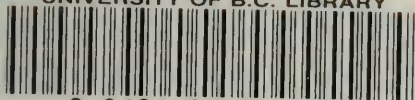


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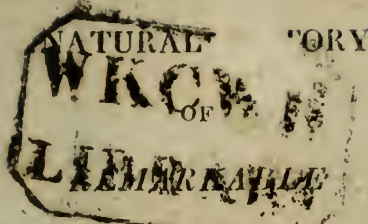




26



NEGRO CLIMBING THE PALM TREE.



TREES, SHRUBS,

AND

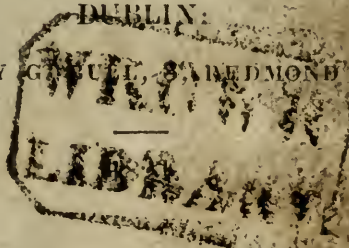
PLANTS.

“And out of the ground, made the Lord God to grow every tree that is pleasant to the sight, and good for food.”

“Not a tree,
A plant, a leaf, a blossom, but contains
A folio volume.—We may read, and read,
And read again; and still find something new,
Something to please, and something to instruct,
E'en in the humble weed.”

DUBLIN:

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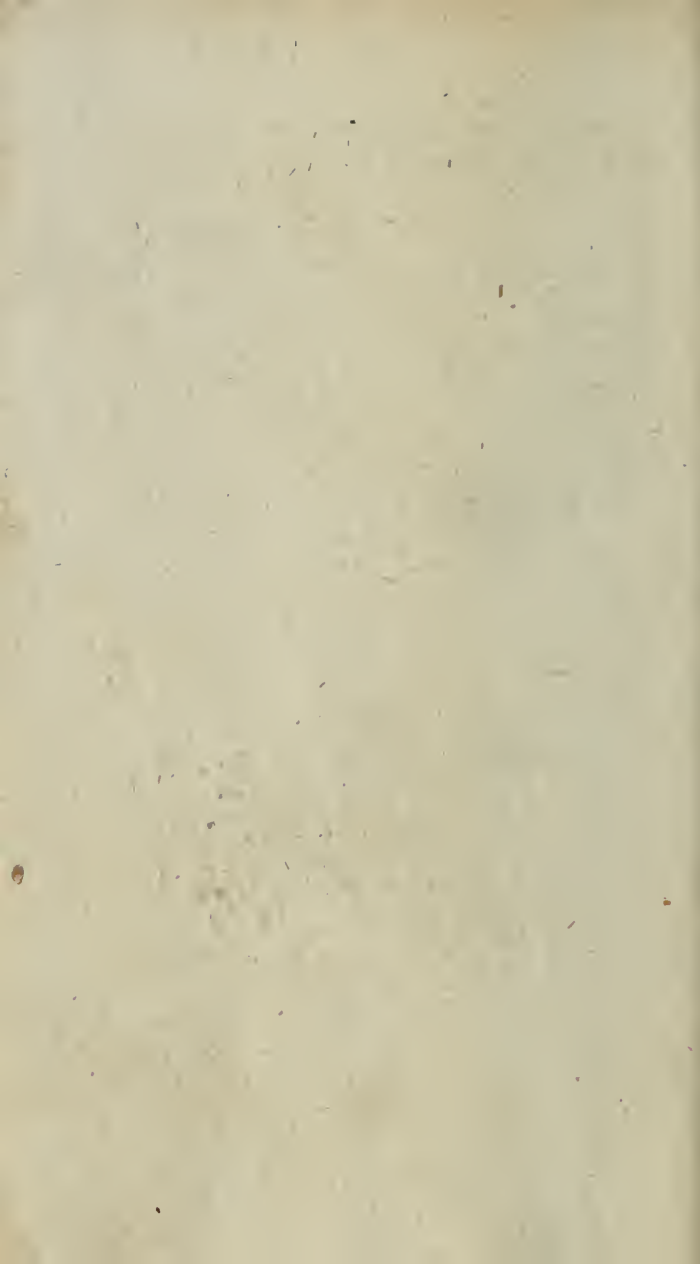


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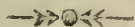
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INTRODUCTION.



