Vendosme should become a rival of the Black Prince I could not conceive; and was more startled when I heard a second affirm with great vehemence that, if the Emperor of Germany was not going off, he should like him better than either of them. He added, that though the season was so changeable, the Duke of Marlborough was in blooming beauty. I was wondering to myself from whence they had received this odd intelligence, especially when I heard them mention the names of several other great generals, as the Prince of Hesse and the King of Sweden, who, they said, were both running away. To which they added, what I entirely agreed with them in, that the Crown of France was very weak, but that the Marshall Villars still kept his colours."

SOILS AND FERTILISERS.

SOILS SUITABLE FOR PLANT-POTTING AND OTHER PURPOSES.

A WRITER on horticultural matters once asserted that a tolerably correct estimate of the professional character of a gardener might be formed by a careful inspection of his soil-yard, a statement in which there is doubtless some truth; but, at the same time, it should be remembered that necessity, quite as much as choice, may have had something to do with the formation or the selection of soils, and the kinds most required may not be always at his command. Owners of estates and of extensive garden establishments are often alarmed by a modest request from their gardeners to be allowed to take the top spit from a few square yards of some out-of-the-way pasture or piece of meadow land; and the refusal of this reasonable request frequently places the gardener in a position similar to that of the Israelites in Egypt, when compelled to render up their tale of bricks without a supply of straw; or, even worse, as they (the Israelites) were allowed to roam in search of stubble. But, should the luckless gardener venture to roam on his employer's estate in quest of suitable soils for his plants, he would stand a considerable chance of getting reproved by the bailiff, or pounced upon by the keeper, and it would be of small avail for him to attempt to conciliate either of these functionaries by an assurance that some particular soil was indispensable to the welfare of his plants. It may, however, be worth while to direct the attention of owners of gardens to this circumstance, and to respectfully assure them that a reasonable and necessary supply of suitable soil, which, in most instances, is to be found on some part of their properties, is of the greatest importance as regards furnishing a supply of forced fruits, flowers, and vegetables. While the injury inflicted upon a very small portion of their land by the abstraction of the same, is so infinitesimal as to be hardly worth being mentioned. The portion of land from which the 2 or 3 inches in depth of surface soil has been taken can be easily forked or dug over; a handful of grass seeds may be sown upon it, and afterwards well rolled down, and protected from stock by a few hurdles until the young Grass is established, and the injury inflicted may be said to be remedied.

Turfy Loam.

This being rich in decomposing vegetable fibre, forms a soil acceptable to almost all families of plants, forming, as it were, the staple or ground work to which other soils or ingredients may be added. Some cultivators prefer using turfy loam as soon as it is taken from the field or pasture, to form the principal ingredient in the formation of Vine borders, and for Melon culture, &c., justly considering that much of its useful properties are wasted, by its retention of, perhaps, years in the soil-yard, before it is supplied to growing plants. It is obvious, however, that it would be inconvenient for the cultivator to have to repair to the field or pasture, supposing that he had permission to do so, whenever he might require even a small portion of this soil; and most plant-growers will only be too glad to take an opportunity, when it offers itself, to lay in a stock of this soil to last them for several years. When this is carted into the soil-yard, it should be stacked up in the form of a ridge, and might, with advantage, be thatched with some littery material, so as to prevent it from becoming saturated with cold rains during winter, or from being desiccated during dry summer weather. If a portion of good farm-yard manure can be procured simultaneously with this soil, a layer of the same might be made to alternate with a layer of the loam, and this would form a most useful compost for many purposes; as, when it had laid some six or more months, it would then be found to be in excellent condition, without further additions, to use for the potting of fruit trees of various sorts, Strawberries, Roses, and other kinds of plants requiring a rich and somewhat tenacious soil; while, to render it suitable for other varieties of plants, river or silver-sand, leaf-mould, peat, &c., could be added in the proportions required.

Peat, Leaf-mould, and other Materials.

In establishments where collections of Heaths and other hard-wooded plants are cultivated, "fibry peat" soil is indispensable; and, in many parts of the country peat, of the desired quality, is exceedingly difficult to procure. The black bog soil, which is sometimes substituted for it, is absolutely worthless, and any attempt to cultivate hard-wooded plants in such material will be sure to end in failure. Where good peat cannot be found, it is always advisable to purchase it from nurserymen or others who may be in a position to supply it, and this can always be done for a trifling outlay. The best description of peat generally contains more or less silver-sand; but, if found to be in any degree deficient in this respect, sand can then be added to any desirable extent; and, as regards silver-sand of the best quality, there are only a few places in which it is to be found. It can, however, always be purchased, and is not expensive; while, for many purposes, sharp river sand, where it can be obtained, forms a good substitute. Leaf-mould, or soil composed entirely of decayed tree leaves, is also an essential material in every garden establishment; and, generally speaking, there is little excuse for a gardener not having an abundant stock of this always on hand. It is seldom, however, in good condition for potting purposes until it is two or three years old, and, even then, it should seldom or never be used alone, but mixed with loam or other soils. The leaves of the Oak and the Elm are generally preferred to those of the Ash, Horse-chestnut, Walnut, and others, whose leaves are of a softer tissue. Every soil-yard ought, also, to contain a portion of clay, or the runnings of a clay pit; this improves with keeping, and is exceedingly useful where the natural soil is inclined to be of a light or sandy character; the latter will be considerably improved by an admixture of clay, which will be found to render it more suited to the culture of fruit trees and Strawberries in pots, Melons, &c. Advantage should also be taken of any opportunity which may occur to secure a quantity of lime-rubbish from any old buildings, which may be about being removed or under repair, as this material is of service to soils deficient in calcareous matter, and in the formation of Vine borders. Of well-rotted stable, or hot-bed manure, I need scarcely say a considerable portion should always be kept on hand; also a portion of dried cow, sheep, or deer dung; decayed Mushroom beds composed chiefly of horse manure; also a quantity of broken bones, charcoal, soot, &c., all of which should be kept separate, and in readiness in the soil-yard.

P. GRIEVE.

BELGIAN FARM-GARDENS.

THE possibility of making a decent living for a family out of a farm depends in a large degree upon soil and climate. A small farm of a few acres in England, and more especially in Scotland, means semistarvation. We have seen several instances in which the thing has been tried, and lamentably failed. A case occurred not long since within our personal observation, in which a land proprietor, by way of experiment, let a piece of ground, extending to about eight acres, with a house upon it, for a merely nominal rent. The land was good, though a little rough, and the tenant set stoutly to work upon it. In two years, he gave it up as hopeless. Another person made the attempt, and he also, in the same length of time, begged to be released of his lease, which was taken off his hands. The experiment was then very properly given up, and the land absorbed into a larger holding. It is quite a different matter trying to farm on a small scale in the Bay of Naples or in Belgium. There the farming is in reality a kind of gardening. Soil and climate, as well as old engrained habits, conspire to make it practicable for a man, wife, and children, to extort a living from a mere patch of ground. It is a pity that theorists who talk confidently about land distribution, do not, from any personal knowledge, tell us how it is to be satisfactorily accomplished. We say distinctly that the cultivation of lands in Great Britain will not prove advantageous unless on a considerable scale, with professional knowledge, and capital to hire labourers, to buy and keep horses, to purchase artificial manures, and lie out of returns in the ordinary course of business. As regards that garden of northern Europe, the more fertile part of Belgium, the appearance of things there is certainly very fascinating—the neat whitewashed dwelling and outhouses, the trim miniature fields, the orchards in blossom, the industrious and simple habits of the people, the spires of village churches peeping out among the trees, all give one notions of the

golden age, "when every rood of ground maintained its man." The very fertility, however, which produces this result is for the most part not natural. It is the effect of centuries of diligent application with the spade or plough, constant drugging with manure, and tact in changing the crops. But there is more than this. It is the result of intensely economical habits, of which we can hardly say there is any parallel in England. Without enumerating all the plants to which the Belgian farmer gives his care, the Colza, Poppy, Hop, Flax, Hemp, Chicory, Wheat, Rye, Buckwheat, and Haricot Beans may be named; and as root-crops or forage, Turnips, Beetroot, Cabbages, Peas, Vetches, Oats, and the common or scarlet Clover. This variety gives to the country a very pleasing aspect; there are no large fields lying bare, as with us, waiting for the Wheat, but they rather appear like a garden, where are large beds of flowers of every hue. In early spring, the scarlet Clover alternates with the bright yellow Colza, then the beautiful blue Flax; the little white stars of the Buckwheat contrast with the gaudy purple Poppy, and the large Tobacco-leaves, whose intense green recalls the vegetation of the tropics. Without these plants the owner never could pay either for the manure he puts in or his high rent, as Wheat grows very poorly. They require much labour, and the soil has no repose; the labourer is always digging with the spade, turning over the soil, hoeing, weeding, or harvesting.

English and Scotch farmers might take a lesson from the Belgian agriculturists in their prodigious care of manure—no wasteful exhalation, no neglect of the liquids which enrich the soil. We might almost say that the Belgian farmer is a reverential worshipper of manure. It is his idol, his treasury. In the first place, there is the manure produced in the cattle-sheds. No cow is allowed to go about in the open air; all stay within doors, and liquids which we too often see running to waste, are carefully conducted into covered tanks. Neither is the solid part allowed to be in the open air; it is covered from sun and rain, which destroy the ammoniacal salts, and trodden by three or four young cattle during the winter. In addition, the farmer collects from his ditches and streams aquatic plants, which he mixes with the manure, or uses them at once to hasten the growth of the Potato. He sends to a distance for the mud dredged from canals, and lime; in the nearest town he buys the refuse from tanneries and manufactories, animal black, cinders, street-sweepings, crushed bones, and the refuse of Flax and Colza. His younger children are out at dawn with a little cart, gathering up from the roads and fields all that, according to agricultural chemistry, can restore to the land what has been drawn from it. Peru sends its guano; and the farmer is seen in spring, sack in hand, sowing the precious powder on the barren portions of his land; and the flinty soil swallows it all with such promptitude, that it must be manured twice or three times a year. In no country is such high-farming carried on, and it would be ruinous without the rich return of these plants, and the accessory crops which are gathered after the principal ones. In Eastern Flanders, of 100 acres of land, 72 are sown with cereals and plants used in manufactures; 28 with roots and forage; but to this must be added 31 acres of after-crop, which gives 69 as affording excellent food for cattle, superior to common meadows, and which explains how poor land can pay a rent of £5 an acre. The second sowing consists of Turnips and Spargula after Colza, Flax, and early Potatoes; and the Carrot, which is sown in spring with the preceding crops, and carefully hoed after they have been taken away. The Clovers having occupied the ground during winter, leave it clear for the April sowing; and the giant Cabbage develops during the cold season, making a stem 6 feet high, and giving abundant and excellent leaves for milch cows. Culture thus pushed to the extreme, necessarily requires some capital, and it is reckoned that, through a system of rigorous parsimony and saving, double the sum per acre is used in Belgium to that employed in England, and two-thirds more in the best farms. In this way the most dense population in Europe can subsist on a soil so little favoured by Nature. Here it will be observed that the small farmers of Belgium, with their 10 to 50 acres, place their reliance on a variety of crops, such as we could not profitably introduce into England. We might say the same thing of small farming in Lombardy. There the land bears three crops at once—Mulberry trees, grown for the sake of their leaves as food for silkworms; Wheat beneath the trees; and Vines in the hollows of the ridges. In the south of France we see the same diversity; in some places Olive trees, for the oil they produce, taking the place of the Mulberry. In such parts, the country is like a garden; and with little winter, there is something growing all the year round. Turning to one of the most fertile parts of Belgium, all, as has been said, is charming—every road is bordered with trees; not a rise in the ground is seen; all is calm, uniform, and presents an image of quiet comfort and peace. Each house is detached, and surrounded with large Apple orchards, hedged in by Box, Holly, or Hawthorn, where the cows are brought to feed every

morning and evening; it is of one-story only, and thatched, containing four rooms, the first for meals, the second for the dairy and preparing the food for cattle, the others for sleeping-rooms. The old-fashioned oak furniture is a model of brightness; tin and copper utensils shine on the walls, which are whitewashed. The garden is gay with Wallflowers, Dahlias, and Hydrangeas, and the florists' flowers which are to be shown at Ghent. Outside, everything is in its place; nothing spoils the greensward; the ditch and manure-heap are banished; the latter is always under the roof of the stable or cow-shed. In this stands five or six large cows, the constant care of the farmer's wife, who gives them abundance of green-meat in summer, with straw, hay, and a kind of warm soup, mixed with Carrots, Turnips, or Rye in winter. Thanks to this nourishment, and the constant rest they enjoy, the animals give from fifteen to twenty-five quarts of milk daily. The tools are simple, but of first-rate construction; the plough is light, drawn by one horse, and works with ease, rapidity, and regularity. The harrows are of various kinds, triangular, rectangular, or a parallelogram; but the special tool with which the Fleming has fertilised sands, dried up marshes, and forced back the sea, is the spade. The proverb on the banks of the Scheldt is: "The spade is a gold mine to the peasant;" and different kinds are made for light or heavy soil. The fields are mostly square, and rarely contain more than an acre; the ground is curved symmetrically, the centre being the highest, so that the water drains down equally in all directions. Round the field, and a foot lower, extends a strip of Grass, three or four yards wide; still lower, a hedge of Elders is planted, which is cut every seven years; and, finally, the plot is surrounded by a ditch, bordered with trees of larger growth. Thus, each piece furnishes rich Grass, firewood every seven years, and timber for building every thirty years. The plough is generally used; but every seven years the sub-soil is turned to the top by the spade, and thus it acquires a depth unknown to all but the best gardens; the principal object being to produce Flax and butter, not cereals. The best farmers never sell their corn, but allow their cattle to consume it. Unhappily, the farm-labourer there, as elsewhere, does not enjoy much comfort; working harder than most men, he is the worst fed. Rye-bread, Potatoes, Beans, butter-milk, without meat or bacon, is the usual fare, chicory the constant drink; beer is reserved for Sundays and fair-days. His wages vary from 10d. to 1s., and he could never live upon it did not all the members of his family work without ceasing. When the day's work is ended, often by moonlight, the father cultivates his small field; his wife and daughters take up the poorly paid lace-work, instead of the old spinning-wheel, which steam has superseded; and his sons, when their field-work is done, bring up rabbits for the London market. Their little hands pick up every tuft of herbage on the road-side, and open up a large trade of exportation not to be despised. From Ostend alone there come to us 1,200,000 rabbits every year; these are skinned and cleaned in Belgium, where the skin is used for the making of hats. Yet, though their life is so hard, the towns do not attract the rural population. Habit and family traditions bind them to the plough; whilst every nine years, at the renewal of their lease, the raising of the rent fills them with anxiety, and poisons their existence. It makes them distrust all those who are making inquiry on the state of agriculture, and disseminate as to the fertility of their land, and the produce they obtain from it. Western Flanders is crossed by a strip of land which is particularly difficult of cultivation; until lately it was scarcely inhabited, and covered with low brushwood and marshy Heath. The Reindeer Moss enveloped the trees with a layer as of white ashes; abundance of Ferns and Moss grew, and the sickly appearance of other plants gave the country a sterile appearance. But by means of the Pine tree this land has also become valuable. About 30,000 young trees are planted on an acre; at the end of seven years these are thinned, and sold for firewood. The land must be rich and provided with Fir-poles, 3,000 to the acre; as it grows, the stems have to be tied, and liquid manure given to those plants which show yellow leaves; finally, at the time of harvest, numbers of work-people have to be gathered together for the picking. But whilst in England the whole of the ground is sacrificed to the Hop, there are in Belgium the most splendid crops of Wheat and Beetroot growing between. Chicory, like the Hop, is a very expensive article of culture; but it gives a rich return, estimated at £40 an acre. The produce of Colza is also very valuable. It will be seen that few sheep are fed in a country where there is so little pasture. Horses of great strength, and milch cows which give much butter, and can be fed in the stable, are considered most advantageous; and statistics show that more of these animals are fed on the acre than in any other country. It is to be remarked that the Flemish farmer has compensated for all the disadvantages of his soil and climate by a simple means within the reach of all—that of restoring to the land what it gives to the wants of men; the secret of agricultural chemistry.—*Chambers's Journal*.

SOCIETIES AND EXHIBITIONS.

ROYAL BOTANIC SOCIETY.

JUNE 10TH.

A good exhibition and favourable weather brought together a large company on this occasion. Prominent among plants were Orchids, Pelargoniums, and what are termed stove and greenhouse plants; Cape Heaths were also shown in quantity and in excellent condition; Ferns and fine foliage plants occupied shady nooks, and there was an interesting display of new plants. Messrs. Lane's fine exhibition of Rhododendrons, too, formed an important feature of the attractions of the day.

Stove and Greenhouse Plants.—In class 1 Mr. J. Ward staged a fine group of plants, prominent amongst which were *Erica depressa*, *E. tricolor* Kingstoni, *E. Candolleana*, and *E. Cavendishii*. The same collection also contained well-finished plants of *Genetyllis tulipifera*, *Statice profusa*, *Anthurium Scherzerianum*, and a splendidly-grown plant of *Phenocoma prolifera* Barnesii. Mr. J. Wheeler had a fine group, consisting of well-grown and profusely-flowered plants of *Pimelea mutabilis*, *Dipladenia amabilis*, remarkably fine *Bougainvillea glabra*, well flowered, but hardly at its best; *Dracophyllum gracile*, *Statice profusa*, *Rondeletia speciosa*, and a fine *Clerodendron Balfourii*. Mr. W. Kemp showed a well-grown group of what are termed half-specimens in this class, conspicuous amongst which were *Genetyllis tulipifera*, *Acrophylum venosum*, *Boronia serrulata*, *Allamanda grandiflora*, and others. In the nurserymen's class Mr. B. S. Williams had twelve fine plants, including *Bougainvillea glabra*, well bloomed; *Ixora amblyensis*, with from twenty to thirty trusses of fine orange blossoms; *Erica Cavendishii*, in beautiful condition; *Azalea Chelsoni*, a glowing mass of scarlet; *Erica tricolor impressa*, well flowered; and a perfect specimen of *Aphelexis macrantha purpurea*, about 4 feet through. In class 3 Messrs. Jackson & Sons staged six fine well-bloomed plants, consisting of *Stephanotis floribunda*, a mass of pearly-white sweet-scented flowers and fresh green leathery foliage; a good *Anthurium Scherzerianum*; *Pimelea mutabilis*; *Azalea*, Sir Charles Napier; *Erica Cavendishii*, the best of all the yellow-flowered kinds; and a well-bloomed plant of *Dracophyllum gracile*. Mr. E. Morse, of Epsom, also furnished a nice group, including *Hæmanthus magnificans*, in charming condition; *Phenocoma prolifera*; *Vineca alba*; and a fine specimen of *Erica coccinea* minor, rather past its best. In the open class for twenty stove and greenhouse plants Messrs. Jackson contributed a well-grown and effective group, in which were good plants of *Anthurium Scherzerianum*; *Aphelexis macrantha purpurea*; *Ixora coccinea*; *Tetratheca verticillata*, and others. Mr. G. Wheeler, also, had a well-grown group of smaller specimens. In class 5, Mr. J. Ward had a dozen fine half-specimens, including one of the finest spathed varieties of *Anthurium Scherzerianum* that we have yet seen, the spathes being nearly 5 inches in width, and brilliantly coloured. In the same collection were also the varieties of the fine old *Kalosanthes* (*Crassula*) *coccinea*, fresh and bright in appearance; and a plant of *Erica Massoni* major, nearly perfect. In the class of six plants, Mr. Kemp staged nicely grown specimens of *Rhynchospermum jasmynoides*, profusely flowered; *Dracophyllum gracile*, and a fine *Polygala oppositifolia*. Foliage plants were well represented by some fine groups from Mr. W. Cole, Mr. G. Wheeler, Mr. B. S. Williams, Mr. Ritchie, and others. *Caladiums* of more than average merit came from Mr. Lambert, gardener to R. Segeleke, Esq., Herne Hill, these were fine fresh specimens about 4 feet through; and Mr. Robert Ritchie, gardener to H. Prance, Esq., of Hampstead, also had a nice group of rather smaller plants. Mr. G. Wheeler and Mr. G. King both showed nice specimens of *Caladiums*.

Orchids.—These were well represented, Mr. B. S. Williams having a fine collection, including well-grown plants of *Cattleya lobata*, a soft rosy-lilac flowered species, with a richly-veined lip; *Cattleya Mossie*, *Lælia purpurata*, *Anguloa Clowesii* with great yellow flowers, resembling deformed Tulips, and a fine specimen of *Saccolabium curvifolium*, bearing two erect spikes of orange-scarlet blossoms. Mr. W. Bull furnished twelve specimens, all in excellent condition. Among them were—*Cattleya Mendelii*, with pearly-white sepals and petals, and a rich blotch of amethyst-purple on its crisped lip; a fresh healthy plant of the new *Odontoglossum Roezli*, with four flowers much larger than when first exhibited; *O. Alexandra*, bearing a nice flower spike; a fine plant of *Cypripedium barbatum grandiflorum*; and a plant of *C. superbiens*, with three fine flowers. In addition to these were plants of *Phalenopsis grandiflora*, with two flower-spikes, *Vanda suavis* with two spikes, one bearing thirteen fully expanded flowers, and a well-grown plant of *Dendrobium formosum giganteum*, with large ivory-white blossoms, and a great yellow-blotched lip. Mr. E. Morse, Epsom, also showed a nice group, in which were *Aërides Lobbii*, with two fine branched spikes of rosy-purple flowers; *Lælia purpurata*; *Stanhopea tigrina*, with immense crimson-blotched yellow flowers; and a nicely-grown plant of *Cypripedium superbiens*. In the nurserymen's class for six Orchids, Mr. Williams was again first with splendid plants, among which were *Cattleya Mossie*, profusely flowered; *Disa grandiflora*, with nine spikes bearing five fully-expanded flowers of scarlet and gold, the soft rosy lip being streaked with purple; *Lælia purpurata*, and others. Messrs. Jackson & Sons, of Kingston, also had half-a-dozen good plants, among which the most remarkable was a plant of *Sobralia macrantha*, bearing eight or ten richly-coloured flowers. Mr. W. Bull's collection contained the rare white-flowered *Palumbina candida*, *Cattleya Mossie*, *C. Warneri*, *Dendrobium citrinum*, and a good *Cypripedium barbatum purpureum*. In the amateur's class for twelve plants, Mr. J. Ward had a finely-flowered and well-grown group, in which were fine specimens of *Odontoglossum Alexandra*, with seven good flower-spikes; *O. Phalenopsis*, well-bloomed; a fine specimen of *Phalæ-*

nopsis grandiflora, *Lælia purpurata*, *Cypripedium Stonei*, *C. villosum*, and a good mass of *Masdevallia Harryana*. Messrs. J. and G. Wheeler each had well-grown groups. Mr. J. Ward's half-dozen plants, staged in class 8, were in every way excellent, and included two fine specimens of *Odontoglossum Bluntii*, *Phalenopsis grandiflora*, *Dendrobium Dayanum*, and a fine plant of *Aërides Lobbi*, with two fine spikes.

Pelargoniums.—These were excellent. The best group in the fancy class came from Mr. Watson, of Isleworth, Mr. King, and Mr. Chas. Turner, of Slough. Among these, the most attractive variety were *Sylvia*, white, with bright rosy blotch; *Lucey*, white and deep rose; *Lady Carrington*, fine lilac; *Mirella*, deep rose, with a white eye; Mrs. Alfred Wigan, fine deep rose. Of large-flowered or show kinds, Mr. J. Ward had a splendid group, each specimen being about a yard in diameter. This group contained *Conflagration*, bright rosy-scarlet, with a black blotch; *Rob Roy*, rosy-purple, with a black blotch; *Caractacus*, a fine purplish-lilac, with dark maroon blotch; *Desdemona*, white, with a dark blotch; and *Rosy Gem*, a deep rose, with maroon spots. Mr. Chas. Turner staged a fine bank of new varieties, belonging to both the fancy and large-flowered classes, the flowers, in the majority of cases, being finely formed, and of the most vivid colours. The Rev. H. Matthews, of Foxton House, Leicestershire, staged three plants of a new variety, named Mrs. Andrew Matthews, a fine kind, with round smooth rosy flowers, with a black blotch on the upper petals.

Heaths.—These were finely grown, the principal exhibitor in the nurserymen's class being Messrs. Jackson, of Kingston, who had *Erica Vernoni* (a fine white variety); *E. oblata*; *E. Aitoniana Turnbullii*; *E. tricolor impressa*; and *E. Parmentieri rosea*. Mr. Morse, of Epsom, had fresh, well-flowered specimens of average merit. And in the amateur's class Mr. J. Ward staged six fine plants, including *E. elegans*; *E. ventricosa magnifica* (well-bloomed); *E. Eassomiana* (a fine white variety); *E. Cavendishii*; and *E. ventricosa grandiflora*, a glowing rosy mass of colour. Mr. J. Wheeler and Mr. W. Kemp, also had well grown collections.

Begonias.—Two or three collections of the old foliage Begonias were staged, the exhibitors being Mr. W. Walker, Acton, Mr. Lambert, Mr. T. Farren, and Mr. W. Foreman. Mr. W. Bull staged six new flowering varieties of the *B. Bolivensis* type, including *B. grandis*, a vivid scarlet; *B. Sparkler*, a rich orange-scarlet; *B. Anacreon*, a most profuse bloomer, of a deep rosy-scarlet; and *B. Glitter*, a vivid orange. These new kinds of Begonia promise to be plants of great value, inasmuch as they are of a comparatively hardy character and have bright glowing colours, qualities that augment their usefulness as decorative plants, for pot culture, and warm sheltered positions out-of-doors.

Roses.—Mr. G. Paul staged nine well-grown specimens, including *Monsieur Woolfield*, a fine light variety; *Madame Margottin*, a clear sulphur-tinted Tea; and *Jules Chretien*, well bloomed. Mr. W. Stoder staged two fine stands of cut Roses, the blooms of *Maréchal Neil*, being of fine quality; and Mr. Henry Eastdon, Star Cross, Devon, had a cut Rose, all the petals of which were curiously tri-lobed. Mr. Turner sent a new light Rose, named *Miss Hassard*, which promises to become a favourite.

New Plants.—Fine collections came from Mr. W. Bull, who had a magnificent group, many of which we referred to in last week's issue. Messrs. Veitch also sent *Sarracenia Stevensi*, *Tillandsia musaica*, *Dracena hybrida*, a fine habited plant, with deep green foliage profusely margined and streaked with creamy-white and bright rose. The same group included a new *Cattleya*, of a creamy-white colour, with purple markings on the lip; *Adiantum Zahnii*, with fine leathery bright green pinnae; *Lilium Philippense*, with linear leaves, and a large white flower, nearly like *L. longiflorum*; *Bignonia argyrea cærulescens*, a graceful climber, in the way of a *Cissus*, has deep green leaves, mottled and netted with silvery-grey.

Miscellaneous subjects.—Messrs. Jackson & Sons staged a fine basketful of a *Saxifrage* named *nepalensis*, but which appeared to be either *S. Cotyledon* or a kind closely related to it. Mr. R. Parker had a fine group of hardy herbaceous plants in pots, including a fine collection of *Pyrethrum*, in many varieties; *Pæonies*, *Iris*, and *Spiræa japonica*. In this group were plants of *Erigeron subumbellatum*, *Lychnis viscaria rubra* fl. pl., and *L. viscaria splendens*, with mauve-tinted flowers. *Gloxinias* were shown by Mr. Farren, Mr. E. King, and Mr. F. Lambert. Messrs. Haage & Schmidt showed a case of flowers from their new strain of double-flowered *Cinerarias*. Messrs. E. G. Henderson staged a collection of succulents, fancy *Pelargoniums*, bedding *Tricolors*, and a dozen and a half of new hybrid flowering *Begonias*. A basket of the graceful Fern-like *Thalictrum adiantoides* was much admired. Dr. Smee, Finsbury Circus, sent a dish of ripe Pears of this season's growth. Mr. B. S. Williams had a large and effective group of choice Palms, Ferns, *Nepenthes*, *Orchids*, and succulents.

Botanical Certificates were awarded to the following:—

Phyllanthum Lindenii (Bull).—A fine *Aral*, with large light green foliage conspicuously marked with ivory veins.

Maranta Leopardina (Bull).—A vigorous growing species, with apple-green foliage, marked on each side the mid-rib with dark shining green blotches.

Croton volutum (Bull).—A strong-growing species, with deep green contorted leaves blotched and veined with golden-yellow.

Macrozamia plumosa (Bull).—A graceful slender-growing Cycad, with arched foliage and narrow leaflets of a fresh green colour.

Dracena Goldicana (Bull).—A robust and distinct species with dark green leaves, banded with grey, markings very distinct and beautiful.

Calamus cilicaris (Bull).—One of the most beautiful of all slender-growing Palms. Foliage bright green, closely pinnate. Well adapted for decorative purposes.

Dendrobium amœnum (Bull).—A pretty white-flowered species, the segments tipped with lilac-purple. Flowers delicately scented.

Tillandsia musaica (Bull).—A robust-growing species, with gracefully

arching deep green leaves, banded transversely with lighter green. Flowers deep orange-yellow. Very effective.

Erythrina Parcellii (Bull).—A strong-growing stove plant, with green ternate foliage, veined with bright gold. It deserves culture as a general decorative plant.

Areca nobilis (Bull).—A graceful pinnate Palm of a fresh green colour, with spinose petioles. It resembles a *Kentia* in contour, and is highly ornamental.

Cypripedium Parishii (Williams).—A strong-growing green-leaved species, bearing three or four large flowers on an erect spike. Sepals and petals marked with purple. Lip greenish.

Sarracenia Williamsii (Williams).—This is an interesting plant, already mentioned in our columns. It appears to be intermediate between *S. purpurea* and *S. flava*, and nearly resembles the last-named species.

Scolopendrium vulgare cristatum viviparum (Williams).—A fine fresh green-crested form of a well-known hardy Fern.

Vanda limbata (Williams).—A beautiful and rare *Orchid*. Alluded to last week. *Sarracenia Stevensii* (Veitch).—A beautiful hybrid. Alluded to in our last week's issue.

Tillandsia musaica (Veitch).—A fine stove plant, alluded to above.

Dracena hybrida.—A fine robust-growing plant with deep green foliage, conspicuously streaked and margined with creamy-white and deep rose.

Lilium Philippense (Veitch).—A large white-flowered species from the Philippines, resembling considerably *L. longiflorum* in the flower, but readily distinguished from that kind by its extremely narrow leaves and slender stems.

Adiantum Zahnii (Veitch).—A robust form of the *A. Wilsonii* class, remarkable for its bright green leathery fronds, and distinct and effective habit of growth.

Nephrolepis davallioides furcans (Veitch).—A bright green form of *N. davallioides* with forked pinnae. A beautiful form of a well-known and valuable basket Fern.

Odontoglossum Rezii (Bull).—A beautiful and rare white flowered *Orchid*, the petals of which are blotched with purple at the base; well worth culture as a companion to *O. vexillarium*.

Pleocnemia Leuzæana (Bull).—A beautiful Fern with ample spreading fronds of a lucid green tint, well worth general culture.

Floral Certificates were awarded to the following novelties:—

Ageratum Little Gem (Turner).—A dwarf blue-flowered form, resembling one shown by Mr. Chater some time ago; will be valuable for carpet bedding.

Pelargonium Countess of Dudley (Turner).—A nice addition to the fancy class, of a rich rosy-lilac colour, and free habit of growth.

Pelargonium Atlantic (Turner).—A free-flowering lilac-tinted fancy variety, the upper segments very deeply coloured.

Pelargonium Crown Prince (Foster).—A lively scarlet, with dark blotch on the upper segments.

Pelargonium Sybil (Foster).—A fine flat scarlet-flowered variety with darker blotch.

Pelargonium Gypsey (Foster).—A dark crimson-maroon-tinted flower of free habit.

Pelargonium Lord Nelson (Foster).—A deep maroon-purple, darkly blotched and veined.

Pelargonium Mrs. Andrew Matthews (Matthews).—A fine smooth soft-rosy scarlet flower of good form, and free habit of growth and flower. It has a good clear centre and deeply blotched upper segments.

Rose Rev. J. B. Camm (Turner).—A fine fall flower of a bright rosy-lilac colour and a highly promising addition to its class.

WELL DRESSINGS.

For many years past the ceremony of decorating wells in commemoration of the introduction of good and pure water into Wirksworth, has been regularly observed at Whitsuntide, and this year was no exception to the rule, the railways bringing some 3,000 persons, all bent on a holiday and a ramble among the hills and dales, for which this part of Derbyshire is so famous. The prizes awarded were—first, £8 10s.; second, £8; third, £7 10s.; and fourth, £4. In the first prize, the well dressing took the form of a Roman alcove, with central recess and supporting panels. The ground of the recess was worked in Parsley leaves, which gave it a beautiful depth of colour, in the upper portion were the words "Unity is Strength." Just below this was a large shield with coat-of-arms of England worked in Laburnum flowers, Geranium leaves, and red Daisies; lions, &c., in coloured Wallflowers and yellow Pansies, whilst round the whole was a representation of the wreath we see depicted on the new half-crowns in circulation. The outside panels were done in grey and green Moss, with rows of white Daisies between, in imitation of stone-work, the inner panels having oblongs of white Daisies and border of red Daisies. The capital running along the top of the centre piece and panels was a very pretty piece of work, the end being in yellow and light-coloured pansies, with strings of Holly berries, while the centre was a scroll-work of dark purple flowers and red berries. Open ornamentation work was fixed at the top, whilst a dove in white Daisies surmounted the whole. The second prize well represented a drinking fountain in recessed archway, supported by two semi-pillars on each side and outside panels. This was a very pretty design, and most artistically carried out. The fountain was of oval-shape, worked in alternate stripes of Blue Bells, King Cups, and lines of red berries, the ground being grey Moss. The arch spanning the centre was also in grey Moss, with lines of Holly berries at intervals, and the motto, "England's Defence," over which was a large crown, surmounted by flags in scarlet Geraniums and Blue Bells—cannon on either side being worked in Sweep-heads, with wheels and mounts in Holly berries. The crown was very pretty, being worked in red Daisies, dark Pansies, Laburnum flowers, and small green Grapes, with mitre of red berries. A large scroll surmounted the whole in King Cups, and at the intervals along the top three pinnacles, dressed with borders of King Cups, and the centre with purple Stocks. In the centre, over the fountain, was a large star, with inner circle worked on white Lilac ground. In the ring were the words, "A living stream as crystal clear," done in red berries, on ground of Rhubarb seed, the centre portion of the star being worked in Bachelor's-buttons, Fir shoots, and Blue Bells. The side pillars were in scrolled form, worked with King Cups, Blue Bells, and Lilacs alternately.

THE GARDEN.

"This is an art

Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

CAUSE AND CURE OF GUM IN FRUIT TREES.

THE formation of gum in fruit trees is a very common occurrence, and, as it is more or less prejudicial to the health of the subjects affected, it has long engaged the attention of horticulturists, whose opinions respecting it differ in a remarkable manner. Du Hamel admitted that gum, when introducing itself into the vessels of the tree, causes obstructions which are fatal to its vitality. Meyer, on the other hand, maintained that the flow of gum is not, in itself, a disease, but a symptom of disease, indicating merely an arrest of the supply and assimilation of the sap. From my own investigations into this subject, I have been enabled to decide between these contradictory opinions, and to establish the fact that the flow of gum in a fruit tree constitutes, of itself, a genuine disease. In the wood of a tree diseased with gum, a great number of vessels are always seen more or less completely filled with it; sometimes, they are entirely filled to a certain length, and, sometimes, the gum only forms a coating either upon all the periphery or only on one side. The gum first shows itself in very small drops, which gradually increase in size and touch each other, forming small irregular masses. Recent German observers have stated that the formation of the gum is due to the disorganisation and transformation of the internal part of the wall of the vessel, but the author has come to an opposite conclusion. In examining the wood of an Apricot tree from which large masses of gum were extracted, it was found that the vessels were marked with areolated punctures, and with a spiral line due to a thickening of the membrane; also that the surfaces of the masses of gum were marked with deep furrows corresponding with the spiral lines of the vessel-wall, and even with small projections according with the punctures. It is thus certain, in the author's opinion, that the gum has poured into the interior of the vessel, and that the marks upon it are imprinted from the vessel-wall. In the production of gum in the cellulæ by the transformation of starch, it has been observed that, on the first appearance of gum in the cellulæ, the unchanged starch gathers into small masses, around which forms a thin coating of gum. Gradually the starch diminishes, while the coating of gum increases, until at last the starch disappears altogether, leaving generally a vacant space in the centre of the mass of gum. Often the gum, produced in such considerable quantity, is formed neither in the vessel nor cellulæ, but in the spaces between the young tissues, generally between the wood and the bark, yet often also at the different depths in the wood. These gum spaces grow at the expense of the neighbouring tissues, which suffer important modifications: the cambium, instead of producing woody fibre, forms cellulæ in which abundance of starch is deposited, which starch subsequently becomes converted into the gum. This specific formation of a starchy parenchyma, which is never found in a healthy plant, may be considered as the first specially active phase of the disease. It is a true pathological indication, exhibiting the formation of a new morbid tissue by a specific transformation of the constituent elements of the normally healthy tissue. What then follows? In the first place, an exudation of gum into the interior of the vessels, and sometimes of the fibres; next, the appearance of the gum, at first, between the cells (probably, in consequence of a gummy degeneration of the inter-cellular matter), and afterwards in the interior of the cellular wall itself, the layers of which become separated by, and distended with, the infiltrated gum. In this case, also, it is possible that the substance of the cellular wall undergoes a partial gummy degeneration. However, this may be, the contact of the gum thus produced exercises a remarkable influence over the adjacent tissues. Although already undergoing a gummy degeneration, they, at the same time, manifest a great activity in forming fresh matter, and the

cellulæ on the margin of the affected space increase in size and number in an extraordinary degree. An organic action has been set up, quite analogous to that which M. Trecul has so well described in his account of the formation of swollen growths on the lips of bark-wounds, which are screened to prevent them from drying up. The vitality of the cellulæ, then, evidently, still exists in a very high degree. If, subsequently, the cellulæ in the immediate neighbourhood of the centres of gummy production give up the starch which they contain, if they become disorganised and exfoliated, and partially changed into gum, we must, nevertheless, recognise in this production of gum quite a different matter from such a purely passive and indifferent a phenomenon as a particular phase of the disorganisation of a dead tissue. It is a genuine disease which presents these special characters, and one in which we see the vital forces of the plant diverted from their normal course, and displaying an increase of energy prior to their final extinction. The study of the changes which occur in the gum-affected tissues enables us also to distinguish the prevailing character of the malady, and to see how, under its influence, the normal functions of the plant are deranged. The nutritive matters, laid up in reserve in the tissues, instead of contributing to the aliment and growth of the plant, go to the production of gum, and a portion of them, before they are transformed into it, collects in quantities around the gummy centres of irritation. We might, I think, almost draw a comparison between the effects of these centres of irritation on the organism of a plant, and what takes place when an insect punctures the bark and deposits its eggs among the tissues. In the latter case under the influence of a specific source of irritation, a gall is formed, the tissues become modified in their structure, and assume a different appearance, while the new cellulæ which are formed enclose in their interior a collection of alimentary substances (and of starch, in particular), which are intended no longer to supply the requirements of the plant, but to serve as food for the little parasite, that is about to be hatched and bred among the materials, which the vital functions of the plant, so deeply perverted by this singular disease, have been compelled to yield and store up within its reach. It is much the same with the phenomena connected with the formation of the woody parenchyma in those parts of the plant which may contain the elements destined to be employed in the formation of gum. These phenomena appear to result from the poisonous activity of the centres of gummy irritation, in the same way as the production of the gall results from the depositing of the insect's egg. The primary cause, however, of the poisonous irritation set up in those parts of the plant which are destined to become gum-centres, is not so obvious as the empoisoned wound and the laying of the insect's egg which produces the gall. But, if the primary cause of the gum-disease is still very obscure, its effects are, nevertheless, now well known, and, when we consider that the woody parenchyma communicates with the medullary rays, which extend through every part of the plant, and constitute the general store-house in which are laid up in reserve the nutritive substances for its support and growth, it is easy to understand how the formation of gum, which is effected at the expense of these food-stores, has no other limit than the final total exhaustion of the plant.

Remedies.

Among the remedial measures which have been proposed for the cure of this gum-disease, there is one, which, to my own knowledge, has been very effectual. This is the scarification of the bark. I have seen trees which were severely attacked by the disease, and unable to produce any but small and feeble shoots, completely restored to health, and sending forth fresh vigorous shoots, after longitudinal incisions had been made in the bark of the branches. The open wounds keep up a very active irritation in the bark, and the food-stores are diverted to the formation of new and healthy cellulæ, and cease to be drained away to the gum-centres, while the vital energies of the plant soon tend to resume their regular course. Scarification, in fine, acts as a powerful diverting agent against the disease. [The foregoing translation of a paper read by M. Ed. Prillieux before the Académie des Sciences, at Paris, will, doubtless, prove useful to cultivators whose fruit-trees are affected with gum.]

W. M.

NOTES OF THE WEEK.

— MAY frosts we are too familiar with in this country; June ones are happily more uncommon. A climate, with dangerous frosts occurring within a week or two of the longest day, can scarcely be called agreeable, and this we have experienced this year. On Friday week, 12th June), the frost in the neighbourhood of London was most severe. The young foliage of many herbaceous plants was destroyed; Potatoes were blackened in many fields and gardens; and the flowers of such hardy plants as Irises, Lilies, and Pæonies were killed. That favourite border flower, *Dielytra spectabilis*, has been cut down by frost three different times this year. Roses are generally a greater failure through frosts than we ever remember to have seen them. And so of most other garden products. After these experiences, it would be rash to say that we are at any time safe from frost in England. "On two nights," says Mr. Titus Salt, writing to us from Milner Field, near Bradford, "within the last week, the thermometer has registered 34° and 36°, with a bitter north-east wind; it is literally destroying all vegetation."

— IN France, where Strawberry culture is very extensively pursued, and the transport of the fruit to the great markets is an important consideration, small jars of baked earth have superseded baskets for the package of fruit of late. They hold about a quart of fruit each, and are conveyed in large baskets. The fruit is said to come to market in these jars in fine condition.

— SEVERAL forms of the Tree-Lupine form large, handsome, and well-furnished bushes in Mr. Ware's nursery at Tottenham, and are strikingly effective. There are various forms of these Lupines in cultivation; but those in the Tottenham nurseries are the best we have seen. It is surprising such handsome shrubs have not become common. They are covered with flowers, and are far more valuable plants than any herbaceous or annual Lupine in our gardens.

— LAST year Messrs. Veitch offered some handsome prizes for fruit; and with such satisfactory results that that firm has been induced to repeat the offer this year, the competition being fixed to take place on the 15th of next month, in the Royal Horticultural Society's Gardens, at South Kensington. The prizes, which, as will be seen by an advertisement in another column, are liberal, deserve attention, and will doubtless be the means of bringing together a highly interesting fruit show.

— THE Legislature, says the *Californian Horticulturist*, has granted permission for the issue of thirty-year city bonds, to the extent of 250,000 dollars, in aid of the next two years' work on the Golden Gate Park. This, though but half the amount which was desired, will serve to make the park a credit to the city, and one, indeed, which, at no very distant day, will be one of the finest in America.

— WE are glad to learn, from the *Revue Horticole*, that our friend M. E. André, editor of the *Illustration Horticole*, and designer of Sefton Park, Liverpool, has recently been decorated, by the King of Holland, with the order of the Couronne de Chêne, in recognition of the valuable services which he has rendered during the last four years in superintending some important improvements in the town of Luxembourg.

— A NEW classification of plants, with special reference to their distribution, is suggested by M. De Candolle, in the last number of the *Swiss Archives des Sciences*. Basing his system on the relations of plants to the physical conditions of heat and moisture, he recognises four great groups. One of these is essentially equatorial, whilst the others are repeated in the two hemispheres. De Candolle's names are *Mégathermes* for those plants which require a high temperature and much moisture for their development, *Xérophiles* for those which affect dry situations, *Mésothermes* for plants living at moderate temperatures, and *Microthermes* for those needing but little heat. There is still a fifth class, of only small importance, and now confined to arctic and antarctic regions, which the author designates as *Hékistothermes*, in allusion to the very small proportion of heat needed for their development.

— ACCORDING to a return made in conformity with instructions issued by the French Minister for Agriculture, the department of Anbe has lost two-thirds of its Vine crop through the May frosts; Upper Charente, one-fifth; Lower Charente, one-third; Cher, one-half; Côte d'Or, from one-third to one-half; Gironde, one-tenth; Indre-et-Loire, one-quarter; Isère, one-fifth; Jura, one-third; Loiret, one-third; Loire-et-Cher, one-third; Maine-et-Loire, one-third; Marne, one-quarter; Meurthe-et-Moselle, one-half; Puy-de-Dôme, one-quarter; Rhone, one-quarter; Saône-et-Loire, one-third; Upper Saône, one-third; Savoy and Upper Savoy, have each lost one-quarter; and, finally, the Yonne has lost two-thirds. Adding up the specified figures, we find a sum of 6,535,603 hectolitres of wine, to which may fairly be added 1,464,397 more for the losses of the other departments of secondary importance, thus giving a round sum of

8,000,000 hectolitres; and, taking the average value at the moderate price of 25 francs per hectolitre, it would appear that the frosts last month have created a direct loss of 200,000,000*fr.*, or £8,000,000 sterling, to the proprietors of French vineyards alone.

— GERANIUM "arenarium," in our last week's "Notes," was a misprint for *G. armenum* of Boissier. It is a native of Armenia, and is perfectly hardy.

— AQUILEGIA WITTMANNIANA, of which there is now a large bed in bloom in Mr. Ware's nursery at Tottenham, is one of the finest of the Columbines, quite worthy of ranking beside even the finest Rocky Mountain Columbines, such as *A. cærulea*.

— THAT pretty aquatic plant, the Water Violet (*Hottonia palustris*), so rarely seen in good condition in gardens, is now blooming very prettily in Messrs. Rollisson's nurseries at Tooting. It grows in a large pond in deep water. The flowers are in whorls, like those of the Japan Primrose, and very beautiful.

— MR. JOHN FRASER informs us that the new park at West Ham, better known in its neighbourhood as Upton Park, is to afford a site for a very important flower show, to be held there on the 30th of June and 1st of July. Of the park itself a full description will be found at p. 434 of the last volume of THE GARDEN.

— AS one of the curious effects of the great frosts of May, Mr. Ware, of Tottenham, informs us that, while large numbers of Roses worked near the surface of the earth perished, standards of the same age and same varieties escaped. This was doubtless owing to the greater cold and moisture near the surface of the ground.

— AT the recent exhibition, at Florence, MM. Vilmorin-Andrieux & Co., 4, Quai de Mégisserie, were awarded a gold medal for their "Album," a splendidly illustrated work, containing carefully-coloured plates of flowers and vegetables, which are figured in their natural sizes.

— SIX HUNDRED lots of the Meadowbank Orchids which were sold at Stevens' on Wednesday and Thursday last, realised £2,000. The highest price given for any one lot was 42 guineas, and that was for Dawson's variety of *Lælia anceps*; *Cattleya exoniensis* fetched £31 10*s.*; and *Cypripedium iosigne Veitchianum* £23 2*s.*; others fetched from £10 to £15 per lot.

— A NOVEL application of photography is described by an Italian correspondent of the *Philadelphia Photographer*. He had some fruit-trees that needed pruning, and there was no one in the neighbourhood who could attend to the work in season. He, therefore, photographed the trees, and sent the pictures to an experienced pruner in Turin, who returned them after marking where the branches were to be cut. The artist then pruned the trees himself, according to the directions.

— TRITOMA CAULESCENS we find is now in flower in the herbaceous grounds at Kew. It has a stout stem and glaucous broad fleshy leaves, which much resemble those of a caulescent Agave. This species is a native of the Stombergen Mountains. The plant now in flower has remained in its present position during the past winter. There is also, at Kew, a fine plant of *Lilium Szovitzianum*, producing richly-scented yellow flowers in abundance; and a tuft of *Allium odorum*, a mass of fragrant bloom.

— WE observe that a national lawn-mower contest is to take place at the Lower Grounds, Aston Park, Birmingham, in connection with the midland counties great show, which is to be held there on the 7th, 8th, 9th, and 10th of next month. At this contest the following prizes are offered:—Premier prize, gold medal, for the machine gaining most points; for the second prize, a silver medal; for the third prize, a bronze medal. A special prize, consisting of a silver medal, will be awarded to the best machine or other appliance for cutting Grass edges.

— THE current number of the *Revue Horticole* contains a coloured plate and a description of a handsome hot-house plant, *Vernonia centriflora*. It is a native of Brazil, and forms compact tufts from 12 to 16 inches high, flowering in November and December, when it exhibits numerous semi-globose heads of delicate lilac flowers, in scorpioid spikes on the terminal ramifications of the erect stems. The plant does well in a temperate house, in a mixture of free loam and spent hot-bed material for full-grown specimens, and a lighter compost mixed with peat-soil for younger plants.

— WE are authorised to announce that, with a view to accommodation intending exhibitors at the forthcoming great midland counties show, the last day for making entries has been fixed for Saturday next, the 27th inst., instead of the date announced in the schedule. Competitors for either of the silver challenge cups offered must deposit a sum of £2 at the time of making the entry. These deposits will be returned on the morning of the exhibition to such exhibitors as only stage their exhibits. Arrangements have been made for holding a public dinner at 6 p.m. on the second day of the show, in order to afford exhibitors and others an opportunity for social intercourse.

THE FLOWER GARDEN.

ADONISES.

THESE belong to the *Ranunculus*, or Buttercup, family. They are chiefly natives of corn-fields in Southern Europe and Western Asia, and are dwarf in stature, with finely-divided leaves, and red, straw-coloured, or yellow flowers. There are about fifteen or sixteen species, most of which are annuals, and not very striking or ornamental in appearance; consequently, with the exception of two or three fine kinds, they are seldom seen in gardens. By far the most showy and finest of the species is

A. VERNALIS, of which we give an illustration. This is a compact-growing perennial plant, forming dense tufts, 8 to 15 inches high, of finely-divided thread-like leaves, which are disposed in whorls along the stems. It flowers in spring, when the tufts become covered with numerous large brilliant yellow, Anemone-like flowers, 2 or 3 inches in

species, are very finely divided into numerous narrow linear segments, and have a very graceful appearance. Individually, the plants are not very effective, as they are rather straggling in growth, possessing none of the compactness of habit which distinguishes *A. vernalis*; but, when grown in masses in borders or flower-beds, along with other autumn-flowering annuals, they afford a very pleasing contrast; and this is, indeed, the only way in which they can be employed to advantage. They do well in ordinary garden soil, and should be sown at the same time, and receive the same treatment, as the commonest annuals. A variety with larger flowers was formerly grown in gardens under the name of *Flos Adonis*.

Some of the other species (which are mostly annual corn-field or vineyard weeds in the south of Europe) are:—*A. flava*, a small French species, with yellow flowers. *A. micrantha*, a doubtful species, with small yellow or flame-coloured flowers—also from France; *A. microcarpa*, a Spanish species, with citron-yellow or somewhat flame-coloured flowers; *A. flammea*, an Austrian species, with large flame-coloured long-stalked



The Spring-flowering Adonis (*A. vernalis*).

diameter, a single flower being produced at the end of each stem. Native of Southern Europe and Siberia. This plant forms an excellent subject for borders, rock-work, or the margins of shrubberies, and will grow in almost any soil. It will come to greatest perfection, however, in a rich calcareous or sandy loam. Its compact habit and free-flowering qualities point it out as an eligible subject for pot-culture, and it is sufficiently showy to take a prominent place among some of our most popular window-plants. Of *A. vernalis* there are several varieties, the chief of which is *A. v. sibirica*, which differs from the type only in having larger flowers.

A. PYRENAICA.—This is another fine perennial species, from the Eastern Pyrenees, at present rare in cultivation, with large showy deep yellow flowers, resembling those of *A. vernalis*, but with broader obovate petals. It flowers in April and May, and may be grown in the same way as the last-named species.

A. AUTUMNALIS.—This British species, popularly known as the "Pheasant's Eye," is an annual plant which grows from 8 inches to a foot, or more, high, and blooms in the end of summer or early in autumn. The flowers are not more than an inch across, but are of a bright scarlet colour, with a dark spot at the base. The leaves, like those of the other

flowers; (this might, perhaps, be advantageously introduced into general cultivation). Others are *A. æstivalis*, a corn-field weed in the south of France, with small vermilion-coloured flowers; and *A. citrina*, which is, perhaps, a variety of *A. æstivalis*, with small citron-yellow flowers. W. M.

EFFECT OF THE SEASON ON FLOWERS.

SPRING flowers, this year, have had a short season and a brilliant one; sun, frost, and drought having made short work with them. Primroses, Violets, Forget-me-nots, Daisies, Aubrietias, Dielytras, Auriculas, and many more, could hardly be said to have been here until they were past; and yet they have seldom been more glorious. Snowdrops, Crocuses, Daffodils, Tulips, Hyacinths, Anemones, all came in in excellent condition, and went past, as it were, with a rush. Some were cut down suddenly by frost, as the *Dielytra spectabilis*; others, were dried up between frost and sun, like the exquisite *Myosotis dissitiflora*, and many of the *Viola cornuta* section; others, again, such as *Polyanthus* and *Auriculas*, were half scorched as soon as opened. Cowslips have hardly been able to flower at all in dry meadows; the new *Primula japonica* has had hard work to hold its ground with the frost and the sun acting by turns, on its juicy tuft of fine foliage. Its crimson spikes are now,

however, about the finest things in the spring garden. It stood the frost of winter well, but it does not like the alternate freezing and scorching of this spring, and many of its leaves are partially browned. The great want of this and other spring plants this year has been water, and that has been scarce; and, where spring flowers are grown by many thousands, it is found impossible to water them on account of the labour which the operation involves. The winter has had a curious effect upon some so-called hardy plants. For instance, the whole of a nice collection of Pentstemons, in the open border, has succumbed to the cold. Hollyhocks have likewise suffered severely. The majority, however, of herbaceous plants look well, and seem to have enjoyed the dry winter. The drought has been most persistent. Seldom have ponds, ditches, or springs been so low. Rain is still wanted to develop the clustering buds of Roses, and to start into growth and beauty the hosts of bedding and sub-tropical plants that have recently been put out.

D. T. FISH.

EVERLASTING FLOWERS.

THE various genera that may be grouped under this heading are all of considerable decorative value in the flower garden and conservatory during the summer, and also in the house during the winter when carefully dried and preserved. It will be most convenient to take the group in alphabetical arrangement, and descant on the properties of each as the list is passed in review. The beautiful *Acroclinium* roseum and its white variety—both introductions from South-West Australia—are very extensively grown, and are much esteemed for cultivation in pots, and for forming beds or patches in borders in the open ground. Though classed as half-hardy annuals, they may be advantageously sown on warm sunny spots in April; but the soil must be open and rich. It is a good plan to sow some seed in pans in March, in a gentle heat, and when the plants are large enough to prick them off into 48-pots, about three plants in each, for blooming early in a greenhouse. The *Acroclinium* grows about 12 inches high, and throws up numerous flower-stems. In the open ground, the seed should be sown thinly in drills, and room allowed to the individual plants to grow and branch freely. They then become bushy, grow freely, and supply an abundance of flowers to cut from. Next comes *Ammobium alatum* (the Winged-stalk Sunflower). This can also be grown as a perennial if protected from frosts; but, on the whole, it is best to treat it as a half-hardy annual. It is by no means so commonly grown as the *Acroclinium*. *Ammobium alatum* forms a kind of tuft of leaves at the base of the flower-stalks, which are tall, erect, and branched, with flowers having a centre composed of tubular yellow florets, with a fringe of white scale-like petals surrounding the disc. Seed of it should be sown early in March in a pan placed in a cold frame, and the plants should be put out in a warm border in May. *Gnaphalium*s are included under the head of Everlastings; but, as they can be purchased so cheaply in London, being largely imported from France, it is not worth while troubling about their cultivation. On the other hand, the *Helichrysms* are among the most valuable of the Everlastings, furnishing a great many shades and tints of colour, from white to the darkest maroon. All the large-flowered double varieties, no doubt, came originally mainly from *H. bracteatum*, an introduction from New Holland, though some trace their descent back to the large-flowered *H. macranthum*. By means of careful selection very fine double flowers can now be obtained, while the plant is of very easy cultivation. What is known as *H. compositum maximum* affords the finest strain. The *Helichrysms* should be raised in a gentle heat; and, if it is possible, to form a small bed in a warm house, or under a frame on a bed of decayed leaves and a little manure, and the seed sown broadcast, the plants will become well rooted by the time when they ought to be planted in the open ground. The Continental seed-growers have succeeded in originating a dwarf free-branching strain, which, growing from 12 to 20 inches in height, is much better adapted for small gardens than the type which grows from 2 to 3 feet. The soil for *Helichrysms* should be light and rich, and the plants should be placed in the open ground as early as possible. *Helipterum Sandfordi* is a very handsome Everlasting, bearing large clusters of golden-yellow flowers, but, as it is of a tender

character and requires careful culture, it is not much grown. The *Rhodanthe* is one of the most popular of Everlastings, and, like the *Acroclinium* and the *Helichrysium*, is very extensively cultivated. The slender, elegant habit of growth of the plants, and their charming Daisy-like flowers, make them general favourites. *Rhodanthe Manglesii*, or Captain Mangles's *Rhodanthe*, first came to us from the Swan River and New Holland many years ago. This grows from 12 to 18 inches in height, with free-branching stems and solitary flower-heads, which are of a charming rosy hue, the disc of tubular florets being yellow. In 1861, or thereabouts, Mr. William Thompson, of Ipswich—to whose enterprise we are indebted for some of the best of our more recently introduced annuals—was enabled to introduce two supposed new species from Western Australia; one, *R. maculata*, which, in general habit, approaches very nearly to *R. Manglesii*, and has rosy-pink flowers, stained at the base near the disc with a deep sanguineous blotch, to which the name *maculata*, given to it by its discoverer, Drummond, the celebrated Swan River botanist, bears reference. There is a white variety of this, known as *Maculata alba*, the outer fringe of petals, or scales, as they are termed, being white. *R. atrosanguinea* has certain distinct characteristics which seem to stamp it as a species; for instance, the buds are erect, instead of half-pendulous, and the flower-heads have a deep bronzy-red disc and a self-coloured striped ray of a deep rose colour, the outer scales being of a silvery hue, as in the other types. The *Rhodanthes* make very charming pot annuals. The best mode of cultivation is to sow the seed thinly in pans in a gentle heat, in February or March, and when the plants are large enough to handle to prick them off into 48-inch pots, about six plants in a pot, and let them flower without further molestation. The plants should be transplanted as soon as they can be handled, as they do not succeed well if moved when older. It is better to transplant to the flowering-pots than to sow the seeds in them, as they are apt to fail to grow. If transplanted to the open ground, a nice light rich peaty soil should be prepared for them. Nearly forty years ago, Drummond sent to England from the Swan River two species of the genus *Morna*, *nitida* and *nivea*, since known as *Waitzias*. The *Waitzias* have something of the aspect of a *Helichrysium*, but are mostly of a dwarfer and more restricted habit of growth, with foliage less obtrusive in character. The best known and most generally cultivated species is *Waitzia grandiflora*. This is the most robust grower of all, and has the largest flowers. It grows from 1½ to 2 feet in height, and bears clusters of large yellow flowers with an orange-coloured disc. It should be treated as a half-hardy annual; the seed should be sown in pans about the middle of March, transplanted to pots, and grown close to the glass in a moderate temperature only, to prevent weak growth, the final transplanting to the open ground being at the end of May. Lastly comes the genus *Xeranthemum*, represented by varieties of *X. annuum*, introduced from the south of Europe. The plants have an upright branching growth, and the flowers range in colour from white to deep violet. The original type grows from 2 to 2½ feet; but there is a dwarf form which only reaches 1 foot in height. The seeds should be sown thinly in the open border. In order to have Everlasting flowers as well preserved as possible, the flower-stalks should be cut just as the blooms are beginning to expand, or when they are not more than half open, tied up in small bunches, and hung up in a cool place to dry very gradually. The flowers of the *Xeranthemum* are apt to fade, and, in order to prevent this as much as possible, they should be dried quickly in the dark, in a very warm dry atmosphere.

R. D.

PRIMULA JAPONICA OUT OF DOORS.

THIS plant is doubtless hardy in the open air; that is, it stands the winter well in a dormant state, almost wholly denuded of leaves—as much, and more so, than our common English Primrose. This utter loss of leaf has caused alarm in some quarters. The plants have been taken for dead, because their crowns were bare of foliage—this Primrose, in fact, being wholly deciduous; while dormant, it seems quite as hardy as our own Primrose. I made a bank for this new Primrose in the end of March, and transferred a fine lot of plants to it early in April. The bank was due south, with a gentle slope. The

plants soon responded to the genial condition of their improved site, and shot forth with marvellous power; the crowns burst into leaf with the force and size of spring Cabbages rather than common Primroses. The foliage of this plant is ample and beautiful, forming a sort of natural vase. Presently, the sun and the frost played alternately sad havoc; and the drought and east wind did their worst to ruin them. They marred their beauty considerably; but, fortunately, could not destroy the flower-stems, which have shot up with a strength and beauty unknown to all other Primroses. They are now throwing up stem above stem and umbel above umbel four and more deep, and have a grand effect. Of course they would have been much finer but for the frost, the sun, and the intense drought; perhaps, too, they would have been taller in an eastern, western, or northern aspect. As this Primrose will continue flowering through June, it is probable that a southern site will prove too hot for it. In all our trials this new *Primula* is glorious; the colour is most intense, and each plant has come perfectly true from seed. The true *P. japonica* is far superior to any of the other varieties that I have bought; the colour is most brilliant, and the style and character of the plant all that can be desired. I hope, in a few years, to fill the pleasure-grounds with thousands of it; it will prolong the season of Primroses for two months; I have not succeeded with any of the imported seed. We gather the seed of our own plants, and sow it the moment it is ripe, in pans in a cold pit; as soon as the plants can be handled we prick them off, and, when big enough, plant them in rich light soil 6 inches apart out of doors. From thence they are transplanted to where they are to bloom with good balls in March and April; old plants promise to bloom with equal strength and far greater profusion than young ones. Without doubt, this is one of the greatest acquisitions to our hardy flowers of late years, and I hope the time is at hand when everyone will be able to hail this queen of the Primroses, not only in garden and border, but also in mead and forest. D. T. FISH.

IRIS SUSIANA AND OTHER SELECT BORDER PLANTS IN SCOTLAND.

HAVING noticed in THE GARDEN of the 6th June some remarks on the culture of *Iris susiana* at Stonehouse, I thought that some account of my experience with the same plant in Scotland might not be uninteresting. I have grown this *Iris* here (Ormistoun House, Kelso), for these last six or seven years; during the most of that time it has been placed in the mixed herbaceous border, without, however, any success as regards flowering it. I must tell you, however, that the soil of my garden is strong clay, and that it has required a large addition of sand to make it at all amenable to the growth of the finer roots of herbaceous plants. About two years ago I prepared a bed especially for *I. susiana*; it was made up of a mixture of peat, leaf-mould, and sand, about 1½ feet deep; in this I planted all I had of it, and have not since disturbed it. The plants have grown much more luxuriantly than they had done before, and I am glad to tell you that the first flower appeared about three or four days ago, and there is also a prospect of more yet to come. The flower is very large for the size of the plant, the petals measuring rather more than 3½ inches across; several people interested in these matters have seen it, and have been quite delighted with the strange appearance of the flower. The plant is quite hardy here, and I think now will flower every year. What it dislikes above all things is being transplanted or disturbed in any way. I may mention that the bed I prepared for it is at the foot of a south wall, warm, and well protected. I have also had an unusually large display of flowers on many other herbaceous and Alpine plants this spring. Among others I may mention—*Primula luteola*, several plants, with seven large spikes each; *P. Munroi*, with a great profusion of bloom; *Silene quadridentata*, a beautiful delicate little plant in fine flower; *Dianthus alpinus* and *neglectus*, both lovely; and *D. fragrans*, so covered with flowers that the leaves have been quite hidden. *Androsace lactea*, *pyrenaica*, and *villosa*, good tufts full of flower; *Mitella aphylla*, a pretty little plant with white flowers; *Aquilegia glandulosa* and *cærulea*, in great beauty; *Cypripedium Calceolus* and *spectabile*, *Hypericum verticillatum*, *Erodium macradenium*, *Delphinium nudicaule*, *Arenaria purpurascens*, *Globularia cordifolia*, *Geranium argenteum*, *cinereum*, and *lancastricense*. *Libertia formosa* has twelve fine flower-spikes on it; this is a plant which does not always flower well here. We are, I think, indebted to the unusually mild winter for the quantity of bloom which we have this season. *Veronica taurica* one of the best of its section, *Linum tauricum* hardy and free, taking the place of *L. flavum*, which does not do well here, are all in fine condition; as is also *Eriogonum subumbellatum*, which is flowering this season for the first time. I have grown the plant for several years. We have likewise in bloom *Campanula turbinata* and *Alyssum olympicum*; and *Spirea*

palmata, too, is showing several fine heads of flower, which will be out in a few days. *Iris pallida* is very fine just now; also *Chrysobactron Hookeri* and *Lotus corniculatus* fl. pl., both very showy. *Myosotis alpestris*, a difficult plant to keep over winter, is fine this year. *Phlox Nelsoni* has been beautiful, and *Iberis Tenoreana* one mass of flower; this is a plant that requires to be raised from seed every year, as the old plants never stand the winter without protection. The fine *Campanula pulla* is just coming into blossom; *Nertera depressa* was very beautiful in a pot last autumn, the whole surface of the plant being covered with its beautiful red fruit.

WILLIAM B. BOYD.

PEGGED-DOWN ROSES.

I AM convinced that the system of pegging down Roses, where it can be put into execution, is one of the most advantageous which the cultivator can adopt. I have seen large quarters of Roses treated in this way. The long shoots are laid down in the most convenient direction, and pegged into the soil, along their length, with strong wooden pegs or hooks. All soft and not thoroughly-ripened shoots are cut entirely away. It is immaterial in this method of culture whether the main shoots thrown up during the year are employed for pegging down, the old being entirely removed, or whether the latter are in part left on, being somewhat retrimmed, and the upright growth entirely removed close to the main laid-down stem. Either plan has its advantages, and must depend for adoption much upon the grower's skill. One special advantage of this mode of culture under the latter mode of procedure (that of cutting back the old rods) is, that in many varieties the young upright growth of the season will be found to have emitted roots where pegged into the soil, especially if this has been deeply done. Thus we get not only a plentiful supply of blooms during the flowering season, but also a stock of rooted plants, and that with a minimum of trouble. An experienced eye will readily detect, during an examination of these pegged-down branches, which shoots along their length indicate separate root action to have taken place. It is well to go critically over the beds in November and take off those which are fit for removal. If these are potted off (the safest way) and subjected to the customary routine of winter treatment under glass, they will form excellent plants, either for pot culture or for planting out in beds, in the following May or June. The second time at which the laid down rods will come under examination is when the operation of pruning is being performed. There will then be found many of the upright clusters of shoots exhibiting indications of having emitted roots, though not in sufficient quantity to justify their removal as separate plants with due prospect of after growth. In such cases it will be well to leave the rods undisturbed, praning the doubtful individuals alluded to back close to the main branch, and subjecting that to any further trimming up the operator may think proper. Every one of these will certainly be well-rooted, and fit for separate existence the following autumn. The ground on which pegging-down takes place ought to be made somewhat fine, and the whole quarter will be the better for a rich mulching as soon as the laying down is completed. An application of liquid-manure from a garden engine before the blooming season commences, and after the first rush of flowers is past, will not be without benefit, as this method of culture requires the stamina to be well maintained. It must, of course, be understood that it is a work of time to get the "stools" into good condition. Rods of 10 or 12 feet long, and of proportionate substance, are not the produce of newly-established plants. Of course a beginning can only be made with dwarfs; plants upon stocks of any kind, except *Manetti*, are totally unsuited for the purpose. There are many who, on looking over their Rose trees, preparatory to pruning, will find that some of the more vigorous growers have thrown out long substantial shoots. Here, then, provided there is border space, is the exact material for the experiment. Remove the sappy points. Cut back all laterals close to the stems, bring those down in convenient directions, taking care not to break them at the collar, and peg them into the soil according to their length. Pegs may be formed of strong branches of any trees, the hook in the form boys cut for nutting, one limb being left sufficiently long to enter the ground 9 or 10 inches, so as to clip the branch firmly, into a hole 2 or 3 inches deep at the point of contact with the soil, which ought to be made fine, in order to aid the emission of roots. All growths, except the shoots pegged down should be cut away from the heart of the plant, and of those of the season only a few of the strongest should be permitted to remain. Anyone who has observed the manner in which *Antubas* are layered from a centre stool will comprehend the system, only I do not recommend "tonguing" Roses which will put forth roots in time without a tongue. Hybrid perpetuals, or other free-growing continuous bloomers, not succeeding satisfactorily upon walls, may be taken

down and dealt with as indicated above, provided there is bed or border room. Many a red-spider haunted, scrubby wall Rose, if worth the trouble, might be converted from a blemish into a beauty by adopting the plan just alluded to. Let those who doubt take heart and try. Pegged-down Roses must not be subjected to lifting or root pruning. They must become established fixtures, and their nourishment must be kept up by artificial means. It is certain, however, that in a thorough Rose soil—naturally so, or made so artificially—they appear more vigorous in growth, deriving as it were, additional stamina from the moisture of the ground. Charles Lefebvre, Madame Victor Verdier, John Hopper, La Brillante, Madame W. Paul, Victor Verdier, Gloire de Dijon, Sénateur Vaisse, and indeed a host of high-class perpetuals of the vigorous kinds are adapted for this mode of culture. Baroness Rothschild, Marquise de Castellane, Mademoiselle Eugénie Verdier, Comtesse d'Oxford, and Paul Neron, amongst newer kinds, are also well worthy a trial. When the young plants are separated at the spring pruning, unless potted and put under glass, many of the weaker rooted ones will be lost, before becoming established, if planted out in beds. Under any circumstances, where this is done, whether in autumn or the following March, it will be desirable to cover the beds with a heavy mulch of Cocoa-fibre refuse.—*Queen*.

Scentless Violets.—I am very fond of scentless Violets. They come in when the sweet ones are gone, and their prettiness almost makes up for their want of fragrance. For the last week or two, *Viola montana*, with its lovely pale blue and white flowers, has been one of the gems of the garden. *V. obliqua*, which I have, also, under the names of *V. tuberosa* and *Pensylvanica*, is very effective with its large long-stalked deep blue flowers. I have a very handsome variety of *V. palmata*, with great blue flowers, splashed with white. The flowers and foliage of the closely allied *V. delphinifolia* are very pretty. I was greatly delighted this spring to flower the beautiful yellow-flowered North American *V. pubescens*, which seems now to have established itself here. *V. biflora* also flowered well in a cold pit. *V. sororea*, closely allied to our British *V. palustris*, is pretty, and does well if grown in peat and kept moist. Some years ago I had, I think, from Mr. Tyerman, a North American species, *V. semperflorens*, which completely smothered itself with large pure white flowers, and is most effective. I have lately procured the white and rose-coloured varieties of *V. hirta*, and the white ditto of *V. Riviana*, with which I hope to be much pleased if spared till another spring. *V. Munbyana*, of which I have only the blue variety, is most effective as a rock-work mass; and the little blue and white *V. palmensis* looks very well when mixed with *V. lutea*. I have, as yet, failed to grow *V. arenaria*, *mirabilis*, *pedata*, and *pedunculata*, but hope to get them again and succeed.—H. HARPUR CREWE, *Drayton-Beauchamp Rectory, Tring*.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Rare Irisæ (see p. 499).—Mr. Elwes will find some of the species of Iris about which he inquires in Messrs. Ant. Roozen & Son's Catalogue of this year, viz. —*Iris kumiaonesis* or *kamoocensis*, *I. aurea*, *I. sicula*, and *Xiphion histrio*. —*SALMONICEPS*.

Direction taken by Twining Plants.—Can any of your readers tell me why the stems of some plants invariably twine with the sun, namely from right to left, and others follow a different direction? The stems of the Honeysuckle always twine from right to left, so do those of the Hop, and the Bryony; but the Convolvulus, and the Dodder take a contrary course.—BERRY GROVE, *Liss*.

Mesembryanthemum sessile album.—This is a pretty succulent plant, well worth the attention of all who use such plants for bedding purposes. In habit it is very dwarf and spreading, resembling a miniature Cactus, its pulpy leaves or stems being thrown out from each other in all directions. It grows about $\frac{3}{4}$ of an inch in length, and $\frac{1}{2}$ of an inch in diameter. Its colour is light green, and it is covered thickly with minute hairs, so that it has quite a bristly appearance. The flowers are small and white; this plant has already been used for bedding purposes, and gives the greatest satisfaction. It is moderately hardy, grows freely, and is easily propagated.—D.

Giant White Quilled Daisy.—This is the finest of all white Daisies, I had almost said of all Daisies, but the largest is the Crown-flowered, a huge mottled kind that is too late, too large, and not sufficiently floriferous to be of much service. The White Quilled Daisy on the other hand is amongst the very earliest; I saw it in bloom in the open air at Christmas, and it is still a mass of blossom. It is a strong grower and blooms most freely. The flowers being snow-white, and as densely quilled, and as full and round as those of the best German Aster. It never shows a hollow centre, and makes a capital flower for nosegays.—A. D., *Bedfont*.

How to Manage Rooted Cuttings and Seedlings.—Order your plants when you have got a nice sweet hot-bed (not too steamy)—one on the decline is preferable, with the heat at about 65°. When you receive a box of rooted cuttings, immerse them in water at the same temperature. When they are all wet, proceed to pot them into 60's, using nice sandy warm soil. See that the roots are separated and naturally spread out in the soil, without injuring them. Place the plants in the frame, keep them shut up close for a few days, be careful of damp, and admit air as soon as they get established. If the weather permits, let them be slightly aired each day, but do not allow them to flag from too much air or sun.—H. CANNELL.

THE ARBORETUM.

THE MADRONA.

(*ARBUTUS MENZIESII*).

THE Californian *Arbutus* or *Madrona* is a tree 25 to 50 feet in height, and about 12 inches in diameter, with smooth bark, red or green, according to the season of the year, and exfoliating in thin flakes, the new bark being green, and gradually changing to a bright red. Hence, from its colour, it is sometimes called in Eastern Oregon, "Mountain Mahogany." It is unbranched for some 7 to 8 feet from the base, and forms an umbrella-shaped summit, with a rather open growth like a Maple. The port of the tree is rather crooked, and with its glistening leaves and smooth mahogany-coloured bark, and bright bunches of white flowers, it presents a very striking appearance when seen in the occasional openings of the dark Fir forests of the north-west. It is not a social tree, being rarely seen in more than one or two together, and then only at considerable distances apart. It is certainly one of the most ornamental trees of that region, and already, even in California, is cultivated as such in private grounds and parks, and in the clumps of shrubbery so commonly used to shade dwelling houses in San Francisco, and other towns of that State. Dr. Newberry remarks that the large, thick, and lustrous leaves, and the smooth and coloured bark, give this tree a tropical look, recalling, by its general aspect, the *Magnolia grandiflora* of the Southern States of America. On the Pacific coast the *Madrona* has a wide distribution, being found over most of the State of California, and to about the northern end of Vancouver Island. In the valley of the Sacramento it is common, and all through the Willamette Valley I saw large trees of it. Here it is often called "the Laurel." East of the Cascade Mountains it is rare, but I am informed by Colonel Drew, and other travellers who have gone across "the great descent of Fremont," that on the isolated hills in that region it is found in stunted forms here and there. It is never found in the depths of the Pine forest, but only in the sunny openings when light and warmth now and then enter. It seems very indifferent as to the soil in which it is found, preferring, if any, dry stony soils, being often found on the bare side of a mountain, on the edge of a cliff on the sea shore (as about Victoria Harbour), or on the numerous islands in the Haro Archipelago and the Gulf of Georgia. It is not found at any great elevation, being essentially a tree of the lowlands, where it flourishes in great perfection. As an ornamental tree, I think it would soon be exceedingly popular, being perfectly hardy anywhere in Britain. In some of the places where I have seen it growing in perfection, 3 or 4 feet of snow must lie for months in the year, and the tree be often subjected to a temperature at and below zero. The wood has not been applied to any important economical purpose, though from its hardness and box-like character, I think it might be used for the rougher kind of cabinet work, and even for wood engraving of the less artistic description—such as play bills, posters, &c.—in fact any of the purposes for which mahogany is now used. In California, the wood is used to some extent for making the wooden stirrups so commonly used in the State. We have seen this tree even larger and finer than it is thus described by Mr. Brown in his "*Horæ Sylvanæ*," and should like to know how it succeeds in cultivation with any of our readers. We have seen it at elevations of 5,000 feet, and in company with trees and shrubs quite hardy in our gardens, and it seemed to attain a greater height than any *Arbutus* we have elsewhere seen.

THE TIMBER CULTURE ACT AMENDED.

By Act of Congress approved March 14, 1874, the former enactment to encourage timber growing upon the prairies has been amended. The new law is free from some of the objectionable features and uncertainties of the altogether impracticable old one, and makes the entry and use of land for the purpose mentioned somewhat more feasible and satisfactory. From a circular issued by the commissioner of the general land office, we gather the most important provisions of the law as it now stands. Persons who are heads of families, or over twenty-one years of age (without distinction of sex), and either citizens of the United States, or having declared their intention of becoming such, may enter not more than 160 acres of land, either minimum or double minimum (lands valued at 1 dollar 25 cents, or 2 dollars 50 cents, per acre), by filing an affidavit of such intent in the local land office. The person entering the land must break and plant with trees one-fourth of it; one-fourth of this required fourth must be broken within one year from the date of entry, another fourth within two years, and the remaining half within three years. One-fourth of the area required to be planted must be planted within two years from the date of entry, another fourth within three years, and the remainder within four years; the trees to be not less than

12 feet apart each way. It is therefore required that the land be broken one year and planted the next. After having been planted the trees must be protected, cultivated, and kept in healthy growing condition for eight years next succeeding the date of entry. In case of the death of the person entering the land, his heirs may continue the occupation and care of the trees and complete the title. The land required under this act is therefore not liable for debts contracted previous to the issue of the final certificate. The fee to be paid on entry is 10 dollars, and the commissions of the officers of the land department in the whole amount to 8 dollars more; the total 18 dollars being the full charge up to and including the final proof of occupation and fulfilment of the required conditions.

VIRGINIAN CREEPERS AND VINES.

The three genera *Vitis*, *Cissus*, and *Ampelopsis*, are, in their organic characteristics, very closely related to each other; the particulars in which they differ may be thus described:—

VITIS (Vines).—These have hard woody stems, and woody, very tough, persistent branches, which are not articulated, or jointed, but divided into sections by knots. The leaves are simple, more or less lobed, very rarely lacinated, or deeply divided. The fruit is produced in pendent bunches of greater or less size, and consists of large, edible, vinous berries, the juice of which in most cases can, if need be, be fermented.

CISSUS.—These have corky-wooded stems, and articulated or jointed, often shrubby, branches, swollen at the joints, where they are frequently liable to break off. The leaves are more or less deeply lobed, the lobes being large, sometimes nearly entire, or more or less toothed. The berries are very small, produced in small groups on erect stalks which form a kind of capitate or head-shaped umbel, and furnished with tendrils. They are not edible, and are incapable of yielding wine.

AMPELOPSIS.—All the general characteristics of this genus approach very closely to those of the genus *Cissus*, the chief and almost only difference being found in the leaves, which are deeply cut, pinnate or bipinnate, the pinnules being of greater or less length, and sometimes toothed. Some species have large, fleshy, turnip-shaped roots, while in others they are perfectly tubercular and spherical. Our illustration exhibits the manner in which the leaves of one species (*Ampelopsis dissecta*) are divided.

AMPELOPSIS DISSECTA.—A vigorous-growing climbing shrub, producing a great number of running shoots. Stem, twining, with long slender branches, covered with reddish bark; leaves, pinnatifid, with long toothed segments; fruit, small, nearly spherical, bluish, glaucescent. This species is remarkably ornamental, on account of its elegantly-cut leaves, and is very hardy. It was first raised in the gardens of the Muséum at Paris, from seed sent from China by the Abbé David.—*Revue Horticole*.



Leaves of *Ampelopsis dissecta*.

to mulch all young trees, but where this has not been done, all those that show signs of suffering should be attended to at once. A timely mulching may save the tree. It makes but little difference what material is used so that the soil around the tree is prevented from losing its moisture by evaporation. Stones, if most convenient, will answer as well as anything. If the trunk is fully exposed to the sun, it should be protected from intense heat. A couple of boards tacked together like a trough, and set up against the trunk, will furnish the required shade, or the trunk may be bound with a hay rope, or be loosely strawed up as for winter protection.—T. F.

The Californian Mountain Laurel (*Oreodaphne californica*).—In the north this tree attains a height of from 50 to even 100 feet, though the latter altitude is rare, but in the south 15 to 30 feet is an average size. It is at once one of the most common and beautiful trees in California. The foliage is dense, the wood greyish in colour, very hard, durable, and difficult to split. Both leaves and wood have an aromatic odour, which is strongest in the former. By the slightest friction of the hand it emits this, but is apt to excite sneezing, and with some people it gives rise to headache. In California, caution is exercised in regard to burning the plant, more especially the leaves, as it is said that a vapour driven off them by the heat is very noxious. It much resembles *Laurus nobilis* in appearance, and is quite as ornamental. It is almost limited to the State of California, not, so far as I have been able to learn, more than crossing the boundary line into Oregon, and goes as far south as Santa Barbara. It is inclined to be a social tree, forming frequently groups of several individuals. It rather prefers the coast, though often found high up in the mountains—hence its common name of "Mountain Laurel." Leaves, oblong-lanceolate, pointed, scarcely acute, reticulately-veined, dark green, lustrous, 4 inches long, 1 inch wide, evergreen; flower, thickly pedunculated, axillary, numerous, involucre; fruit, roundish elliptical, nearly an inch in diameter, when immature green or greenish-yellow, when ripe dark purple—flowering in California from March to April. This very fine evergreen would seem to be quite hardy in mild districts with us; in Mr. Ellacombe's garden at Bitton, there is a handsome bush of it. We have never seen handsomer pyramids of verdure than it forms in a wild state.

The Mexican Plane (*Platanus racemosa*).—This is a tree with smooth white scaly bark, often dividing into several trunks, which diverge widely and irregularly, giving to the tree a straggling and irregular growth. Along river banks, Newberry mentions that its growth is usually open and symmetrical; but that when it is found in open and high ground, it adopts the general habit of the trees of the country, and spreads out into a wide and compact head. Its trunk will reach 6 feet in diameter, and an altitude of more than 100 feet, with a spread of branches nearly equal to its height, constituting a noble specimen of a tree. It is a tree of a more southern character than most of the trees with which it is associated in California, the centre of its range being probably about the southern boundary of the State. It grows as far north as the Sacramento River, but I have never met it over the Californian boundary line. It is also principally, if not entirely, a tree of the western slope of the Cascades and Sierra Nevadas. It chiefly affects river banks, but, as mentioned, is occasionally found at a higher elevation. Like most of the deciduous trees of California and the dryer portions of North-West America, the wood is very brittle, and travellers encamping under it require to be cautious in case of falling branches, which a fresh breeze will easily bring down upon them. In both habit and character the Mexican Sycamore bears a striking resemblance to the Sycamore of the Atlantic slope (*P. occidentalis*),

Recently Planted Trees and Shrubs in Hot Weather.—

This is a trying time for young trees. Those that were set this spring, and have appeared to be doing well thus far, may succumb to the long continued drought and heat of midsummer. It is safest

and is often considered by unbotanical observers to be the same. It has the same habit, and the same smooth white scaly exfoliating bark; but the bark is whiter, the leaf darker, and the fruit is in racemes of three, instead of being solitary. The leaves are not, except in the young state, pubescent or tomentose, as figured by Nuttall. The dark polished and digitate leaves contrasting with the white bark, give to *P. occidentalis* a more tropical aspect than that of its Pacific cognate.—*Horre Sylvane*.

Ailantus glandulosa as a Remedy for Dysentery.—In a recent issue of the *Archives de Médecine Navale* is published an official note, addressed by Dr. Robert, who is the medical chief of the naval division of China and Japan, to the inspector-general of the health service in the French navy, calling attention to a drug used by Chinese physicians in the treatment of dysentery. It consists of the root bark of the *Ailantus glandulosa*, a plant common in the north of China, and less so in Japan. It is also frequently cultivated for the purposes of shade, whilst its leaves have been used as food for silkworms. Dr. Robert sums up by expressing his opinion that the administration of the *Ailantus glandulosa*, as witnessed by him in China and Japan, gave superior results to that of *Ipecacuanha*, astringents, alone or combined with opiates, or calomel.

Wall-plants for Cold districts.—I have a wall 18 inches high on the north-east side of my garden, which I do not wish to raise, as it would be unsightly; but I want a good screen to protect the garden from the north and east winds, which sweep across it with great violence. I should also like this screen to be a very ornamental one, and to present as great a mass and variety of colour as possible. My own idea is to have a wooden trellis, or a trellis of galvanised wire, put up against the wall, rising to the height of 5 feet, and to train on this, not Ivy, or any mere evergreen, because that would be monotonous and wanting in colour, but *Cotoneaster*, or the evergreen *Cratægus*, called *Pyracantha*. With both these plants one would secure an evergreen screen, and also a mass and variety of colour, as each would be covered with white flowers in spring, and with red berries in autumn and winter. Would these plants grow well in such a situation in a cold wet climate in the north of England, and afford the advantages which I wish to secure? Which is the most ornamental for the greatest length of time at the various seasons? and what is the rate of growth of each? Is there any other plant that would be likely to suit my purpose better than these? The situation, though exposed to north and east winds, gets the sun all day.—M. O. D.

The Grass-flowered Mahonia (*M. glumacea*), sometimes called *M. nervosa*, is found wild in Pine woods in the north-west of North America, on the river Columbia, and was introduced in 1822. It is a beautiful little evergreen, which rarely rises higher than from 1 to 2 feet from the ground, and its large pinnate leaves are generally as long as the stems, which, shooting up from the roots, form a tuft-like bush. The flowers are golden-yellow, produced in racemes of about 6 inches long, and are in perfection in March, followed by clusters of deep blue berries, which are ripe in July and August. The uses to which this pretty little shrub may be applied in ornamental gardening are many. It may be planted with the greatest advantage on or near the shady side of rockeries, on the margins of shrubberies or garden clumps, and no plant can supply its place as an edging for walks below trees. It grows best in a cool, peaty, or fibry soil, prefers a shady aspect to a sunny one, and, though perfectly hardy, should always be sheltered from violent winds.—*Gardener*.

The Manzanita (*Arctostaphylos glauca*).—This is a prominent feature in the forests of California and Southern Oregon, forming a dense, clump-like shrub, which grows as high as 12 feet, and nearly as broad as it is high. The trunk divides nearly from the ground into several or many branches, these terminating in a multitude of twigs, so that the shrub is a dense mass of branches and branchlets, all of which are very crooked. The bark is red and smooth, occasionally peeling off, and exposing a new light green bark, which soon turns red. It is everywhere in California, being abundant on the hills and mountains, and extending northward into Oregon. The shrub has a wide range of altitude, growing equally well in the coast valleys, and on the Sierra Nevada Mountains, up to the limit of perpetual snow. The wood is like that of *Arbutus Menziesii*—dense, dark, and dark red in colour, and somewhat resembles that of the Apple tree. I am not aware that any use is made of it in the arts at present, except that rustic seats are fabricated from its crooked and twisted branches. For this purpose it is exceedingly well adapted. The berries have a pleasant acidulous taste, and are often eaten by the Indians and grizzly bears (of which they form the favourite food). As an ornamental shrub, the *Manzanita* is well worthy of introduction in the parks of England, and, from its hardy constitution, will bear the most severe cold to which

it can be subjected to in this country. Both it and the *Madrona* I introduced in seed into this country, but whether still growing or not I cannot learn. From experiments tried with the seed in its native country, I find that it soon loses its vitality, and germinates with difficulty.—*ROBERT BROWN*.