BEFORE we enter upon the description of particular Plants, it will be interesting to preface it with a few general observations upon Vegetables, and their mode of production. It will serve, besides, to call forth our admiration and gratitude to the Almighty, for, in every step of the inquiry, we shall trace his power, wisdom, and goodness.

The first of those contrivances, by which Nature provides for the safety of the future Vegetable, is to be observed in the structure of the seed. Every one of these, is furnished with a different sheath, which protects it from injury till it is lodged in the earth. Thus shut up and secured, the seeds are turned over, tossed into sacks, measured, and heaped together, and all without danger. Some of these are placed in the very heart of the fruit, as in apples; others grow in shells or pods, such as peas and beans; a third, besides being shut up in the fruit, is furnished with a wooden shell, as in the almond, apricot, plum, &c. Others, besides their wooden shell, have a bitter rind, which is the case with the walnut; or a covering of prickles to defend the seed till it has arrived at maturity like the chesnut.

We may next remark the manner in which these seeds escape from their enclosure: while shut up, they can be of no service, since the same covering which guards them from injury, also prevents them from growing. This difficulty, however, is removed by the power of Nature, and nuts and shells, which even our teeth cannot penetrate, will gradually divide and make way for the little tender sprouts which proceed from the kernel. Another instance of the care with which nature guards against failure, is to be observed in the mode in which the seed strikes into the ground. No matter in what direction it fall, the root will always strike downward, and the bud find its way into the air. From one end of the grain, issues a green sprout, from the other, a number of fibrous threads. How can this be explained? Why not sprouts to both ends? Why not fibrous threads from both ends? To what is the difference to be referred, but to the wise design of Providence, to the different uses which the parts are thereafter to serve, and which discover themselves in the sequel of the process. The sprout struggles into the air, and becomes the plant, of which, from the first, it contained the rudiments; the fibres shoot into the earth, and thereby both fix the plant to the ground and collect nourishment from the soil for its support. Now, what is not a little remarkable, the parts issuing from the seed, take their respective directions, into whatever position the seed itself happens to be cast. If the seed be thrown into the most unnatural position, that is, if the ends point, in the ground, the reverse of

what they ought to do, every thing nevertheless goes on right. The sprout, after being pushed down a little way, makes a bend and turns upwards; the fibres, on the contrary, after shooting at first upwards, turn down. Without this provision of Providence, the toil and labour of the husbandman would be in vain; if the harvest were to depend upon the position in which the scattered seed is sown, not one in a hundred would fall in a right direction. This is most curious, for though almost all plants rise a little crooked and will even go out of the way to avoid any obstacle in their passage to the surface, and will even make a second bend or elbow if necessary, yet afterwards, they will shoot up straight, never leaving the ground in an inclined direction. This singular circumstance, like many others, is looked upon, every day, without surprize, because we are not accustomed attend to the wonders of nature.

Many plants are more or less sensible to the touch, and to the action of heat and light. The Sensitive Plant, for example, contracts and hangs down its leaves, when slightly touched; there is another, which if a fly perch upon one of its flower leaves, closes instantly, and crushes the insect to death; others are observed opening and closing their leaves at different hours of the day, as if possessed of the instinct of animals, & this singular property has furnished some Naturalists with the idea of a time piece which they call *Flora's Clock*, each plant opening and closing so regularly as to indicate the particular period of the

day. All the different kinds of Clover draw in their leaves together, on an approaching storm, and lastly, a plant has been lately discovered, whose leaves are in continual motion, all day long, but when night approaches, they fall down, from an erect posture, to rest.

A plant has a power of directing its roots for procuring food, and will even, when in a bad situation, make an effort to come at better nourishment. Among the ruins of New Abbey in Galloway, a County in Scotland, there grows on the top of a wall, a Plane Tree, about 20 feet high; straitened for nourishment in this barren situation, it several years ago directed roots down the side of the wall, till they reached the ground 10 feet below; and now, the nourishment it afforded to those roots during the time of their descending is amply repaid, by its having, every year, since that time, made vigorous shoots. From the top of the wall to the surface of the earth, these roots have not thrown out a single fibre, but are now united in a single root.