Sambucus Fontenaysii.—This very ornamental, vigorous-growing, and continuously-flowering shrub, was raised by M. Billiard, nurseryman, of Fontenay-aux-Roses, from seeds of *Sambucus californica* (glauca), which is, no doubt, identical with *S. pubens*. The stem is smooth and covered with a reddish-green shining bark; leaves, of a glaucous green colour, with broadly-oval leaflets, the margins of which are sharply toothed; the flowers, which are disposed in broad corymbs, are reddish when in bud, and of a pale yellow when fully expanded. Like those of the parent plant, *S. californica*, they are produced continuously at the extremities of the shoots which develop themselves during the summer's growth. The plant is exceedingly ornamental, and worthy of introduction into our gardens. M. Carrière considers the parent plant, *S. californica*, to be nothing more than a local American variety of our common Elder.

Dimorphism in the Rose.—A very singular instance of this has recently occurred in a nursery at Lyons, where a specimen of *Rosa polyantha*, a Japanese non-perpetual species, with climbing shoots, and single rose-coloured flowers, bore, in the first place, a number of double flowers, and also produced, from seed, a number of plants, entirely different from the parent. These are all dwarf in habit, and not climbing; some of them, in fact, growing only an inch or two high. Their flowers are mostly double, and of various colours—white, red, and yellow. These varieties will, no doubt, be found useful for covering the bare spaces under specimen shrubs, the surface of flower beds, &c. Too little attention has been given to this accessory embellishment, and many a fine Conifer may be seen in our public and private gardens, the aspect of which would be vastly improved, if the usually naked circle of earth, in which it stands, were gracefully clothed with some sort of verdure.—*W. M.*

NOTES AND QUESTIONS ON TREES AND SHRUBS.

Raising Ground over the Roots of Trees.—Will some of your correspondents kindly favour me with their opinion as regards raising ground round the trunks of Oak trees? Will it hurt the trees to raise the ground round them 3 feet? If it will, what is the best thing to be done?—*T. J. G.*

Hardiness of Eucalyptus globulus.—It is continually asserted that the *Eucalyptus globulus* will not bear more than three or four degrees of frost, but I know instances in which this plant has withstood our winters well; one is near Exeter, where there is a large tree planted twenty-five years ago, and supposed to be the first planted in England; the other was planted in 1869, and though exposed through all winters since that time, it is now growing and doing well. *JOHN WATERER, Bagshot.*

Mock Orange (*Prunus Caroliniana*).—This is a peculiarly graceful low tree, with glossy deep green leaves, and all the branchlets pendulous. In its native country this tree is an evergreen; in our climate deciduous, at least about London. It retains its leaves for a long time, however. There are fair specimens in Kensington Gardens, where, however, they are not easily found, as they are not labelled. The best is just within the Kensington Gate, on the left-hand side.—*W.*

The Dying Elms on Cheyne Walk.—The improvements which the Thames Embankment has made in this quarter have been attended with disastrous results to some of the fine Elms on Cheyne Walk. At its western end five trees in succession are apparently dead. Near the eastern end too, the trees are in equally bad condition. The rapid decay of these trees, so much to be regretted, is doubtless, with good reason, attributed to the cutting off of the water which formerly refreshed their roots, and to the importation into their immediate vicinity of thousands of tons of dry soil which form the embankment.—*W. M.*

Ribes sanguineum grandiflorum.—This variety, a seedling from *R. sanguineum*, of which it possesses all the chief characteristics, was raised by M. Danvesse, nurseryman, of Orleans. It flowers very freely, the numerous flowers, which are disposed in very compact clusters, being of a rosy-flesh colour on the outside, and white, or rosy-white, within, somewhat resembling those of *R. albidum*, which is also a variety of *R. sanguineum*. Both are very handsome plants, which, when grown along with *R. sanguineum*, produce a very pleasing effect. Treatment and mode of propagation exactly the same as employed for *R. sanguineum*.

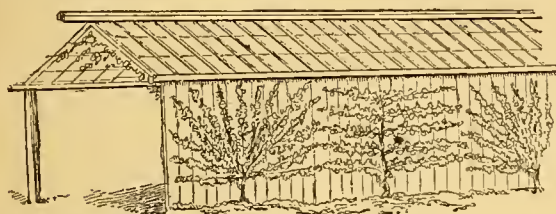
The Dutch Medlar.—It is a mistake to neglect the planting of some of our varieties of fruit trees for their ornamental qualities alone, and among edible fruits few are more worthy of a place among our ornamental trees than the Dutch Medlar. This is the one most commonly grown for its fruit, being the largest, though not the best flavoured variety. It forms large and handsome specimens, with a weeping tendency, and is one of the most desirable of trees for park, lawn, or pleasure ground. Other varieties and species have showy blossoms, and form very ornamental objects, but this is the only one with a tendency to be pendulous.—*R.*

Siberian Weeping Cherry (*C. chamæcerasus*).—This is a graceful little tree, weeping densely, and with slender twigs. Naturally the species is very dwarf, so that it must be grafted high on a stem to get the effect usually sought after in weeping trees; but it is best suited for a dwarf stem, say 18 to 30 inches, and thus trained, is admirable for high rock-work, banks, or any position where a miniature weeping tree may be desired. A variegated form of this is a pleasing addition; it is spotted or suffused with greenish-lemon, and the variegation does not seem to check the vigour of the tree, as is often the case with variegated subjects. Neat specimens of both kinds may be seen in nurseries for hardy plants, and there is a large specimen in the Crystal Palace grounds.

THE FRUIT GARDEN.

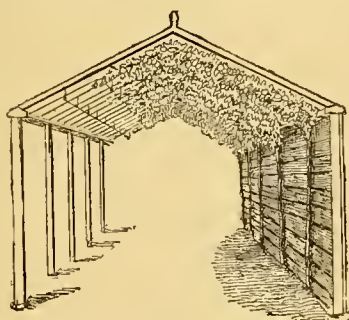
FRUIT SHEDS.

At the request of several correspondents we reprint the following remarks on this subject from the first volume of *THE GARDEN* (p. 35). They were contributed by Mr. Pearson, of Chilwell, whose recent report on the subject (p. 441) has created so much interest:—Mr. Foster, of Beeston, has, says Mr. Pearson, by chance, hit on the best known plan of growing Apricots. Requiring a shed to back carts under, and to shelter ladders, planks of Oak, &c., he thought, as it would be seen from his garden, that a glass roof would look much better than one covered with slate. He accordingly built one about 100 feet long and 10 feet wide. Posts every 9 feet carry the roof, which is all fixed, no ventilation being required. The south-west side, next the garden, is boarded and painted over with tar, wired,



Portion of Apricot shed.

and planted with dwarf fruit trees, as in the woodcut. Wires are also stretched under the glass, as if for Vines; the distance from the glass being about 1 foot. On the north-east side of the wooden fence, standard Apricots, Plums, and Nectarines are planted, whose heads are trained under the glass, their roots passing under the wooden side into the same border in which those shown growing on the outside are planted. Both ends of the shed are closed in with boards. It is, in fact, a long narrow glass shed open to the north-east, just high enough to back a cart under, but looking from the garden like a double-roofed greenhouse. The trees have been planted three years (this was written in 1871); they have never been syringed, and, in fact, except tying the shoots to the wires and thinning and gathering the fruit, have had hardly any attention. In some parts of the sheds it has been necessary to climb over piles of timber from 4 to 5 feet high to get a good look at the fruit. The result has been



Section of Apricot shed.

extraordinary, and, to me, most unexpected. I should say the trees have been only watered twice since they were planted, and that in the hot summer of 1870. Though I think few would have foreseen such a success through, what may be considered, an accidental discovery, it cannot be thought the less valuable on that account. How loudly it proclaims the advantage of ventilation for Apricots! Does it not equally proclaim, too, the advantage of a dry climate for this tree? What method of growing Apricots can compare with this, either for productiveness or cost of production? The trees are sheltered from frost and wet, and the roots take care of themselves. How different from either the open wall or the orchard-house! No watering, no syringing, no shading! Even good gardeners have been surprised at the result.

THE WEATHER AND THE FRUIT CROPS.

MAY this year has been unusually harsh and severe. The Apricot crop was thinned early, but the warm weather brought out the leaves with a rush, and these protected the later blooms, which have generally set well and, in many situations, promise

a good half and three-quarter crop. Peaches beneath glass copings have withstood the frost well, and are likely to be a fair crop, except in cold and low-lying localities. Plums are very partial; Cherries, as yet, promise well; and Apples and Pears bloomed freely. Early Pears were much cut off in many gardens, and early Apples look suspiciously brown. Court Pendu Plat has only very lately begun to open its flowers; and, as the wind at last has a point of south in it, and the temperature has run up to 68° in the shade, late Apples are now, it is to be hoped, safe. Gooseberries are ruined in many districts, even the largest fruit falling off by wholesale, as if it had been partially roasted. Currants have escaped rather better, though these in places have also been hard hit by the frost. Raspberries have also come safely through in some gardens. Early Strawberries have suffered very much; the early flowers have been blackened in the centre, and some crops have suffered so severely that they have been dug in, and the ground cropped with late Potatoes. The lesson of these late springs is more glass, larger orchard-houses to store away immense numbers of fruit trees in pots until the fruits are set, and the May frosts at an end—after which they could be put out to grow and ripen in the open air. We also want more late flowering varieties of all hardy fruits. Each day taken from the season of flowering renders the probability of a crop the more certain. For instance, as has been stated, early flowering Strawberries have lost their first blossoms, which are mostly the producers of the finest fruit, whereas, Elton Pine and other late varieties are safe. There is, perhaps, less difference in the time of flowering of Pears, Cherries, Plums, &c., than of Apples; but Louise Bonne of Jersey, is often a week or a fortnight before Winter Nelis and Beurré Rance, and it mostly loses its crop in consequence. I wish that raisers of new fruits would earnestly lay this matter to heart, and try to furnish us with races of late flowering and quick-growing varieties. The shorter the season between setting and finishing the better are the chances of fruit in our fickle climate.

D. T. F.

Curious Dimorphism of the Apple.—The last number of the *Revue Horticole* contains a coloured plate and a description of two distinct looking fruit, which were produced last year, on the same shoot of a Ménagère Apple tree in the nurseries of M. Durand, at Bourg-la-Reine. The tree was young, and trained as a vertical cordon. One of the fruit in question was of a fine greenish-yellow colour, passing into a rich golden hue on the sunny side, and marked with numerous whitish dots. This fruit exhaled a strong and very agreeable perfume. The other fruit, which grew close beside it, on the other side of the shoot, was a little larger, of a conical shape, and remarkably different in the colouring, which, for about two-thirds from the base up, was of a brilliant red, tinged in some parts with violet, the upper part only being of a greenish-yellow. This fruit, unlike the other, had no perfume whatever. When ripe, both were tasted, when the first was found to have the flavour of a Quince, while the other was harsh and acidulous. Neither could be termed a fruit of good quality, and the circumstance is only worthy of record as an instance of the dimorphism that frequently occurs in the family of the Rosaceae, to which most of our fruit trees belong.—W. M.

Good Advice on Thinning Fruit.—It takes no more time to pick off a little Apple in the summer than it does to pick the same Apple in the fall—and with me the fall is the busiest season of the year. I used to think that thinning fruit was one of the refinements of horticulture which those of us who grow fruit largely for market could not stop to bother with. But a friend's experience convinced me of my error. If there are 2,000 Apples on a tree in the summer, and I let them grow, I have to pick them all in the fall. If this is as many again Apples as the tree ought to bear, the 2,000 Apples would fill, say, five barrels. Now, if I pick off 1,000 of the smallest, and poorest, and specked, and wormy Apples in the summer, the probabilities are that the 1,000 left on the tree would grow so much larger that they would fill the five barrels as before. We pick 2,000 Apples in either case, and get the same amount of fruit. What, then, do we gain? In the first place, the 1,000 Apples do not exhaust the tree as much as the 2,000. There is as much fruit by measure, but it consists largely of material that takes little from the tree or the soil. There is only half as much seed, &c. We ought to thin out at least enough to leave the tree strength enough to bear a full crop the next year. In the second place, the 1,000 Apples are worth much more than the 2,000; and last, but not least, the trees will bear every year. We do not remember to have seen the case stated in a manner more concise or convincing.—*Agriculturist*.

THE GARDEN IN THE HOUSE.

BRITISH FERNS AS TOWN PLANTS.

ALTHOUGH there are no more useful plants in existence for decorative purposes than our hardy British Ferns, yet, singular as it may appear, they are not valued as they should be, except in a cut state. They are the best of all plants for town gardens, in which their graceful fronds keep fresh and green where Geraniums could not exist. Their usefulness in a cut state is admitted, else they would not be brought to market; but it is the common Brake which is selected, a kind which is the least graceful of any. It is, however, their utility in a growing state to which I wish to direct attention. In stands in sitting rooms, even in the darkest streets, they will remain fresh and continue to throw up their cheerful-looking green fronds year after year. Small gardens, too, even though surrounded by high walls, might be made attractive, simply by the introduction of a few Ferns. The great drawback to British Ferns is, they can be bought cheaply, or be bad for the trouble of carrying home after a day's ramble among country lanes. In nearly every house the inmates of which are fond of flowers, will be found a Wardian case, or a pan covered by a bell-glass, in which a few exotic Ferns are vainly trying to live and look healthy. Such Ferns receive every attention; their glass covers are now and then removed to give them air, and, yet, in point of freshness and greenness, they cannot be compared with hardy Ferns, which only require a little water to keep them in good health. For small stands, the best suited are *Asplenium Adiantum-nigrum*, *A. marinum*, *A. Trichomanes*, *Blechnum Spicant*, and *Polypodium vulgare*. These are all dwarf kinds which make very effective table-ornaments, if planted in 10-inch seed pans, and if the surface of the soil is covered with fresh wood Moss. Should an ordinary pan not be considered sufficiently ornamental, one of a rustic character, which is generally covered by a bell-glass, may be obtained; those made of virgin Cork are also well adapted for this purpose. For furnishing window-boxes, singly in pots, or large stands, varieties of a more robust growth than those just named, should be chosen, say such kinds as *Athyrium Filix-femina*, *Polystichum aculeatum*, *Lastrea dilatata*, *L. Filix-mas*, *Polystichum angulare*, *Osmunda regalis*, *Scolopendrium vulgare*, and others of a similar character. Large stands of these look well-placed in halls, and are not readily injured by draughts, to which they are subjected. The roots of such Ferns as these, though lifted from a hedge-row, when planted in some London back-yard, push up fronds in spring as fresh as if they had never been disturbed. Most Ferns, in the growing season, require plenty of water, though even on this point they are very accommodating. I have seen plants of *Asplenium Adiantum-nigrum* growing so near the edge of water that their roots have been in it, and I have seen it also on hill sides growing equally well, overhung by rocks, which must have screened it even from rain. Out of all the Ferns just enumerated, the one which revels in dampness more than the others is *Asplenium Trichomanes*. Of this elegant little Fern I have seen some fronds quite a foot in height, when growing near water. One of the most lovely sights possible is a Ferny lane. Last summer I saw one which I shall never forget; it formed a private road to the gate lodge of the house of a friend, and was over a mile in length, the banks on each side being high, and one mass of Ferns and wild flowers. The road itself was very narrow, overhung by trees, which, forming as they did, a leafy tunnel, at least half a mile in length, produced a charming effect. Out of this shady grove I brought some Ferns, which have quite repaid me for my trouble. Amongst hardy kinds the Parsley Fern (*Allosorns crispus*) should not be forgotten. It is dwarf in growth, has bright foliage, and even when planted in a pan has an excellent effect. A few of the Horse-tails, too, when planted in pots, form very graceful plants. Townspeople, who do not find ordinary plants to thrive with them so satisfactorily as they could wish, would do well to take my advice, and import a few Ferns from the country to take their places; were they to do this, I feel confident that they would not be disappointed with the result. In some little London gardens, I have seen Ferns in excellent condition, and, if well attended to, they last good for years.

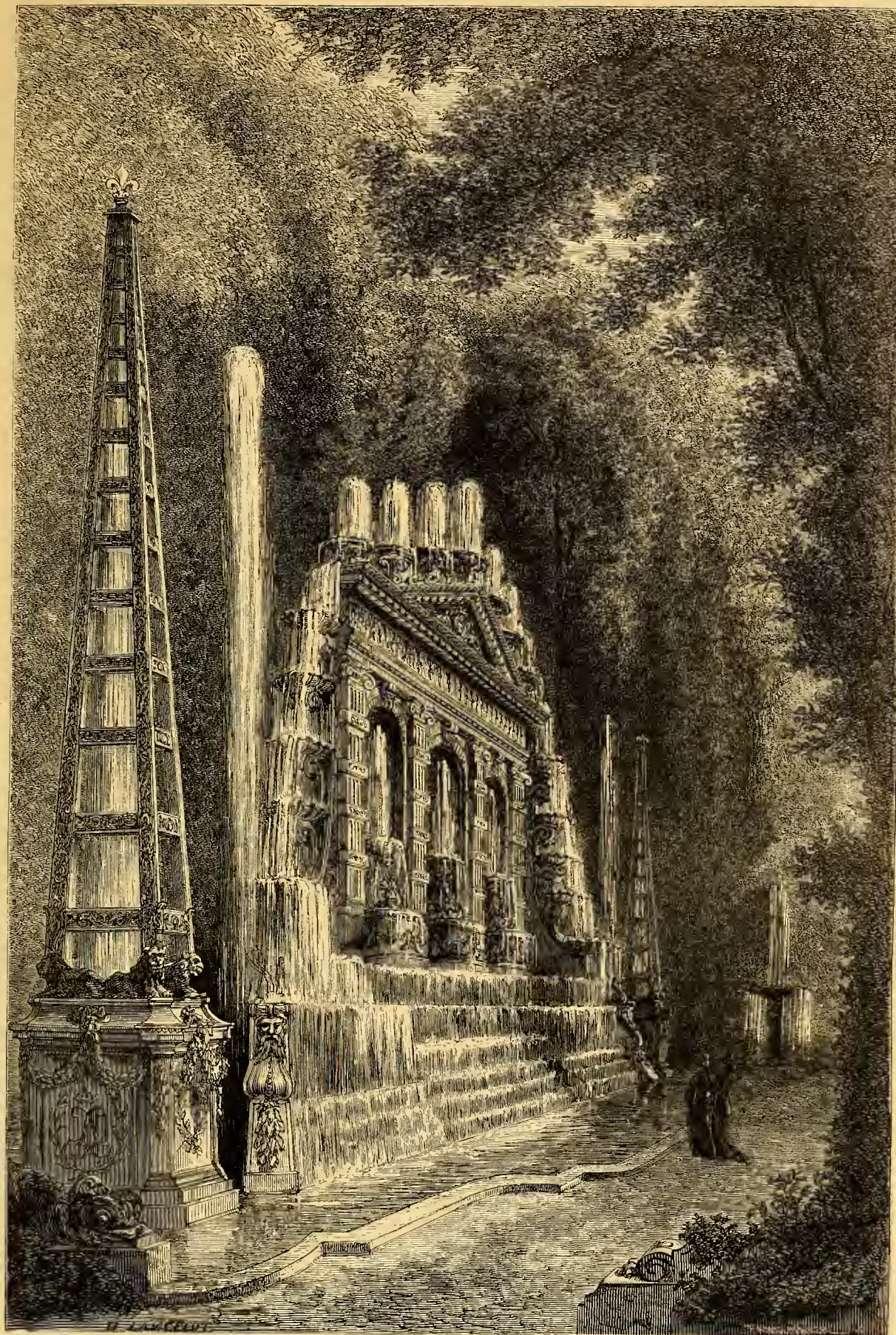
A. HASSARD.

Upper Norwood.

FOUNTAINS AND FOLIAGE.

THE refreshing aspect of tree-shaded walks, which form such delightful retreats in high summer, is greatly enhanced by the judicious introduction of fountains or cascades. Where well-contrived cascades of a natural character are practicable, they are, perhaps, more desirable in artificial landscapes than fountains, as they may be made to accord more easily with the semi-wild aspect of woods; that is to say, if the intention of the planter has been the creation of certain aspects of the untrimmed grace of natural scenery. The rocky arrangements, by means of which the fall of water is effected, add pleasantly to the picturesque effects of such garden or park scenery, and the general composition being thus combined with the dash and gurgle of the falling waters, is made to produce a sense of coolness at the same time that the unmeasured cadences of one form of Nature's music are pleasingly simulated. But cascades of the kind suggested are rarely practicable in ordinary localities, unless by very costly arrangements; it is, therefore, to fountains, which, if on a moderate scale, are practicable in almost any situation, that the present remarks will be entirely confined.

Fountains, that animate with their soothing plash, and impart a feature of motion, in the shape of glistening shafts, and falling sheets, as of translucent silver, are always attractive during the summer months, especially in wood-shaded retreats. In the glaring sunshine, in openly conspicuous situations, where there is little temptation to linger about their precincts, these garden adjuncts are of far less real value; though it is in such situations that they are generally found, as at the Crystal Palace, the palatial gardens of Versailles, and most of the great public gardens of the Continent. There are, however, exceptions to this general rule, some of which are favourable specimens of artistic aptness for the successful design and placing of a fountain in a woodland scene, and others which are quite the reverse. The first example, illustrative of the foregoing remarks, is represented by the annexed engraving of the magnificent fountain of the Bosquet de l'Arc de Triomphe at Versailles. It is one of the most elaborate and magnificent pieces of fountain-work ever devised. The central portion of the composition is, indeed, elaborately rich in design. The crowning vases, each with its water-plume, and the lateral falls of foaming water over a series of richly-carved marble tazzas in the form of gigantic cockle-shells, flanked on either side by an unsupported single jet, form the least part of this highly-wrought composition, the central portion being that on which the chief labours of the architect, sculptor, and hydraulic engineer have been lavished. It is composed of an entablature, a cornice, and a façade of four richly-embellished pilasters, between which are three niches, each ensconcing an elaborately sculptured vase, standing upon a suitably enriched pedestal, in front of each of which is a marble basin, equally sumptuous in decorative carvings; the whole of these features being made subservient to the display of rising or falling waters, the whole masses of which eventually shimmer down in glassy sheets over a series of marble steps into a basin of the same material. These features form the chief part of the composition, which is a real triumph of that kind of art; and yet it was not enough for the florid tastes of the Le Notres, and Mansards, and Le Pautres of the day. Additions of a splendid character were yet to be made, which consisted of two elaborately perforated pyramids of most intricate design and enrichment, devised in such a manner as should fit them to exhibit a jet of water rising to their very summits within the prison bars of their marble frame-work. This is surely an example of utter extravagance, and, indeed, of outrageous excess in garden fountain work. A costly gew-gaw, of which even the tasteless king (to gratify whose caprice the monster fountain was constructed), devoted, as he was, to meretricious and costly display, must have tired of in a week. It is just the sort of thing to see once—say at the Crystal Palace, mingling with fireworks, or in the transformation scene of a pantomime—and to exclaim, on its successful production, how very magnificent! What a gorgeous design! and then, the momentary surprise being over, never caring to see it again. As a permanent object to be placed in a "bosquet," that is to say, a sylvan wilderness, it is simply an over-done piece of tawdry splen-



FOUNTAIN OF THE BOSQUET DE L'ARC DE TRIOMPHE.

dour, only redeemed from positive vulgarity by its grand dimensions, its ingenuity of device, and its costly material. Viewing the "bosquet" in question as a cool summer retreat, let the reader place his hand over the great mass of masonry, marble, and water-display, so as just to leave in view the simple fountain in the distance, with its single jet and dripping tazza, and I fancy that he will be of my opinion, that the more simple and unpretending form of fountain amalgamates far more soothingly with the scene, while the greater structure disturbs the repose of the grateful shade, both with its noise and its obtrusive, garish grandeur. The fountain in the gardens of the Horticultural Society is another example of a highly wrought work of that class being an uncomfortable excrescence, rather than an ornament, however good it may be in itself. In landscape-gardening, and even in semi-architectural gardening (if that combination may be called gardening at all), nothing is more difficult and requires more care and artistic judgment than the introduction of fountains, which, far more often than otherwise, serve to spoil the combinations which they are intended to embellish.

H. N. H.

FRAGRANT WOODS.

THE properties and uses of woods are various; some are sought for their beauty and utility for the cabinet-maker or pianoforte manufacturer, some for their adaptability for carving or engraving on, others for their colouring properties, and some for their medicinal uses. There are a few, however, which have the rare attraction of being fragrant and odorous, and hence are valued for small special fancy articles for ladies' use, or for the purposes of the perfumer, who distils pleasant scents from them. The study and consideration of woods may be influenced by many causes, according to the purposes to which they are to be applied. The cabinet-maker will group them according to the disposition of their colours and the direction of their fibres, and will sometimes also take into consideration the odour, which is an essential point in the eyes of the perfumer. Two or three are tolerably well known, such as Camphor, Sandal, and Cedar woods; others have not been so generally described. Although fragrant odours are very generally diffused over the vegetable kingdom, yet they are not often centred in the woody fibre of the plants. We know these odours well in flowers, and we find them strongly diffused in many aromatic leaves, as those of the Lemon and Citronelle Grasses, and of the Faham Orchid (*Angræcum fragrans*), and of *Eucalyptus citriodora* and *E. odorata*. Sometimes the pleasant odour or pungent flavour is concentrated in the seeds and seed-vessels, as in the Nutmeg, the Tonquin-bean (*Dipterix odorata*), the Musk-seed (*Abelmoschus moschatus*), the odoriferous seeds of *Aydenndron Cujumary* (Nees.), the Vanilla pods, and those of *Myospermum erythroxylum*, of South America. In several trees the aromatic principle is strongest in the barks, as in Cassia and Cinnamon, the Sassafras of Tasmania, *Atherosperma moschata*, and *Croton Cascarrilla* and *Elentheria*, of the Bahamas. Essential oils are obtained from many of these. The bark of *Ocotea aromatica*, from New Caledonia, possesses a strong Sassafras flavour, and there is a fragrant bark yielded by the *Alyxia aromatica* of Java and Cochin China. The Coffee (*Ixora odorata* of Tahiti has a close and fragrant wood. In Tasmania and Australia we have the Musk-wood (*Eorybia argophylla*) with timber of a pleasant fragrance and a beautiful mottled colour, well adapted for turnery, cabinet-work, and perfumery purposes. The native Box-wood (*Bursaria spinosa*, Cav.) has also a pleasant but fleeting scent. The Scent-wood of the same island (*Alyxia buxifolia*, R. Br.) has an odour similar to that of the Tonquin-bean. It is but a straggling sea-side shrub of 3 to 5 inches in diameter, and consequently does not produce wood of any size, but it is fine and close-grained, of a lightish brown mottled appearance. In the colony of Western Australia we have the Raspberry-jam-wood, of a species of *Eucalyptus*, which derives its popular name from the similarity of the scent to that preserve. It is a handsome wood, well fitted for cabinet purposes. Many of the Australian woods exhibit a peculiar beauty of structure, which adapts them for small furniture and turnery uses. Some are highly fragrant, and retain their agreeable odour for a considerable period of time; this renders them additionally pleasant and acceptable in the form of ornamental articles for the boudoir and drawing-room. The scented Myall (*Acacia homalophylla*) is a very hard and heavy wood, having an intense and delightful smell of Violets. It has a dark and beautiful "hardening," which makes it applicable to numerous purposes of the cabinet-maker and the wood-turner, and for an infinite variety of minor uses. It rarely exceeds a foot in diameter, but has been used as veneers. This tree is common in

many parts of Australia. Since the London Exhibition of 1862, when caskets and other articles were shown from Queensland, and the remarkable property it possessed became generally known to European manufacturers, the wood has been in request for making glove, handkerchief, and other fancy boxes. As long as it remains unpolished it preserves this peculiar fragrance of Violets, which does not occur with such perfection in any other known substance. The desert Sandarac Pine (*Callitris verrucosa*) is a tree of moderate size, from the vicinity of the River Murray, seldom attaining to more than 18 inches in diameter. It has a peculiar odour, from which it is sometimes called Camphor-wood, and it is said to be obnoxious to the attacks of insects. The dark beauty of its wood makes it useful for many articles of small cabinet furniture. The mountain Sandarac Pine, another species, similar to the preceding, is available for identical uses.

The Sassafras tree (*Atherosperma moschata*) has an aromatic bark, which yields an essential oil, resembling the Sassafras oil of America, with as admixture of oil of Carraways. The timber, which is useful to the cabinet-maker, has a dark "hardening," and frequently exhibits a pleasant figure; it has also the quality of taking a beautiful polish. Sassafras wood (*Sassafras officinale*), which is brought over from North America in billets, is highly aromatic, both in smell and taste, owing to a yellow volatile oil it contains. As this repels insects, the wood is used in India for the interior work of trunks, drawers, boxes, &c. Brazilian Sassafras is the aromatic bark of *Nectandra cymbarum* (Nees.) The fragrant bark of the swamp Sassafras of the United States (*Magnolia glauca*) is greatly sought for by beavers, and hence is often called Beaver-wood. A common deception is much practised in the streets of London in selling artificially-scented woods and roots which have been steeped in citronelle and other pleasant essential oils.

Sandal-Woods.

The Sandal-wood of commerce is the product of various trees belonging to the genus *Santalum*, and the species called *S. album* for a long time furnished the principal supply. Being a hard, close-grained, and ornamental wood, it is used for some descriptions of cabinet work and various carved, ornamental, and useful articles, such as writing-desks, work-boxes, card-cases, &c., are made of it. But its chief characteristic consists in the remarkable smell of the wood, which it owes to the presence of a peculiar volatile oil, extensively used by the natives of India as a perfume. This, also, has caused it to be largely used as incense to burn in the temples of China. In course of time Sandal-wood was discovered to be abundant in some of the South Sea Islands, where it is the product of several species of *Santalum*, different from the long-known Indian one. There are about ten species of the genus, which are chiefly restricted to the East Indies, Australia, and Oceania. The Indian species are *S. album* and *S. myrtifolium*. The former is a small tree, from 20 to 25 feet high, which is found on the border of Wynnaad, in the Peninsula, and in Mysore. The exports of the wood from Madras to Bombay, Bengal, Pegu, and the Persian Gulf are considerable. The wood is burnt to perfume temples and dwelling-houses. The same tree yields both the white and the yellow Sandal-wood, the last being the inner part of the tree, and is very hard and fragrant, especially near the root. The Mahomedans procure a precious oil from the moist yellow part of the wood, which they value as a perfume. Large shipments of it are made to Bombay, Bengal, and the Persian Gulf. The tree grows in the island of Sandal, Timor, Rotti, Savii, Sumba, Bali, and in the eastern part of Java, in the arid soil of the lower regions. The wood, which in its colour and texture resembles Box-wood, is much sought for as an article of commerce by the Chinese, who use the sawdust for making rings and pastiles for burning, as, during combustion, it exhales an agreeable odour. Mixed with some chemical preparation, the sawdust is often used in scent-bags, which hang as charms to the women's dresses. The imports of Sandal-wood into Chinese ports have, however, of late years almost ceased. While, in 1862 and 1863 from 7,500 to 8,000 piculs (1½ cwt.) of Sandal-wood, valued at about £14,000, were imported into Canton, within the last four or five years the imports have ceased altogether. In Europe Sandal-wood is chiefly used for carving and turning. In the India Museum, Whitehall, various specimens of the ornamental application of Sandal-wood in the East may be seen in boxes inlaid with ivory, a handsome carved Sandal-wood table from Bombay, and other objects. The Australian species of Sandal-wood are believed to be derived from *S. lanceolatum*, *oblongatum*, *obtusifolium*, *ovatum*, and *venosum*. The tree is found in Queensland and Western Australia. At the London International Exhibition of 1862 a fine log of Sandal-wood, weighing 4½ cwt., was shown from Blackwood River, Western Australia; and another, 3 feet 6 inches long by 11 inches diameter, from York. It is of an inferior quality as regards odour. In

1849 as much as 1,204 tons of Sandal-wood, valued at £10,711, were shipped from Western Australia. The merchants bought it for shipment at £6 to £6 10s. a ton. The Sandal tree of any size within a radius of 150 miles of Perth have now been cut down, and little can be obtained. It is probable that there are several distinct species of the tree in the South Sea Islands which have yet to be botanically determined. The tree is not found on all the islands of the Pacific; its head-quarters would appear to be among those of the south-western portion, including New Caledonia, the Loyalty Islands, New Hebrides, Espirito Santo, and some others. In the Fiji Islands, which have produced several thousand tons within the last thirty years, the tree has also become scarce. It is only the central portion of the tree which produces the scented yellow wood constituting the Sandal-wood of commerce. The trunk and larger branches are cut into lengths of from 3 to 6 feet, and the whole of the bark and outer white wood are chipped off with the axe—an operation technically called "cleaning." Thus, a log 1 foot in diameter is reduced to a billet only from 4 to 6 inches thick. The quality of the wood depends on the quantity of the oil contained in it, as indicated by the smell when freshly cut or burned. The old trees produce the best, and in them that part of the wood near the root is the most prized. A handful of the shavings of the wood will prevent moths from attacking clothes of any description; and the same means may be used to keep away insects from specimens of natural history. Owing to a similar strong aromatic odour, furniture made of the fragrant timber of the bastard Sandal-wood of Australia (*Erimophila Mitchelli*, Bentham) may be free from the attacks of insects. The wood is hard, of a brown colour, nicely waved, and beautifully grained. It will turn out handsome veneers for the cabinet-maker. *S. Austro-Caledonicum* (Viell.) of New Caledonia, furnishes a superior kind of Sandal-wood to that of other countries, owing to the strength and fineness of its odour. It is to be regretted, however, that this tree is being ruthlessly destroyed in the island, as the wood is of such great use in perfumery. Scarcely anything but the stumps and roots left from former trees can now be utilised. An essential oil, distilled in England and France from Sandal-wood, fetches £3 per pound. Powdered wood, for filling sachets and other uses, is sold at 1s. per pound. The Pacific species of Sandal-wood are *S. ellipticum* and *S. Freycinetianum* (Gaudichaud), which are met with in the Sandwich Islands. The latter species is found in the high mountainous ranges of Tahiti; but the wood is of inferior quality, as it is not odoriferous, or only becomes so by age. The wood of *Myoporum tenuifolium* (Forster) is sometimes used as a substitute for Sandal-wood; the fragrance of the fresh wood is very pleasant, but it soon loses its odour, after being kept some time.

The Cedar-wood chiefly imported is *Cedrela odorata*, from Cuba, Mexico, and Central America, in quantities varying from 3,000 to 5,000 tons yearly, and the red or pencil Cedar of Virginia and Bermuda, *Juniperus virginiana*. Fragrant cedrine, an essential oil, is distilled from the wood. The Cedar-wood of British Guiana (*Icica altissima*, Aubl.) has also a strong aromatic odour which keeps away insects, and adapts it for cabinets, wardrobes, &c.

An undefined rare wood from South America, called *Paosanto* (probably the *Kielmeyera* of St. Hilaire), has a fine odour, which it never loses. It takes a magnificent polish, is of a green colour, very solid, and elastic. It may be used for furniture, wind instruments, and would make magnificent pianos. A log brought down the river to Parana some years ago measured 27 feet in length, with a section of 17 inches square. The Violet-wood of British Guiana, or *Andira violacea*, derives its specific name more from its colour than its scent. In Japan they cut up the wood of a small tree, called *Camahoe*, largely for making toothpicks, which is of itself quite a trade in that country. The bark has a peculiar and pleasant aromatic flavour. A small portion of the bark is allowed to remain on each toothpick. All the Japanese use them regularly after every meal.

Camphor-wood.

The Campher-wood boxes, brought from China and the East, are well known for their strong preservative odour, and are found useful in keeping away moths from woollens and furs. The China and Japan Campher-tree belongs to the Laurel family, but that of Sumatra and Borneo is the *Dryobalanops camphora*. Even the leaves and fruit smell of camphor. In Sumatra this tree is abundantly met with on the west coast, chiefly in the extensive bush, but seldom in places more than 1,000 feet above the level of the sea. The tree is straight, extraordinarily tall, and has a gigantic crown, which often overtops the whole woody giants by 100 feet or so. The stem is sometimes 20 feet thick. The *Barus* camphor of this island is the most esteemed of any, and it is for this drug, obtained in but small quantities—seldom more than half a pound to a tree—that it is ruthlessly destroyed. The tree, when felled, is divided into small pieces, and these are afterwards split; upon which the

camphor, which is found in hollows or crevices in the body of the tree, and, above all, in knots or swellings of branches from the trunks, becomes visible in the form of granules or grains. An essential oil also exudes from the tree in cutting, which is sometimes collected, but is scarcely remunerative. On the west coast of Formosa there are forests of Camphor-wood, and a great deal of crude camphor is shipped thence to Amoy and other Chinese ports. Large quantities of the wood are sawn into planks. Tables and cabinets are then made of it, and it is also turned into platters and washing-basins. Only a small portion of the vast Camphor forests of Formosa has been reclaimed from its wild inhabitants, and this consists of fine tall trees, the growth of ages. When a tree is felled, the finest part of the wood is sawn into planks, the rest chopped small and boiled down for the Camphor. Camphor-wood (*D. camphora*) grows in abundance in the mountains of Santerborg, Marang, Sunda, and Surgony Water, Borneo. Its girth reaches 17 or 18 feet, and the stem often attains the height of 90 or 100 feet to the first branches. The wood contains a quantity of oil, is tough, durable, and, owing to its strong scent, withstands the attacks of the worm, so destructive in those seas. Hence it is much valued for ship-building. It takes metal fastenings well from being oily, and iron has been found not so liable to rust in it.

An essential oil of Roses, from some undefined wood, called *Aspalathum*, is distilled in France and Germany, and sells at about £3 the pound. There is a wood which comes from French Guiana, called there *Bois de Rose femelle*, believed to be the produce of *Licaria odorata* which has a delicious odour approaching to Bergamot; but being extremely fugitive, it is necessary to pulverise the wood at the moment of distillation. The essence drawn from it is now employed by the Parisian perfumers. It is a coarse-grained, yellow-wood, and scarcely ornamental enough to be sought for cabinet-work. The *Lignum Aloe*, Calambak, or Eagle-wood of commerce, is of all perfumes that most esteemed by Oriental nations. The trees from which it is obtained are not well defined. The best is supposed to be from *Aloexylon agallochum* (Lour.), of Cochinchina; while the *Aquilaria ovata* (Cav.), and *A. agallocha* (Roxb.), of tropical Asia, furnish, it is believed, other kinds of Aloe-wood. All are highly fragrant and aromatic, and are occasionally used by cabinet-makers, and inlayers. *Aquilaria agallocha* (Roxb.), is a medium-sized tree, growing in Borneo, Sumatra, and Java, in the high regions. The wood is compact, of a yellow colour streaked with black. By rubbing, however, it only gives forth an odour of Rhubarb, which is also palpable in slicing the wood. The most esteemed kinds of this wood are obtained from the mountainous countries of Cambodia and Cochinchina, to the east of the Gulf of Siam. It is the decaying old heart-wood which is burnt for perfume. Some specimens of odoriferous wood passing under the name of *Lignum Aloe* were a few years ago imported from the coast of Mexico, and believed to be the produce of a species of *Bursera*. Incense wood is the fragrant product of *Icica guianensis*. In conclusion it may be added that, while some woods attract by their pleasant odour, others are so fetid and obnoxious that they have obtained the appropriate name of "stink woods." Of this we have an example in the Stink-wood of the Cape of Good Hope (*Oreodaphne bullata*), which has a very disagreeable smell when first cut; hence its vernacular name. The brown-coloured wood is durable, takes a good polish, resembles Walnut, and might probably be employed for cabinets for natural history collections, as it is not infested by insects. The foregoing paper is from the pen of Mr. P. L. Simmonds, and appeared some time ago in the *Art Journal*. It contains so much interesting information that we have deemed it worth while, in the interest of our readers, to reproduce it at length.

The Pop-corn Trade of Chicago.—Here now is a native industry which has been quietly making a gigantic growth, if an increase of 6,000 per cent. in a year can be considered gigantic. What effect it may have upon the settlement of the great West, or upon the civilisation of the East, remains to be seen. We allude to the Pop-corn business, as carried on in Chicago. The raw material is raised upon the broad Burr Oak openings of Wisconsin; the finished product is consumed by the juveniles of Chicago, and the profits realised go to add to the magnificence of the metropolis of the West. The *modus operandi* is simple. The Corn, inclosed in a wire-gauze pan, is held for a few moments over a clear fire; then a noise as of a miniature musketry ensues, and each kernel, as it snaps and pops, turns inside out with a large increase of volume. The starch granules are burst by the heat, and swell until the hitherto insignificant grain becomes as large as a Hickory Nut.—*New York Tribune*. [Pop-corn is a small variety of Maize, which is very extensively used in America, and which forms, when prepared as above described, a pleasant substitute for biscuits. It deserves to become popular in all countries.—Ed.]

THE INDOOR GARDEN.

CHAMÆDOREA KARWINSKIANA.

ALL the species of the genus *Chamædorea*, about forty in number, nearly half of which have been introduced into cultivation, are natives of America, some being found in Columbia, but the greater number in Mexico. They grow from 6 to over 12 feet in height, and have straight, smooth, annulated, or ringed, stems, somewhat like those of the Bamboos, marked with scars left from fallen leaf-stalks. The leaves are borne on the upper part of the stem, and are sometimes entire, but, more frequently pinnate, with segments varying in width. The inflorescence is developed from the axils of the lower leaves, and is generally accompanied by a more or less persistent spathe. The flowers are small and insignificant. The species (*C. Karwinskiana*), of which we give an illustration, is a native of Mexico, and grows to the height of from 6 to 10 feet. It produces five or six annulated stems, each crowned with five or six leaves, from $2\frac{1}{2}$ to over 3 feet long, with from sixteen to twenty-two lance-shaped pointed divisions, of a lively green colour. The sheaths of the younger leaves are thickly covered with a whitish meal or powder. It requires the heat of a temperate house, and should be potted in light soil, which must be kept continually moist. It may be multiplied either from seed or by separation of the shoots which spring from the base of the stems. These should be potted and placed under a bell-glass in heat, where they should remain until they have taken good root. W. M.

HOW I TREAT LISIANTHUS RUSSELLIANUS.

As this fine Mexican plant seems, now-a-days, to be set aside as uncultivable, and, as I have been able to grow and flower it in perfection, perhaps the following account of my mode of treatment may not be undesirable. I first fill a 6-inch pot half full of potsherds, over which I place 1 inch of Sphagnum; I then fill the pot within an inch of the top with rich light sandy soil. When all is pressed down equally and firmly, and a smooth surface is made with the bottom of a small pot, I sow the seed early in spring, and cover it very slightly with dry white sand. I then cover the pots with bell-glasses, and place them on a shelf in a shady part of an early Vinery, keeping the surface constantly moist by pouring water on the outside of the glasses. As soon as the plants have come up, air is admitted, and increased as they advance in growth. When sufficiently strong, they are pricked out into small pots, having the same drainage, Moss, and mixture as the seed-pots, and are again shaded with hand or bell-glasses until the plants have become established. In three weeks or a month's time they require to be potted off singly into small pots; and I encourage their growth as much as possible by placing them in a shady part of either a Vinery or Melon-pit, whichever is kept at the highest temperature, with a humid atmosphere. As soon as they begin to fill their pots with roots, I give them a little clear manure-water once a week. I re-pot for winter about the middle of August, using pots according to the size of the plants, and replace them in the same growing tempera-



Chamædorea Karwinskiana.

ture as before, until the pots are filled with roots. After this, I begin to prepare the plants for winter by giving them less moisture, more air, and a cooler temperature; and, finally, they are placed on a shelf near the glass, in the coolest part of the stove, and wintered in a rather dry state. Early in February I begin to increase the heat and moisture, and, as soon as they begin to grow freely, I re-pot them, an operation which is generally performed about the second week in March. They receive another shift in April, and those intended for large specimens are again shifted in May into 18 or 20-inch pots, using a mixture of equal quantities of strong maiden loam, peat-mould, burnt clay, leaf-soil, and cow manure, to which is added a little white sand. In potting, I use a large quantity of drainage. I give very little water till the roots have reached the sides of the pots, when it is increased as the plants and the season advance, giving heat and moisture in proportion. I stop the young shoots immediately above the second joint, as soon as they are sufficiently advanced to

permit that operation to be performed. Each shoot then produces four, and they require stopping about three times. The last stopping for plants required to bloom early should take place in the first week in June, and for plants required to bloom later in the first week in July. As they advance in growth, I tie out the branches in order that I may have well-formed plants. When growing freely, they are sometimes attacked with a disease at the base—the result of a moist confined temperature. To prevent this, I allow the surface to become dry once a week or so, during which time the plants are supplied with moisture from the pans in which the pots are placed for a few hours, being careful not to allow any stagnant water to remain about them. As soon as the blooms begin to expand, the atmosphere is kept drier, and more air and light are admitted. This mode of growing the *Lisianthus* is the same as that practised by the late Mr. Green, under whose direction I once was placed, and the results in my case have been equally as good as those obtained by that excellent cultivator. My plants, when fully grown, are about $2\frac{1}{2}$ feet high and as much through, and bear abundance of flowers, the beauty of which is the admiration of all who see them. Most people lose

their plants while quite young through over-watering; and I confess there is some difficulty in getting them established, but, if the directions just given are strictly followed, success will be almost certain. T.

ECHVERIAS.

THIS interesting genus of succulent plants was founded in 1828 by De Candolle, and named by him in honour of Echeverri, a distinguished Mexican flower-painter. The greater number of the species are natives of Mexico, although the genus is distributed from California to Peru, and a few doubtful species are ascribed to Japan and Abyssinia. In their native habitats, they are found growing in dry positions fully exposed to the sun, on rocks, mountains, and elevated table-lands. They delight in a dry warm atmosphere, and a light soil rich in humus or decayed vegetable matter. They somewhat resemble the

Sempervivums in their general appearance, but are usually of larger growth, and the leaves are disposed in looser rosettes of irregular shape. They are often glaucous and, sometimes, exhibit pleasing metallic reflections. The following is a very comprehensive enumeration of the known reputed species, arranged in alphabetical order:—

E. abyssinica (Hort.).—Introduced into England from Abyssinia by Major Leveson. It is, probably, a species of *Cotyledon*, but very like the *Echeveria* in its habit and rosettes of leaves. It is announced in this year's catalogue of M. L. de Smet, nurseryman, of Ghent, who also calls it *E. sempervivoides*, adding that, during the summer, its leaves are entirely brown. Flowers, red.

E. acutifolia (Lindl.).—A rather large-growing species, allied to *E. gibbiflora*, with spatulate, or spoon-shaped, acute leaves and flowers in a dense panicle. Discovered by Hartweg, in Mexico.

E. adunca (Baker), (*Pachyphytum roseum*, Hort.).—A handsome plant, attaining a height of 4 feet in a temperate house. The leaves are olive-shaped, and are covered with a light white mealy powder; the flowers are striking, the petals being yellow and red, the calyx red and green; while at the base of each flower there is a conspicuous red bract. The inflorescence is disposed in a simple unilateral cluster. Native of Mexico.

E. agavoides (Lem.).—This handsome and very distinct species, which was introduced about 1860-61, resembles an *Aloe* in habit, forming a small dense rosette of spiny-pointed glaucous leaves, of a greenish opal colour, and margined with red, at least on the upper part; the flowers are insignificant in appearance, but valuable for the sake of producing seed, the plant being re-produced with difficulty in any other way. Native of Mexico.

E. argentea (Hort.).—Probably a garden name for *E. pulverulenta*.

E. atropurpurea (Baker), (**E. sanguinea**, Hort.).—A very handsome large-growing species. Stem, a few inches high; leaves, oboval-acute, glaucous, deep red, especially on the upper surface; flowers, white at the base, red above; calyx, green, regular in shape; inflorescence, in a simple and regular cluster. Probably a native of Mexico. An excellent subject for the centre of small circular beds of white-foliaged plants in summer.

E. Bernhardtiana (Forst.).—According to Mr. Baker, this is a form of *E. gibbiflora*.

E. bifida (Schlech.).—This plant is only known from the description of it given by Schlechtendahl, in his work on the plants brought from Mexico by Schiede and Ehrenberg. It appears to be closely allied to *E. secunda*, but bears its flowers in a two-cleft cluster.

E. bracteolata (Lk.).—This species, which is a native of Caracas and the Andes of New Granada, has quite a different appearance from that of the Mexican species. The stem is tall, and the leaves are green and distant from each other; the flowers are yellowish, and are produced in a two-cleft unilateral cluster.

E. bracteosa (Paxt.), (*Pachyphytum bracteosum*, Lk.).—A handsome species, introduced from Mexico in 1838. The leaves are large, tongue-shaped, and of a handsome glaucous-green colour; the flowers are of a yellow and red colour, and are more curious than handsome in appearance; the divisions of the calyx being very broad, and exceeding the corolla in length.

E. caespitosa (D. C.).—A small stemless species, from California and Mexico, with narrow green leaves in a rosette; flowers, yellow, in a compact cyme. This species is difficult to cultivate, and does not rank amongst the finer kinds.

E. californica (Baker).—A small stemless species, with narrow glaucous leaves; flowers, yellow, arranged in a unilateral cyme. Native of California. A handsome and easily-grown species. There is a variety (*E. c. viridis*) which has green leaves.

E. calophana (Hort. ang.).—Probably a garden name for *E. acutifolia*.

E. campanulata (Kuze).—A Mexican species, identical with *E. caespitosa*, according to Mr. Baker. Leaves, glaucous underneath, and margined with rose-colour.

E. canaliculata (Hook.).—A handsome and robust-growing caulescent species, with long strap-shaped channelled leaves, narrowed at the point, green, with brownish reflections, and arranged in a rosette. Flowers, red, in a handsome cluster. Native of Mexico, and introduced by Mr. Staines, an amateur at Kew.

× **E. carinata** (Hort.).—Said to be a hybrid between *E. metallica* and *E. atropurpurea*. M. L. de Smet announces a form of it which he has named *Gandavensis*, and which he describes as a magnificent variety.

E. carnicolor (Bak.).—A handsome stemless species, belonging to the same section as *peruviana* and *lurida*, forming a small rosette of glaucous and reddish leaves, with small clusters of fine red flowers. Native of Mexico.

E. coccinea (D. C.).—An old-fashioned caulescent species, intro-

duced from Mexico in 1816, closely allied to *E. pubescens*, but with narrower leaves, covered with a finer pubescence. The flowers, which are of a saffron-tinted red, are disposed in a dense spike.

E. Corderoyi (Bak.).—Nearly allied to *E. agavoides*, but forming a large rosette of sixty to seventy leaves. Flowers, fifteen to twenty in number, arranged in a trichotomous cyme.

E. cymosa (Lem.).—A stemless species, with long attenuated leaves, which are at first glaucous, and ultimately green. Flowers, yellow, in a dense cyme. Native of Mexico, and also, it is said, of California. The plant grows slowly, and perishes if exposed to moisture.

E. decipiens (Baker).—This is not properly an *Echeveria*, as the plant has all the appearance of a *Sedum*, while it resembles an *Umbilicus* in its corymb of white flowers. Mr. Baker considers it a native of Peru, while M. L. de Smet, in his recent catalogue, puts it down as coming from Port Natal. When in flower the plant stands about 8 inches high.

E. Desmetiana.—This species is thus described in a letter from M. L. de Smet:—"The finest of all the *Echeverias* is, undoubtedly, *E. Desmetiana*, a native of the higher mountains of Mexico. Imagine a specimen of *E. agavoides*, with shorter and more numerous leaves, overlapping each other, like the petals of a Rose, and of a fine blue colour. This will only give you a feeble notion of this new introduction. Unfortunately, as I have not succeeded in multiplying the plant, I do not know when I shall be able to distribute it."

E. discolor (L. de Smet).—Leaves, red underneath, in a compact rosette; flowers, large, of a very deep orange colour. Native of Mexico.

E. farinosa (Lindl.).—A pretty dwarf species, from Carmel Bay, California, forming a rosette of leaves covered with a white mealy powder; the flowers are yellow, and disposed in cymes like those of a *Sempervivum*. This plant is very impatient of water applied either to its leaves or to its roots.

E. farinulenta (Lem.).—A name given by Lemain to a species not mentioned by any other author.

E. fulgens (Lem.).—See *E. retusa* of Lindley, further on.

E. gibbiflora (D. C.).—This is the largest species of the genus, and the most extensively grown in plant-houses. It is a native of Mexico, and has been known for about fifty years. The stem is 1 or 2 feet high, and nearly 2 inches thick. The leaves, which are disposed in a rosette, are large, thick, wedge-shaped, mucronate, flat, glaucous, and, more or less, exhibiting metallic reflections. The flowers are pitcher-shaped, red and yellow, disposed in a large panicle of scorpioid cymes. This plant is highly valued on account of its flowers, which are produced in great abundance all through the winter, and last for a considerable time. There are several varieties of it, of which the most remarkable is—

Var. metallica (Baker).—This is remarkable for its iridescent foliage, which presents the metallic hues of some pigeons' neck-feathers, that is, rose-colour, with a play of copper-coloured and bronze reflections. The inflorescence, also, is very fine during the heats of summer. The plant forms an admirable subject for the centres of circular flower-beds containing plants with variegated foliage. Like most of the *Echeverias*, it dreads moisture, especially if stagnant, and a single ill-advised watering will sometimes kill it immediately. It requires a light well-drained soil, rich in humus. In winter it should be removed into a temperate house, and kept in a dry atmosphere. Three sub-varieties have been distinguished by florists, viz., *metallica grandis*, *m. lucida*, and *m. crispata* (Baker). The leaves of these are very broad, and some are undulated on the margin.

E. glauca (Baker).—A dwarf stemless species, with glaucous wedge-shaped leaves, terminating in a small red spine; flowers, red and yellow, in a small, short, simple, unilateral cluster. This charming species is now much used for summer edgings to mosaic beds of succulents, and other fine-foliaged plants. It thrives in the full sun. In winter, it should be removed to a temperate house, and placed in a well-lighted position, and in a dry atmosphere. The catalogue of M. L. de Smet contains two forms of this plant—viz., *E. glauca metallica* and *E. glauca roseo-cincta*.

× **E. glauco-metallica** (Veitch).—Said to be a hybrid between the two kinds whose names it bears. It is very largely used for summer edgings and mosaic patterns.

E. globosa (Hort.).—This garden variety, named in catalogues as a synonym of *E. rosacea*, appears to be a variety of *E. glauca*, and is employed for the same purposes.

E. gracillima (Muhlbf.).—A variety of *E. secunda*, with slender leaves.

E. grandiflora (How).—A synonym for *E. gibbiflora*.

E. grandis (Hort.).—A variety of *E. gibbiflora*.

E. Grayii (Baker).—A synonym for *E. paniculata* (Gray).

E. Greeni (Cat. L. de Smet).—A slender erect plant, the leaves of which, in shape and arrangement, resemble those of a *Portulaca*,

but are three times as large. Native of Port Natal. This plant presents a very singular habit for an *Echeveria*.

E. Hookeri (Lem.).—*Dioscoremon Hookeri*, Salm Dyck.

E. lanceolata (Nutt).—Native of California. Flowers in a panicle. Referred by Mr. Baker to *E. Cespitosa*.

E. laxa.—A Californian species, with yellow flowers, 1847 (Paxt. "Bot. Diet.")

E. linguæfolia (Lem.), (*Pachyphytum Lingua*, Hort.).—A small Mexican species, of no horticultural value.

E. lurida (Lindl.).—A stemless species, with a compact rosette of narrow, channelled, glaucous leaves, tinged with purple or brown. Flowers, handsome, red, in a simple cluster. Mr. Baker refers this species to *E. racemosa* of Schlechtendahl. It should be grown in light sandy soil in the dry atmosphere of a warm house, and should receive no water in winter.

× *E. luteo-gigantea* (Hort.).—A hybrid between *E. retusa* and *E. macrophylla*, raised by M. Rendatler, nurseryman, at Nancy.

E. macrophylla (Hort.).

E. metallica (Hort.—see *E. gibbiflora*).

E. misteca (Cat. L. de Smet, 1874).—A dwarf plant, with leaves 1.10th inch long, terminated by a red mucro or point.

E. mucronata (Schech.).—This stemless species was observed in Mexico by C. Ehrenberg, but it does not appear to have been introduced into our gardens.

E. navicularis (Cat. L. de Smet, 1874).

E. navicularis, var. *rubra* (Cat. L. de Smet, 1874).

E. nodulosa (Baker).—A small Mexican caulescent species, with green leaves, edged with a red margin, forming a rosette. Flowers, in a simple cluster.

E. nuda (Baker).—A small caulescent species, sent from Mexico by Botteri. Leaves, rather distant from each other, slightly reddish at the ends; flowers, in a cluster, of a bright red colour; petals united for a considerable distance.

E. Pachyphytum (Baker).—See *E. bracteosa*.

E. Pachyphytioides.—"A splendid hybrid between *Pachyphytum bracteosum* and *Echeveria metallica*. The leaves are coloured like those of the latter species, and resemble those of the former in shape, but are two or three times as large." Cat. L. de Smet, 1874.

E. paniculata (S. Gray), (*E. Grayii*, Baker).—A North Mexican species, with flowers in a panicle.

E. peruviana (Meyen).—A stemless species, from the Cordilleras de Tacna, Peru; leaves, very glaucous, in a dense rosette; flowers in a simple cluster. Does not appear to be in cultivation.

E. Pfersdorffii (Hort.).—A small garden variety of unknown origin, with green leaves.

× *E. pruinosa*.—A hybrid between *E. linguæfolia* and *E. coccinea*. Cat. W. Bull, 1874.

E. pubescens (Schlech.).—A caulescent species, covered all over with a soft pubescence; flowers, of a fine red colour, in a simple spike.

E. pulverulenta (Nutt).—A Southern Californian species, with a stem 8 to 12 inches high, surmounted by a rosette, 12 to 16 inches in diameter, of large, longish, pointed leaves, covered with a white powdery efflorescence. The effect of the plant, when well-grown, is that of a work of art in massive silver.

E. pumila (Lem.).—This species resembles *E. glauca* and *E. secunda*, but is much smaller than the last-named, and more finely glaucous. It forms handsome small rosettes, of closely-set, narrow, longish, glaucous leaves; flowers, in a unilateral cluster. A good plant for flower-beds in summer. Requires a temperate house with a dry atmosphere in winter.

E. quitensis (Lindl.).—An insignificant species from the Andes of New Grenada. The leaves are not disposed in rosettes, but are distant from each other, and green in colour; flowers, in a cluster.

E. racemosa (Schlech. et Cham.).—Leaves, 6 to 8 inches long, in a rosette, deep green edged with pale buff; flowers, in a simple cluster. According to Mr. Baker, this species should be referred to *E. lurida*, although the name *racemosa* has, we believe, priority in date.

E. reflexa crispa (Cat. L. de Smet, 1874).—A Mexican species, with leaves 4 inches long, glaucous, edged with red, and undulated; flowers, large, numerous, of an orange-yellow, and appearing early in the season.

E. retusa (Lindl.).—A caulescent species, from the mountains near Anganguco, in Mexico; leaves, ten to fifteen in number, glaucous obtuse, and sometimes notched at the end, arranged in a rosette flowers, very handsome, coral-red, unilaterally disposed in a two-cleft cluster. This species is very much prized for its handsome flowers, which are produced all through the winter, provided it is properly grown in a warm and dry house in good vegetable soil. *E. fulgens* of Lemaire does not differ from the present species. The following hybrids have been obtained from *E. retusa*:—× *Floribunda* splen-

dens, raised by M. Rendatler, of Nancy. × *Mincata*; same source. × *Retusa glauca*, hybrid from *E. retusa* and *E. glauca* (Cat. W. Bull, 1874).

E. rosacea (?) (Linden and André).—A stemless garden variety, with a regular rosette 4 to 6 inches across of glaucous leaves. It is also known in gardens as *E. globosa*. It is nearly allied to *E. secunda*, and also very much resembles *E. glauca* and *E. pumila*, of Baker. It is largely grown for forming ornamental edgings.

E. rosea (Lindl.), (*Cotyledon roseata*, Baker).—A Mexican species, which has received the name of *rosea* from its rose-coloured bracts. The flowers are yellow, and the plant, which is caulescent, has not the appearance of a true *Echeveria*. Mr. Baker thinks the specific name should be changed as there already exists the Siberian *Cotyledon rosea* of Lessing.

E. sanguinea (Hort.).—See *E. atropurpurea* (Baker), supra.

× *E. scaphylla* (Delenil).—This plant was first noticed in the *Belgique Horticole*, when M. Delenil, of Marseilles, stated that it is a hybrid between *E. agavoides* and *E. linguæfolia*. From the description and figure given it appears to resemble *E. secunda*, and is a handsome-looking plant, with a stemless, well-furnished rosette of leaves, and a good subject for ornamental edgings.

E. Scheerii (Lindl.).—A Mexican large caulescent species, introduced into the Royal Gardens, Kew, about 1842 by Mr. Fr. Scheer. Leaves, oval-acute, narrowed into a foot-stalk, of a silvery-white colour, and arranged in rosettes.

E. secunda (Lindl.).—A charming stemless species, introduced from Mexico, about 1837. The leaves are disposed in small and regularly-formed rosettes, resembling those of a *Sempervivum* with glaucous and diverging leaves. Flowers in a small, simple, unilateral cluster. This is a distinct species, and much used in forming ornamental edgings. The following varieties are also cultivated: viz. —Var. *glauca* (*Revue Horticole*, 1869, p. 229).—Forms rosettes 2 to 4 inches across. Var. *glauca major* (Cat. W. Bull, 1874). Var. *pumila*.—Rosettes of smaller size.

E. spathulata (Cat. W. Bull, 1874).

E. spatulifolia (Cat. L. de Smet, 1874). A small caulescent species, quite smooth, of a grass-green colour; leaves, oboval, distant, obtuse, spreading. It has no resemblance to an *Echeveria*, but it is very like a *Crassula*.

E. Sprucei (Baker).—A species found in the Andes of Ecuador, by Dr. Spruce.

E. stolonifera (Baker).—A small Mexican species, with handsome flowers, and green leaves, shining on both sides. It is remarkable for producing numerous runners or suckers. Introduced by Mr. W. Saunders, about 1865. Requires a dry and warm temperature.

E. strictiflora (A. Gray).—A species found in the mountains of Texas; not in cultivation.

E. subspicata (Baker).—A caulescent smooth species, closely allied to *E. coccinea*. Native of mountains in Columbia, near the snow-line.

E. subulifolia (Baker).—Mr. Baker thus names *E. teretifolia* of De Candolle, as Thunberg had already described a *Cotyledon teretifolia* from the Cape of Good Hope.

E. teretifolia (D. C.).—A synonym for *E. subulifolia* (Baker). Flowers, unilaterally arranged in a two-cleft cluster.

× *E. tortuosa* (Hort.).—A garden variety, known only by name.

E. undulata (Cat. L. de Smet, 1874).—Said to be a hybrid between *E. atropurpurea* and *E. metallica*.

E. Van Celsti (Cat. L. de Smet, 1874).

E. Verolietii (Hort.).—A garden variety, known only by name.

E. villosa (Cat. L. de Smet, 1874).

E. yuccoides (Hort.).—Perhaps the same as *E. agavoides* of Lemaire.

General Remarks on *Echeverias*.

None of these plants (says Prof. Morren, in the *Belgique Horticole*, from which the present article is translated) are able to endure even a slight degree of frost, and, when used out of doors, they should never be put out before the middle of May, nor left out after the third or fourth week in September. During winter they require a well lighted and moderately warm house. They succumb at once to cold and stagnant humidity. They thrive best in a rich light soil, the most suitable compost being a mixture of vegetable mould, peat or heath soil, free loam, and sand, thoroughly well drained. They are multiplied by using the leaves as cuttings, or from cuttings of the stems, or from seed; and, in some cases, from the suckers which are sent up from the base of the plant. The following useful directions on this subject were published last year in the *Revue Horticole*, by M. J. B. Weber, head gardener in the botanic garden at Dijon:—" *Echeverias* are very easily multiplied. When a large number of plants is not required, they are propagated either from cuttings of the flower-stems or from the suckers at the base, when they are produced. These are much to be preferred to

cuttings of the flower-stems, as they form plants which maintain a compact low habit for a longer time. The cuttings or suckers should be laid by for some days on a dry shelf until they have become cicatrised, and then they should be planted out in a temperate house. If, on the other hand, a large number of plants is required, it is best to cut off the leaves at the base, laying them by to become cicatrised, like the cuttings, and then planting them obliquely in pots, merely inserting the base of the leaf into the soil. Roots will soon be thrown out, and, before long, the young plants will appear." The soil should be a light sandy mixture, such as has been already described, and the leaves or cuttings should be sparingly watered until they have taken root. As soon as they have rooted well it is best to re-pot them in a mixture of leaf-mould or well-rotted manure and loam, with about one-fifth part sand. It is best to keep young plants within doors for the first season, as they are generally too small and weak during that time to make any very effective display out of doors.

M. Bazin, of Clermont (Oise), has described his successful mode of propagating these plants, in the *Horticulteur Français* of 1854, as follows:—"Many authors say that Echeverias are propagated by means of stem-cuttings and from the suckers which are emitted from the base of the plants. For many years, during which I have grown these plants, I have never seen any of these suckers; and, as for stem-cuttings, when these are made, the plant must be sacrificed, that is, the entire head of a plant must be cut off in order to furnish the cuttings. My mode of propagation is very different, and does not involve the sacrifice of a single plant. It is as follows:—I first pot the plant in a small pot, so that it may become pot-bound; this, however, does not prevent it from flowering. I allow the flower-stem to lose its flowers and dry up naturally; after the flowers have fallen, the sap, still continuing to flow to the extremity of the flower-stem, causes a small rosette of leaves to be produced there. When these are formed, I cut off the flower-stem and make cuttings of the extremities, which I plant in small pots filled with heath soil. In two years time, I have plants flowering to perfection, and the old plant from which the cuttings were taken, having been removed into a larger pot, is still splendidly vigorous and unimpaired. In this way I propagate as many Echeverias as I wish, without any sacrifice and without any difficulty."

How to Grow Lapagerias.—No one should think of growing the beautiful Lapageria in a pot. Plant it out in a border by all means, and let its roots go where they like for nourishment. Treated in this way, it will grow well, and soon fill a whole house. Be it either the white or the red variety, no matter, give it room. It is, undoubtedly, the most ornamental climber that the conservatory can boast of. It is clean-growing, and not, like many other climbers, liable to bug and scale. Thrips, and even spider, will attack it; but wash it well with the syringe, and no danger need be feared. Anyone who has it in a pot should turn it out at once; and, if there be no conservatory border, let it have a tub of good loamy earth, and it will succeed, sending up growth after growth, to the delight of the cultivator. Those who have seen the corridor at Messrs. Veitch's, with the bells of the white Lapageria suspended from its roof, need not be told that it is even more valuable than the red form.—*Farmer.*

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Fuchsia corymbiflora.—Several plants of this Peruvian species, trained as standards nearly 6 feet high, are now in flower in the large temperate house at Kew. This species has leaves nearly as large as one's hand and bears terminal clusters of crimson flowers, each fully 3 inches in length. It is a plant well worth growing indoors.—J. H. S.

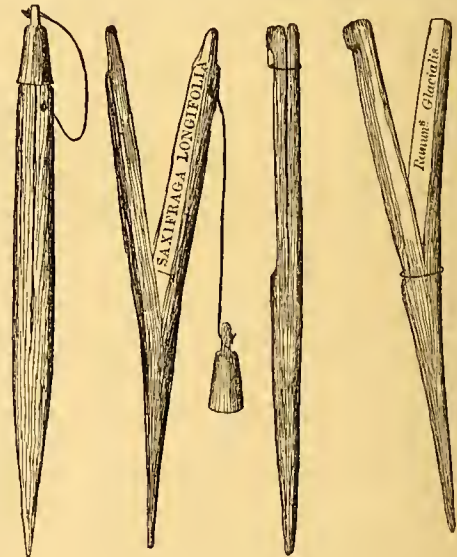
Sonchus multibracteatus.—This is now in flower in the succulent house at Kew, and like its congener, *S. laciniatus*, it has cut or finely-lobed foliage of a fresh green colour, the mid-rib being hairy at the base, and its flowers are borne in terminal clusters, each being rather larger than a shilling and of a bright lilac-purple colour. It is one of the few "Sow Thistles" worth growing for its flowers.—B.

Dictyopsis Thunbergii.—This does remarkably well planted out in the border of a little greenhouse. In habit it somewhat resembles *Myrsiphyllum asparagoides*, but the leaves are much larger, and, if possible, of a brighter and fresher green tint. It grows vigorously in a moist border of sandy loam. Its flowers are small, of a pea-green colour, and rather sweetly scented. It comes from the south of Africa, and is well-deserving of cultivation, either in pots or planted out.

Arnica conspicua as an Indoor plant.—Grown in pots in a cool greenhouse or winter garden, this noble Reed forms a striking object, and its silky plumes last in perfection much longer than when produced out of doors. It likes a strong fibrous loamy soil, and a plentiful supply of water nearly all the year round. I have had a plant of it in a large pot in our conservatory for over two years, and it is just now throwing up feathery plumes in abundance, and these, unless broken or cut, will last until young ones are again produced. Last autumn I had this plant for several weeks in my front hall, and it was much admired by all who saw it. It was placed immediately in front of some heavy crimson hangings and its silvery sprays stood out clear and bright, thus forming a novel and pleasing natural indoor ornament.—J. H. S.

A NEW KIND OF LABEL.

Most people are familiar with the many different kinds of labels that have from time to time been introduced. Wood, iron, zinc, porcelain, glass, and other substances, have all been tried, and now whalebone has been added. This last, which has been named the Elastic label or tally, has been found efficient, and to possess the following advantages, viz., cheapness, being made out of the rib of any old umbrella; simplicity, for any one can make them; durability, for, if the ring (or cap) is made just sufficiently tight to move easily, they are weather-proof and water-proof; neatness, because they are unobtrusive; and ease in reading the name, as, from the elasticity of the material, the split opens so wide that it is unnecessary to take the label out of the soil. For ordinary purposes neither ring nor cap is needed; as, when the split is not too long, it closes of itself sufficiently to keep the label dry, or if the split is long enough to allow of its being partially inserted into the soil, the pressure of the earth holds the parts close together. The portion of the label on which the name is written or printed is affixed with bookbinder's paste, the paste being rubbed on the side of the split intended to receive it, and the label (unpasted) attached; then, by pressing the parts together or tightening the ring, complete union is effected. No danger exists of the split parts sticking together from the protruding paste, as the



Whalebone Labels.

elasticity of the whalebone prevents that from happening. The sides of the split parts are better left as torn apart, as, from the unevenness, the pressure acts more effectively, and the label is more firmly fixed. R. R.

DISCOVERY OF A NEW MEDICINAL PLANT.

In the forests of Brazil a plant, as important as the Cinchona itself, has just been brought to light by the intelligence and perseverance of Dr. Coutinho, a Portuguese physician. The plant and its qualities have long been known to more than one of the native tribes, but their medicine men have hitherto kept their knowledge a profound secret. Dr. Coutinho, however, having once heard of its extraordinary properties, and secured safe evidence that they were not overstated, allowed no opportunity to pass without endeavouring to gain something like positive knowledge of the nature of the plant, and the localities in which it was found. At length he succeeded in obtaining a specimen of "the great medicine plant," as it was called, and tested its efficacy. Its chief property was said to consist in its power to produce most copious perspiration, for which purpose it was administered in fevers, and was said to be almost a certain specific. Having proved that copious perspiration ensued almost immediately after a single dose, Dr. Coutinho considered its importance established, and forwarded a specimen to the well-known pharmaceutical chemist, M. Rabuteau, of Paris, under its native name of Jaborandi. The results of M. Rabuteau's analysis and

experiments, published in the scientific journal, *L'Union Pharmaceutique*, are to the following effect:—He discovered, by careful analysis, that Jaberandi contained no alkaloid; and the eventual residuum, which was of a brown colour, proved perfectly tasteless. So far the experiment was unsatisfactory. But, as he states, he determined to make an infusion of some leaves, and, thinking himself the fittest person to make a first experiment on, took a dose, covering himself with a blanket, and, lying down calmly, awaited the result. After about a quarter-of-an-hour, drops of perspiration began to exude about the temples and forehead, and eventually the perspiration became general and profuse. No unpleasant symptom of any kind supervened, neither of prostration or nausea; and, after changing his wringing wet linen, M. Rabuteau went to bed, and slept calmly and soundly till morning, awaking with a pleasant sensation of refreshment, and, feeling convinced, as he unhesitatingly states, that a new and most valuable medicine had been added to the range of medical knowledge—a medicine which he thinks scarcely, if at all, less important than Quinine itself. It is still uncertain, in consequence of the specimens received consisting only of leaves, to what class of plants this new febrifuge belongs, whether to the Peppers, or to one of some two or three other families of plants that have been suggested. M. Rabuteau found that the leaves had a slight peppery taste which may have suggested the Pepper tribe as that to which the plant belonged.

H. N. H.

THE FLOWER MISSION.

[The practice of taking flowers to the sick in hospitals, tenements, houses, &c., is spreading in American cities. The following verses accompany a fine page illustration of the subject, which recently appeared in *Harper's Weekly*.]

Into the homes of sorrow and distress
The rare sweet flowers go to bud and bloom,
And with their own bright life make glad awhile
The lives that wither in perpetual gloom.
Poor hearts that long have starved for word of love,
Dim eyes that ne'er behold a beauteous thing,
And tired hands that stretch themselves in vain
For joys that ever from their grasp take wing:

To these the flowers on their mission go,
And breathe a fragrance fraught with new sweet life,
And cause an atmosphere of joy and peace
To enter e'en 'mid scenes of pain and strife.
Sweet buds of beauty! how they seem to say,
"Cheer up! cheer up! there are kind hearts and true,
And though your paths seem overgrown with thorns,
Yet there are flowers still which bloom for you!"

A thousand blessings on the kindly hands
Which pluck the fragrant flowers for the poor!
A thousand blessings on the kindly feet
Which falter not, but go from door to door,
And leave with tender, loving charity
The sweet joy-breathing gifts of love divine.
Who knows what endless flowers of grace and truth
The Flower Mission may hereafter twine?

A Remarkable Manure.—The following testimony to the virtues of a patent manure was recently received by its owner:—"Dear Sir,—The land composing my farm had hitherto been so poor that a Scotchman could not get a living off it, and so stony that we had to slice our Potatoes and plant them edgewise; but, hearing of your manure, I put some on a ten-acre field surrounded by a railroad fence, and in the morning I found that the rock had entirely disappeared, a neat stone wall encircled the field, and the rails were split into fire-wood, and piled up systematically in my back-yard."

Packing Plants.—Plants always travel better by being sent upright in round baskets, with sticks and mats round them; no system invented up to the present is equal to this, but it is the most expensive. All delicate-leaved plants, such as variegated Pelargoniums, suffer by the foliage being broken and otherwise disfigured by all other modes of package. The next best system is a good box, and the plants laid down and all spaces filled up with moss or small shavings, and as many plants turned out of pots, consistent with safety, and put in sugar paper. This is a capital way of sending such things as tender Zonals, &c.; more common things, as bedding plants, &c., are laid down with their roots wrapped up in paper to keep them together. By this means the weight of the pots is saved, a great quantity can be packed in a small space and at a small expense, and the carriage cost is but trifling to any part.—H. CANNELL.

WORK FOR THE WEEK.

The Flower Garden and Pleasure Grounds.

THE weather hitherto has been most exceptional in character, as regards cold and drought. "Cassella's Registering Thermometer" fell to 32°, or the freezing point, on the night of the 7th; to 31° on the night of the 10th; and to 26°, or 6° of frost, on the night of the 12th inst. Ice, of considerable thickness, has been formed; and the foliage of Potatoes has again been blackened. Recently turned-out bedding-plants, of the most tender species, have, however, suffered less than might have been expected. What rain we have had has been exceedingly partial. In many gardens, the planting of flower-beds has, on account of the unfavourableness of the weather, been delayed to an unusually late period; and, even in cases where the planting has been accomplished some time since, little or no progress has as yet been made by the plants, and incessant watering has been absolutely necessary to keep them alive. In ordinary seasons, it is always advisable to give the beds a thorough soaking at least twice a week, until the plants become somewhat established; but this season it has been found necessary to sprinkle the plants every evening, an operation which has always a tendency to cake, or render the surface of the soil hard; and, on this account, mulching is very desirable wherever that is practicable. Peg down the shoots of all plants which are large enough to admit of that being done, so as to prevent them from being blown about and broken. Pick off the blooms of Pelargoniums and other bedding plants for some time to come, in order to strengthen the plants as much as possible. Stake up Carnations, Picotees, and other plants which may require that attention; and attend carefully to Roses, which are, in many instances, suffering severely from the ravages of the rose maggot, as well as from aphides. The maggots must be picked carefully off and destroyed, while the aphides should be washed off with the garden engine. To render this operation effectual, however, a person should precede the engine, and, with his fingers wetted with tobacco-water (which he should carry with him in a small watering-pot), examine the young shoots and unexpanded flower-buds, and crush the insect pests on them as much as possible, without injuring the shoots or foliage. The engine, which should be put in operation immediately afterwards, should be charged with the coldest water which can be procured; and this, vigorously applied, will wash the crushed and discomfited aphides from their stronghold before they have time to recover themselves. It is quite necessary, at the present time, to free Rose-trees of everything in the form of insects, if at all possible, as they will very soon be in full flower, when syringing cannot well be practised without serious injury to the blooms. Any trees or shrubs which may have been recently transplanted, and which may show indications of suffering from the effects of the long-continued drought, should, in addition to frequent and liberal supplies of water and mulching at the roots, be syringed so as to thoroughly wet the foliage—late in the evenings of hot dry days. Let hardy Ferns, in the root or rock-garden, be well supplied with water while dry weather continues, or the fronds of many will become a prey to red spider, which will seriously impair their beauty during the remainder of the season. The dry weather which we are experiencing will, to some extent, obviate the necessity of so frequently mowing lawns and Grass borders as would otherwise have been needed; straggling tufts and bents will, however, here and there, present themselves, and these should be occasionally cut down with a scythe. Lawns, in many gardens, are already quite brown; this, however, may always be prevented where there is an unlimited supply of water, as an occasional flooding with a hose, or otherwise, will always keep the Grass green.—P. GRIEVE, *Culford, Bury St. Edmund's*.

Hardy Flowers.

Herbaceous and Alpine plants, being now at their best, will require some attention. Vigorous-growing perennials will need staking—an operation which will have to be extended, in some cases, to annuals and biennials, the blooms of many of which are now very attractive. The surface of beds and borders should be occasionally stirred by means of a hoe. Double Rockets, which have bloomed profusely this season, should have their shoots layered—an operation which will soon induce the production of shoots in abundance; and these, when they have attained a length of 2 or 3 inches, may be taken off and made into cuttings. Pyrethrums for late blooming, if cut down and allowed to grow afresh, will come into bloom during the later summer months. Hardy perennials generally, which bear division, may still be multiplied in that way; and, where that is not applicable, cuttings should be inserted as soon as possible, in order to ensure their becoming well established before winter. Hardy annuals for late blooming should be sown in shady spots, to be transplanted hereafter to the positions in which they are to flower. Seeds of Brompton, Emperor, and Queen Stocks should also now be sown for flowering next spring. Continue to prick off perennials as soon as they are ready for

removal. Plants in pots will require plenty of water at this season; and specimens of such plants as Phloxes, Pæonias, Pyrethrums, &c., will need attention in the way of staking and removing dead blooms. If not already done, lose no time in plunging the stock of plants in store-pots in wood-ashes or sand. Conspicuous amongst hardy plants now in bloom may be mentioned various kinds of Iris, particularly the different forms of Spanish and English Iris, and the tall-growing and handsome *I. ochroleuca*. Lilies, too, of various kinds have commenced flowering, the most attractive, at present, being some forms of *Lilium Thunbergii* and the yellow Martagon. I have likewise noticed the rare *L. Szovitzianum* producing its richly-scented yellow flowers in several gardens abundantly. Larkspurs of various sorts are also in bloom; and the tree-Lupine (*Lupinus arboreus*), a valuable plant for planting against a south wall or in warm shrubberies, is now one mass of yellow inflorescence. *Baptisia australis*, a handsome blue-flowered leguminous plant, is now very attractive; as are also several species of *Astragalus*, such as *purpureus* and *Onobrychis*. The different varieties of the tree-Pæony, now in flower, are very ornamental, and a good display is produced by Bell-flowers, Pentstemons, Alliums, Sweet Williams, Pinks, &c. In many places, too, the blooms of various hardy aquatics, such as the Water Violet, are conspicuous. The blooms of this plant, which are of a pale lilac colour, with a yellow eye, are arranged in whorls on a spike often a foot or more in length, and are very effective. I recently observed the Ethiopian Lily producing its well-known white spathes in abundance in the lake at Battersea, where it has, I believe, remained for the past three or four seasons uninjured, and has bloomed annually. Some ornamental Grasses also look well in the open garden at this season, notably *Poa fertilis*, a graceful-habited species, which forms a dense tuft of slender leaves, surmounted by airy panicles of purplish flowers. It is a capital plant, either for border decoration or for isolation on turf—a position in which a good specimen of this Grass may now be seen just within the principal entrance to the Botanic Gardens at Kew.—T. SPANSWICK.

Cool Orchids.

If the weather continues hot, ventilation may be allowed, in the case of the cooler-growing species, both night and day, and during the hottest part of the day all the ventilation possible should be given, in order to keep the thermometer down to as near 60° as possible, for it is a well-known fact that many *Odontogloss* and *Disa* are often injured by a high summer temperature, more than by a very low one during the dull winter months. Plenty of water should now be used, the stages and floors should be damped two or three times daily, and many of the plants, such as *Cypripediums*, *Disa grandiflora*, *Masdevallias*, and newly imported *Odontogloss*, will be all the better for regular syringings once or twice daily. Keep a sharp look-out for all insect pests. Thrips, greenfly, and red spider, are now very busy, and soon do an enormous amount of mischief, unless speedily exterminated. Regularly sponging the plants with clean tepid water is one of the very best preventives of insect pests, and the plants always look fresh and clean after such an operation; if fumigation is resorted to in the case of aphides, care must be taken not to allow the fumes to become too hot, or the foliage of *Odontogloss* and *Miltonias* will be sure to curl and fall off in a very short time. Top-dressing may still be proceeded with, using newly-gathered Sphagnum, which should be kept moist with the syringe so as to induce it to grow freely. The following, amongst other Orchids, are now in bloom, and should be removed to the driest and coolest end of the house, viz.: *Odontoglossum Alexandræ*, *Masdevallia Harryana*, *Veitchii*, *igneæ* *Lindenii*, *Oethoides*, *Nycterinia*, and *Polyantha*. *Nasonia cinnabarina* is also in flower, and is one of the smallest of all Orchids, a good established plant being only about 2 inches high. *Disa grandiflora* now throwing up its flower-spikes will require a copious supply of water at the root. Imported *Odontogloss* should be simply laid on a bed of living Sphagnum and syringed occasionally until they form growth and roots.—F. W. BURBIDGE.

Indoor Plant Department.

Conservatory climbers require more attention at this season than at any other. Fuchsias trained on rafters should have their shoots thinned, and the borders in which they grow occasionally watered with manure-water. Where *Climanthus Dampieri* is in bloom, the greatest care must be taken in watering it; some raise the soil a little around the neck of the plant, so as to prevent its getting wet; others feed with water from saucers placed under the pot. Seed-pods on *Azaleas* are removed as soon as they appear; the latest-flowered ones should be re-potted, if necessary, and placed in well-shaded Vineries. Camellias, Orange trees, &c., should be still kept in warm well-shaded houses, and syringed early every afternoon. Pelargoniums, as they advance in growth, should be staked and brought into the conservatory. In stoves, a little weak manure-water

should be given now and then to *Caladiums*, which should also be kept well shaded and in a nice moist temperature. The first-flowered *Gloxinias* and *Achimenes* are now about over, and should be placed on back shelves in warm houses, water being partially withheld. Such as are in flower should be kept near the glass, shaded from sudden outbursts of bright sunshine, and the foliage kept dry. They should also be brought into cool or intermediate houses to prolong their beauty. Keep *Gardenias* well watered, syringed, and shaded. *Aristolochias* and a few other stove creepers, apt to harbour mealy bug, should be occasionally syringed with weak tobacco water, which will clear them of that pest. Similar applications are also effectual in preserving the young shoots of *Diospyros*, *Medinillas*, *Cyanophyllums*, &c. *Cycas*, *Encephalartos*, and other plants of that class should be frequently examined, in order to liberate and keep in proper order the young fronds that become entangled with other plants, with which they are associated. Give liberal supplies of water to Orchids, but no more shading in dull weather than is absolutely necessary, unless it be to prolong the beauty of their flowers. *Calanthes*, which are growing strongly, should be kept on shelves near the glass. Filmy Ferns, which enjoy a steady temperature under hand-lights, should be kept in the darkest parts of the Fernery, and receive extra shade. The glasses under which they are kept should be rubbed dry with a cloth, and the plants should every evening be gently watered through a fine rose or syringe.

Indoor Fruit Department.

Suckers of the earliest of the Queen Pines which are now colouring should be taken off, potted, and plunged in front of the beds. Where tan or other fermenting material, is used, the beds should be either wholly or partially renewed before the next successions are introduced, and as the heat begins to decline. Where Fungi make their appearance in the beds a little fresh air-slaked lime should be mixed with the fermenting material. Inside Vine borders should, occasionally, receive thorough waterings, and waterings of weak manure should be given to those in pots. A little air is necessary, both night and day, when the Grapes are colouring, and also a little fire-heat. Peaches and Nectarines that are ripening should receive a steady gentle heat, and air should be given them on every favourable opportunity. The syringe should be freely used in the case of late crops; thinning and tying in the shoots should also receive attention. Strawberries in full bearing should occupy the top shelves on the back walls of Vineries and early Peach houses; the next in succession having set their fruit should be kept in cooler houses, and the last crops for the season's forcing should be placed outside in front of walls with a north aspect, or on the sides of shady walks. French Beans producing crops in early Vineries, should be kept near the glass, but not in close proximity to the pipes, as that induces red spider.

Pits and Frames.

These are now nearly cleared of bedding plants, and, as sufficient time has not yet been spared to re-fill them, *Alternantheras* and *Coleuses* still under cover should be, therefore, allowed more room. *Dracænas*, variegated *Abutilons*, &c., should be still retained in frames; but early-flowered *Calceolarias*, when turned out of the conservatory, if good, should likewise be placed in frames to ripen seed. If desirable to retain some of the best of them for next year, the flower-spikes should be cut off, and the plants placed in frames in front of those kept for seed. Plants of *Amarantus salicifolius*, as they advance in growth, should be re-potted, placed in rather close cold pits, and encouraged by weak applications of manure-water. Single and double *Petunias* should be trained into form, and not allowed to bloom until they have attained the required dimensions. Japan Lilies, as they form their flower-buds, should be removed from pits to larger houses, then top-dressed with decayed cow-dung and turfy loam in equal proportions, and securely staked. Plants of *Erythrina Crista-galli*, as they make sufficient growth to require stakes, should be removed from pits to larger structures.

Hardy Fruit Garden.