The next circumstance which excites our wonder, is the manner in which the seeds are dispersed. It was evidently the intention of the Almighty, that every part of the earth should be covered with plants; and for this purpose, he has adapted different kinds to different climates. Some will grow on the highest parts of mountains, and bear also the severest cold, whilst many others will flourish under a burning sun. If every plant, however, was confined to

its own district, in a short time, many kinds would perish by not having room for their growth, or for the propagation of their seeds. The Author of nature has therefore provided for the dispersion of seed in a most wonderful manner. Some are furnished with what we call wings, of which the thistle and dandelion are examples. These are carried by the wind to a considerable distance from the parent plant. Every one has seen those little balloons sailing through the air, but perhaps he has never remarked that the seed, from its greater weight, always keeps its under position, and lights first on the ground, in the direction most favourable for taking root.

Others are furnished with little hooks, by which they stick to animals which brush against them, and carry them to a distance; whilst more are picked up by birds, and dispersed in different places, where they afterwards grow. Lastly, some seed vessels are burst by the sun's heat, and throw out their seeds, with a violent jerk, to some distance.

The re-production of Vegetables, however, is not accomplished by seeds alone; we see every day, at the foot of trees, young shoots which proceed from the roots; and our forests are not perpetuated otherwise than by the roots of the large trunks which are left in the ground, in order that they may throw off suckers; after a certain time, these are separated from the trunk which gave them birth, and planted

in other situations: and sometimes, Plants, as the Strawberry, furnish branches which creep along the surface of the ground to take root at a distance.

We have already seen the manner in which Nature provides for the safety and propagation of the seed. We shall now select the Autumnal Crocus, or Meadow Saffron, as an instance of the care with which the tender parts of the plant are defended from injury.

“I have pitied,” says Dr. Paley, “this plant, a thousand times. Its blossom rises out of the ground apparently in the most forlorn condition possible; without a sheath, a fence, a calyx, or even a leaf to protect it; and that not in the Spring, not to be visited by Summer suns, but under all the disadvantages of the declining year; when we come, however, to look more closely into the structure of this plant, we find, that, instead of its being neglected, Nature has gone out of her course to provide for its security

“The seed vessel, which in other plants is situated within the cup of the flower, or just beneath it, in this plant lies buried ten or twelve inches under ground, within the bulbous root. The tube of the flower, which is seldom more than a few tenths of an inch long, in this plant extends down to the root. The stiles in all cases reach the seed vessel, but it is in this, by a length unknown in any other plant. All these singularities contribute to one end, as this plant blossoms late in the year, and probably would not have time to ripen its seeds before the access of winter, which would destroy them.

“Providence has contrived its structure such, that this important office may be performed at a depth in the earth, out of reach of the usual effects of frost; that is to say, the ripening of the seed, which, in other plants, proceeds within a case, exposed together with the rest of the flower, to the open air, is here carried on, in the Autumn and during the whole Winter, within the heart, as we may say, of the earth; that is, out of the reach of the usual effects of frost. But a new difficulty presents itself; seeds though perfected, are known not to vegetate at this depth in the earth; our seeds, therefore, though so safely lodged, would, after all, be lost to the purpose for which all seeds are intended. Lest this should be the case, a second admirable provision is made to raise them above the surface when they are perfected, and to sow them at a proper distance, viz. the germ grows up in the Spring upon a fruit stalk accompanied with leaves. The seeds now, in common with those of other plants, have the benefit of the Summer, and are sown upon the surface. The order of vegetation, externally, is this:—The plant produces its flower in September; its leaves and fruit in the Spring following.”