Modern horticulturists have not only learned, but have endeavoured to practise the great lesson of the husbanding of force. In the olden times growth was made to be cut away. Now, wise cultivators lead it from the first into channels of usefulness. Hence the greater attention devoted to summer pruning than used to be the case; indeed, properly practised, it is almost the only pruning that is needed; for there is no reason why a single shoot should be grown in summer more than will be wanted to fully furnish or enlarge the tree next spring; that is if the tree is in a perfect state. At times, a useless shoot may be allowed to remain, as a stimulant to sickly roots, or as a mode of creating more roots, and stronger than those that already exist. But, assuming that root force and top growth are

fairly balanced, then all useless growth is wanton waste; therefore, the great aim of summer pruning should be to reserve sufficient wood for fruit bearing and furnishing, and no more. Such pruning can hardly be too gradual and slow. Begin by getting rid of any weak, diseased, and ill-placed shoots, if possible. Then go on selecting for removal other shoots—if one at a time on a branch so much the better—until all superfluous wood is removed. In hardly any process is so much evil wrought by hastiness as in the summer pruning of hardy fruit trees. A process that ought to be spread over the growing season is often, for want of thought and time, concentrated into one or more wood slaughterings, often inducing, in the case of Peaches, Nectarines, and Apricots, the production of gum and stunted growth. Were it not on account of late frosts, I would advise beginning summer pruning so early that a knife would never be needed. The safest summer pruning consists in making it wholly a case of dis-budding; but the frosts come too late for this method, and render it dangerous to prune much, or at all, till June; there is, therefore, the need of more care, lest evil should arise from the diversion of so much sap into new channels; and the best mode of meeting the difficulty is to proceed only with a few shoots at a time. Simultaneously with pruning, the fruit should be thinned. Nothing is gained, but a great deal lost, by leaving too many. It is difficult to lay down rules, so much depends on the strength of the trees, the character of the soil, and the object of the cultivator. For Peaches and Nectarines, a fruit on every 6 inches of space may be accepted as a good average, if fine fruits are expected. Many leave them much closer, and some recommend 9 inches or 1 foot apart. It is a bad plan to leave the fruit in clusters, so that they cannot swell without crushing each other out of shape, or go against a branch or a nail that is likely to mar their form or pierce their substance. Missbapen fruits are not fit for table, and those that are pierced are sure to rot before they are ripe. Attention to these trifles now will tell most satisfactorily at gathering time. Unless the crop is very scant indeed, each ill-formed awkwardly-placed fruit should be removed at once. This is of less consequence in the case of Apricots, as they are mostly used for preserving; and squeezed fruits are generally the highest flavoured.—D. T. FISH.

Kitchen Garden.

Mulching, hoeing, watering, and shading should receive careful attention during the continuance of the present dry weather. Amongst established crops the more vigorously the hoe is kept going the less necessity there will be for watering; but, where the latter has to be done it should be done thoroughly, or not at all. Occasional surface waterings do more harm than good, by encouraging, during the temporary supply of moisture, the formation of surface roots, which are destined to perish almost the moment the supply of moisture is withheld; whilst, if the plants had been left to themselves, with an occasional stirring of the surface, they would have sent their roots deeply into the land, and have drawn their supply of moisture from a stratum less influenced by extremes of heat and drought. I do not wish to say a word against irrigation, where it can be done thoroughly, but I believe a good deal of time and labour is spent in dry seasons in watering, from which no appreciable result is obtained. Deep culture and fairly liberal dressings of manure form the only safeguards against drought. Now that bedding plants are removed from pits and frames, have the latter cleared out and whitewashed, preparatory to filling them with fermenting material; and this should be managed so as to produce a steady mild heat that will last for a month or so, in order to give the plants a start. Cucumbers, Melons, Capsicums, and Green Ginger for preserving, will do very well in such pits now, but as the latter will grow at least 3 feet high, sufficient space should be left for the proper development of the foliage. Cucumbers and Melons succeed well in such pits, if the proper varieties are selected; thus affording an opportunity for cleaning and painting the Cucumber-houses, ready for the reception of the autumn crop in September. The main crop of Broccoli, &c., should now, or shortly, be put out. In all gardens in which the land is required to produce to its utmost extent, it is a good plan to plant Broccoli between the rows of early and second early Potatoes; one row of Broccoli to every two rows of Potatoes. Thus, if the rows of Potatoes are planted 2 feet apart the Broccoli will be 4 feet apart; and, by Christmas, it will be found that the Broccoli will have pretty well covered the ground. I have followed this plan some years, and I am satisfied with the result. It is well, also, in planting late Broccoli not to plant all of it in one aspect; and, in order to prolong the season till Cauliflowers come in, a few might even be planted under a north wall, which, in the event of a severe winter setting in, will, probably, pass through the ordeal with the least injury. On the morning of the 15th inst. the thermometer here fell to 31°, and this unusually low temperature was accompanied by a keen biting north wind, which must, had it continued a short time longer, have arrested growth.—E. HOBDAV.

SOILS AND FERTILISERS.

THE SEWAGE QUESTION FROM A CHEMICAL POINT OF VIEW.

THIS subject was brought before the Chemical Society the other day in the form of a lecture, by Dr. Corfield. The removal of the refuse from towns, said Dr. Corfield, and especially excretal matter from the neighbourhood of habitations, was one of the most important sanitary problems of the day, the general death-rate at any place being in inverse proportion to the efficiency of the means used for this purpose. He would warn people that he considered the immediate removal of excretal matters of the highest importance, since the retention of these matters near habitations for a longer or shorter period was always certain to be attended with evil consequences. All the various systems for treating sewage might be reduced to two classes:—(1) Those in which the whole of the refuse matter was removed with the foul water; (2) those where this foul water was allowed to run into the sewers, but as much of the solid matter as possible was kept back. In judging of the respective merits of these two classes in all their varieties, chemistry comes to our aid, and shows that, where midden-pits or cesspools are used, the water of the wells in the neighbourhood becomes contaminated with nitrogenous organic matter, ammoniacal salts, and chlorides, the presence of the latter in any quantity in surface waters at places not in the neighbourhood of the sea being an almost certain indicator of sewage. Of the conservancy systems, three of the most important varieties were—(1) The employment of tubs or pails with or without disinfectants and deodorisers; (2) ash closets; (3) dry-earth closets. In these the faeces were retained, and it was advocated that they would be extremely valuable as manures, especially from the latter. It was found, however, that the earth, after having been used three times in the dry-earth closets, did not contain more nitrogenous matter than a rich garden mould, viz., 0.446 per cent., and consequently its value as a manure was so small that it would only pay for carriage to a very short distance. Dr. Veelcker had estimated it to be worth about 7s. 6d. per ton. This arises from the fact that the total amount of nitrogen excreted in the faecal matter is not more than one-fifth that in the urine, the former only containing 1.5 per cent of nitrogen. In Paris much of the excreta are collected and sent to Bondy, and there converted into a manure called "poudrette;" this costs the city annually a large sum, although the company who manufacture the manure make a profit. The system of pails or tubs, especially with the use of deodorisers, was essentially bad, as in the latter case the refuse matter might possibly be kept in houses some time, and deodorising was not the same as disinfecting. Numerous processes have been proposed for the precipitation of sewage. These remove the suspended matters more or less completely, deodorise the liquid, and precipitate a portion of the phosphates; but they are ineffectual, as they only partially remove the ammonia and the organic matter which is in solution, or do not do so at all. The clear liquid, therefore, is not in a fit state to be poured into the streams; moreover, the precipitate has comparatively little value as a manure. Of the method of employing sewage for irrigation, that of upward filtration was found to be useless; for, although the solid matters were removed, no oxidation took place, and the effluent water was, consequently, quite unfit to be allowed to flow into our streams. With intermittent downward filtration the case was quite different. This system was applied to the sewage of Merthyr Tydvil, a town of 50,000 inhabitants. Here, the sewage was passed on to a planted filter of 20 acres, and it was found that the effluent water contained the same amount of nitrogen as it did before it passed through the soil; but it went in as ammonia, and came out as nitrates and nitrites, being completely oxidised by its passage through the soil. In the case where the sewage is simply passed over the surface of the soil, where the plant growth alone acts, and not the oxidising action of a porous soil, the effluent water is always very impure. In order to purify sewage, therefore, it must be passed through the soil, and not merely over it. The lecturer stated that experiments had been made during two years on irrigation land consisting of 121 acres, to ascertain how much of the nitrogen was retained by the plants. In this land about 25 tons of nitrogen per annum pass in as sewage, of which 10 per cent. are lost in the effluent water as nitrates and nitrites, and 40 per cent. were recovered in the crops during the first year. The latter number was probably too high for the average, the second year giving much less.

Dr. Gilbert, who occupied the chair, said:—He quite agreed with the lecturer that all the conservancy methods hitherto proposed had failed, and no precipitation process had given a manure worth carrying beyond a very small distance. As we have to use water to cleanse our dwellings so as to get rid of all refuse matter, the best way was to send it into the sea, if near enough; and, if not, to adopt the method of intermittent irrigation, with or without previous

treatment. The results alluded to by the lecturer, as obtained from two years' experiments on land consisting of 121 acres, must not be relied on as an average; on a large scale, for a period of several years, the amount assimilated would probably be found to be much smaller.

Dr. Frankland said he agreed with Dr. Corfield as to the comparatively small value of the manures obtained by the conservancy systems, and he thought that the proportion of nitrogen in the solid and liquid excremental matter was rather under than over-stated; he should himself be inclined to say that it was six or seven times as great in the latter as in the former. One point interested him very much, namely, that the passage of the sewage through the soil purified it to a far greater extent than the plants growing in the land. He believed that this was the most effective method of treating sewage; although at Norwood, where the soil is stiff and not underdrained, the state of the effluent water was quite satisfactory even in winter.

Dr. Voelcker believed that sewage could never be made a profitable thing, and so long as that was the main thing looked to they would never arrive at a solution of the question. With regard to the utilisation of the sewage at Bondy, they profitably extracted ammonia by distillation from the liquid containing 2 per 1,000, and, although the whole sewage was not treated in this manner, several thousand tons of sulphate of ammonia were annually produced from it. The solid was mixed with charred peat and burnt gypsum to form pondrette, but the peat actually contained more nitrogenous matter than the solid faecal matter did. He also pointed out that the employment of large quantities of liquid for experiments on sewage was likely to give rise to errors, from the want of uniformity in the composition of different portions of the liquid.

Mr. Hope called attention to the fact that, in the application of Heisch's test to the effluent water, it was found that the organisms were produced when phosphoric acid was present; he thought, therefore, that was what we should search for to ascertain the purity of the water. Land at Crewe, consisting of stiff clay, was converted into a very fair filter-bed by paring off and burning the soil to the depth of 6 inches, and then plunging it up to the depth of 3 feet by steam. It was then laid with drains at the distance of 4 feet apart.

Dr. Gilbert said that rapidly-growing crops assimilated much of the nitrogen, but in the winter-time comparatively little was taken up. Where dry manure was applied to land on which Wheat had been grown for twenty-one years successively, it was found that not more than one-third was recovered in the crop, but with Barley, where it was not exposed to the winter rains, one-third was got back.

The Best Way to Reduce Bones.—I shall be grateful for information concerning the most practicable method of pulverising bones.—J. CROUSE. To this question, Prof. S. W. Johnson has published the following answer in the *Tribune*:—"If you have ground bones, make them up into a compact heap with twice their bulk of coal-ashes, muck, sawdust, loam, or even sand; moisten the whole thoroughly with water and cover the heap with a few inches of earth. In warm weather, the bones will begin to heat in a few days, and, usually, in a week or two the bones will be reduced to a mouldy mass, that they may be rubbed to powder in the hand. The exterior of the heap, for a few inches of depth, may not ferment as thoroughly. If needful, the heap may be opened, turned, moistened again, and set into a second fermentation. The larger the heap, the finer the bone, and the warmer the weather, the more rapidly will the fermentation go on. The above process will not only reduce coarsely-crushed bones to a state suitable for distribution, but is an excellent way to treat bone-dust just before application, rendering it more active. With coarser bones more time will be needful, while opening the top of the heap at various points and pouring in stale urine or dung-heap liquor will expedite the process. The Russian method of reducing entire bones with potash, or, what amounts to the same thing, with wood-ashes and lime, is as follows:—To 4,000 lbs. of bone take 4,000 lbs. of wood-ashes, 600 lbs. of fresh burned lime, 4,500 lbs. of water. First slake the lime to a powder, mix it with the ashes, and placing a layer of bones in a wooden vessel—a pit in the ground lined with boards or stone slabs—cover them with the mixture, lay down more bones and cover, and repeat this until half the bones, or 2,000 lbs., are interstratified with the ashes and lime, then pour on 3,600 lbs. of water and let stand. From time to time add water to keep the mass moist. So soon as the bones have softened so that they can be crushed between the fingers to a soft soap-like mass, take the other 2,000 lbs. of bone and stratify them in another vessel or pit with the contents of the first. When the whole is soft, shovel it out to dry, and finally mix with dry muck or loam (4,000 lbs.), or enough to make it handle well."

SOCIETIES AND EXHIBITIONS.

ROYAL HORTICULTURAL SOCIETY.

JUNE 17TH.

This meeting was less interesting than some of its predecessors. Mr. Gilbert, of Burghley, exhibited a new Melon, named Lady Isabella Cecil, and a new seedling Grape, named Gilbert's Russian Emperor. The Melon is a medium-sized oblong fruit with white flesh, and when we tasted it at Burghley, a few days ago, its flavour was excellent. The Grapes shown were cut from a weakly pot Vine and were, therefore, not so good as they otherwise would have been; but when well-developed clusters are cut from established Vines, this Grape will, doubtless, be found deserving of a place in the most select collections; the bunch is tapering, the berries of a jet-black colour, and oblate in form. Messrs. J. & C. Lee sent a plant of Brown's Wonder Strawberry, taken up from the open border, to show its prolific character. We remember seeing this Strawberry in Yorkshire a year or two ago and considered it to be an excellent variety. Mr. Douglas, of Loxford, sent Bloxham Hall Melon, a scarlet-fleshed kind, which was also shown by Mr. E. Bennet, of Hatfield. Messrs. Carter & Co. furnished Maclean's Little Gem Pea for comparison with Carter's Extra Early Premium Gem, the latter being found to be, in every way, more prolific than Maclean's Gem. Among flowering plants, perhaps the most interesting were the Lilies, staged by Mr. Barr, Mr. G. F. Wilson, and the Rev. G. Kemp; Messrs. Veitch & Son also exhibited L. purpureum, a creamy-white kind, spotted with purplish-crimson. The other kinds were principally forms of the Martagon Lily, L. Thunbergianum, L. daburicum, and a few other summer-blooming sorts; the kind shown by Mr. Wilson, however, appeared to be an undetermined species, with yellowish flowers. Mr. R. Dean, of Ealing, staged a collection of Peustemons and Antirrhinums; and, considering the freedom with which such plants grow on dry banks, or in out-of-the-way borders, they deserve more general culture than they receive. From Mr. Noble, of Sunningdale, came a nice batch of the deep rosy-flowered *Spiraea palmata*, which is one of the best of the Meadow Sweets for pot culture; it does not, however, force so freely as *S. japonica*. Messrs. Cripps and Sons contributed two varieties of hybrid Clematis, the best being Delicata, a semi-double variety of a soft lilac colour, and having fresh green foliage. Mr. Petridge, of Brentford, exhibited a nice collection of tricolor and bronze zonal Pelargoniums in good condition; and Messrs. Downie, Laird, and Laing, Forest Hill, sent a pretty silver tricolor, named Mrs. Downie. Mr. Bull had the pretty *Pescatorea* (Huntleya) albo-sanguinea, the sepals and petals of which are of pearly whiteness, and the lip deep crimson at the base, with a rosy apex. Mrs. Williams, 30, Hazlewood Crescent, Westbourne Park, showed some tastefully-modelled artificial Roses, their resemblance to the natural specimens being heightened by their being perfumed with otto of roses.

First-class Certificates were awarded to the following novelties:—

Imperial Dwarf Carnation (Veitch).—A dwarf and compact-habited scarlet self, well adapted for forcing and for furnishing cut flowers.

Lobelia Duchess of Edinburgh (Lidgard).—This is a profuse-flowering white variety, of a compact habit, and one which deserves to become popular.

Colens Duchess of Edinburgh (Chitty).—A finely-coloured form, the leaves of which are of a rich crimson-maroon or purple margined with sulphur or apple-green.

The People's Garden.—Last Saturday, the Marchioness of Lorne distributed the prizes to the successful exhibitors at a flower show which was held on that day in the People's Garden, Old Oak Common, Willesden. The Princess, and others belonging to the Royal party, made a tour of the garden, and then inspected the flowers offered for exhibition, which were staged in a tent. Amongst the exhibits were some very fine Geraniums, a great many Ferns, Roses, and other plants, besides a small quantity of fruit and vegetables. It may be as well to state that the People's Garden consists of an estate of about 50 acres, and belongs to a company who work it for their mutual advantage on the club principle. The chairman said it was generally supposed that the members were composed only of working men, but that was a mistake. The object of the club was to break down class differences, and to place every man upon the same footing, and her Royal Highness's visit that day was the crowning point of their effort. The garden is tastefully laid out, and the situation is both picturesque and convenient. Two bands were present, and the afternoon and evening were spent pleasantly and rationally.

OBITUARY.

MR. MARKHAM NESFIELD.

We deeply regret to announce the death of Mr. A. Markham Nesfield, son of Mr. Nesfield, the distinguished painter and landscape gardener, and well-known to many of our readers. He was riding from his house, in Dorset Square, in the direction of the Regent's Park, and when near the Hanover Gate his horse ran away, carrying him in the direction of St. John's Wood; on entering the St. John's Wood Road he was thrown and killed almost instantaneously, the horse kicking him in the head. He had for the past ten years or so carried on the practice of landscape gardening, succeeding to his father's business, and was in the front rank of his profession. He was only in his thirty-third year.

THE GARDEN.

"This is an art
Which does mend nature: change it rather: but
THE ART ITSELF IS NATURE."—*Shakespeare.*

ANNUALS AND PERENNIALS IN EARLY SUMMER.

How various are the feelings which are aroused by the first examination of an album full of photographs! Here is one whom we know well, and whom we may not see again for a long time. There is one whom we have often heard of, but have never seen his face before. Here is another with whom we have not met, even photographically, for many a year; and yet we recognise him again at a glance. There is another whom we know not, even by name; while there is something about his portrait which makes us feel that we cannot help liking him. Here is another whom we have only seen once before, but are not likely ever to forget. Much the same thing happened in visiting an interesting collection of plants for the first time as I experienced when, during the early part of the present month, I strolled over the various flower-farms of Messrs. Carter & Co., in Essex. I cannot say that I was unprepared for an exhibition of seed-saving upon a large scale; since I remember, twenty years ago, walking through the warehouses of a large wholesale firm, and finding, amongst their stores of agricultural seeds, a bin, as large as a small room, full of Mignonette seed. It did not, therefore, surprise me so much when I saw a bed of blue *Nemophila*, 12 feet wide, running in a straight line for nearly half a mile, and beds of hundreds of varieties of flowering plants, each covering an area which people of moderate means might be excused for calling a good-sized garden. It did not surprise me to see fifty men weeding in one place, and thirty men employed in another part in "rogueing"—a term which means pulling up and throwing away plants which are producing flowers of not just the right shade of colour, and which are growing a little unlike the rest. But what did very much surprise me was the recollection that gardens generally should be so bare of colour during May and June, when there are so many beautiful hardy annuals and perennials in flower at that season. It is the season at which these particular flowers are in their greatest beauty. It is the season at which spring-bedding is over and summer-bedding plants are not worth looking at, even if they are out. Surely, then, room might be found in some garden for many of the plants to which I am now about to refer. Turning now to annuals, a much larger selection presents itself to our view. Not having before mentioned any plant with orange flowers, I will commence with that colour by naming *Shortia californica* (also called *Hymenoxys californica*), *Eschscholtzia crocea aurantiaca*, and *Erysimum Perowskianum*, as having rich intense colours which are visible from a long distance if sown in big clumps. *Bartonia aurea* is a beautiful annual with paler orange flowers than the preceding, but is a plant which goes off very quickly if sown in beds, where it blooms itself to death; whereas, if allowed to grow singly or in rows, where it can have plenty of air, it lasts in flower for a long time. For a carpet plant with orange flowers, there is probably nothing to beat *Leptosiphon luteus aureus*, with its profusion of golden blossoms. In yellows there is less choice, the only things that occur to me as particularly worthy of mention being the sulphur-coloured varieties of *Limnanthes grandiflora* and of *Linaria bipartita*, together with the more decided yellows of *Oxalis Valdiviana* (best grown as an annual) and *Leptosiphon luteus*. Amongst crimsones there are none of dark colour that are especially noteworthy; while the paler shades, found in *Oxalis rosea* and in *Leptosiphon roseus*, are particularly recommendable. It is in purples, lilacs, and blues, that early-flowering annuals present the greatest variety, in which category I must award the premier place for intensity and richness of colour to *Linaria bipartita*. This species has several good varieties with purple and white, with white, and with sulphur, flowers. The genus contains other interesting and useful annuals in *L. speciosa*, pale purple and white; in *L. spartea*, yellow and orange; in *L. Perezi*, yellow; and in *L. macroura*, white and lilac. The *Lupines* next deserve mention, and especially *Lupinus magnificus*, a tall-growing kind

with pale purple blooms, and *L. nanus*, a dwarf sort with dark blue and white flowers. The purest and brightest pale blue is, undoubtedly, *Nemophila insignis*; the next shade darker will be found in *Gilia capitata* major; darker still are *Eutoca viscidula* (which has a singular sooty smell) and *Whitlavia grandiflora*, of which last there is a very beautiful blue and white variety, very appropriately named *gloxinioides*. In lilacs, I would mention the little known *Phacelia tanacetifolia* (which grows nearly 2 feet high), and a very delicate variety of *Nemophila insignis* called *lilacina*, as especially worthy of cultivation. The genus *Schizanthus* may here be mentioned, since amongst the many colours which are found in the blossoms some shade of lilac, more or less, usually occurs. The three species, *S. gracilis*, *S. pinnatus*, and *S. retusus*, with their many varieties (some of which are probably hybrids), are, most of them, worth growing; but there are two more beautiful, to my fancy, than all the rest, and they are *S. papilionaceus* and *S. oculatus atropurpureus*. Taking now perennials, let me begin first with the *Columbines*; amongst which the foremost place must be given to *Aquilegia olympica*, which grows from 2 to 3 feet high, and has large expanded noble flowers of dark lilac and white. Then there is the very dwarf-growing *A. sibirica*, with dark purple, erect, double flowers; also the double white variety of *A. vulgaris*, which is not quite so dwarf as the last mentioned; the curious *A. Verviniana*, with its golden-veined leaves and dull pink flowers; and the beautiful *A. Skiuneri*, with its blooms of scarlet and yellow. Let me next refer to the *Alkanets*, and especially to the well-known *Anchusa italica*, and to the less common *A. capensis*, the Cape Forget-me-not, which grows about 2 feet high, and bears a profusion of rich blue flowers, quite putting into the shade our modest-looking British *A. sempervirens*, with its pale blue flowers. Amongst dwarf-growing plants with rosy blooms, there are few perennials to beat *Oxalis multiflora*. In crimsones there are those free-flowering plants, *Valerian* (*Centrauthus ruber*), French Honeysuckle (*Hedysarum coronarium*), and *Lychnis viscaria*, all of which have rose-coloured, and also white, varieties, and are well worth growing. The foliage of the French Honeysuckle, even if the plant bore no bloom at all, would entitle it to an honourable place in the garden; while, near it should grow the equally noble-looking *Lupinus polyphyllus* and its white variety. The last perennials to which I will now refer are the *Larkspurs*, in which we find almost every shade of purple and blue. *Delphinium formosum* and *D. Hendersoni* are well-known showy plants, with blue and white flowers; *D. grandiflorum* grows taller and is blue, some shades darker than the others; *D. celestinum* has very pale sky-blue flowers; the blooms of *D. Nahami* are purple, with a bronzy hue; while *D. nudicaule* differs from all the others, in decking itself out with scarlet flowers. I cannot close these notes without mentioning the fine *Papaver bracteatum*, whose noble scarlet and black blooms are noticeable a long way off. W. T. P.

Cultivation of the Tea Plant in Anjou.—An interesting experiment in the cultivation of the Tea plant is reported to have been carried out in Anjou. The district is celebrated for the culture of the *Camellia*, one cultivator, M. André Leroy, having in his ground upwards of a 100,000 of these plants. The suitability of the soil for the growth of *Camellias* induced M. Leroy to try whether the kindred Tea plant could not be raised, and he now has 400 or 500 fine plants of *Thea viridis*, from eight to ten years old. They are all grafted on *Camellia* Stocks, and are planted amongst the *Camellias*, which they greatly resemble. Each year, if the temperature has not been too cold, the extreme branches bear flowers and capsules; the flowering takes place in April, and the seeds are ready for collection in October. Of course it is an interesting question whether the Tea produced in Anjou is as aromatic as that grown in China. Unfortunately, it is not, as its infusion has not really any of the taste of Tea. M. Meniere, of Angers, writing in the *Répertoire de Pharmacie*, is inclined, however, to attribute this to ignorance as to the proper mode of drying the young leaves, or, perhaps, to the absence of the more aromatic flowers of some other member of the *Camellia* family, which may be mixed with Tea for the purpose of giving it flavour. In an investigation for the presence of theine, and also of the quercitannic acid of Mulder, in the leaves of the Anjou plants, M. Meniere found the former of these substances in small quantity; he has also met with tannic, gallic, and oxalic acids.

NOTES OF THE WEEK.

— WE never saw that fine hardy plant *Spiræa palmata* so well grown as at the Botanic show last Wednesday. It was not only remarkably beautiful as an herbaceous plant, but certainly the finest specimen plant in the show. This reminds us of the high merit of the old and neglected *Spiræa venusta*.

— MR. B. WADDS writes from Middleton Hall Gardens, "The limekiln erected by Mr. Cowan at this place is a success in every way. I consider it the best system of heating extant. It only requires time to be universally adopted where limestone is to be had. I would say to all interested in it, come and see it in operation, and those who do so will then see what it is capable of doing."

— WE have received from Miss Hope, of Wardio Lodge, Edinburgh, some unusually fine blooms of the double Marigold, which, as Miss Hope justly remarks, "is not cultivated so extensively as it deserves to be." Blooms produced by plants of it raised from carefully saved seeds show little or no heart; indeed, they are as double as a *Ranunculus*, and by having self-sown seedlings of different ages, flowers may be had during ten or eleven months in the year.

— WE have received fine specimens of a New Zealand *Cordylina* (which Mr. Baker, at Kew, a great authority in such matters, says is *C. australis*) from Ireland, in the neighbourhood of Kilkenny, where the plant has attained a height of 14 feet, in the open air, in as many years. It was raised from seeds received from New Zealand under the name of "Cabbage tree." About six years ago it was apparently destroyed by frost; but it grew again, pushing up two leaders which were divided, and now form separate plants. The flowers have a delicious odour.

— IN the second biennial report of the San Francisco Park commissioners some interesting experiments are recorded regarding the cultivation of sand-binding plants for the reclamation of sand dunes. Many trees, shrubs, and herbaceous plants were tried; but two kinds of Lupin seemed to give the best results. The plants were raised from seeds; and, to prevent them from being smothered by sand-drift before they attained any considerable growth, common Barley was planted with them. The Barley sprouts on the fifth day after it has been sown; and, by the twelfth, attains sufficient height to hold the drift, whereas the growth of the Lupins is rather slow. In a single year the Lupins covered the sand with vegetation 3 or 4 feet high.

— A MEETING of the Committee on Plans and Buildings of the National Centennial Horticultural Society was held May 18, in the Horticultural Hall, Philadelphia. Mr. Schwarzman, assistant engineer of the park, presented a plan for the conservatory to be used at the great Centennial Exhibition in 1876. The proposed building is to be constructed of iron and glass, and will cover an area of 370 by 194 feet. In height it will be 71 feet, surmounted by what is known as a suspending roof. It will be divided into five compartments, a large one extending the whole length of the centre, and two small ones on each side. The small houses are to be used for Palms and tropical plants. The large one will be a general greenhouse. The cost of this structure is estimated at 200,000 dollars (£40,000).

— A SINGULAR exhibition is to take place in the Palais d'Industrie, at Paris, from September 15 to October 11, of all the useful insects and their products, and of the noxious insects and the depredations which they commit. This is the fourth exhibition of the kind, the last having been held in 1872 in the Luxembourg Gardens. The first division consists of useful insects arranged in six classes; each species should be shown in its several stages of egg, larva, chrysalis, and the perfect insect. First among these are the silk-producing insects, then those producing honey and wax, among which are the honey-bearing ants, of which one species has been long known in Mexico, and its honey utilised. Next follow the insects yielding colouring matter—cochineal, gall, &c. The fourth class comprises the edible insects; the water-bug (*Notonecta* and *Corisa*), whose eggs are converted into bread, and, under the name of "hanté," sold in the markets of the cities of Mexico, and particularly in the capital, where the eggs are gathered from aquatic insects found in the lakes, more especially in that of Tezenco; then follow the grugru worm, or eatable caterpillar of the Cabbage Palm; the locusts of America and Australia, crickets and grasshoppers, white ants (termites), the eatable spiders (*Epeira edulis*) of Polynesia, &c. The fifth class comprises the insects used in medicine; cantharides, &c.; the sixth, those used as ornaments, as the phosphorescent insects, beetles, &c. The second division (the noxious insects) includes those that are injurious to the cerealia, the Vine, oleaginous plants, textile, medicinal, and ornamental plants; those hurtful to

forest trees and to building timber, which destroy wool, horsehair, and feathers; parasitic insects, &c. The exhibition promises to be one of great interest, and likely to be productive of useful results.

— THE annual festival of the Gardeners' Royal Benevolent Institution is to take place on Thursday next, the 2nd of July. Let us hope that those who have the means will assist the committee in every way in their power to render the meeting a success.

— A GRAND National Rose Show is to be held in Dublin on the 8th and 9th of next month. Upwards of £100 is to be given away in prizes, the highest of which in any one class is to be £10. Schedules, and other information respecting the exhibition, may be obtained of the Secretaries, Messrs. Moore & Watson, 11, Eden Quay, Dublin.

— MR. JEAN SISLEY, of Lyons, informs us that the great Rose show fixed to take place there on the 3rd, 4th, and 5th of July, is postponed until September, on account of the damage caused by a tremendous hail-storm which occurred on Sunday last, and which broke all the glass-houses in and around Lyons, and did much injury to plants. No one remembers to have seen such large hail-stones, many of which were as large as the fist, and in other places some pieces of ice weighing 10 lbs. have been picked up.

— AT last roof-gardens promise to become common not only in London but elsewhere. The extensive premises now being erected for Messrs. Barr and Sugden, in King-street, Covent Garden, are to be surmounted by a winter-garden. A large building, divided into "flats" for house-keeping, has been put up in Chicago, the roof of which is very strongly built and well drained, covered with earth and decked with some forty or fifty trees, which are growing luxuriantly.

— THE gas fittings and other preparations for the fête in the Botanic Gardens, Regent's Park, appear to be pressing forward rapidly; those for the illumination of the grand promenade remind one of the Champs Elysées on the occasion of the Paris fêtes. The evening fêtes have proved very successful, and are likely to be more so this year, as better arrangements for the lighting have been adopted. There is to be an important display of table-decorations. We trust the fresh air of the garden may not be so frequently defiled with the stench of the material used to produce coloured lights, &c., as on the last occasion.

— ONE of the most attractive plants now in flower in the herbaceous grounds at Kew is Matthioli's Spiguel (*Athamanta Matthioli*). It grows about 18 inches in height, and the flowers, which are white, are produced in good-sized umbels in abundance. It is worth growing, too, for the beauty of its leaves alone, being of a bright green colour, finely divided, and Fennel-like. It is a plant which, though not new, is but rarely met with. There is also now to be seen at Kew several other handsome plants in flower, particularly *Aquilegia leptoceras chrysantha* (a plant alluded to in these columns last year under the name of *A. aurea*), of which there is a good example pretty freely laden with rich yellow flowers, and a good tuft of *Orobis lathyroides*, a plant which, although not new or so rare as the last-named, is still deserving of more attention from cultivators of hardy perennials than it receives. It grows about 2 feet high, and forms a neat tuft of bright shining foliage, surmounted by an abundance of pretty purplish-blue coloured flowers, borne in crowded racemes. On the rock-work there are several rare and conspicuous plants at present in bloom, of which the following are the most striking, viz., *Campanula cenisia*, *Androsace lanuginosa*, *Trilecia laxa*, and *Allium uniflorum*, a kind producing good-sized umbels of fleshy-rose-coloured flowers.

— As the time for holding the midland counties great horticultural exhibition at Aston Park, on July 7, 8, 9, and 10, draws near, it not only appears to assume large proportions, but it also awakens considerable interest among horticulturists generally. It appropriately steps in and fills the void made by the absence of any provincial exhibition of the Royal Horticultural Society in 1874, which gardeners and others had come to look upon as an annual festival. All the Aston Park arrangements are in a forward state, and every precaution has been adopted to secure despatch in staging the plants, and rapidly making and publishing the awards, so as to have the tents ready for visitors at the hour announced. The various tents will be so arranged as to secure to a great extent a continuous, but not unbroken, promenade. In one large and lofty tent, destined to form the great centre of attraction, will be placed all the large collections of plants; while separate tents will contain fruits and vegetables, cut Roses, table decorations, &c. An important part of the exhibition will be the show of implements, and the trial of lawn mowers. Wednesday will be devoted to judging the implements and the lawn mowers, and in the evening the Mayor of Birmingham will preside at a public dinner in the grounds, at which a great number of horticulturists will be present. The dinner will be provided at a very moderate cost.

THE FLOWER GARDEN.

SISYRINCHIUM GRANDIFLORUM.

THIS elegant hardy perennial was first discovered in 1826, by Douglas, near the Columbia River, and named by Drummond, who was, no doubt, ignorant that the specific term *grandiflorum* had been already bestowed by Cavanilles on a Peruvian species, distinguished by its bulbous roots, lance-shaped leaves, and large yellow flowers, borne two or three on each spathe.



Flowers of *Sisyrinchium grandiflorum* (natural size).

To avoid confusion, M. Carrière has suggested that the present plant should be named *S. Douglasii*. The habit of the plant is well shown in the accompanying illustration. It grows about a foot high, forming an erect tuft of irregularly-sized, narrow, glaucous, sheathing leaves, the lower ones reduced to the dimensions of mere scales. The flowers are either solitary, or, more generally produced in pairs, from a two-valved spathe, and are of a splendid dark, velvety, vinous-purple colour, with yellow anthers, and of the size shown in our

first engraving. They bloom in April and May. There is a very pleasing variety of this plant with pure white flowers, which, we believe, was raised by Mr. McNab in the Botanic Gardens, at Edinburgh. It is, as yet, rather scarce, but, when it can be obtained, it forms an admirable contrast to the purple-flowered type. These plants are quite hardy enough to withstand our ordinary winters. It is, however, safer to grow them in pots, and winter them in a greenhouse, or under a frame. The best compost for them consists of a mixture of sandy loam and peat, broken into largish lumps. The pots



Sisyrinchium grandiflorum (entire plant, reduced).

should be well drained, and placed in a half-shady position. The plants are very easily multiplied by division of the fibrous-rooted tufts in autumn.

W. M.

DAHLIAS FOR EXHIBITION.

By GEORGE RAWLINGS, Old Church, Romford.

ONE of the best means of maintaining the popularity of the Dahlia is to make amateurs familiar with its cultivation, and thus enable them to produce good blossoms without difficulty. In speaking of its cultivation, I may say that, as a rule, the finest blooms are produced in moderately deep and well-drained loam. The cultivator need not, however, trouble himself much upon this point; for, by judicious preparation, there are not many soils in which good blooms cannot be produced. Deep digging is a prime necessity, as is also liberal manuring; for, by these means, the most unsuitable soils can be made fit for the reception of the plants. Let the intending cultivator select a position where the plants will not be exposed to rough gales of wind, whilst, at the same time, they can enjoy the fullest advantages resulting from a free circulation of air. Air and light the plants must have to ensure firm short-jointed growth; for, without that, they cannot produce flowers of large size and fine quality. If a quarter that was manured in the autumn, and then trenched or dug over deeply, can be set apart for Dahlias, well and good; but, if they have to be planted in ground which has not undergone such preparation, it must be dug over after having been previously dressed with manure that has become thoroughly decayed. Old hot-bed manure, such as would be obtained from an exhausted Cucumber-bed, would be the most suitable. It may be observed here, however, that the Dahlia is in no sense of the word a delicate plant; and, as a matter of fact, undecayed manure may be employed in its cultivation, especially on poor thin soils, where it is difficult to ensure for it a good root-hold. In digging over soil that is at all heavy, just before the plants are put out, care must be taken to avoid bringing the heavy material from the bottom of the trench to the surface, as

there is not sufficient time for the weather to reduce it to a good tilth, and to plant in rough lumpy soil is not desirable.

Planting.—In reference to planting, I first of all warn the cultivator against the mistake which is frequently committed, of planting before the weather is settled. By planting too soon, you incur the risk of having the plants injured by frost or cold windy weather; but in keeping them in pots until the weather is sufficiently settled to admit of their being planted with safety you incur no risk at all. No doubt a considerable amount of work is incurred in keeping a stock of Dahlias in pots well supplied with water during the month of May, and, to avoid this, growers are naturally anxious to plant out as soon as possible, and frequently they allow a few days of genial weather to induce them to plant before it is safe to do so. During the time I have been engaged in the cultivation of the Dahlia, which is now many years, I have seen many a promising plantation injured severely, and in some cases totally ruined through too early planting. It is not amateurs only who suffer in this way, for in my time I have known more than one of the best growers thus caught. To keep them out of the ground longer than is necessary would be simply to lose most valuable time, and I will at once say that the fortnight commencing with the last week in May and ending with the first week in June is the most suitable for planting. During the whole of the time I have been in business, I have sent out Dahlias in 2-inch pots, and the system answers perfectly, for a fair-sized and thrifty plant may be made in that sized pot, and the cost of carriage is considerably lessened to customers. It would be well, however, for the amateur to give his plants a shift as soon as they come to hand, and large sixties or common forty-eights will afford them plenty of pot-room until the time comes for planting out. The compost should consist of turfy-loam and rotten-dung with a little sand—there is no occasion for leaf-mould; for, as remarked above, the Dahlia is not a delicate plant, and it is sheer waste of time to prepare an elaborate compost for it. Before planting drive in the stake, and, if in a quarter where it can be done, sow Lettuce-seed over the whole piece. The cost is nothing, the result will be a supply of Lettuce, and so long as ground vermin can get Lettuces they will not touch the newly-planted Dahlias. It may be more convenient to plant Lettuces at the same time as you plant the Dahlias, and that plan will answer as well as sowing seed. When planting, have at hand a little fresh dry lime in powder, and give a slight dusting, and also sprinkle lime on the soil in a circle round the little Dahlia, taking care not to leave a gap in the circle for a slug to crawl through. Repeat the lining after every shower until the plants are a foot or so high, when the slugs will no longer care to touch them. Three weeks after planting apply a good surface-dressing of short dung, and prick it in all over the ground. This will be of immense service, both for promoting a healthy growth and for keeping down vermin. Where exhibition is wholly the object, it is most convenient to plant in rows; and to afford sufficient space for attending to the plants and preparing the flowers without, on the other hand, wasting the space, let the rows be 5 feet apart, and the plants 4 feet from each other in the rows. In planting, take out two or three spits of the soil where each plant is to be put, and replace it with fresh loam and well-decayed manure.

Staking.—As remarked above, the stakes should be inserted before the plants are put out, but if this is neglected they must, of course, be put in afterwards; in that case, to prevent injury to the roots, drive the stake in at a distance of 3 or 4 inches from the stem. I have, for many years, practised a system which benefits the plants, and ensures to them more perfect protection against gales of wind, while it renders them more pleasing in appearance than the old-fashioned way of allowing every plant to attain its full stature. It consists in bending them down, so that the stems run for a short distance on the ground, and then turn up, and are secured to short stakes. This system may be prepared for by bending down the stem while it is pliable, and then securing it to stout pegs; but if the stem has got somewhat firm, a dexterous twist will bring it down without injury, and the tying will follow as a matter of course.

Watering and Liquid-manure.—Water liberally when newly planted, to settle the soil about the roots, and if the weather happens to be dry, sprinkle overhead in the evening, and apply water to the roots as may appear necessary. Dahlias require a liberal share of moisture, nevertheless it is not good practice to thoroughly saturate the soil at the commencement of the season. By the second or third week in July the plants will have become thoroughly established, and the soil will be full of roots. Consequently, larger supplies of moisture will be required, and during periods of dry weather it will be necessary to water liberally once or twice a week, according as the soil may be heavy or light. Soft water, such as may be obtained from a pond, is preferable until the necessity for applying stimulants arises. Rain or river water is also suitable, but that from deep wells is the least to be desired, because of its coldness and hardness. The

beginning of August is a most suitable time for commencing the use of liquid-manure, and if applied twice a week the plants will receive ample assistance. The draining from manure-heaps and stables will be the most suitable, and if it can be allowed to run into a tank and be diluted with an equal or double quantity of water, according as it comes from the manure-heap or stable, it will be more convenient; but in any case it will be necessary to dilute it, and at all times care must be taken to avoid wetting the foliage with it.

Thinning and Disbudding.—It is not advisable to thin the plants severely; but, as there is generally more growth than we require, systematic thinning must be resorted to. I like to see a plant with at least six shoots from the bottom, each shoot secured to a good stake. I would allow eight or ten shoots if I could, and count upon a few good blooms for every shoot. A certain amount of thinning afterwards will generally be required; but, as the varieties differ in habit to some extent, and soils and seasons influence the growth, the cultivator must use a little judgment. I advise him to make sure of a good plant, and to thin too little rather than too much, if in doubt about it, taking care, of course, to thin sufficiently to ensure a free circulation of air amongst the branches. Generally speaking, the plant produces more flower-buds than it can bring to perfection for the quality desired. But the operations of disbudding requires judgment. The beginner who does not see his way may safely remove all the buds that are produced except the centre bud of every group. As the buds usually show themselves in threes, this system removes two-thirds of the whole crop, and the remainder suffices for a good display. As experience is gained, it will be found that varieties characterised by the production of thin flowers may be disbudded as soon as the buds are fairly visible, for the result of the operation is the thickening of the flowers that are allowed to develop themselves. In the case of doubtful kinds, and especially such as come "cross-eyed," it is well to wait for a bud with a "pin-hole," that is, a visible aperture in the centre. This pin-eyed bud will produce a good flower; therefore, keep it, and remove those that are cross-eyed. Those with "hard" eyes must be very slightly thinned; for, by allowing them to perfect a number of flowers, we reduce their vigour and improve their eyes—the hard eye being the result of a superabundance of material in the flower. The hard-eyed sorts should be planted as early as possible.

Shading.—It is impossible to put up a good stand of Dahlias unless some amount of shading is resorted to. But shading in Dahlia-culture is an art, and one to which the amateur must give both mind and hand, if he is resolved to cut flowers that shall bring him prizes. The shades I have already preferred consist of painted calico on wire-frames, and there is any amount of wear in them. The old-fashioned tin shade is not to be despised, but in a hot season it is apt to serve as a sort of Dutch oven, which cooks the flowers too much. An inverted flower-pot makes a good shade, but the hole must be unstopped at midday. Where earwigs abound muslin bags must be used, for if carefully put on and neatly secured round the stalk, such pests are effectually kept out; bags, however, weaken the flower, and are, on that account, objectionable. I advise that painted calico be adopted for all ordinary purposes; other kinds of shades may come in for extraordinary purposes. The best material for bags is thin muslin, but for shades calico. It will be a nice point with the amateur to determine how long to shade a flower, and, to initiate him into the mystery, I will suppose we have before us a swelling bud of a tipped variety, and we wish to ensure a grand flower. To be in a hurry to shade will spoil it, for we want the tips well coloured, and the sun is the great flower-painter. We will, therefore, wait until two rows of petals are down, and then put on the shade to promote the purity of the light tint which contrasts so pleasingly with the richly-coloured tips; a bloom with one or two rows of petals down will generally take a week to fully develop itself, and longer as cold increases.

Earwigs.—If there is one Dahlia and one earwig in a garden, that earwig will be sure to discover the Dahlia. Prevention is better than cure, and I can recommend, as a perfect preventive, the circular earthen pans that are made for the purpose, in the fashion of a collar to the plant. They should be put down firmly and kept full of water, and nothing in the shape of a bridge should ever be allowed to make a way for the earwigs to cross the water. A small flower-pot, with a bit of dry moss in it and mounted on a stake, forms a very good trap, and, as the earwig will go up into any dry and dark retreat, traps of this kind may be improvised *ad libitum*. Malching is said to induce earwigs, but I am certain that it does not, for whatever keeps the ground cool and moist acts as a preventive.

Staging.—In selecting blooms for exhibition, take those only which are well up in the centre, the eye well covered, and the petals or florets uninjured. If there is a choice of blooms of any of the varieties possessing these essential qualities, the largest and purest in colour should be selected. The evening or early in the morning

is the best time for cutting, and if there is any probability of a heavy rain during the night preceding the exhibition they should be cut in the evening. To set the blooms up in a tasteful manner is a matter of primary importance, and, if possible, the intending exhibitor should carefully examine the best put up at an exhibition held previously. One of the most essential points is to tastefully arrange the colours, and to keep the light flowers towards the outside of the stand; the largest blooms should be put in the back row, and, as far as practicable, the finest should be distributed regularly over the stand. An old hand would commence by placing the finest blooms first, and then group about them those that remain, in such a manner as to set off the principal flowers to the best advantage. Some practice is necessary before it is possible to arrange a stand in a thoroughly satisfactory manner; but, by acting upon these hints, and closely observing what is done by more successful exhibitors, a certain degree of proficiency will soon be attained.

Selection of Varieties.

In the case of those who want a large collection, a trade list should be consulted for names and prices of sorts, but for a collection of fifty or so of the very best the following will, probably, be found all that can be desired:—

LIGHT.—Florence Pontin, Herbert Turner, Nelly, Emily Williams, Miss Turner, Mr. Sinclair, Julia Wyatt, Mrs. Bruton, Hon. Mrs. Wellesley, Queen of Beauties, Annie Neville, Dawn, Mrs. Dodds, Miss Henshaw, Joy, Mrs. Pigott, Peri, Queen of Summer, Charlotte Dorling, Anna Keynes, Alexandra, Princess, Bird of Passage, Lady G. Herbert, Fair Imogene, Heleu Potter, Lady of the Lake, Harriett Tetterell, Clara Simmons, Valentine, Lady J. Ellis, Flag of Truce, Hebe, Lady Derby, Caroline Tetterell, Mrs. Dorling, Marchioness of Bath, Mary Keynes, Snowball, Prince Puma, Maid of Essex, Queen of York.

YELLOW AND ORANGE.—Cremorne, Arbitrator, Lord Hawke, Miss Bateman, Prince Arthur, Acme of Perfection, King of Primroses, James Hunter, Samuel Naylor, John Dunnington, Norfolk Hero, Chairman, Hugh Miller, Mr. Boshell, Charles Turner, Lord Russell, Fanny Purchase, Hon. Miss Herbert, Leah, Queen of Primroses, Lady M. Herbert, Master of Arts, Vice-President, Gazelle, Flambeau, Yellow Perfection, Yellow Boy, John Kirby, Royalty, Toison d'Or, Gipsy King, John Neville Keynes, Lothair, William Lucas, Amy Creed, Bishop of Durham, Golden Beauty, Yellow Standard, William Keynes, Marchioness of Lorne.

CRIMSON AND RED.—Thomas Goodwin, Walter Reid, William Newman, Thomas White, James Service, Mr. Dix, Firefly, Emperor, John Keynes, Madge Wildfire, Disraeli, Lord Palmerston, Triomphe de Pecu, British Triumph, Chancellor, Bob Ridley, Scarlet Gem, Edward Spary, Foxhunter, Sir Grenville Smythe, Aristides, Charles Backhouse, Thomas Hobbs, Roundhead, George Peabody, Victory, James Cocker, Earl of Radnor, John Standish, Crimson King.

PURPLE AND MAROON.—Indian Chief, Eclipse, Empress of India, Andrew Dodd, Lord Derby, Favourite, George Wheeler, Herbert, James Backhouse, John Sladden, Paradise Williams, High Sheriff, Vedette, Autocrat, Darkness, Monarch, Bluebeard, Lord Salisbury, Robert Lambert, Alexander Cramond, James Wilder.

LILAC AND ROSE.—Memorial, Ne Plus Ultra, Mrs. Hogg, Baron Taunton, Juno, Jenny Austin, Lilac Queen, Criterion, Miss Roberts, Paul of Paisley, Head Master, Blushing Fifteen, Mrs. Boston, Harvard, William Pringle Laird, Kate Haslam.

Fancy Varieties.

STRIPED AND SPOTTED.—Egyptian Prince, Rev. J. B. Camm, Harlequin, Carnation, Herbert Purchase, Galatea, Lady Dunmore, Hero of York, Mdle. Nilsson, Attraction, Fancy Queen, Purple Flake, Judy, Garibaldi, Leopard, Mary Lander, Octoroon, Prince of Wales, Regularity, Sam Bartlett, Coquette, Ebor, Striped Perfection, John Salter, Queen of Sports, Artemus Ward, Top Sawyer, John Bunn, Frank Tiffin, Chang, President Lincoln, Jenny Deans, Remarkable, Butterfly, Mrs. Goodwin, Flora Wyatt, Flossie Williams, Richard Dean, Mrs. Bunn, John Sealey, Wonderful, Grand Sultan, Leopardess, Chameleon, Viceroy, Billy Button, Marquis of Lorne, Jessie Gill, Dolly Varden.

TIPPED.—Laura Haslam, Polly Perkins, Miss Annie, Miss Jones, Miss Frampton, Stafford's Gem, Ethil, Empereur de Maroc, Imperatrice Eugénie, Lady Paxton, Madame Sherrington, Magician, Mrs. Crisp, Nora Creina, Pauline, Pluto, Queen Mab, Starlight, Magpie, Polly Fawcett, Formidable, Startler, Prospero, Anne, Fanny Sturt, Le Domino Noir, Gem (Pope), Miss Ruth, Sparkler, Alice Purchase, Gem of the Grove, Mrs. Saunders, Mrs. Bennett, Livonia.

Bedding Varieties.

LIGHT.—Queen of Whites, Alha floribunda nana, White Bedder.

YELLOW.—Pluton, Duke of Newcastle, Golden Bedder, Titiens, Leah.

SCARLET.—Beauté de Massifs, Fireball, Ranunculiflora, Scarlet Tom Thumb, Sir J. Watts, Rising Sun, Little Wonder, Northern Light.

ROSE AND LILAC.—La Belle, Rose Gem, Scarlet Gem, Blonde, Amata.

CRIMSON AND PURPLE.—Tom Thumb, Captain Ingram, Gem of the Dwarfs, Crimson Gem, Crimson Dwarf, Royal Purple, Zelinda, Gladiateur, Sambo.

Bouquet Varieties.

Annie, Little Darling, Little Dear, Little Mistress, Little Nigger, Little Philip, Little Puss, Rover, Bessie, Lina, Fairy Child, Pure Love, Little

Dorrit, Fireball, Guiding Star, Sacramento, Burning Coal, Dr. Webb, Northern Light, Pet of the Village, German Daisy, Sunshine, Pretty Gem, Conqueror, Little Wag, Little Bobby, Little Willie, Nemesis, Golden Canary, Perfection of Lilliputs.—*The Gardener's Magazine.*

CHOICE SUMMER BORDER OF LOBELIAS.

THE favourable reception by your readers of the account published in your columns of the arrangement of one of my spring borders of choice Daisies, induces me to hope that a similar account of the arrangement of the same border for summer bedding, in which ten varieties of new bedding Lobelias take the place of the double Daisies (now removed to their store beds till October next) may prove equally interesting to a large portion of your readers. The line of *Myosotis dissitiflora*, at the back of the border next the conservatory, I have replaced with a line of *Pyrethrum Golden Feather*; and, instead of the circles of crimson Daisy, I have put a series of contingent half circles, in chain pattern, of that elegant and satisfactory hardy edging plant *Polemonium caeruleum variegatum*; in front of the chain of semi-circles runs a line of Henderson's beautiful *Lobelia Mazerine Gem*, a novelty of last season unequalled for depth of colour, and only possessing one fault, that of being of somewhat too straggling a habit; this is, however, to a great extent compensated for by its exceeding freedom in blooming throughout the entire summer season. In front of the *Mazerine Gem* runs a line of *Stellaria graminea aurea*, the new golden Chickweed, also sent out by Messrs. Henderson, and said to be a good companion to, or substitute for, *Pyrethrum Golden Feather*, and which, if it retains its bright gold colour during the summer, will, doubtless, be preferred by many to the older plant, as it is much lower growing, spreading closely over the surface of the ground; only, however, about half of the plants obtained from seed come golden, the remainder being common green, which are also much stronger growing than their golden brethren, requiring these latter to be pricked out and taken away from the seed pan as soon as they are large enough to handle. The first three half-circles are filled each with half a dozen plants of the three new Lobelias sent out by Messrs. Dixon, of Hackney, and named respectively Painted Lady, said to be the precursor of a new race of spotted Lobelias; *Cærulea*, one of the prettiest shades of light blue I have yet seen; and *Purpurea*, a deep-coloured variety with very dark foliage, and also of somewhat strong and spreading habit of growth. The next three spaces are each filled with a similar number of the three new Lobelias now being sent out, for the first time, by Messrs. Carter, of High Holborn, and named by them respectively, Faith, Hope, and Charity. Of the merits of these novelties I can as yet say nothing whatever, not having seen their blooms; but, I believe, they were much admired, and one of them at least was awarded a first-class certificate when submitted for the opinion of the Floral Committee of the Royal Horticultural Society in the autumn of last year. The extremely moderate price, also, at which they are sent out should, I think, induce all lovers of this pretty class of plants to give them a trial during the summer. The remaining four spaces are filled with a similar number of plants of four of Messrs. Henderson's novelties of this season, named, by them respectively (1) *Porcelaine Brilliant*, said to be an exceedingly pretty shade of porcelaine blue, with the excellent habit of growth of the older variety sent out by the same firm some years ago, under the name of *Brilliant*; (2) *Pumila purpurea maxima*, said to be the largest and finest shaped flower that has yet appeared on any of the true *Pumila* section; (3) *Speciosa bicolor*, said to be a variety in which the two colours of white and blue are particularly evenly and well divided; (4) *White Brilliant*, said to be a really good and pure white of large sized pip, and possessing also the excellent habit of growth of *Brilliant*. At each contingent angle of the half circles, I have also planted a single strong plant of the double variety of *Lobelia pumila*, keeping them in their pots, which are plunged, and so hidden from sight, in the hope that this treatment will induce them to bloom, which the plants of this pretty novelty, grown by me last year, persistently refused to do throughout the whole season, doing nothing but develop themselves into large tufty plants, and only one out of the lot producing any blossoms at all. At the

end of the summer season, when full development shall have been attained, I shall hope to send you a few remarks on the respective merits of these *Lobelias*.
W. E. G.

Roses for Town Gardens.—Permit me in reply to "M. R." (see p. 478), to state that I consider the selection of Roses given at page 438 a very suitable one for the purpose indicated, although, probably, as time wears on several may be discarded and others substituted. I think, too, "M. R.'s" selection might be added with advantage; I should also like to include Céline Forestier (Noisette), Souvenir d'un Ami (Tea), the White Provence, and the common Moss. The two latter should be in masses on their own roots; it is also desirable to secure, either by means of home production or by purchase, a steady influx of young plants. Of course, such vigorous favourites as Jules Margottin, John Hopper, and Gloire de Dijon, will, under almost any circumstances attain a good old age, and flower well to the last. But many others, amongst which I may class Charles Lefebvre, after their first flush of youth is passed, do not flower so finely in suburban gardens as in those in the country out of the reach of smoke and dirt.—E. HODDAY.

Kniphofia (Tritoma) caulescens.—I have a specimen of this now in flower; though less brilliant in colour than *T. Uvaria*, its very distinct and robust habit, and the early period at which it blooms, will make it welcome in any garden. The stem, at 5 or 6 inches from the ground, can just be spanned by two hands; the scape is about $4\frac{1}{2}$ feet in height, with a dense head of flower 6 inches in length, the perianth being of a reddish-salmon colour in its earlier stages similar to that of *T. Uvaria*, though less bright; but, in the fully-expanded flower, which is about three-quarters of an inch long, with a somewhat inflated tube, the colour passes gradually to white, faintly tinged with greenish-yellow, producing an effective contrast. The unequal stamens are very conspicuous by the length, which is twice that of the flower-tube. The foliage of this species affords a distinctive feature, too curious to be overlooked, the extreme tip being inflexed and compressed, like the point of a nail bent over and hammered down. The plant appears to be perfectly hardy; but, as the last winter was comparatively mild, further experience on that point is requisite.—W. THOMPSON, Ipswich.

Wild Grasses.—I have just spent a delightful evening about the local lanes, gathering here and there small bunches of all the distinct Grasses I could find, and I am rewarded by having secured good handfuls of a dozen sorts at least. Unfortunately, I have no botanical knowledge of Grasses, but, even without such information, I found the labour one of extreme interest. In plucking Grasses, one is not committing any such act of vandalism as too many wild plant collectors commit when they dig up, root and branch, every pretty flower that comes in their way. The plucking of a Grass stalk does no worse mischief than the prevention of a little seed being shed on the surrounding soil, and the pretty heads of the Grasses form pleasing objects all through the succeeding winter. Those who use Grasses for their epergnes, table dishes, or intermixed with dried flowers, should collect them at once whilst they are at their best. There is the Oat Grass, with its heavy ears hanging like pendent drops, the pretty Barley Grass all bearded and bristled. Some, also, are delicately branching, like Gossamer, others like miniature heads of the black Rush—all beautiful and full of interest.—D. A.

The Male and Female Pampas Grass.—In procuring a plant of the Pampas Grass, care should be taken to get a female plant, as it grows more gracefully than the male, produces its flower panicles quickly, and brings them to perfection. When more plants are wanted a good plan is to split up a moderate-sized female plant, and pot off the smaller portions in 6-inch pots; these should be placed out-of-doors in a shady place, and the pots should stand in saucers filled with water about $1\frac{1}{2}$ inches deep, until the plants get fully established. It is always well to have a few plants in store to replace any that have been killed in winter, or for planting out for decoration on rockeries or other suitable places. The best time to propagate the plants is about the end of May, or in June, about which time this Grass begins to grow in earnest. A botanical examination of the flowers of the two kinds of Pampas Grass will show that the male and female flowers are borne on different plants. In the most graceful panicles there are no stamens—these belonging to the female. The one which produces stamens is the male. The distinction is of the utmost importance to cultivators. The male should never be planted on a lawn—it has not sufficient grace, though it looks grand on a high knoll of a rockery, or on the summit of a bank. The two kinds are not difficult to distinguish; the male is the most robust, and the leaves are considerably broader than those of the female. The leaf of the male has a strong and conspicuous mid-

rib; in the female the mid-rib does not rise so much above the plane of the leaf. The female throws its leaves around in exquisitely graceful form, resembling a fountain; the male has a more lateral growth, and shows the divisions of the stool into separate parts.—H. T.

What is an Herbaceous Plant?—I am a member of a florists' society in this town (Paisley). We have monthly competitions; and, at each of these meetings, cut herbaceous flowers are shown. There has been much disagreement among us as to what is herbaceous and what is not. For example; at our last meeting an *Antirrhinum* was passed as being herbaceous; while, at a previous competition, a double Wallflower was thrown out. Will you kindly give us your opinion as to what is herbaceous and what is not. We have experienced gardeners and nurserymen for judges.—W. CALDWELL. [A double Wallflower is certainly "herbaceous;" an *Antirrhinum* is also considered to be so. Place both on a wall, and their habit and mode of growth will be exactly alike. Many tropical plants are herbaceous also; but, being tender, they are not usually so termed by gardeners; thus, *Begonia* is an evergreen herbaceous plant, as distinguished from a woody one, but it is a stove plant, and, therefore, not herbaceous according to gardening language. The term "hardy herbaceous" should always be used for the sake of clearness. Evergreen herbaceous plants, like the *Iberis*, should be included in the term "hardy herbaceous" plants. Nature draws no sharp lines in these matters, nor is it possible for man to do so; we can only follow what seems to be the most sensible usage.—Ed.]

A New Opinion of *Primula japonica*.—The Japan Primrose we are obliged to regard as one of the greatest of recent horticultural humbugs—or rather let us say, not the plant, but the manner in which it has been introduced. The plant, taken upon its own merits, is well enough, and a desirable addition to our hardy species, should it prove hardy, as we do not doubt it will. It is only when we compare the plant as it really is with the representations made of it both in descriptions and engravings in foreign journals and catalogues, that we are obliged to regard it as a fraud. An English journal goes on in this way:—"Hail! Queen of the Primroses! for so its introducer designates the lovely flower we now figure, which is as hardy as a peasant and as resplendent as a princess," which, as a "gush," is about equal to anything to be found in a New York weekly paper. Then we have in another journal with a picture to match, "A *Primula* a foot and a half high, bearing four or five separate whorls of flowers, each an inch in diameter, and of a splendid magenta colour, and the plant, moreover, perfectly hardy—can anything be added to this to indicate its value?" To this last conundrum we can say yes—tell the truth about it, and say that while there are four or five whorls of flowers, they do not all open at the same time, and that the plant is about one-fourth as floriferous as the pictures show, and as this description would imply. Our florists, with this as they do with other new things, have copied the foreign descriptions and engravings, and are not to be charged with misrepresenting a plant they had not yet had an opportunity of flowering.—*American Agriculturist*.

NOTES AND QUESTIONS ON THE FLOWER GARDEN.

Irises in Kensington Gardens.—As these showy border perennials are now in flower, it may interest some of the readers of THE GARDEN to know that an extensive collection of the best species and varieties has been planted in one of the flower borders in Kensington Gardens. They are all labelled, and many of them have flowered profusely during the past spring.—B. W. F.

Cypripedium spectabile at Kew.—A plant of this fine hardy North American species is now flowering on the new rockery at Kew. It grows well in a cool moist compost of sandy peat, and a year or two ago I remember seeing some very healthy patches planted out along with other hardy Orchids in Messrs. Backhouse's rock-garden at York. It also grows well in a pot plunged in a cool frame shaded from the mid-day sun.—J. B., Epsom.

Transmutation of Primroses.—I raised (says a correspondent of *Chambers' Journal*) from the natural seed of one umbel of a highly-matured red Cowslip a Primrose, a Cowslip, Oxlips of the usual and other colours, a black Polyanthus, a Hose-in-hose Cowslip, and a natural Primrose, bearing its flower on a Polyanthus stalk. From the seed of that very Hose-in-hose Cowslip I have since raised a Hose-in-hose Primrose.

Flowering of the American Pitcher plant in Ireland.—*Sarracenia purpurea* which has been for years flourishing and producing pitchers in abundance in a piece of artificial bog at Glasnevin, has, we learn from the *Irish Farmers' Gazette*, flowered this season. A remarkable thing respecting this plant at Glasnevin is, that for several of the winter months it is completely covered with water.

Improved Foxgloves.—Some of the spotted kinds with white corollas are very ornamental, and well worth growing along shrubby borders, or the semi-wild margins of woodland walks. They are easily raised from seed, and bloom the second year, but if once introduced they propagate themselves and form stately ornamental plants, just at this season of the year. One of the plantations in Kensington Gardens, is margined with different varieties which are much admired.—J. H. S.

THE GARDENS OF ENGLAND.

DUNORLAN, TUNBRIDGE WELLS.

The gardens at Dunorlan, which occupy some eight or ten acres of undulated hill-side, are tastefully laid out and pleasingly diversified by means of rock-work and fine specimen Conifers, while, in the valley below the mansion, is a spacious lake, about 6 acres in extent, partly belonging to Dunorlan and partly to the adjacent estate. Here are some of the finest Deodars we have ever seen, fresh and healthy, and feathered to the base, and varying from 40 to 50 feet in height. An avenue of these leads from the entrance gates to the house, and another fine avenue of Deodars and Douglas Firs (*Abies Douglassii*) planted alternately, extends from the terrace to the left of the mansion, right down the hill-side, forming a noble vista, as

Araucarias do well here, one specimen planted in pure clay near the head of the lake, being especially vigorous and healthy. From the terrace and different points in the grounds, splendid views are obtained of the surrounding park-like scenery, which is well wooded, and the boundary line is everywhere so carefully concealed, that the estate seems much larger than it really is. On the hill-side is a nicely arranged rosary, on one side of which is a walk over-canopied with *Noisette* and crimson *China Roses*, profusely loaded with fragrant flowers. The shrubbery borders contain a selection of hardy flowering shrubs, and in shady spots we noticed *Gaultherias*, hardy *Heaths*, and other peat-loving plants. Descending still lower down the hill, the walk winds between neatly kept *Yew* hedges, which are ultimately designed to form a shady canopy overhead. At the foot of the hill we cross a little stone bridge which spans a stream formed by the overflow from the lake



Artificial Rock-work and Waterfall at Dunorlan, Tunbridge Wells.

seen from either extremity. It is proposed to cut out the Deodars and leave the Douglas Firs to develop themselves, and, judging by their vigorous growth, they are evidently destined to form noble specimens. Conifers here seem quite at home, and give a very distinct character to the place. Among others we noted *Thuja aurea*, 5 feet high, and fully as much in diameter; also, a fine healthy specimen of *Thuja gigantea*, said to have been the first of the kind that bore cones in this country. *Cupressus macrocarpa*, likewise forms splendid tapering columns fully 50 feet high, well furnished to the very base. There are too, several fine specimens of this beautiful Conifer in various positions about the grounds, and the dissimilarity in habit which they exhibit is wonderful, some being spreading while others are fastigate. There is a noble specimen of *Picea cephalonica* here, 50 feet high, feathered to the base with fresh green branches, and younger plants of the silvery *P. nobilis* are growing with extraordinary vigour.

above. From this point a fine view of the waterfall, of which the accompanying is an illustration, is obtained through the trees, and the splashing of the sparkling spray falls pleasantly on the ear. This charming bit of scenery is one of the best features of the place. The great masses of imitation rocks are very artistically and naturally disposed, and are draped with *Cotoneaster*, *Periwinkle*, *Berberis*, *Escallonia macrantha*, and clumps of *Lastrea*, *Osmunda*, and other British Ferns, while the feathery Birch and sombre Conifers which tower overhead on either side, add interest and effect to the whole arrangement. Below the cascade is a small pond planted with *Nymphaeas* and other choice aquatics, the turf banks being margined with *Typha palustris*, common yellow Iris, coarse Sedges, and other appropriate water-side vegetation. From the pond a meandering stream trickles through the lower portion of the grounds, and the banks of this are judiciously embellished with jutting masses of rock-work, partly draped with hardy *Heaths*, and other

plants in keeping with the surroundings. The grounds around the waterfall, and by the borders of the stream, are not mown; and, being agreeably undulated, a very natural effect is the result. Here tall and graceful wild Grasses and noble British plants are allowed to develop themselves undisturbed. The place has been improved and beautified under the direction of Mr. Marnock, who has made it one of the most interesting in its neighbourhood. The waterfall and rock-work have been constructed by Mr. Pulham, of Broxbourne, and, like all his work, show a pure taste and a perfect knowledge of his art. We have seen artificial rock in many countries, but never any so naturally (that is to say, artistically) formed as that made by James Pulham.

THE GARDEN IN THE HOUSE.

HANGING BASKETS.

This graceful and convenient form of decoration increases in popularity from year to year. Many a city home, which would otherwise be destitute of floral adornment, is brightened by a hanging basket or two; and in the country, among people of taste and refinement, they are becoming more and more common. The baskets themselves are made of wire, terra cotta, or wood. The first named is the most usual, but the small terra cotta baskets are extremely neat and elegant for bay windows or other interior situations. They possess, with the rustic wood baskets, the additional advantage over the wire of retaining moisture longer, and thus suffering less from neglect of frequent watering. The wood basket generally consists of a turned wooden bowl, covered over with twigs and roots to give it a rustic appearance. When this kind of basket is used, care should be exercised to see there are a few holes in the bottom to permit drainage. The matter is scarcely ever attended to by the makers, and florists who sell them ready filled with plants are apt to neglect it. The consequence is that the basket soon becomes water-logged, and the plants contained in it die of wet feet. Where provision for drainage has been neglected until after the basket is filled, holes may be bored from the outside, and the dropsical condition relieved. The wire baskets are first lined with thick Moss and afterwards filled with earth, into which the growing plants are set.

Selection of Plants.—The central portion of the basket should be filled with upright plants of a neat dwarf habit, and around the edge those of creeping or trailing growth. But while a basket filled with any bright thrifty plants of suitable habit of growth is a thing of beauty, it is far better to make such a combination of colour as to present a harmonious living picture. The colours, not only of the flowers, but also of the foliage employed, should be studied with a view to this effect. Our greenhouses furnish such a variety of plants with ornamental foliage—crimson, golden, white, bronze, purple, and silvery-grey—that almost any desired effect of colour can be produced independently of the blossoms. When a less complicated style is preferred, a basket may be made beautiful by its very simplicity. In such cases a single plant is sufficient, provided it makes up, by its luxuriance of growth, for the lack of variety. We saw a very attractive basket recently, which was completely wreathed with the rich foliage and bright mauve-coloured flowers of an Ivy Geranium. A plant of *Saxifraga sarmentosa*, sometimes called Strawberry Geranium, set in the centre of a small basket, will soon cover the surface with leaves, while the long tendrils and tassel-like stolons droop gracefully down the sides. Another useful plant in this way is the *Convolvulus mauritanicus*, a single specimen of which will soon make the basket a rich mass of bright green foliage and blue flowers. No one need be deprived of hanging-baskets on account of remoteness from greenhouses, or inability to purchase greenhouse plants. No baskets are produced more exquisite than can be made by judicious use of the plants found in the forests and fields. The basket itself may be made of woven twigs, the end of a little barrel covered over with rustic branches and roots, or a framework of brass or galvanised iron wire. Then, for filling, the forest furnishes abundance of Moss, rich light soil, and Ferns, Partridge Berry, Saxifrages, and all the immense variety of other plants which love to nestle in its shades, or seek its open sunny banks.

Care of Baskets.—The first and most essential requisite for the health and even the life of plants suspended in baskets, is sufficiently frequent watering. Their wants in this respect vary, of course, with the size of the baskets and the material used. Wire baskets, in addition to being sprinkled every day and the Moss kept fresh, are greatly benefited by an occasional dipping in water. Wood and terra cotta baskets evaporate only at the surface, and, therefore, need less frequent watering. Partial shade is essential to the healthy

growth and luxuriance which are desirable in a hanging-basket. If exposed all day to the full glare of the summer sun, no amount of watering or care can preserve the plants from a parched and shrivelled appearance. Another requisite to the health and full development of plants in baskets, is, that they should not be overcrowded. Those which are bought from the florist's ready made are almost invariably either overgrown or overcrowded.—*Cultivator*.

Best Window Plants.—Will you oblige me with the names of the best twelve flowering and foliage plants for windows.—J. M. Norwood. [The following may, perhaps, suit you, viz.:—*Acacia lophantha*, Ivy-leaved Geraniums, Creeping Jenny or Moneywort (*Lysimachia Nummularia*), *Aloe variegata*, or *Aloe fruticosa*, *Mesembryanthemum blandum*, or any of the free-blooming large flowered species, *Aspidistra lurida variegata*, *Hydrangeas*, *Senecio* (scandens) *Mikanoïdes* or German Ivy, *Asplenium flabellifolium*, *Fuchsia fulgens*, any of the free-flowering fancy *Pelargoniums*, common Musk, *Aloysia citriodora*, and a plant of the common small-leaved Ivy. Of these, the Musk, Ivy, Moneywort, and Ivy-leaved Geranium, will grow, and look best, planted in baskets; or what is equally well, place the pot on little brackets at the side of the window. Most of the foliage plants last in beauty all the year round. We have forgotten to mention *Chrysanthemums*, some of which are well adapted for blooming in windows in winter, especially those belonging to the Pompone or small flowered class.—B.]

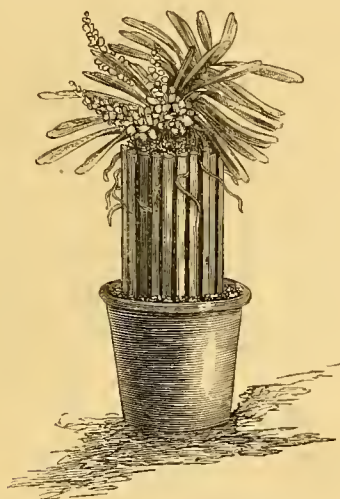
An Air-tight Fern-case.—Our village parson is fond of gardening, and especially of Ferns, of which he has a vaseful worth a moment's attention. This vase or pan is made of thin glass, somewhat over a foot in diameter. It was filled with common sandy loam and Moss from one of the surrounding hillsides several years ago; the Ferns were then planted in it, and a glass globe placed over them. This globe has never been removed since that time, and no water or any artificial nourishment of any description has been given them during all these years. The whole is nearly, if not quite, air-tight, so that the dry air of the room has no opportunity of absorbing the moisture which was supplied to them when watered seven years ago. If the pan had been earthenware moisture would doubtless have found its way through it; but, being glass, it is entirely air-tight. The soil has subsided about an inch; but, as seen through the glass, it has still a fresh nourishing look about it. According to the temperature of the room moisture rises and condenses on the glass and falls again, revealing the beautiful fronds of *Pteris serrulata*, *Aspleniums*, *Scolopendrams*, and similar Ferns. All these seem in excellent health notwithstanding their imprisonment, during which old fronds have died and crumbled into dust, new ones have taken their place, and now they are in as fine condition as any Ferns possibly could be under the most skilful attention. They seem happy in confinement, and look as if they would exist in health and beauty for many years to come.—J. Muir.

Rain Water Impurities.—In a recently published work on "Sanitary Arrangements for Dwellings" Mr. Eassie points out the precautions to be adopted by householders in cases where rainfall forms the chief or only source of water supply. Generally it will be found convenient to store rain falling on the roof in an underground tank, formed of brick, or concrete, puddled outside with clay and covered inside with Portland cement. But care must be taken that the downspouts conducting the rainfall to the tank do not drain either zinc roofs, or lead flats. Even on tile or slate-covered roofs, the water will have passed over "lead flashings, ridges, hips, and valleys" charging it with a small percentage of lead, but not more than 1-20th of a grain to the gallon. With a greater proportion than this, water becomes dangerous to use, being more or less poisonous. Since rain acquires certain impurities, even while passing through the air, it should always be carefully filtered before being used for drinking or cooking purposes. In the case of a house supplied with an underground receptacle, filtration could be easily managed by placing an earth filter on the delivery side of the downspout, at its exit from the tank. An eminent authority on sanitary subjects, Dr. Angus Smith, believes rain-water can be so completely filtered through earth as to remove all impurities. Whenever rain-water is stored for drinking purposes, the eaves of the roof, troughs, and down-spouts should be enamelled, and the supply ought to be carried to the tank through glazed earthenware pipes. This prevents "leading," but other deleterious ingredients will still remain. In manufacturing towns, soot, oil, and sulphuric acid form some constituents of rain water. With these facts in view, most people will agree with Mr. Eassie in his conclusion that, "generally speaking, rain-water should be excluded from the kitchen," although extremely useful in laundries and conservatories.

THE INDOOR GARDEN.

RATIONAL ORCHID CULTURE.

At a meeting of the Royal Horticultural Society, held on the 13th ult., Messrs. Veitch exhibited a plant of *Saccolabium ampullaceum* growing in an open teak-wood cylinder, as shown in the accompanying illustration. I have carefully watched the results obtained in Orchid culture under different modes of management, and believe this to be one of the best methods of treatment that can be adopted; at least, as far as the growth of *Aërides*, *Vandas*, *Saccolabiums*, and others of that kind is concerned. It might be argued that better specimens have been grown under the ordinary system of pot culture than in any other way, but this plan, simple and easily managed as it is, is totally at variance with Nature's teaching, and is the means of confining the culture of these beautiful plants to the gardens of the wealthy. After many years' experience in Orchid growing, I look upon the pot system of culture in the case of strictly epiphytal species as unnatural and, to a great extent, wrong in principle. Long ago Messrs. Maule & Sons, of Bristol, invented hollow rustic pots fashioned like tree trunks, and in these some fine specimen *Saccolabiums* and *Aërides* may now be seen; while Mr. Turner, of Leicester, has more recently adopted semicircular rafts, on which to grow *Phalænopsis*, *Saccolabiums*, and other choice epiphytes; and



Orchids in open Teak-wood Cylinders.

Mr. E. Wrigley, of Bury, placed his collection of *Cattleyas* and *Lælias* on blocks formed of tree-trunks and branches, and these succeeded perfectly, forming fine healthy roots, which do not decay annually as when grown in pots in the usual manner. The great principle in Orchid-growing is a genial and humid atmosphere, and every grower must have repeatedly observed how seemingly anxious the roots of all kinds of epiphytes are to escape from pots, and to branch out into the warm moist atmosphere, when genial, rather than remain to become bleached and comparatively useless embedded in a mass of cold wet *Sphagnum* or peat. The merits of the circular teak contrivance lies in the fact that it is absolutely impossible to over-water while the roots are naturally exposed to the beneficial action of light and aerial moisture so essential to this class of plants.

J. B. G.

PALMS AS DECORATIVE PLANTS.

For several years past, this noble family of plants has been gradually gaining favour both here and on the Continent. Their properties are numerous and varied; Dates, Sago, Areca, Palm-oil, Betel-nuts, Cocoa-nuts, &c., being valuable and well-known products obtained from them. The dry fibrous pericarp of the Cocoa-nut is worked into mats and cordage, indeed, this plant alone is said to have as many uses as there are days in the year. To the reader of books on travel, the very name brings associations of bright and sunny skies, where the leafy shade of Palms and the refreshing products which they

yield must be very grateful. But apart from their history, no class of plants whatever is so useful as Palms for general decorative purposes. Standing as individual specimens, in halls, balconies, or rooms, their stately forms look noble; grouped with other plants they add dignity and relieve monotony. Some may even be placed out in sheltered situations in the open garden during the summer months. The following is a list of useful and cheap kinds; those classed under the head of Greenhouse Palms may be used in the summer season in sheltered situations outdoors, and generally for room decoration. Those under the head of Stove Palms may be removed to the greenhouse during the summer months, and even many of those may be transferred occasionally to rooms without injury.

Greenhouse Palms.

<i>Areca</i> <i>speciosa</i> (syn. <i>Hyophorbe</i> <i>amaricaulis</i>) <i>lutescens</i>	<i>Chamaerops</i> <i>tomentosa</i> <i>humilis</i> <i>Fortunei</i> <i>littoralis</i>	<i>Jubæa</i> <i>spectabilis</i> (syn. <i>Molinia</i> <i>chi-</i> <i>lensis</i> , <i>Cocos</i> <i>chilensis</i>)	<i>Phoenix</i> <i>humilis</i> <i>pumila</i> <i>lemonensis</i> <i>Rhapis</i> <i>dabelliformis</i>
<i>Attalea</i> <i>Magdalenæ</i> <i>spectabilis</i>	<i>Cocos</i> <i>australis</i> <i>livistonia</i> <i>campestris</i>	<i>Lantania</i> <i>borbonica</i> (syn. <i>Livistona</i> <i>si-</i> <i>nensis</i>) <i>Loddigesii</i> (<i>glaucochylla</i>)	<i>Sabal</i> <i>Adansonii</i> <i>longifolia</i> <i>princeps</i> <i>Seaforthia</i> <i>elegans</i> <i>robusta</i> (syn. <i>Areca</i> <i>Bauerii</i>)
<i>Bactris</i> <i>echinata</i>	<i>Corypha</i> <i>australis</i> (syn. <i>Livistona</i>) <i>spiuosa</i>	<i>Licuala</i> <i>peltata</i> <i>Livistona</i> <i>olivæformis</i> (syn. <i>Saribus</i>) <i>humilis</i>	<i>Trithrinax</i> <i>mauritiæformis</i> <i>Thrinax</i> <i>parviflora</i> <i>tunicata</i>
<i>Brahea</i> <i>egregia</i> <i>nobilis</i> <i>dulcis</i>	<i>Desmoncus</i> <i>mexicanus</i> <i>major</i>	<i>Geonoma</i> <i>speciosa</i> <i>Schottiana</i> (<i>multifolia</i>) <i>fenestrata</i> (syn. <i>Malortica</i> <i>gra-</i> <i>cilis</i>) <i>elegans</i>	<i>Verschaffeltia</i> <i>melanochates</i> <i>Wallichia</i> <i>porphyrocarpa</i> <i>Oranii</i> <i>Wettinia</i> <i>maynensis</i>
<i>Chamaedorea</i> <i>atrovirens</i> <i>elegans</i> <i>Verschaffeltii</i> <i>Ernesti Augusti</i> (<i>simplicifor-</i> <i>mis</i>)	<i>Diplothemium</i> <i>maritimum</i>	<i>Oreodoxa</i> <i>regia</i> <i>Phœnix</i> <i>reclinata</i> <i>dactylifera</i>	
<i>Chamaerops</i> <i>excelsa</i> (<i>vera</i>) <i>Giesbreghtii</i> <i>nivea</i>			

Stove Palms.

<i>Arenga</i> <i>obtusifolia</i>	<i>Borassus</i> <i>madagascariensis</i>	<i>Calamus</i> <i>dealbata</i> <i>Gedah</i>	<i>Euterpe</i> <i>frigida</i> <i>Livistona</i> <i>umbraclifera</i> (syn. <i>Corypha</i>) <i>Maximiliana</i> <i>elegans</i> <i>regia</i> <i>Oreodoxa</i> <i>regia</i> <i>Oncosperma</i> <i>fasciculata</i> <i>Phytelephas</i> <i>macrocarpa</i> <i>Pritchardia</i> <i>pacifica</i>
<i>Areca</i> <i>speciosa</i> (syn. <i>Hyophorbe</i> <i>amaricaulis</i>) <i>Verschaffeltii</i> (syn. <i>Hyophorbe</i> <i>amaricaulis</i>) <i>rubra</i> <i>nobilis</i>	<i>Chamaedorea</i> <i>aurantiaca</i> <i>excelsa</i> <i>paniculata</i> <i>atrovirens</i> <i>latifolia</i> <i>Caryota</i> <i>sobolifera</i> <i>nrens</i> <i>speciosa</i> <i>Calamus</i> <i>elegans</i> <i>adpersus</i> (as- <i>perimus</i>)	<i>Cocos</i> <i>coronata</i> <i>flexuosa</i> <i>Damonorops</i> <i>hystrix</i> <i>fixus</i> <i>Elæis</i> <i>guineensis</i> <i>Euterpe</i> <i>oleracea</i> <i>montana</i> <i>edulis</i> (syn. <i>Oreodoxa</i> <i>sand-</i> <i>chona</i>)	
<i>Bactris</i> <i>echinata</i>			

Out of upwards of 400 species in cultivation, there are many, which, for grace and beauty may be said to eclipse many of the above, but they are considerably more expensive.

Botanic Garden, Glasgow.

ROBERT BULLEN.

NOTES AND QUESTIONS ON THE INDOOR GARDEN.

Veronica Hulkeana.—This pretty Birch-leaved species from New Zealand, bears white or pale lilac flowers in terminal panicles. It is of a semi-frutescent habit, and flowers profusely in any cool house. It is readily propagated by means of cuttings made of the young growth.—B.

Scutellaria Ventenati.—The flowers of this are vivid scarlet in colour, and altogether it is a plant which well deserves extensive culture. Plants of it look well as dinner-table ornaments under artificial light, and for this purpose are preferable to their blue-flowered congeners.—J. H., *Sydenham*.

Acradenia Franklinia.—This pretty Tasmanian plant, nearly related to the *Boronia*, is well adapted for greenhouse or conservatory culture. It forms a dense shrub 3 to 5 feet high, having deep green ternate or three-lobed leaves, very harsh to the touch. The flowers, which are white, are borne in clusters like those of the Hawthorn and are sweetly scented. It is the only species in the genus. It forms a very ornate shrub in the temperate house at Kew, and well deserves attention.—F. W. B.

Ruscus androgynus.—As a climber for a cool conservatory few plants equal this; it grows freely planted out in a border consisting of any good garden soil. It has slender stems which run 30 or 40 feet high, and its pinnate leaves are frequently 2 feet in length, the leaflets being thick and of a leathery texture. When grouped with cut flowers the foliage will last fresh and green for several months, it occasionally rinsed in clean water to free it from dust. There is a fine specimen of this plant on one of the spiral staircases in the temperate house at Kew. Its small and inconspicuous flowers are borne along the margins of the leaflets, and are of a pale green colour.—J. H. Q.

Oldenburgia arbuscula.—This is apparently a rare plant, the only specimens I have seen being in the succulent house at Kew. It is one of the most beautiful of all slow-growing woolly or silvery-leaved plants, and, on that account, deserves to be more popular than it is. The Kew plants have erect stems as thick as one's finger, clothed with about eight or ten large oblong leaves the size of one's hand. These, when young, are densely covered with silvery tomentum, while the older foliage acquires a rich glossy green tint. It is a plant which everyone may grow, even in a sitting-room window, its constitution being sufficiently robust to withstand much irregular treatment.—B.

THE FRUIT GARDEN.

FRUIT CROPS.

A MILD winter, succeeded by unusual warmth during the later portion of April, made vegetation at least a fortnight earlier than usual, and fruit prospects were most satisfactory. In the western counties, especially, the bloom was most abundant; but now, after six weeks of the most ungenial weather ever experienced, a somewhat doubtful and scanty crop upon orchard trees in general is likely to be the result. In low-lying situations the blossoms have suffered much from the severity of the frost, during the early part of May. The prolonged continuation of north-easterly winds, too, with sudden transitions from cold to heat and from heat to cold, has engendered an unusual amount of blight, and has made the trees in general present, in most instances, a seared and weather-beaten aspect. Apples are much blighted, Cherries and Plums are eaten up with aphides and their fruit is dropping; in fact, what Cherries I have seen ripen are small in size and worthless; early Pears in general look promising. But, upon the whole, as regards orchard fruit prospects are anything but flattering.

G. WESTLAND.

Witley Court, Stourport, Worcestershire.

Peach Buds Falling.—Having suffered from this, I read the communication of "J. S. W." (see p. 458), with much interest. My plants are in pots, assisted by some heat in spring. After fruiting they are placed in the open air, and returned to the house about the end of September. They have no more artificial heat till spring. I was told that drought during winter was the probable cause of the evil, but, for the two past winters I have kept the plants sufficiently damp. Last year I came to a conclusion exactly the opposite one to your correspondent, namely, that the evil was caused by want rather than excess of heat, and under this idea I kept one tree, which had been a great offender, inside the orchard-house all the summer, and it has this year rewarded me. Hence I have concluded that the dropping of the buds has arisen, in my case, from unripened wood, and I intend not letting the trees remain in the open air after the latter end of August. Perhaps some other of your correspondents may favour us with their opinion on this subject, as it is a very interesting one.—G. S.

The Phylloxera of the Vine.—In a report presented to the Academy of Sciences of Paris, M. Dumas expresses his conviction that this scourge of the French vine-grower may be got rid of, but he adds, that for this purpose concerted action is absolutely necessary. He discusses the best methods which have been proposed for the destruction of the insect, and these he limits to three. The process of inundation is certain of success, but it is not applicable in all cases. Surrounding the plants with sand is also an effectual remedy, as the phylloxera cannot move in sand, and, according to M. Blanchard, the fine particles destroy the insects by stopping up the orifices of their respiratory organs. The use of sand in this way has also the effect of causing a development of a quantity of rootlets, which suffice to support the life of the plant even when its roots are attacked by the phylloxera. But sand is also not of universal applicability. Where neither of the methods can be employed, M. Dumas recommends the employment of materials which will poison the mischievous insects, and for this purpose he names especially sulphocarbonate of potass, which gives origin to sulphuret of carbon and sulphuretted hydrogen, both noxious to insect life, and leaves a residue of carbonate of potass, which serves as a useful manure for the Vines.