In the next place, those plants which are too weak to support their own weight, are furnished with tendrils or clasps, by which they are able to cling to each other, and thus to sustain themselves, or to clasp those which are stronger. In these plants,

says Dr. Paley, from each knot or joint, issue, close to each other, two shoots, one bearing the flower and fruit, the other drawn out into a wire, a long, tapering, spiral tendril that twists itself round any thing which lies within its reach. Considering that in this class, two purposes are to be provided for, and together (the fruitage of the plant and the support of its stalk,) what means could be used more effectual or more mechanical than what this structure presents to our eyes? Why, or how, without a view to this double purpose, do two shoots of such different and appropriate forms, spring from the same joint, from contiguous points of the same stalk? It never happens thus in robust plants, or in trees; we see not (says Ray) so much as one tree, or shrub, or herb, which hath a firm and strong stem, and that is able to mount up and stand, furnished with these tendrils. Make only so simple a comparison as that between a pea and a bean; why does the pea put forth tendrils and the bean not, but because the stalk of the pea cannot support itself; the stalk of the bean can. We may also add, as a circumstance not to be overlooked, that in the pea tribe, these clasps do not make their appearance till they are wanted, till the plant has grown to a height to stand in need of support.

Lastly, we may observe, that the plants which are of greater benefit to mankind, are found in the greatest abundance. How solicitous is Providence

to preserve the different kinds of grasses! They serve as food to our most useful animals, they afford nourishment to birds, and their leaves cover the earth with a carpet the most refreshing to the eye; they grow in any situation, and are calculated to bear the hardest treatment, without being destroyed; the more they are trodden on, the thicker they grow, and their roots increase as their leaves are consumed. Neither the scorching heat of the sun, nor the frosts of winter, destroy them; for we see them on the first opening of Spring, pushing forth the most delightful green, and convincing us that the gloom of Winter is past.

Why does grass spring up so soft and tender to the feet, when, if the nourishment of animals were alone intended, a stronger and more woody stem might have contained an equal quantity of juice,—and why do trees rise to some height from the earth, before they send off side branches? Let us remark the final cause of these differences of growth, that we may feel a more enlarged gratitude to the Almighty, whose paternal care is visible in all his works.

If the grasses which are so soft to the feet had been furnished with a woody stem, we should be unable to walk on the turf, and deprived of all approach to the meadows; and on the other hand, if the trunks of trees, instead of rising to a certain height before they send off branches, had produced

them nearer to the ground, the woods and groves would have formed an impenetrable barrier.

The care of Providence is also particularly remarkable in this, that animals prefer the leaves of the grasses, and if left at liberty to consult their choice, will not touch the straws which support the flowers, and, therefore, are necessary to the ripening of the seed.

In the deserts of America, a plant is seen growing like the Mistletoe, on the tops of trees, and having its leaves turned, at the base, into the shape of a pitcher; in this the rain is collected and preserved for the benefit of birds and other animals. The Water Tree in Ceylon, also produces round bladders covered with a lid, into which the plant itself pumps up a pure and refreshing water, and there is likewise a kind of Cuckoo Pint in New France, which, when cut, will afford a pint of excellent water.

In fact, the different vegetable productions are no less numerous than useful. The purposes to which our native trees are applied, are well known, from the Willow that forms the basket, to the Oak, which forms the ship that is to bring us the produce of the most distant countries. Each possesses different qualities, and is applied to different purposes; the meanest have their use; even the Thistle is not only the food of the patient ass, but is serviceable in making glass. There is scarcely a plant which, although rejected by some animals, is not preferred

by others. The horse leaves the common Water Hemlock to the goat; and the cow, the long-leaved Water Hemlock to the sheep. The goat, in return, yields the barn berries to the horse, and even the spurge is gradually devoured by some of the insect tribe. Some plants, as rhubarb and opium, relieve the pains of disease, and others, like Peruvian Bark, are given in fever. When the heat of the climate prevents wheat from growing, its place is well supplied by the Bread Fruit, the Cassavi root, and Maize, and more particularly by Rice, which is the common food of a great part of the immense population of Southern Asia. The wild Pine of Campeachy retains the rain water in its deep leaves, not less for the refreshment of the tree itself, than of the thirsty native. A tree also has lately been discovered in South America, the juice of which affords a nourishing milk, and, from this circumstance, it has been named the Cow-tree. The travellers who mention it were informed, that the negroes always acquire flesh at the season when the Cow-tree yields the greatest quantity of this sap, and prefer it to animal milk.