Orange-growing in the Azores.—The Orange business of the Azores has had remarkable development since 1840, by reason chiefly of more care in culture. At that date the shipments were 40,000 boxes; in 1872 the number had increased to 600,000. Formerly the orchards were unprotected, and the trees were planted very sparsely, thus growing into magnificent proportions, and bearing an average crop of 20,000 Oranges each. But these splendid trees were unable to stand the hurricane blasts which sweep up from the ocean, and in a single night thousands of them have been prostrated. Now the trees are planted in orchards of 200 yards square (nearly 10 acres), and each orchard is surrounded by a stone wall 9 to 18 feet in height, and an interior belt of Acacias. The Orange trees are planted in the quincunx manner, about 33 feet apart. The soil is cultivated for four or five years, and afterwards twice a year, the cultivation being very shallow. At ten years of age the trees bear 1,000 to 1,500 Oranges, older trees bear 7,000 to 8,000, and the price realised for the fruit is from 1 dol. 80 cents to 5 dols. per thousand.

A method of propagation is in practice which has been learned from the Chinese. It is to select a strong branch and make a circular incision around it. Below the incision a straw plait is firmly wound, so as to form a sort of basket. This is rammed full of fine rich earth. The operation, which is performed from the 15th of May to the 15th of June, causes roots to strike from the wounded branch; and, before winter, enough have started to support the branch. It is then detached from the tree and planted, and often bears in two years. This process, although more rapid than grafting, is not so permanent or productive in its effects. The most destructive disease in the Azores is known as "tears." The bark splits and discharges a gummy liquid, which exhausts the tree and speedily destroys it. Its course at first is marked by the production of immense crops of inferior Oranges. As soon as this is noticed severe root pruning, by means of trenches dug around the trees, is resorted to, and incurable cases are rooted up and burned.—*Tribune*.

The Difficulties of Water Melon Culture.—"Can the Water Melon be successfully cultivated on sandy soil, in a rural town of 4,000 inhabitants, and a theological institute located near by containing 120 students studying for the ministry?" This question excited considerable comment and loud discussion among those present (at the meeting of "The Hayseeds," in Cleveland), and nearly an hour and a half was spent in discussing the matter. An old market gardener, who had raised early and late vegetables for market for twenty years of his earlier life, said he could raise Melons on the top of a barn or on a billiard table even, let him pick the locality and his neighbours. It was not so much the soil nor the season that the Melon depended upon for its perfection, as it was the peculiarities of the inhabitants of the country round about. Where there was an excess of coloured citizens, it was almost as impossible to raise a paying crop of Melons as it was to keep spring chickens, unless they roosted at night in an iron safe. Then, again, colleges have a bad effect upon the Melon crop, and even a minister's family of seven boys has been known to blight a large patch in a single night. In sections of country where these drawbacks exist, the speaker had learned that the only method to ensure a full crop of Melons was to station a man by each Melon from the time it was the size of a hen's egg until it ripened. This was expensive, but the result was always gratifying. As the fruit grew in size and approached ripeness, the speaker had sometimes found it necessary to station two guards over each large Melon, and even then, in communities where a too great fondness for these luscious products existed, he had known of the insides of a very large water Melon being stolen and devoured when two men with clubs were seated on the shell or rind engaged in friendly converse.—*Danbury News*.

NOTES AND QUESTIONS ON THE FRUIT GARDEN.

Milton's Mulberry Tree.—Several of these trees, says *Notes and Queries*, were planted by Milton in the old vicarage garden of Stowmarket, Dr. Young, tutor to Milton, being then vicar. But only one is now left, bound with girders and propped up with poles. It is still an abundant fruit-bearer, furnishing annually a considerable quantity of excellent wine.

Training Gooseberry Trees.—The old plan of training the heads of these, by means of pruning, into the form of a cup set on a short clean stem, is, I suppose, still the best, or is there any better way of managing young trees?—*Rms.* [For ordinary purposes, the cup-shaped head is perhaps best; but the Gooseberry may also be grown, either as a standard or bush, or trained on espaliers or walls; on the latter some sorts, especially the Red Warrington, may be preserved till November.—*Ed.*]

Cherry-house.—What kind of house do you recommend me to build for a collection of Cherries in pots?—*J. DONALD, Whalley Range.* [A span-roofed house would suit your purpose admirably, but such a house would be more expensive than a lean-to structure, that is, supposing you have a blank wall against which to set the lean-to. Mr. Gilbert, of Burghley, is just having one erected, 64 feet long and about 12 or 14 feet wide, ventilated on the improved Paxton principle; but, for two or three dozen small trees, a less sized house would suffice. Whether span-roof or lean-to, it should be light and airy.—*Ed.*]

Fruits for a North Wall.—Would glazed sashes of from 2 to 3 feet wide, put sloping on the top of a wall, facing the north, and about 25 yards long, be sufficient protection for fruit trees, and what other than Morello Cherries would answer on a north aspect?—*J. H. S.* [Glazed sashes, of from 2 and 3 feet wide, applied as you propose, would be good protection; but, for such an aspect, and, for the few fruits that could be grown on it, the expense would be too great. In addition to Morello Cherries, a north aspect suits Coo's Golden Drop Plums; and, grown in that way, their flavour is more delicious than on any other aspect. I have likewise grown the Ickworth Imperatrice Plum on a north wall, and have allowed it to remain, when ripe, until shrivelled off, when it eats like a sweatmeat or preserved Plum.—*WILLIAM TILLEY.*]

The Himalayan Blackberry.—In the Geelong Botanic Gardens a plant known by this name has been growing for some time without attracting as much notice as it seems to deserve. The curator has sent us specimens of the branches loaded with fruit, and we must acknowledge that it is superior in both size and flavour to that of any other Blackberry we have seen, not excepting the Lawton. In size it equals a large Mulberry, and its flavour is wholly devoid of that mawkishness which characterises English Blackberries; it is brisk and at the same time rich; the fruit would, indeed, be likely to make a nice preserve, only that it is to be had fresh from the tree all the year round. As a covering for arbours or unsightly fences the plant has special merit owing to its foliage. We think it will become very popular both for its ornamental and useful qualities.—*Australasian*.

THE ARBORETUM.

THE CASUARINAS.

THESE may be classed amongst the most remarkable productions of the vegetable world, uniting, as they do, the dimensions of lofty trees with the slender, articulated, leafless branchings of the Equisetums or Horsetails. They are, however, closely related to the Coniferae, and some of the species are decidedly ornamental in appearance. Hitherto, they have not been cultivated to any great extent, and are rarely seen either in nurseries or private gardens. When a specimen is met with in such places it is usually so poor and uninteresting in aspect, as to afford no idea whatever of the capabilities of the plants as ornamental subjects. In the gardens of the Hamma, at Algiers, however, M. Rivière has succeeded in forming a fine collection of them. These, of course, are grown in the open

These trees grow chiefly in marshy or damp places, and, when cut down, send up fresh shoots readily from the stump. Most of the species also run at the root, and as they spread, send up numerous shoots which, in the course of time, form a dense and ever-extending wood.

2. *CASUARINA AFRICANA* (Lour.).—This species in its general appearance somewhat resembles *C. stricta* of Aiton. The branches are erect, spreading, and distant from each other; the secondary branches are few in number, and soon become bare at the base; the bark is of a reddish-grey or brownish colour, smooth, and continues for a long time marked with the scars of the long, bristly, brownish, foliaceous bracts. The final ramifications are closely set together, sometimes forming bundles, as it were; they are 5 or 6 inches in length, of a glaucous green colour, with white articulations or joints. The fruit is cone-like, oblong, somewhat elongated, and borne on a tolerably thick stalk. Native of the island of Réunion,



Casuarina nodiflora.



Casuarina africana.

air there, and attain their full dimensions as forest-trees under the congenial heat of an African sun; but, there is no reason why young plants should not be employed to lend an additional attraction to our hothouses, where the singularity of their appearance would form a very striking contrast to Palms and other stove plants. There are several species of Casuarinae, from which we select two for description giving an illustration of a branchlet of each.

1. *CASUARINA NODIFLORA* (Forst.).—This is one of the handsomest, and most ornamental species. The branches stand erect, with numerous secondary branchlets, often erect. The final ramifications are very closely set together, and are very slender, almost hair-like, and from 8 to 10 inches long; bark greyish-red, slightly wrinkled as if it were cracked or scaly; bracts, foliaceous, small, often wanting; fruit, cone-like, stalked, small, nearly spherical. A native of the New Hebrides.

and probably of other parts of the African Continent. These plants are not at all difficult of culture, and deserve to be better known than they appear to be at present. W. M.

DRAPED TREES.

SOME time ago I discovered and had removed from the woods to the pleasure grounds a robust round-headed Holly tree, which had been taken entire possession of by a wild Honey-suckle plant, which, originating at the root of the tree, had scrambled up through the branches to the top, and there, extending itself in all directions, had formed a large head and hung in festoons all round—a highly ornamental object indeed. The Holly had endured the subjection for many years, and still seemed to put forth sufficient shoots and leaves annually

to ensure a steady support to its climbing companion. The birds also had discovered that the dense and tangled thicket created by the Honeysuckle was a suitable home for their young, for inside of it was a regular settlement of nests of various kinds; and, since the tree has been moved it has been taken complete possession of again by the feathered tribe. Those, therefore, who desire to induce birds to come near their houses have only to afford them eligible quarters. The Honeysuckle in question is an example of what might be done with such climbers as Clematis Jackmanii and other varieties of Clematis, some scrambling Roses, such as Gloire de Dijon, and other flowering creepers or climbers. What could be more effective, for instance, than a lofty tree-like mass of the purple and white Clematis mixed, or either of these alone, or, better still, a gigantic head of Roses? I once saw a thicket of the old double white Rose, similar to the Honeysuckle tree just described; and on another occasion a somewhat similar example of a scarlet Tropæolum scrambling over a shrub. I throw out these hints for those who choose to act upon them. Draped trees, such as I have described, may soon be had. I do not know that a better tree than the Holly could be selected for a support, and it should be of moderate size and of shapely form. Where the trees are not in the place in which they are wanted, they should be moved about the end of August to the desired situation, and if some good rich soil—loam and decayed manure—is furnished to the roots at the same time, it will be in proper condition for climbers in spring. The latter should be planted pretty closely to the stem of the tree, and a start should be made with good vigorous plants whether of Honeysuckle, Roses, or Clematis. If the latter are cut down within a foot of the ground, they will grow much stronger than they otherwise would do, and a good display may be expected the same season. Slugs are, however, terrible enemies of the Clematis, and the young shoots should be watched till they get hold of the tree. They will soon push through the Holly branches, when they may be left to take care of themselves and allowed to scramble at will. The Roses and other things will, of course, also want a little leading off at first till they get hold of their supporters, but afterwards no pruning or interference should be attempted.

S. W.

FIR AND PINE TIMBERS.

Unconverted Fir Timber.

Baltic Fir.—All Baltic Fir is the produce of the Scotch Fir (*Pinus sylvestris*), or the Spruce Fir (*Abies excelsa*), the wood of the former being known, in the timber market, as Red Fir, Baltic Fir, Memel Fir, &c., in the unconverted state, and as red or yellow planks, deals, or battens, in the converted state; whilst the wood of the Spruce is known as Spruce Fir, or White Fir, if unconverted, and as white planks, deals, or battens, if converted. The peculiarity of calling the same wood red or yellow, under different circumstances, should be carefully remembered, since the terms employed have led to the very prevalent, but mistaken notion, that red, yellow, and white comprise three, instead of only two, distinct kinds of Baltic Fir. Red Fir is imported from the Baltic, mostly in barks from 11 to 18 inches square, though sometimes reaching as much as 21 inches; and in lengths running from 18 to 50 feet, the longer lengths being generally rather knotty at the top ends. All logs under 12 inches square are termed “undersized,” and command a proportionately lower price. The best Baltic Fir in bark comes from the Prussian ports of Memel, Dantzic, and Stettin; but chiefly from the two first. Memel timber runs in the most convenient sizes, not as a rule exceeding 13 inches square and 35 feet in length; whilst Dantzic timber is considered the strongest, though not generally so free from defects, being subject to large knots and cup or ring shakes (a separation of the concentric rings or layers of the wood). Dantzic timber averages from 13 to 16 inches square. Riga Fir, coming from the Russian port of that name to the north of Memel, is inferior in strength to both Dantzic and Memel Fir of the best quality, and does not run so large. It averages about 12 inches square and 40 feet in length; but it is often preferred for cutting into scantlings on account of its being straighter-grained and freer from bad knots. It is, however, subject to splitting at the heart, called “heart-shake” and “star-shake;” besides which, it is getting so scarce, from the great demand having exhausted the forests, that there is no certainty about obtaining it. Fir timber from Sweden and Norway is tough, but weak and undersized, the best being converted into deals, &c.;

that from Sweden averaging from 10 to 12 inches square, and from Norway 8 to 9 inches. Its principal use in bark is for staging and scaffolding, for which purposes its small size renders it especially suitable. Very little Baltic White Fir (Spruce, or *Abies excelsa*) comes into the market as square timber. When it does, it is distinguished as white timber or Spruce Fir; but Spruce poles, or the young trees merely felled and stripped of their branches, are largely imported from Norway and Sweden, chiefly from the former, for scaffold-poles, whilst the best are selected as ladder-poles. They mostly run in lengths of from 20 to 50 feet, and are classed according to the diameter of their butt ends, as under or over 4 inches; those under 2½ inches at the top ends being classed separately as rickers, and running about 22 feet long.

American Pine.—Fir timber coming from America is distinguished in the market from Baltic timber by being termed Pine instead of Fir. The different kinds imported are known as yellow Pine, red Pine, white Pine, or Spruce, and pitch Pine, according to the nature of the wood, and they are mostly classed as first, second, or third quality, without, however, any distinguishing marks. The chief ports for American Pine timber are Quebec and St. John, the best yellow Pine being shipped from the former, and the best Spruce from the latter. American yellow Pine is the product of the *Pinus Strobus*, or Weymouth Pine, a very different tree from the *Pinus sylvestris*, or Scotch Fir, which supplies the Baltic yellow deals; moreover, the term “yellow” is only applied to this wood in our markets, in America it goes by the name of “White Pine.” It can be purchased in barks up to 60 or 70 feet in length, and 24 inches square; it is not so strong or durable as the American red Pine, but is much lighter, and is, therefore, readily distinguished in the floating docks by the height it stands out of the water. It is not much used in large scantlings in England, but is largely purchased as planks and deals, for it is admirably suited for all kinds of joinery, being remarkably free from knots, and very easy to work. American red Pine is the wood of the *Pinus Mitis*, which is called in America the “Yellow Pine,” and very closely resembles the wood of the Scotch Fir, though it does not equal it in either strength or durability, nor does it grow so large as the Dantzic and Memel timber, though it is said to be slightly stiffer. Being very straight grained and free from knots it is valuable for joiners’ work, where a stronger wood than the yellow Pine is required, but it is not so much used in England, in consequence of its being more expensive, in proportion to its quality and size, than Baltic Fir. American white Pine or Spruce is very similar to Baltic white timber, but, not being considered equal to it in durability or strength, does not command a large sale in our markets. It is the produce of two different trees, the *Abies alba*, or White Spruce, and the *Abies nigra*, or Black Spruce, so named from the colour of their bark, though the colour of the wood is in both cases white. The Black Spruce timber is much better than the white, besides being more plentiful and growing to a larger size. Pitch Pine is the produce of the *Pinus resinosa*, comes from the United States of America, but chiefly from the ports of Georgia, Savannah, and Pensacola. It is, on account of its dark grain, coming much into use for treads of stairs, framing of doors, and other purposes, when varnish instead of paint is to be used. The wood is heavy, sticky, and is as difficult to work as Oak, but the great quantity of resin which it contains—though it clogs the plane, and so adds to the difficulty of working it—renders it very durable, especially when exposed to damp and water; but if cut from trees which have been recently tapped for turpentine, the durability and strength of the timber is much reduced. The wood is very free from knots, since the tree runs up to a great height, only throwing out branches at the top. Logs of Pitch Pine can generally be obtained in the market, from 11 to 16 inches square, and from 20 to 40 feet long, but being subject to heart-shakes and cup-shakes it is more economical to purchase it ready cut into planks, which can be obtained from 3 to 5 inches thick, from 10 to 14 inches broad, and from 2½ to 40 feet long.

Converted Fir Timber.

Fir timber, when sawn into convenient dimensions for purposes where large scantlings are not required, as in joiners’ work, is called deal. In this form it comes into the market, sawn into different widths, which, though often collectively classed as deals, are distinguished as battens, deals, and planks, varying from 2 to 4 inches thick, but mostly 3 inches, and in length from 8 to 20 feet, but chiefly 12 feet, all under 8 feet in length being classed as ends and sold at a cheaper rate. They are termed battens when 7 inches wide and under, deals when from 7 to 9 inches, but mostly running 9 inches, and planks when over 9 inches, though mostly running 11 inches in width.

Baltic Deal.—Baltic deal is either called yellow deal, in which case it is merely the red Fir timber (Scotch Fir or *Pinus sylvestris*)

sawn up, or else white deal, which is prepared from white Fir timber (Spruce Fir or *Abies excelsa*).

Yellow Deal.—The best yellow deal for building purposes is shipped from the Russian ports of Petersburg, Onega, and Archangel, and the Swedish ports of Soderhamn, Gefle, Stockholm, and Holmsund. Onega and Archangel, in the White Sea, and Gefle, furnish little but deals of the best quality, Petersburg deals are apt to be shaky, leaving a great many centres in the planks and deals, but the best qualities are very clean and free from knots. Wyborg chiefly sends clean and sappy battens.

White Deal.—Some of the best white deals come from Christiania, but that from the other Norwegian ports is not to be relied on, being apt to warp and split in drying; large quantities, however, of these inferior shipments are used for such common purposes as making packing-cases, &c. The best Russian white deals, &c., are shipped from Onega. Petersburg white deal, though generally finer and closer in the grain, is given to shrinking and swelling according to the hygrometric state of the atmosphere. Riga, which is about the most southerly port from which considerable shipments of deals are made, sends white deals only into the market; they are, however, considered to be inferior to Narva and Petersburg white deals, being coarser and more open-grained than either. In white deal the sap wood can hardly be distinguished from the heart wood, whereas a lot of yellow deals may readily be recognised by the sap wood, which more or less discolours the edges of most of the deals. The annual rings in white deal are not so marked or red coloured as in yellow deal, whilst the knots are much harder to cut with a knife, and very liable to become loose. It is not so durable as yellow deal, especially under exposure to the weather, but is much used for internal work, such as cap doors and floors, not exposed to great wear and tear; it is nice clean wood for tops of dressers and common tables, as also for shelves, but, on account of its liability to warp, should not be cut too thin—not under an inch, if possible.

White Spruce Deal.—American white deal is the wood of the *Abies alba* or *nigra*—or, in other words, Spruce or white Pine logs sawn into planks, deals, &c.—and is known in the timber market as white Spruce deal (or American, Canadian, or New Brunswick Spruce), to distinguish it from the white deal imported from the Baltic, to which it is considered to be slightly inferior both in strength and durability; though, from its being of a freer growth, it is straighter in the grain, less knotty, and can be obtained in wider and longer planks. White Spruce deals, &c., are sorted into first, second, and third qualities.

American Yellow Deal.—The yellow Pine (*Pinus Strobus* or Weymouth Pine), when sawn into planks, deals, and battens, is known in our markets as "American" or "Canadian" yellow deal, and is largely used for joiners' work on account of its being exceedingly straight in the grain and free from knots, besides being easy to work, and obtainable in planks of very great width, frequently running as wide as 30 inches. When wrought with the plane it is readily recognised, from the surface being covered with short, fine, darkish marks, like scratches made with the pen, in the direction of the grain.—*Architect.*

NOTES AND QUESTIONS ON TREES AND SHRUBS.

The Miniature Bamboo (*Bambusa nana*).—This is a very diminutive fresh green Bamboo, which will probably prove a neat bordering plant in certain positions, and also useful in the rock-garden, hardy Fernery, and mixed herbaceous border. It is growing now in Mr. Ware's nursery, at Tottenham.—W.

All Saint's Cherry (*Cerasus semperflorens*).—This is a valuable ornamental low tree, drooping gracefully, especially when old, and producing singly numbers of brilliantly-coloured fruits on long stalks, also drooping elegantly from the branches. It is a capital lawn or pleasure-ground tree, and grows from 12 feet to 28 feet high. It derives its botanical name from flowering several times during the summer.

Large Oaks.—In 1823 a venerable Oak known as the "Admiral's Oak," which grew with two others, along the avenue of Bellvue, Lawrencetown, County of Galway, measured 31 feet in circumference when felled, and was sold for £170. It was reputed to be 500 years old. There are numerous very ancient magnificent Oak, Ash, Walnut, and Cedar trees still flourishing in Lisreighan, Galway. The Cowthorpe Oak, in Yorkshire, which still throws out leaves, and has a circumference close to the ground of 60 feet, and, at 5 feet from the ground, 36 feet 3 inches, is estimated by Professor Burnett at 1,600 years.

The "Pall-Mall" on London Tree-pruning.—It is not impossible that, at some future day, when agricultural labourers have emigrated *en masse*, the cultivation of trees will take the place of the cultivation of grain, and the British farmer will of necessity employ himself in the growth of plantations as the only mode of employing the soil left to him. Arboriculture will then, perhaps, not be neglected as a part of education, and the pruning of trees in the suburbs of London no longer be entrusted to persons utterly devoid of taste. It is at present truly painful to see fine trees decapitated, and left with nothing but their bare trunks, by order of senseless local authorities, who stand themselves sorely in need of the pruning-knife.

THE KITCHEN GARDEN.

TOMATO CULTURE IN FRANCE.

ABOUT Paris, the seed of the Tomato is sown in January in hot-beds, and the young seedlings are also transplanted into hot-beds; 200 or 300 plants are placed under each light, and these are afterwards transplanted in March and April into a hot-bed or a trench $4\frac{1}{2}$ feet wide, and covered with a frame or with cloches. Nine plants are set under each light at a distance of 16 inches from each other, but only one is placed under each cloche, and the plants are then set at 18 inches distance from each other. The cloches are placed in two or three rows; but, if in two rows only, the trench should not be wider than $3\frac{1}{2}$ feet, with a depth of 1 foot or 14 inches of manure. As soon as the plants are rooted, air is given when necessary; this is indispensable, and the plants should be covered with mats in the early stages, in order to accelerate their taking root. The Tomato is a vigorous grower, and runs very much to wood; it requires a great amount of air, and yet is very sensitive to frost; this peculiarity, therefore, demands constant care and attention. Two modes of treatment are practised. In the first, the plant is at once cut back, and three or four stems are allowed to spring from the base. All the buds which appear on the stems, at the axils of the leaves, must be carefully removed, and, as soon as the first fruit cluster is developed, the plant may be stopped, if the weather is settled and likely to remain so. But, generally, as frost may possibly recur and render the first flowers abortive, a second cluster of fruit is allowed to develop itself, in order to guard against any accidents which may happen to the first. We shall thus have six clusters of fruit developed instead of three, if the weather continues favourable, that is two on each of the three stems. It is true that when one cluster of fruit only is left on each stem, the crop comes in somewhat earlier, but then with six there is nearly a double crop. The clusters of fruit are fastened to two rows of iron wire, the lower one of which supports the first-formed clusters, and the upper one those that are developed last. In the second method of culture, the main stem or head is not cut back, but along with it two stems are allowed to grow, on each of which two clusters of fruit are left; the head forming a central cluster; there are thus five on each plant. This method produces a crop somewhat earlier than the other, but as the central cluster absorbs most of the sap, the lateral stems grow but slowly, and do not bear much fruit, whereas, in the first method, all the stems have an equal growth, and all the fruit is set at nearly the same time. Those market-gardeners who employ the second method bring to market small quantities of the fruit of the central clusters a week earlier than those who adopt the first method, but then they are three weeks later with the other fruit. The Tomato is a plant which requires much care. As soon as the fruits are well set, all the shoots should be pinched off. If the weather is warm, the plants must be watered abundantly, even when in full flower; but if it is damp, even moderately so, no water should be given, as damp cold weather induces disease. The crop comes in in July and August. In tying up the Tomato, a stout stake is planted every 4 feet along each row; a coil of galvanised iron wire (No. 9 or 10) is then taken and fastened to the first stake, after which it is carried to the second and wound round it with a single turn, keeping the wire well-tightened; then to the third and so on. This line of wire serves to support the first clusters of fruit. When the last stake is reached, the wire need not be cut, but should be wound round the stakes upwards to the height of the second clusters of fruit (when these are formed) and carried back from stake to stake as before. The same wire will thus serve for several seasons. The plants are tied to the wire with good Rye straw, and, being thus fastened, are more easily attended to, the fruit grows more rapidly, and ripens sooner and better. The Tomato is also planted in hot-beds among Chicory plants which are half-grown. When grown in the open ground, the seed is sown in hot-beds in February and March, and the seedlings are transplanted into hot-beds also. The plants, when put out in open quarters, are treated in the same manner as those first described. The heads may either be cut back or not; there is, however, some advantage in cutting them back, but, if found inconvenient, it may

be dispensed with, except perhaps in the case of the first crop. The small early variety is grown in hot-beds, the medium-sized both in hot and cold beds, and the large on wall-borders. In the open ground they are planted at the distance of 20 inches or 2 feet from each other, in three rows in an ordinary bed 8 feet 8 inches wide, always with a good aspect. I. P.

POTATO CROP OF 1873.

THE following is an analysis of the results of the sets of twenty different kinds of Potatoes planted last year at Marnham, in the County of Nottingham:—

			SEED.				CROP.	
			No. of Sets	Wt. lbs.	Distance apart. Rows Sets.		Wt. lbs.	Diseased. Weight in lbs.
1.	Racehorse	...	24	1½	2 ft.	9 in.	18	None.
2.	Mona's Pride	...	50	2½	"	"	38½	"
3.	Early Rose	...	105	12½	"	10 in.	132	"
4.	King of the Earlies	...	136	13	4 ft.	15 in.	258½	"
5.	Myatt's Ashleaf	...	265	16½	2 ft.	1 ft.	262½	"
6.	Early Goodrich	...	30	3	2½ ft.	14 in.	35	7 moderately.
7.	Harbinger	...	69	7½	"	"	124½	2 (about) very slightly.
8.	Bresce's Prolific	...	41	5½	"	"	92½	35 (about) rather badly.
9.	Sedilla	...	60	8	"	"	89	A few slightly.
10.	Lapstone	...	26	2½	"	"	33	Before Xmas, almost all.
11.	Peach Bloom	...	9	1½	"	"	20	8 moderately.
12.	Redskin Flourball	...	110	17	4 ft.	15 in.	315	Not quite 5 moderately.
13.	Model	...	82	7½	"	"	310	38 slightly.
14.	Oxfordshire Kidney	...	84	6½	"	"	140	10 ditto.
15.	American Red Seedling	...	103	14	"	"	136	4 (about) ditto.
16.	Red Fluke	...	63	6½	"	"	225	22 moderately.
17.	Walker's Impr. Regent	...	32	3½	2½ ft.	"	62½	6 slightly.
18.	Paterson's Victoria	...	54	6½	"	"	134	8 moderately.
19.	Ditto Improved ditto	...	89	10½	"	"	125	38½ rather badly.
20.	Hundredfold Fluke	...	47	6½	"	"	90	8 slightly.

1, 2, 3, 17, 18, 19, and 20, were planted on a 10 feet border under a hedge, and all were more or less affected in yield by the neighbourhood of the hedge. The sets were planted—the early ones, 6 inches; the late ones, 7 inches deep; and none were earthed up at all. The soil is a sandy loam, and no manure was used, except with 4, 12, 13, 14, 15, and 16, which had a small quantity of old thoroughly rotten stable manure and leaf-mould mixed. N.

Market Peas.—Growers of Peas for market will do well to look after Laxton's William the First, a fine new early Pea. It is of about the same height and habit as Sangster's No. 1, and equal to it in earliness, but the pods are larger, fuller, and as green as those of Prizetaker, the Peas also being deep green. Mulum in Parvo has also been largely grown in my neighbourhood as a market Pea with the best results, coming in, as it does, quite as early as Sangster's No. 1, but having larger pods, and the Peas as delicious as those of Veitch's Perfection. It grows to a height of from 16 to 18 inches, can be sown in rows 20 inches apart, wants no laying, and if cut with frost, as the early Peas have been this year, it will send up a profuse second growth that will bear a heavy crop. Laxton's Omega will also, on account of the deep green colour of its pods and Peas, become a favourite market Pea. It is a dwarf Ne Plus Ultra, but hardier and as good a cropper; the pods fill well, the Peas being still soft and juicy when the shells are full to bursting; it is a fine dwarf late Pea.—A. D.

NOTES AND QUESTIONS ON THE KITCHEN GARDEN.

Land Injured by Sea-water.—My garden has suffered very much from the high tide of the 20th of May last, and though the salt water was got rid of in the course of four hours, nothing that I have planted since will grow. If any of your correspondents can suggest a remedy I shall be most grateful.—H. C., Colchester.

A Little at a Time.—Mr. W. A. Armstrong, of the Elmira Club, made the sensible remark at a recent meeting that, in undertaking deep plowing or digging in heavy clay, it is well to go down gradually. "If every time the work be done, 1 inch of the lower earth be added to the surface soil, the rains and snows, the air and frost will so act upon it in the course of the year as to convert it into proper soil for the nourishment of plants, and the addition of 1 inch at each subsequent plowing or digging soon makes a depth sufficient for all the needs of every crop to which these lands are suited."

Cattell's Eclipse Broccoli.—Most gardeners know the importance of having a good late Broccoli to meet the earliest Cauliflowers, but I am not sure whether this variety is as sufficiently well known, as it should be, for this special object. It is certainly the latest I know of, and late enough for this part; not one of them is as yet (April 23) showing signs of flowering. It is a very hardy robust sort, and one which it is in every way desirable to have where a good Broccoli is at all appreciated.—H. KNIGHT, *Flora, in Florist*. [Since this was put in type, we have received from Messrs. Cattell a head of this Broccoli, measuring 3 feet in circumference. It was, however, a little past its best, though quite fit for table. It is, undoubtedly, a fine late Broccoli.—ED.]

THE HOUSEHOLD.

RECIPES FOR COOKING SPINACH.

PICK the Spinach carefully, seeing that no weeds or stalks are mixed with it, and wash it thoroughly through several waters. About fourteen quarts of Spinach will be sufficient for five or six persons. Put this quantity into a very large saucepan, with about half-a-pint of boiling water and three heaped table-spoonfuls of salt. Press it down frequently with a large spoon, that it may be done equally. In about ten minutes it will be perfectly tender; then drain it through a colander, pressing until quite dry, and chop it finely. Put it now into a small saucepan with an ounce of butter and a seasoning of pepper; stir the whole over a fire until quite hot; then put it on a hot dish, and garnish with sippets of toasted bread or slices of hard-boiled eggs. Poached eggs are also frequently served with Spinach, when they should be laid on the top. Lemon-juice or white vinegar is considered an improvement.

BEET-TOP SPINACH.—The tops of young Beets, if treated in the same way as Spinach, but boiled for half-an-hour instead of ten minutes, will be found very similar to Spinach and quite as good. This dish should be garnished with slices cut from the roots of larger red and white Beets, and seasoned plentifully with pepper.

FRENCH METHOD.—Either of these may be dressed with cream after the French fashion. Thus, after the Spinach or the Beet-tops have been chopped and returned to the fire in a small saucepan with a little melted butter, add half-a-pint of cream, which has been previously boiled to prevent curdling, and simmer for five minutes; just before removing from the fire, add a small teaspoonful of powdered sugar and a very little grated Nutmeg.

The Adulteration of Tea.—Mr. Jackson, described as of Spital Square, London, and of Manchester, has given some extraordinary evidence before the Select Committee on Food Adulteration. He spoke chiefly of tea adulteration. He said there were persons who called themselves "tea improvers," and their business was, by colouring or uncolouring tea, to give it a fictitious value, and to get a profit from the public which was not legitimate. For instance, he said by a process in which there was little trouble a tea worth only 1s. 2d. a pound, duty paid, could be made to appear to be a character of tea worth 2s. a pound. While some teas were altered in character by being coloured, others were uncoloured by a process which hid but did not remove any deleterious colouring matter. The articles used in adulteration were for the purpose of heightening the appearance in quality and to increase the bulk or add to the weight, and for this purpose an astringent called catechu gum, together with quartz and iron, were used; and besides these a "lie tea," or exhausted leaves—tea which had served its purpose and been re-dried—was used.

Corn-flours.—Statements which have appeared in the daily papers tend to prove these to be worse than useless. They are said to contain no protein or flesh-former. Professor Huxley, "On Elementary Physiology," p. 4, says:—"That compound known to chemists as protein, which contains carbon, hydrogen, oxygen, and nitrogen, must form a part of food if it is to sustain life." Dr. Letheby, "On Food," p. 119, states:—"Up to six or seven months of age, infants have not the power of digesting farinaceous or fibrous substances." Dr. Edward Smith speaking of arrowroot, which, like corn-flour, is nothing but a pure starch, tells us in "Foods," p. 243:—"In my experiments on arrowroot when eaten alone on an empty stomach it gave no sense of satisfaction, but, on the contrary, there was a sense of sinking and *malaise* in the stomach and bowels in about an hour. The effect of arrowroot upon the respiratory and vital functions was very small." Dr. Hardwick has also testified against the corn-flours; and Dr. Lancaster's "Plain Rules on Hand Feeding," boldly affirms, "that most of the deaths under six months old arise from the use of corn-flour and other kinds of starchy food." Messrs. Brown and Polson admit that their corn-flour is pure starch; it therefore contains none of the protein which Professor Huxley says must form a part of food, if it is to sustain life. It has been affirmed that mixed with milk, corn-flour is nutritious; but, the question is, is it not the milk instead of the corn-flour which is nutritious? The corn-flour, even when boiled with milk, does not, as Messrs. Brown and Polson say, "closely resemble ordinary beef and bread." The compounds called fibrin, syntonin, creatin, gluten, and many others are, totally wanting; nor may Rice and Potatoes be fairly compared with pure starch, as they contain from 2 to 7 per cent. of protein, besides the full amount of mineral salts. Dr. Voelcker, who was examined before the Committee on the Adulteration Act, asserted that he did not agree with the statements which set forth that corn-flour was an article which contained no nutrition.

GARDENING FOR THE WEEK, AND AMATEUR'S CALENDAR.

The Flower Garden and Pleasure Grounds.

On the 20th inst. the temperature never exceeded 56°, and fell during the night to 27°, being 5° of frost, a depression which appears to have been even more disastrous to recently turned-out tender plants than the frost which occurred on the 12th. Among plants which have suffered most severely are *Ageratum Imperial Dwarf*, *Coleus Verschaffeltii*, and some of the variegated and bronze Zonal Pelargoniums. Taken altogether, the season has certainly been most unfavourable to newly turned-out bedding plants, a circumstance which shows the necessity of always retaining in pots a considerable portion of stock of each variety of plants employed in furnishing both beds and borders, in order to be able to replace any casualties which may, and do almost always, more or less, occur. As soon, therefore, as we are favoured with a genial rainfall, no time should be lost in making good all deficiencies; so that all beds and borders may, as soon as possible, be in what may be considered a finished condition. To accomplish this desideratum, such plants as *Petunias*, *Verbenas*, &c., should all be neatly pegged down, or, what is better, fastened to the surface of the soil by means of short pieces of bast, which should be passed round the shoots, and the ends thrust into the soil with a wedge-like pointed stick. This is a practice which should be persevered in until the plants fairly cover the surface of their respective beds. Other plants, to which the practice of pegging down may not be applicable, should be supported by stakes or otherwise, wherever it may be found necessary; while the surface of the soil should be frequently stirred, in order to destroy weeds, &c. Endeavour to promote as much as possible the growth of sub-tropical plants, by mulching the surface of the beds containing them, with well-rotted manure, upon which, water should be frequently poured in hot and dry weather. Where edgings consist of such plants as *Thrift*, *Daisies*, &c., they should now be trimmed, or reduced to any desirable extent; and gravel walks and drives should be kept free from weeds, and frequently rolled. The proper time for rolling is soon after a considerable rain-fall, when the operation will be found to be really effective. To some sorts of gravel a good dressing of salt proves beneficial, giving, as it does, increased solidity to the walk, greatly improving its colour, and destroying moss and small weeds upon its surface; but care must be taken to prevent the salt coming within 5 or 6 inches of the turf or any edging plant, which it would be sure to injure. A period of dry and sunny weather should also be selected for this application, or it will have little or no beneficial effect. Commence the propagation of *Wallflowers* and various other plants by inserting cuttings under hand-glasses, and by sowing seeds of the same on a shady border, to be afterwards transplanted into the reserve garden, so as to be in readiness for spring-bedding purposes. The reserve garden is also the proper place for novelties in the way of bedding plants, where they can have a fair trial, and where their merit or adaptability for certain purposes can be ascertained, without incurring the risk of marring the general effect of the parterre, should they happen to prove unsuitable for what they are intended. The reserve garden should also contain a portion of plants, of more or less extent (according to probable requirements), of all the varieties of plants bedded out in the flower garden; in order to furnish an early supply of cuttings for the following season, and thereby obviate the necessity of having recourse to the flower-beds for this purpose, before they can be well spared without injuring the general effect.—P. GRIEVE, *Culford Gardens, Bury St. Edmunds.*

Hardy Flowers.

Warm south-west winds have now set in accompanied by a welcome fall of rain, which has rendered operations in this department much more agreeable than they hitherto have been. The thinning and pricking out of perennials sown in the open ground should now be carried on with despatch, and hardy annuals, if coming up too thickly, should be thinned. Sowings may still be made in the open ground of annuals for late blooming; also, of biennials and perennials, except in the case of rare plants, which should have the protection of a frame. The tying and staking of plants requiring that assistance, should likewise be looked to at once, as heavy rains and strong winds prematurely impair their beauty. The division of most perennials may be more safely performed now when the air is warm and the ground moist, than when bitter winds prevailed and the ground was parched; therefore, some spring-flowering plants, of which it may be desirable to obtain a larger stock for next year, should now be divided into as many pieces as will allow of each forming a tolerably good sized plant by next spring. Some of the more important plants that have come into flower during the past week, have been *Lathyrus grandiflorus*, a near relation to

the common Everlasting Pea, but a somewhat earlier bloomer, and a plant which has larger and handsomer flowers although these do not last so long as those of the commoner kind. It is, however, worthy of more attention than it receives, and is a fine plant to intermix with low shrubs. I observed at Kew a very distinct *Lathyrus* called *Drummondii*, a kind with brick-red-coloured flowers, which are apparently produced in abundance. Several *Spireas* now in flower are very showy, particularly *S. Aruncus*, and the double variety of the *Dropwort* (*S. Filipendula*), the last being valuable on account of its finely divided leaves and its showy blossoms. Various members of the Sage family are also nicely in bloom, notably several *Scutellarias*, *Salvias*, *Phlomis Russelliana*, *Betonica grandiflora*, a fine plant either for borders or for pot-culture, *Prunella pyrenaica*, and *Melittis Melissophyllum*. *Verbascum Chaixii* a true perennial species is now finely in bloom, its yellow flowers being produced in a large pyramidal panicle. Of plants which have been in flower for some weeks past, and which are still in great beauty, I would mention *Geranium sanguineum*, *Dicentra eximia*, a plant, which, notwithstanding the severe weather to which it has been subjected, has bloomed continuously from the early part of May to the present time, and it is now a very handsome plant, both in leaf and flower; *Corydalis capnoides* and *lutea*, various *Pyrethrums* and the different coloured varieties of *Snapdragons* (*Antirrhinum majus*). Early sown annuals are also coming finely into blossom.—T. SPANSWICK.

Orchids.

Orchids in bloom may now be grouped together in a warm conservatory along with Ferns, Palms, and other fine foliaged plants. In some establishments this is done all the year round, and where practicable we recommend a glass case to be erected in the cool conservatory, in which tender plants can be arranged for effect, and where they can have the advantage of a warmer and more genial atmosphere than when staged without such protection. Continue to syringe or sprinkle the shelves and floors regularly, and during the present uncertain weather particular attention must be paid to shading, as sudden gleams of bright sunshine often do considerable damage. Plants in a healthy growing state will require a copious supply of water which should be regularly given them every morning. Plants on blocks, such as *Laelias*, *Sephorites*, *Cattleyas*, and *Dendrobiums*, will require plunging over head, or syringing once or twice daily, so as to keep them regularly moist. Plants on blocks are often starved from want of moisture, the result being weak spindling growths, which never flower and only serve to attract various insect pests. This is the best period of the year to purchase Orchids, as they do not suffer so much in transit as when removed from warm quarters during cold weather.—F. W. BURBRIDGE.

Indoor Plant Department.

Every means should now be employed to prolong the blooming of such plants as are at present in flower in greenhouses and conservatories, as well as to encourage such as are progressing, for that kind of decoration. Owing to the greater number of conservatories being usually much loftier than ordinary houses for plant growing, a much greater surface is exposed to the action of the sun; consequently, the atmosphere is much drier, so much so, indeed, during the long summer days, as to make short work of the greater number of blooming plants available at this season. The borders that usually exist for climbers should be kept as moist as is consistent with the well-being of the plants growing in them; the moisture given off from them will, in some measure, counteract the dryness of the atmosphere, and on all available occasions, especially early in the mornings and in the evenings, water should be applied under the stages, where such exist, and on the tables, yet not so plentifully as to occasion the unsightly inconvenience of wet paths to walk upon. Moisture applied in this way has not only the effect of benefiting the blooming plants, but tends to keep down red spider, which generally has a particularly genial feeding ground on conservatory climbers. The latter should have forcible applications of water from the syringe, or, still better, from the garden-engine, occasionally. Thin shading material (in all cases movable) should be used not only for the roof, but for the sides of the house next the sun, if the house is lofty. Assist by all necessary attention *Fuchsias*, *Liliums*, *Amarantus*, *Balsams*, *Pelargoniums*, *Vallotas*, *Cassia corymbosa* (yellow), *Witsenia corymbosa* (hinc), two plants of easy culture, but not nearly so often met with as they deserve. *Achimenes*, *Gesnera Cooperi* and *Doncklaari*, *Tydeas*, and *Gloxinias* should be properly and carefully hardened by giving them plenty of light, and placing them near where air is admitted in the stove before their introduction to the conservatory, where they should be placed in such a position as to be so far removed from draughts as possible; by such means such plants may be made to last in good condition for a con-

siderable time; and it is necessary to employ plants of this description during the next two months, when there is a greater scarcity of blooming plants for conservatory decoration than at any other time during the year. Attend well to all autumn and winter blooming plants. The first batch of Cinerarias should, by the middle of next month, be ready to be placed in their blooming pots; six-inch ones will be large enough, if the plants have been well managed all through the several stages of their growth. The first batch of Hydrangeas should now be potted, using pure peat and sand for a portion, and loam and sand for the rest of the stock; by this means in all probability, both the blue and pink colours will be secured. Attend well to indoor Ferns in the way of water, especially such as have filled their pots with roots; any inattention to this matter results in the destruction of that healthy green appearance of the foliage which is the most prominent characteristic of well-grown plants. Do not maintain a higher temperature than is necessary for healthy development, such being inimical to persistency of foliage or to its endurance if required for cutting. Keep down insects by repeated light fumigations in preference to performing that operation seldom and severely. Azaleas should now be making active growth, which should be encouraged by syringings overhead every afternoon, shutting up early, and keeping the plants thoroughly free from their two great enemies, thrips and red spider. Plants that require repeating if their roots are active, should be shifted at once, using nothing but good peat, and sufficient sand to keep the soil sweet. Hard-wooded plants that have been potted some time, and that are growing freely, should now be no longer shaded in bright weather; but, on the contrary, should be fully exposed to the sun, throwing water liberally about under the stages amongst the pots, so as to counteract drying influences. Young stock that was potted early, and that is growing vigorously, may be benefited by a further shift. Some growers of Heaths re-pot such as require it about this time, when the plants have done flowering; but it is much better to defer the operation until the autumn, when the weather gets cooler. Pick of all seed-pods, if seed is not wanted, as soon as the flowers are decayed, as the production of seed greatly exhausts the energies of plants.

Indoor Fruit Department.

When the Grapes are all cut in the earliest houses every attention should be paid to getting the wood ripened thoroughly, and trying to get the Vines into a state of rest by taking the lights off when it can be done, or exposing them to the air as much as possible. Give abundance of air night and day, and gentle fire-heat in dull weather to Grapes in late Vineries. All Grapes intended to be kept late in bottles of water should be well thinned, and, if possible, got thoroughly coloured and ripened by the end of September. Where Peach-houses have been cleared of fruit, give the trees a good syringing to clear them of dust collected when the fruit was ripening. In houses where the lights can be taken off, it is a good practice to expose the trees to the air, as they will make firmer wood and buds under its influence for next year's forcing. In the late houses syringing the trees and sprinkling the paths once or twice a day will all help to keep up a moist atmosphere and to keep down red spider and aphids. The stopping and thinning of the shoots of Fig trees bearing the second crop must now be attended to. Keep a moist atmosphere by frequent syringings and sprinkling the paths with water to keep down red spider. Still maintain a steady bottom-heat to Melons by means of linings, or hot-water pipes if in houses or pits. Mulch the surface of the beds with well-fermented horse droppings, the same as for a Mushroom bed, and keep this well watered till the fruit begins to ripen. Melons when swelling require plenty of water at the roots, not dribblets on the surface, but a good soaking to reach the bottom roots. Sow seed now for the autumn supply of fruit, and if the plants are to be grown in pits heated with hot-water pipes, the supply of late fruit will be more certain than when grown in dung-frames. This is a good time for setting and marking the fruit of any good sort of Cucumber that it is desirable to keep for seed. Some grow their plants in large pots to seed from, and after carefully fertilising the flowers, leave only from three to four fruit on a plant. By this mode success is more certain as to getting plenty of seed true to the sort, than by trusting to fruit from plants exhausted by cropping. For the next four months no difficulty need be experienced in producing excellent Pine-apples. The fruits will show quickly and strongly from fine healthy plants; their swelling will be greatly assisted by applications of tepid clear manure-water to the roots and occasional syringings with clear soot-water, together with a kindly atmospheric humidity well charged with ammonia, and a free but judicious circulation of air on all favourable occasions. Succession plants, in order to form strong healthy shoots, should be shifted on in due time, and placed farther apart in the bed; maintain a strong humid atmospheric heat, and a steady kindly bottom temperature. Syringe freely, and supply air abundantly night and day.

Hardy Fruit.

The side-shoots of cordons should now be stopped back to within five or six buds of their base, any excess of fruit thinned, and the leading shoots tied in or secured against wind. I do not approve of incessant pinchings, neither are they necessary for the successful culture of fruits on the cordon system. Two or three stoppings are better than greater attention in that way, and more likely to result in the establishment of a constant habit of fruit-bearing than the continual pinching recommended by many. The sure mode of establishing continuous fertility is to prune the roots if necessary, and to leave the top alone. Cordon fruit trees, whether Apples, Pears, or Plums, seldom have their fruits sufficiently thinned. Cultivators have a pride in exhibiting the fruits, touching each other along the entire length of the tree, and there is generally too many left. The frosts have, however, thinned many off, but much of the fruit left is in clusters, and all should be carefully gone over and thinned for quality of fruit, rather than quantity. A cordon, with a dozen fruit of Calville Blanche, Alexander, Lord Suffield, Wellington, Blenheim Orange, or other fine Apple grown to its utmost capacity is a more striking object, and a better exhibition of skilful culture than the same tree burdened with four dozen third-rate fruit. Upright cordons need special skill at times to hinder the leaders from monopolising the major portion of the strength of the trees thus robbing the fruitful spurs on their side. Where such tendency is developed, pinch the leader off at each leaf or two made, until the central flow of sap is arrested and the vital force of the plant is more equally distributed in all parts of the tree. Plums do remarkably well as vertical cordons, and often yield a better crop than horizontals, or even trees on walls. This may be owing to their flowering later, being more lifted above the sharp line of late frosts, and also from the fact that birds do not seem able to sit comfortably on these slim trees to enjoy their sweet feast of bursting flower buds. When the spurs are kept short the trees hardly afford a seat for the birds; at least, there does not seem room for a perch and a peck on the same spur or group of buds, and I have observed that most bud-eating birds peck on the line of, and below, the seat, seldom or never above it. Be this as it may, the fact, which is important, remains—account for it as we will—that the birds are less destructive to vertical cordons than to standard trees, trained trees, or espaliers on walls, and horizontal cordons. Cordons pretty heavily weighted with fruit may be materially assisted by six inches thick of half-rotten farmyard manure being put over their roots; this proves an anti-soil exhauster of plant-food and water, and also a direct source of nutriment. Food may also be applied even more directly, and with more immediate effect, in the form of liquid-manure and house and other sewage. There is no better mode of converting house refuse into usefulness than its application in liquid form to fruit trees and bushes. The amount of food that fruit can turn to account is marvellous. The art of gardeners of Nottingham have learned this lesson to some purpose. Favourite Gooseberry bushes have the best manure a foot thick overlying the roots, and almost touching the prize fruit. Apples, Pears, Plums, and Cherries, are equally grateful for rich food, though they may not respond to it so quickly as Gooseberries do. In dry weather, Cordon fruit should be sprinkled overhead every day at five o'clock. These shower-baths refresh and cleanse the leaves, and help the fruit to swell to a larger size. Of course, the practice of overhead sprinkling will not be begun till all danger of late night-frosts is over. It ought not to be needful to add that no insects of any kind must be permitted to establish themselves on cordon trees. Their smallness makes them more manageable and easier kept clean than large trees, and when alike under the eye and hand, neither fly, blight, nor scale ought to be allowed a foot-hold on them. In addition to the fruit of high quality and rare size that cordon trees yield, they are worth growing for their beauty, the interest they excite, and the admirable manner in which they bring fruit culture within easy reach of all. No garden is too small for a few cordons; and those who have no garden might place a couple in pots, one on either side of the window, and wreath it with choice fruits in lieu of showy flowers.—D. T. FISHER.

Kitchen Garden.

During the past week the sky has been almost continually overcast, with scarcely a break in the dull leaden clouds; but, after the late severe frost, the absence of bright sunshine has been an advantage rather than otherwise. Potatoes have in many places in the Fens been severely injured, and, in some instances, where planted late, they have been cut to the ground by frost. In making successive sowings of small seeds during the continuance of the present dry weather, such as Radishes, Lettuce, Endive, Chervil, Turnips, Spinach, &c., let the land be thoroughly soaked with water some hours before sowing. The best plan is to water the ground

thoroughly in the evening, rake it over, and drill in the seeds early the following morning. Shade at once with netting, over which branches might be laid if necessary, and the seeds will germinate immediately without any further trouble. In the case of Turnips, a very slight sprinkling of super-phosphate, mixed with ashes or burnt earth, and sown in the drills with the seeds, will hasten the growth of the young plants, and enable them to withstand the attacks of the fly. After the plants appear occasional dustings of lime, soot, or dry ashes will also be beneficial. In an exceptional season, like the present, the following is a very good way of securing good Lettuces that will not readily bolt. Open a trench about 3 feet wide and the depth of the spade, it may be any length in proportion to the demand; place in the bottom 5 or 6 inches of manure—the refuse vegetable matter from the rubbish-yard, if thoroughly decomposed, will do well—and over all place 2 or 3 inches of soil, give the whole a thorough soaking of water, in two or three hours rake it level, and in the space sow three drills of Lettuce; or, if preferable, the drills may be drawn across the trench about a foot apart. Cover the seeds with fine soil, and shade with branches or something similar. There are some varieties of Lettuce that are less influenced by heat and drought than others, amongst which may be mentioned All the Year Round Cabbage and Incomparable Cos; the latter will grow to a large size, and should be tied up a week at least before required for use. Towards the end of the month make a sowing of second early Peas. Amongst those adapted for the purpose may be mentioned William the First, Supreme, and Hundred-fold; thoroughly soak the trenches with water before sowing the Peas, and cover with fine dry soil. Plant out Leeks on well manured land, in rows 1 foot apart and 6 inches apart in the rows; if large white Leeks are wanted, open trenches similar to Celery trenches, using a liberal quantity of manure; if the trenches are 15 inches wide, two rows can be planted in each trench, the trenches may be 2 feet apart. This plan gives facilities for blanching, by earthing up, and fine large white Leeks are produced. This wholesome vegetable is hardly cultivated so much as it deserves to be, especially in the midland and southern counties; in cottage gardens it is rarely to be met with, but its good qualities are better appreciated in the north. Discontinue cutting Asparagus, and, if possible, soak the beds with liquid-manure, as, upon the strength of the growth made now, depends the quality of the produce next year.—E. HOBDAV.

GARDEN DESTROYERS.

CURE FOR MEALY BUG ON GARDENIAS.

I BOUGHT at a sale some plants of *Gardenia intermedia*, and I afterwards found them, as I thought, splashed with whitewash, but, to my consternation, the little patches proved to be alive, and by the aid of a glass they looked like white woodlice. I at once well washed them with aphid wash from the City Soap Works; but the insects still lived, so, after eyringing, I had to pick them off singly to the number of hundreds. Can you say what the pests are and how I can get rid of them? They look like white scale.—T. [Mr. Baines, to whom this has been submitted, says, "from the description I should suppose that they are mealy bugs. White scale is about the 20th of an inch in diameter, very thin, quite circular, and adheres so fast to the leaves, and more especially to the wood, as to be unmovable with the syringe. Mealy bugs may be moved readily, and they are three times the size of white scale, which is the most difficult of all plant pests to kill. Your correspondent will possibly now be able to make out what the insects are with which he is troubled; and, having determined that point, will be able to apply the remedy given lately by me in THE GARDEN in my papers on insects, and which, if persevered in, will certainly effect their destruction."]

A Dog the Best Scarer of Birds.—I quite agree with Mr. Tillery, that it would be a troublesome undertaking to keep birds out of a large garden by means of squibs and crackers. The best plan, where a gun is not allowed to be fired, is to induce a small terrier dog to drive them out. On sending it among the Gooseberry and Currant bushes, the birds fly out in a few minutes. Where fruit-trees are surrounded by plantations, birds soon become accustomed to any amount of clapping, &c., and even firing off a gun will not frighten them, if done too often; whereas a dog, scampering among the bushes, alarms them at once; and a dog soon knows what it has to do, and takes a delight in driving out the intruders. Of course, where fowls are in the way, a dog requires a little training to keep it from running after them; but a little checking will soon obviate that. A cat is very useful, too, in a garden; but a cat likes to sit and watch for her game, and would not notice blackbirds and thrushes, which are the two greatest destroyers of fruit.—W. H.

Moles.—M. Floarens, and other French naturalists, have experimented with moles to ascertain their true habits. It has been found that they will starve to death in presence of abundant vegetable food, refusing to touch it, but that they will greedily devour cutworms, earthworms, mice, and even small birds, when nearly starving in an enclosed jar. Of the birds they only devour the inside, but they devoured, indiscriminately, their own weight each day of snails, insects, larvae, chrysalides, caterpillars, adders, slow-worms, and lizards. M. Carl Vogt relates an instance of a land proprietor in France who destroyed every mole upon his property. The next season his fields were ravaged with cutworms, and his crops totally destroyed. He then purchased moles of his neighbours and stocked his fields, and afterwards carefully preserved them as his best friends.

The Little Friends of the Rose.—The common sparrow is one of the most active and assiduous; for, if left alone, sparrows will banquet on green fly, and pick, pick, pick for leaf-rollers, and nibblers, and excavators of all sorts. If you find your Roses are becoming dreadfully clothed with aphids, and you really have no time to puff or poison them, you may adopt an efficacious method of enlisting the sparrows in your service. Two or three times a day sprinkle a handful of grain or bread-crumbs amongst the Roses. The sparrows will soon appreciate your bounty; and, having cleared the ground, will next proceed to clear the trees, taking the best care possible to repay your kindness. To render this plan a perfect success, you should keep the sparrows always on the look-out, and never supplied very bountifully; so, as far as possible, institute frequent sprinklings of infinitesimal bounties. Make yourself acquainted with the larvae of the ladybird, or coccinella; for these are greedy devourers of aphids, and touch no vegetable food whatever. The larvae of the syrphidæ, again, are indefatigable destroyers of the same pest. Still more destructive to aphids than either of the foregoing are the larvae of the lace-winged fly, *Carysopa perla*—a sort of ephemera with golden eyes and green wings. This fly lays its eggs in a manner which causes them to appear like minute fringe; for every egg is on a transparent stalk, the latter being a kind of gluten deposited with the egg, and drawn out by the parent to elevate the egg out of the reach of danger. These stalked eggs may often be seen, like microscopic fans, fixed on the edges of Rose-leaves, and on the young shoots of the Lilac. The ichneumon fly (*Ophion luteum*) is another friend of the Rosarian; for its larvae feed on caterpillars, and the more of them we can find amongst the Roses the better.—"Amateur Rose Book."

NOTES AND QUESTIONS ON GARDEN DESTROYERS.

A trap for Mice.—To make a simple and efficient mouse trap, procure a tolerably tight barrel—bore a hole near the bottom for a place of entrance; set in the place where the mice "most do congregate," throw into it an armful of ears of Corn and a handful of rags or waste paper to make a nest, cover it so that the mice may "keep dark," and let it stand quietly a few days to give the mice time to colonise, then plug up the entrance. Remove the dead and dash in a few gallons of water, set your trap again.

The Wireworm Beetle.—Wherever the temperature of the soil ranges from 50° to 60°, there will the wireworm beetle be daily from the 10th to the 20th of this month. It is now a perfect beetle. It rises from the soil in which it has hibernated generally between the hours of 10 and 4 o'clock; flies slowly and heavily, and may be easily caught. In the garden it prefers to lodge on the Malvaceæ; the Hollyhock and common Willow are special favourites with it, also the common garden Bean. In the field it prefers Sanfain, Beans, and Rape. In its winged state it is known to every school boy as soldier and sailor beetles, the colours being blue and red.—W. FRASER.

Cockroaches.—These are often great pests in plant-houses, where they devour everything within their reach. A very simple and effectual remedy for them is given in the *Revue Horticole*, communicated by M. Lorry, chief propagator at the Jardin Fleuri, Paris. It is as follows:—Dissolve the heads of a box of phosphor matches in a pint-and-a-half of water; then mix with it about 1 lb. of flour, and add about $\frac{1}{2}$ lb. of sugar, of which these insects are very fond. The mixture may then be distributed in various parts of the house overnight, on pieces of board, slates, &c., and when examined in the morning, numbers of dead cockroaches will be found close to wherever the poison has been laid.

Poplar Insects.—On one of a row of Poplars at the bottom of my garden I find a great number of excrescences, which on being cut open are full of insect-life. Can you tell me whether or not the fly which you will find almost developed, is the same aphid as that which attacks the Hop plant?—JOHN GREEN, Wallington. [The Poplar galls contain *Aphis bursaria*, a well-known species that infests various kinds of Poplar, and which sometimes makes much larger galls on the leaf-stalk than those sent. If our correspondent or any of our readers meets with very large specimens it would be obliging if they would send them to us for examination. The *Aphis bursaria* is quite distinct from the Hop aphid.—A. M.]

Effective Ways of Destroying Ants.—I have seen several queries as to how to destroy ants, and I give you my experience of fifteen years in New Mexico, where there are a great many. We have three ways of getting rid of them. 1. If they are where they can be stirred up with a hoe, persistently stirring up the nest every day or two will eventually run them away. 2. Pouring a little coal oil upon their nest every few days until they are all killed or have left. 3. Make a mortar bed of their nest into mortar carry the mortar away, mud, and after having made their nest into mortar carry the mortar away. Either of the three ways will rid you of them if well done; but as perseverance is one of the main characteristics of the ant, those who would get rid of them must also be persistent.—R. J. HAMILTON, *Hatch's Ranch, N. M., in Tribune.*

INSECT DEVOURING PLANTS.

Sarracenia variolaris as a Fly-catcher.

THIS will rank with *Dionæa* itself as a vegetable fly-trap. Indeed, where *Dionæa* captures ten or a dozen insects this captures a thousand, and that by a process wholly different, yet not less amusing. With very rare exceptions dead and decaying, or, more properly, macerated insects were to be found packed at the base of the tube—most frequently a large red ant—also beetles, bugs, flies, &c., and invariably within the decaying mass one or more small worms, perhaps the larvæ of insects hatched within the putrefying mass. At this period, having examined only young leaves of the season, and older ones of the previous year, Dr. Mellichamp, from whose letters these details have been extracted, had not detected the sweet exudation at the rim of the pitcher. Directing his attention to the watery liquid which collects within, he made the unexpected discovery that this has

Inebriating or Narcotic Properties.

By draining every leaf plucked of its few drops of juice, he says, I collected about half-an-ounce of the secretion in a vial, with which I made careful experiments in testing its intoxicating effect upon insects. My "subjects" were chiefly house flies. About half a drachm to a drachm of the secretion was placed in a small receptacle, and the flies thrown in from time to time—the liquor not being deep enough to immerse them completely, but enabling them to walk about in it without swimming and the risk of being drowned. Some twenty flies were experimented with. At first the fly makes an effort to escape, though, apparently, he never uses his wings in doing so—the fluid, though not, seemingly, very tenacious, seems quickly to saturate them, and so clings to them and clogs them as to render flight impossible. A fly when thrown in water is very apt to escape, as the fluid seems to "run" from its wings; but none of these escaped from the bath of the *Sarracenia* secretion. In their efforts to escape they soon get unsteady in their movements, and tumble sometimes on their backs; recovering, they make more active and frantic efforts, but very quickly stupor seems to overtake them, and they then turn upon their sides either dead (as I at first supposed) or in profound anæsthesia. I had no doubt, from the complete cessation of all motion, and from their soaked and saturated condition, that they were dead, and, like dead men, they were "laid out" from time to time as they succumbed to the powerful liquor; but, to my great surprise, after a longer or shorter interval—from a half hour to an hour or more—they indicated signs of returning life by slight motions of the legs and wings or body. Their recovery was very gradual, and eventually, when they crawled away, they seemed badly crippled and worsted by their truly Circean bath. After contact with the secretion, the flies which were first thrown in became still, seemingly dead, in about a half minute, but whether from exposure to the air or exhausted by action on these insects, the liquor did not seem to be so intoxicating with those last exposed to its influence. Anæsthesia or intoxication certainly did not occur so quickly; it took from three to five minutes generally, and in one rebellious "subject" it took at least ten minutes for him to receive his *coup de grâce*. A cockroach thrown in succumbed almost immediately, as did also a small moth, and much more slowly a common house-spider. On the recovery of the latter, it was almost painful to witness his unsteady motions and seeing him dragging his slow length along. Without doubt, therefore, the secretion found in the tubes of *Sarracenia variolaris* is intoxicating—or anæsthetic, or narcotic, or by whatever word you may prefer to indicate that condition to which these small insects succumb. In another letter, Dr. Mellichamp announces that he had verified the existence of the

Sugary Secretion within the Rim,

which acts as a lure; and also that he had discovered a trail of it leading down the outside of the pitcher nearly to the ground! This remarkable statement should be read in his own words as follows:—"Having discovered, therefore, in an unburned pineland, many plants of *Sarracenia variolaris* which were far more advanced than the more tender and succulent ones first examined, the leaves being more rigid and harsher to the touch, and more deeply coloured, I had no difficulty in detecting in almost every leaf the sugary secretion or honey-like exudation at the mouth of the tube. It extends downwards more than a quarter of an inch, generally half an inch, or even three-quarters of an inch, I also found it more sparingly under the arched lid or upper lip of the leaf, in and upon the thick and coarse hairs found there, and which I believe are thicker and coarser than those in the lowermost portion of the tube. The sugary exudation, I frequently found glistening and somewhat viscid—along the whole red or purple-coloured border, or edging of the broad 'wing'—extending from the cleft in the lower lip even to the ground. There

is, therefore, a painted or honey-baited pathway, leading directly from the petiole (or the ground itself) up to the mouth, where it extends on each side as far as the commissures of the lips, from which it runs within and downwards, as before stated, for at least half an inch. One now can readily understand why ants should so frequently be found among the earliest macerated insects at the base of the tube. Their fondness for saccharine juices is well known, and while reconnoitering at the base of the leaf and bent on plunder, they are, doubtless, soon attracted by the sweets of this honeyed path lying right before them, along which they may eat as they march, until the mouth is reached, where certain destruction awaits them. Having determined this still in the woods, I collected a large number of the maturest and most perfect and most sugared leaves. When I reached home I placed them in two goblets of fresh water, and that morning fortunately having perfect leisure, I sat down before them for the purpose of carefully watching the entrapment, and determining, if possible, whether the flies were intoxicated after sipping the honey. I remained in my position for, I suppose, at least two hours, and in other ways continued my observation more or less the greater part of the day. Flies were soon attracted to the leaves. But I soon found that this was no way to test the matter; for, although the flies would disappear, none escaping, it was no easy matter to see the process. I, therefore, turned backward the greater part of the overhanging lid, and thus flooded the prisons with daylight, so that the whole region of the 'sugar countries' could be seen and examined while the flies were busy at their food. And what did I witness? After turning back the lids of most of the leaves, the flies would enter as before, a few alighting on the honeyed border of the wing and walking upward—sipping as they went—to the mouth and entering at the cleft of the lower lip; others would alight on the top of the lid, and then walk under the roof, feeding there; but most, it seemed to me, preferred to alight just at the "commissures" of the lips, and either enter the tube immediately there, feeding downward upon the honey pastures, or would linger at the brink, sipping along the whole edge of the lower lip, and eventually enter near the cleft. After entering (which they generally do with great caution and circumspection, apparently), they begin again to feed; but their foothold, for some reason or other, seems insecure, and they occasionally slip, as it appears to me, upon this exquisitely soft and velvety 'declining pubescence.' (The nectar is not exuded or smeared over the whole of this surface; but, as before remarked, seems disposed in separate little drops.) I have seen them regain their foothold after slipping, and continue to sip; but always moving slowly, and with apparent caution, as if aware that they are treading on dangerous ground. After sipping their fill, they frequently remain motionless, as if satiated with delights, and in the usual self-congratulatory manner of flies proceed to rub their legs (or hands) together, but, in reality, I suppose, to cleanse them. It is then they betake themselves to flight, strike themselves against the opposite sides of the prison house—either upward or downward, generally the former. Obtaining no perch or foothold they rebound off from this velvety microscopic *cheveux de frise*, which lines the inner surface still lower, until by a series of zigzag, but generally downward falling, flights they finally reach the coarser and more bristly pubescence of the lower chamber, where, entangled somewhat, they struggle frantically (but by means drunk or stupefied), and eventually slide into the pool of death, where, once becoming slimed and saturated with these Lethean waters, they cease from their labours. And even here, although they may cease to struggle, and seem dead, like drowned flies, yet are they only asphyxiated, not by the nectar, but by this 'cool and animating fluid, limped as the morning dew.' After continued asphyxia they die, and after maceration they add to the vigour and sustenance of the plant. And this seems to be the true use of the 'limpid fluid,' for it does not seem to be at all necessary to the killing of the insects (although it does possess that power), the conformation of the funnel of the fly-trap is sufficient to destroy them. They only die the sooner, and the sooner become liquid manure. But let me return from this digression to the

"Entrapment of the Flies.

"As before stated, I could never see any indications of unsteadiness or tottering in the sipping flies—nothing save an occasional slip from the uncertain hold which the peculiar pubescence would give—save once or twice while watching intently I saw a fly disappear so quickly downward that I could not with certainty say whether it was flight or a tumble from stupor or insensibility. But on so many other occasions have I satisfied myself to the contrary, by seeing them fly upward as well as downward, with full vigour of an unharmed, unintoxicated insect, that I altogether reject the idea of stupor. I may state that while watching I observed not a single one escape when the lid was down, but after I had turned it back on most of

the leaves under examination a few, but only a few, escaped. And those which escaped, after sipping to repletion, seemed in no wise inebriated. Indeed, I have still better proof as to the innocuousness of the nectar. The other day, about sun-down, I strolled into the Pine-land, and brought home with me the laminae of perhaps a hundred leaves—all maturing and sweet with the exudation. Some of them were placed on a table after candle-light, and attracted a few hungry flies. They remained many minutes sipping, and would return to sip—seeming to enjoy the evening meal thus afforded them. Of course there could be no entrapment here, as only the honey-bearing portions which I had torn off were exposed; the flies I can only say eat and eat, but no unsteadiness, or tottering, or falling, was in a single instance to be seen, and my guests, after having satisfied their appetites with my repast, retired for the night. This morning, also, the same viands have been temptingly placed before them, and although they have been visiting the board off and on through the day, I have yet to be informed of a single case of intoxication. I have only now a word or two more to say as to the cause of the entrapment from the peculiar conformation of *S. variolaris*. The nectar being found below the lower lip for a half-inch or more, when the fly is satiated and makes for flight, he must do so immediately upward for a very short distance, and then somewhat at right angles to get through the outlet—a somewhat difficult flight, which perhaps of all insects only a fly might be capable of, but which even he probably is not. This, too, upon the supposition that his head is upward, whereas his head is, I believe, generally downward, or at least parallel with the lip. If, in the first position, he attempts flight, he is very apt to strike the arch overhead, and if he escapes, that it is next to an impossibility for him to turn and strike that small space between the projecting (and downward projecting) lid and the lower lip. If, with head downward, he is very apt in flight to strike the opposite wall at a still lower angle, and then from rebound to rebound get lower and lower until he touches the pool. In almost every instance, therefore, a fly once entering is caught." Dr. Mellichamp finally alludes to the light spots, which gives to this species its name of *variolaris*, from a fancied resemblance to the markings of smallpox. These cover the upper and posterior part of the pitcher, and are translucent. Dr. M. suggests, as probably a wild fancy, that this translucent portion may play a part in detaining the flies, by suggesting a direction of escape the very opposite of the only practicable one. As to that, one should not hastily reject a view which goes to show that even this arrangement, which is especially conspicuous in this species, may be of useful account to the plant; that is, if the capture and destruction of flies are useful to it, as I cannot doubt. As to Dr. Mellichamp's capital discovery of the honeyed pathway leading from the ground up to the larger feeding-ground to which ants are thus enticed, it may well be compared with the trail of corn with which hunters are wont to entice wild turkeys into their traps. One cannot imagine anything more curious.—[For the foregoing, which appeared in the *Tribune*, we are indebted to Dr. Asa Gray.—Ed.]

June Weather in the Alps.—The first days of June at the Bel Alp and Eggischhorn were days of extraordinary heat. The snow had disappeared, and the pastures were crowded with Violets and Gentians, while clouds of insects fluttered over the Grass. On the evening of the 13th there was an astonishing display of lightning over the Italian mountains, not forked, but reflected; it thrilled incessantly, flashing with dazzling intensity, where it encountered a suitable cloud. No thunder was audible, and some people thought that none existed. To determine this point the proprietor of the Bel Alp hotel telegraphed to Mont Generosa, inquiring whether a thunderstorm had broken over Italy on the evening of the 13th. The reply was as follows:—"Huit heures soir enorme orage dominant toute haute Italie." On the 14th the temperature had fallen, and cold white clouds wrapped the mountains. Snow fell during the afternoon, evening and night, and on the morning of the 15th the pastures were covered to a depth of 12 inches and more. The snow still covers the slopes and has whitened all the surrounding heights. On the morning of June 17 the Matterhorn, which is usually an obelisk of dark brown rock, was as white as a sugar loaf. The snow was gradually disappearing.—*Times*.

Friendly Criticism.—The rockery, which has formed so attractive a feature at Kew for the last few years has been reorganised and extended. In its present shape it consists of a series of terrace-like ledges arranged in undulating lines. Small peat-beds occupy the recesses at the foot of the rockery, in which are planted sundry gems. Bye-and-bye, when the stones get more thoroughly concealed, and the formal rectangular appearance is thereby obviated, this rock work will be very attractive.—*Gardeners' Chronicle*.

GREAT DESTRUCTION OF VEGETATION.

A STORM, very terrible in its effects on vegetation, took place this day week in the region about Lyons and southwards. Our correspondent, Mr. Jean Sisley of Lyons, writes us particulars which force us to regard the climate of England as not so very bad after all. About Vienne the Vines, which had escaped the destructive frosts of May, were denuded of foliage, the crops generally so injured, and the country laid under ice and water to such an extent that women wept like children at the desolation. The Canton of Montignac has been fearfully ravaged. The hail (says an official reporter) has destroyed all; there are no more trees, Vines, fruit—nothing. The disaster commenced at three o'clock and lasted twenty minutes. The populace were in the greatest consternation; the country people lost everything they possessed, and, it is feared, many were killed, the hail falling on them in pieces nearly as large as eggs. At Oullins the government road was encumbered for a mile in length by the trees overthrown by the storm. To the east of Lyons there were the same ravages; the crops, almost ripe, were entirely lost; it was the same with the fruit trees and Vines. The soil is strewn with leaves and the remains of branches. North of Lyons there were torrents of rain, but no hail to cause serious damage. The glass roofs of the stations at Lyons were completely destroyed. The hailstorm followed in its work of destruction the boundaries of the Rhone and the Isere. To the extreme north of the Isere the ravages were very great, the land torn up, trees disrooted, the branches twisted and torn off Vines, and crops cut to pieces. Numbers of birds were killed in the fields, stunned by the hail. Many persons were much bruised, either by the hailstones or by the fragments of broken glass.

The Weather in the Border Counties.—The summer in this district is the driest that has been experienced for many years. We have had no rain for six weeks, not much then, and very little for weeks previous to that time. I am told by some of the old inhabitants that the river Tweed is smaller now than it was in the memorable year of 1826; many of its tributaries are dried up altogether. Cold bleak east winds are very prevalent; the thermometer outside often rises to 80° in the shade throughout the day, and frequently falls to 35° during the night. Misfortunes never come singly—insects and other pests are destructively plentiful. In favourable seasons summer bedding plants were getting into effect by this time, this year they are looking worse than when they were put out, so that their flowering period will be shorter than usual, and the display meagre. Many Turnip and other seeds, sown near the surface, show no signs of germinating, although they were put in a month ago; Potatoes are showing up well; lawns and pastures are burnt quite brown. The present aspect and future prospects of vegetation in general are anything but bright.—J. MUIR, *Clovenfords*.

Current Earth-Changes.—The State Geologist of Mississippi, Mr. Hilgard, has been engaged in analyses of the soils of that State, in which facts interesting to geologists in other countries have been brought to light. Of the soil of the cotton uplands of Western Mississippi and Tennessee, he reports that it has such a tendency to be washed away, that the "effects of denudation are fast assuming the proportions of a public calamity." Another soil, bad for cultivation, but good for pottery, is known locally as "hog-wallows," because when rain occurs after a drought, it swells and bulges so strangely as to have the appearance of having been resorted to by a herd of porkers. In the calamitous floods which have taken place this year along the shores of the Mississippi, we have once more an evidence that geological convulsions are not exclusively things of the past. The great river has swept away all obstacles, and, as is said, is now cutting a new channel to the sea.

OBITUARY.

WE regret to announce the death of Mr. W. Beattie Booth, which took place on the 18th inst. at his residence, in the New Road, Hammersmith. In old times, he was garden clerk at Chiswick, from which he went to Carclew, a Cornish estate, where he was general manager for very many years. He afterwards held the office of assistant-secretary to the Royal Horticultural Society until its removal to South Kensington. During his long and honourable career he made many friends, to whom his death must be a sad loss.

SOCIETIES AND EXHIBITIONS.

ROYAL BOTANIC SOCIETY.

JUNE 24TH.

THE weather, on this occasion, was most unpropitious, thunder and heavy rains occurring at intervals during the afternoon. As regards the exhibition itself, Palms, New Plants, and Orchids, were all well represented; but the show of fruit was hardly so good as usual, a circumstance owing, perhaps, partly to the comparatively small sum offered in prizes, and partly because the principal growers are keeping back their productions in order to be able to compete for the Veitchian fruit prizes. One of the great attractions of the show was a splendidly grown specimen of *Spiræa palmata*, fully 5 feet high and nearly as much in diameter, a perfect mass of fresh green palmate foliage and glowing clusters of deep rosy flowers. This came from Mr. Strathan, Waddon House, Croydon.

Stove and Greenhouse Plants.—Mr. Ward, gardener to F. Wilkins, Esq., of Leyton, furnished six fine little specimens in this class, notably a variety of *Kalosanthes coccinea*, named Frederick Desbois, literally a mass of bright rosy-scarlet flowers, as delicately perfumed as a Hyacinth; a plant of *Phenocoma prolifera* Barnesii, a model of good culture, the growth being fresh and bright, and the deep rosy-purple flowers highly coloured; a well-bloomed plant of the white-flowered *Erica Eassoniana*; *Ixora aurantiaca*, glowing orange-scarlet; and the deep purplish-blue *Statice profusa*. Mr. J. Wheeler also showed a creditable group in this class. Conspicuous among his plants were *Erica Parmenteria rosea*, a mass of red blossoms; *Bougainvillea glabra*, covered with delicate lilac bracts; and a well-bloomed plant of the pearly-white *Stephanotis*. In the nurserymen's class, Mr. B. S. Williams contributed a good group, including a splendid plant of the choice white-flowered *Erica obbata*, quite 3 feet in diameter; *Dracophyllum gracile*, remarkably well grown; and a splendid mass of the scarlet-spined *Anthurium*; also *Allamanda Hendersonii*, *Erica Cavendishii*, and the rosy *Bougainvillea glabra*. *Dracænas* were staged in splendid condition by Mr. W. Bull, and other growers sent well-grown collections. In Mr. Bull's group were *D. Baptistii*, with bronzy-green foliage, margined with deep rosy-crimson; *D. Chelsonii*, in the way of *D. terminalis stricta*, but more robust, and brighter in colour; *D. amabilis*, one of the finest of all the creamy variegated kinds; *D. Mooreana*, the finest of the bronze-leaved group; and the dense rich crimson-tinted *D. Fraserii*. Palms were shown in good condition by Mr. W. Bull and Mr. B. S. Williams, both of whom contributed fine collections in the nurserymen's class. In the class of eight kinds Mr. Bull had *Kentia Fosteriana*, a vigorous and gracefully pinnate species; *Areca sapida*, with arching pinnate foliage; *Lantana borbonica*, with great fan-shaped leaves; *Hyophorbe Verschaffeltii*, *Chamerops excelsa*, and *Dæmonorops palmbanica*, the last with slender arching pinnate foliage, the petioles being formidably armed with stout clustered spines. Mr. B. S. Williams had a splendid group, in which were *Cocos Weddelliana*, one of the most valuable and elegant of all the pinnate-leaved section; *Chamerops humilis gracilis*, *Astrocaryum mexicanum*, a bright green irregularly pinnate species, the undersides of the leaves being mealy or glaucous; other specimens consisted of *Areca lutescens*, *Phoenix sylvestris*, and the Thief Palm (*Phoenixophorium sechellarum*). In the open class for six Palms Mr. W. Bull had a select group, in which were unique specimens of the dense green-leaved *Pritchardia grandis*, a native of Solomon's Isles, and of which, we believe, there are only two plants in this country; *Euterpe montana*, an extremely elegant species, well adapted as a centre plant for a large dining-table; *Thrinax elegans* and *Kentia Moorei*, the last a highly ornamental and desirable plant. In the amateurs' classes Mr. J. Croucher, gardener to J. T. Peacock, Esq., Sudbury House, Hammersmith, and Mr. R. Butler, gardener to H. H. Gibbs, Esq., Regent's Park, both had well-grown groups. Of fine-foliaged plants, Mr. J. Hudson, gardener to J. C. Inthrum, Esq., Champion Hill, had a well-grown group, in which were fine plants of *Croton pictum* and *C. variegatum*, both well coloured; a fine plant of *Areca sapida*, and well-grown plants of *Yucca aloifolia variegata*, *Zamia villosa*, and *Cycas revoluta*. Mr. Hill also showed a nice group in this class; and, among nurserymen, Mr. B. S. Williams had a good collection, in which *Maranta rosea picta*, with very fine foliage, was conspicuous. In class 6 the same exhibitor showed the old but valuable *Cordylina indivisa*, a splendid mass of *Gleichenia Spelunca*, *Dasyllirion acrotrichum*, and others. Several well-grown and attractive groups of Ferns were exhibited, the principal exhibitors being Mr. J. Ward, Mr. Ritchie, Mr. G. Wheeler, and Mr. Heims, all of whom produced well-grown specimens. Mr. Ward's collection included a splendidly-grown plant of *Todea superba*, nearly 2 feet across, and of a rich deep green colour. In the same collection was a fine plant of *Lomaria hybrida*, a vigorous habited variety, which looks exactly intermediate between *L. gibba* and the robust *Blechnum (corcovadense) braziliensis*. Mr. Wheeler had a nice plant of the beautiful *Adiantum Farleyense*, and other well-grown specimens. Prizes were offered for the best three groups of stove and greenhouse plants, arranged for effect. Mr. B. S. Williams was first with a choice group of Orchids, Ferns, Palms, Cycads, and other plants. Mr. W. Foreman was second with a more tastefully arranged group of commoner plants; and Mr. G. Wheeler came in a good third.

Roses.—Mr. Chas. Turner, of Slough, had a fine bank of small but well-bloomed Roses in pots, and some stands of choice cut blooms of marvellous quality, as did also Mr. Geo. Paul, of Cheshnut. Among other exhibitors, Mr. J. Mitchell, of the Piltown nurseries, had some splendid blooms; and Mr. W. Ingle, gardener to Mrs. Pond, Birch Hall, Colchester, had nice stands of Hybrid Perpetuals and Teas. The last-named

exhibitor had, also, a new seedling H. P. Rose, named Wm. Ingle. It had rather fully expanded flowers, each petal being mottled or striped with rosy-crimson on a pale rosy-lilac ground. It struck us as being distinct in colour and character, although not a first-class flower.

Miscellaneous Subjects.—Messrs. Veitch & Sons had a fine group of new Orchids, Succulents, and foliage plants. This collection included two unnamed *Pescatoreas*, one with bright purple flowers and the other with creamy-white sepals and petals, the apex of each segment being blotched with bright purple, the lip being of a deep purplish-maroon colour; this group also contained a plant of the new yellow variegated *Abutilon Sellowianum marmoratum*, the heart-shaped leaves of which are 8 to 10 inches across, and beautifully blotched with yellow on a dark green ground; a plant of the half-hardy *Begonia Vesuvius* was conspicuous, bearing, as it did, very large rich vermilion coloured flowers. Mr. W. Bull had a fine group of new and rare plants, including nearly all the novelties recently exhibited. Mr. B. S. Williams also staged a very effective bank of Orchids and new plants, as did also Messrs. Rolleston & Sons, of Tooting, the latter had *Phajus bicolor*, *Thunia Bensoniae*, with very large and richly coloured flowers; *Trichopilia tortilis*, an old plant, but in this instance remarkably well flowered; these were relieved by choice foliage plants and Ferns. Mr. John Bester, of the Pine-apple Nursery, exhibited a fine basket of *Lobelia pumila magnifica*, literally a mass of dark blue flowers. Mr. J. Catlin had some well-flowered specimens of scarlet Zonal Pelargoniums, consisting of the following varieties, viz., *Miss Saunders*, fine scarlet and a good truss; *John Williams*, salmon; *Lord Derby*, a profuse flowering variety of the most vivid scarlet, and others equally effective. Mr. D. Pizzey had a fine stand of cut flowers of tree Carnations, which were greatly admired, a remark which also applies to a stand of Pinks from Mr. C. Turner. A splendidly-coloured *Coleus*, named *Duchess of Edinburgh*, came from Mr. Chitty, Stamford Hill. Mr. Parker had a nice group of hardy herbaceous plants in pots; also, a splendid group of cut flowers, neatly arranged in pots of wet sand. These last consisted of *Iris*, *Pyrethrums*, *Delphiniums*, *Spiræa*, and other showy hardy perennials.

Fruit.—Pines: About three dozen fine fruit were staged from different exhibitors, and some were of excellent quality. The finest fruit in the show came from Mr. G. F. Miles, gardener to Lord Carrington, Wycombe Abbey, Bucks, this was a Queen, weighing 5 lbs. 1 oz., and a symmetrical well-swelled fruit. The same grower also had a Providence, rather a coarse fruit, weighing 9 lbs. Grapes were also of excellent quality, Mr. Woodbridge staging some splendid Black Hamburgs, the berries being especially fine and heavily hammered. Mr. Stapleton and Mr. J. Douglas, of Loxford, also had splendid examples remarkably well finished. Mr. Cole, of Ealing, staged some very fine Muscats of that delicate amber tint so highly prized by cultivators. Excellent examples also came from Mr. Smith and Mr. J. Douglas, those exhibited by the last competitor being very fine in the berry. Mr. Tooner staged a fine pot Vine, laden with fine clusters of well-coloured berries, the variety being Black Hamburg, the very best for the purpose. This deservedly obtained a first prize. Peaches and Nectarines generally were of average quality, Mr. D. Pizzey having Noblesse and Royal George in fine condition. Mr. Tillyard's Royal George and Gros Mignonne were also very fine highly-coloured fruit. Mr. W. Kemp had very fine specimens of Hunt's Tawny and Elruge Nectarines in good condition. Mr. Bannerman having *Violette Hative*, and very fine specimens of Downton. Mr. Woodbridge, of Syon, had Elruge and Duc de Telliers, both fine fruit. Strawberries were excellent in every way. Mr. J. Douglas had four splendid boxes, President, La Constante, Seedling No. 1, and British Queen; and Mr. W. Clarke had Wyatt's British Queen, Alice Mande, Comte de Paris, and President, all of unexceptional quality. Mr. Tooner has some splendid British Queens; and Mr. Meadows had a fine box of a large bright-coloured variety, named Premier. Cherries, of excellent quality, came from Mr. Musk, who had wonderful examples of Black Tartarian; Mr. Miles also had splendid fruit of Black Eagle and Black Circassian, both excellent varieties. Melons were shown in quantity, but, owing to the recent dull sunless weather were scarcely up to the usual average as regards flavour. A nice collection of fruit came from Mr. Bone, who had fine Strawberries, Cherries, and Grapes, a good Pine, and nicely-coloured Peaches and Nectarines. Mr. Prant was second with a very nice group.

Certificates of Merit were awarded to the following novelties:—

Dipladenia Brearleyana (Bull).—A remarkably effective-flowering stove climber, already alluded to in our columns.

Bowenia spectabilis (Bull).—This is a very ornamental Cycad, and interesting on account of its being the only known member of the group having bipinnate foliage. It is a noble plant when well grown, having stems from 4 to 5 feet in height, the leaflets being of a bright apple-green colour. It well deserves culture as an ornamental-foliaged plant.

Martinezia granatensis (Bull).—A dwarf irregularly pinnate Palm with spinose petioles, and a very interesting addition to the two species already grown in gardens.

Begonia Vesuvius (Veitch).—One of the best of the new hybrid kinds, having dark glossy foliage and a profusion of large flowers of the most vivid vermilion-scarlet.

Croton Cooperii (Veitch).—A free-growing and ornamental addition to a well-known group.

Tillandsia Zahmii (Veitch).—A very ornamental Bromeliaceous plant, with apple-green foliage striped with brown.

Pescatorea, sp., with purple flowers. (Veitch.)

Pescatorea, sp., with creamy purple-tipped flower. (Veitch.)

Aërides virens Ellisii (Veitch).—A fine form of a well-known Orchid, the raceme of flowers being nearly half a foot in length, and delicately perfumed.

Viola cornuta *Admiration* (Veitch).—A free-flowering form of a well-known bedding and border plant, well deserves cultivation.

Cattleya Mossiae majestica (Veitch).—A very beautiful variety of a favourite Orchid.