The Cocoa of the West Indies answers many of the most useful purposes. The whole of Lapland is too barren, and the climate too severe for the growth of corn; but as a compensation, the surface of the ground is covered with a low and stunted moss, which the rein deer digs from beneath the snow in

winter: and thus, this animal, which gives food and clothing to its owner, is supported. On the bleak mountains of the same country, the Pine, the Fir, and many resinous trees grow, which shelter man from the snows by the closeness of their foliage, and furnish him in winter with torches and fuel.

It is thus we discover the Almighty Creator of all things in his works. We cannot with our earthly sight behold his presence, but we can every where trace his benevolence and wisdom; wherever a plant takes root, or an animal appears, there we discover his workmanship; and we should ever recollect, that they were not formed by him to be looked on with a careless or inattentive eye; but, that discovering the marks of his Almighty power, and of his benevolence to man, we should learn from them a constant reverence for the Deity, and a steady and hearty obedience to his laws.



THE
NATURAL HISTORY
OF
REMARKABLE TREES,
&c. &c.



THE OLIVE TREE.

THE Olive Tree deserves to be placed in the first rank amongst those which are of most use to mankind, and cannot be too highly valued for the oil which is extracted from its fruit.

Considered merely as to its appearance, the Olive is not striking. It is an evergreen, with oval leaves, which have a near resemblance to those of the willow, and grow opposite to each other; of these, the upper side is a pale shining green, while the under side is whitish. The flowers are disposed in bunches, and give an agreeable smell, but the whole plant is of such a dull colour, that it would hardly deserve attention, if its fruit did not enrich the inhabitants of the southern countries of Europe, and benefit so large a portion of mankind. Considered in this light, it truly deserves the title which was given to it by ancient writers, who call it the first of trees.

This plant is found on the northern coast of Africa, and in Asia Minor, but it is cultivated with most success in the South of France, in Italy and in Spain; in the more northern parts of Europe, it will not grow, being extremely sensible to the impression of cold. On this account, even where the climate is favourable for their cultivation, the planter's chief care is to give them a southern aspect, and to supply them with a constant and regular heat. As a proof that warmth is the chief source from which these plants derive their vigour; the Olives planted in India, and in South America, produce fruit three times as large, as those cultivated in France, though not so well flavoured, for want of the necessary care. The stem of the Olive is seldom allowed to rise to the height of twenty feet, in order that the heat of the sun reflected from the earth may be stronger, the fruit sooner ripened, and the crop collected with more ease. It is also necessary to scrape the rough bark from the trunk, since it harbours insects during the winter, and retains the wet, which renders the tree more easily affected by cold. It is said to be by no means rare to find the trunk of the Olive tree rotten from top to bottom, and pierced through in every direction.

The fruit is applied to two uses. When intended for preservation, it is gathered before it is quite ripe, and put into a pickle of salt and water, flavoured with aromatic herbs; in this state, it is used by the rich merely to sti-

mulate the appetite, and therefore we shall pass to its more important and serviceable qualities. When it is intended to extract the oil which it yields in such abundance, the Olives are, in November or December, gathered just at the proper degree of ripeness, for the extreme either way will be prejudicial; the leaves also are found to give an unpleasant bitterness, and therefore must be carefully separated; they are then put into baskets, or into bags made of wool and hair, and pressed immediately. The oil extracted from the pulp alone, is the purest that can be obtained. This is much used throughout Europe, in various preparations of food, and in medicine is found useful for many complaints; it will also keep for several years, but that expressed from both the pulp and the kernel in mills, is always inferior, and is very apt to become rancid.—Where the Olive is over-ripe, it yields a large quantity of oil, which, however, is of an indifferent quality, and is made use of only in soap manufactories, and for burning in lamps. In former times, the luxurious Romans were accustomed to rub their bodies over with this oil, on coming out of the warm bath; they conceived it had the effect of softening the skin, and keeping the pores of the body in an open and proper state. Their wrestlers also used to anoint themselves with it, before they contended, in order to make their limbs more supple. From the earliest ages of the world, the Olive has been the symbol of peace and con-

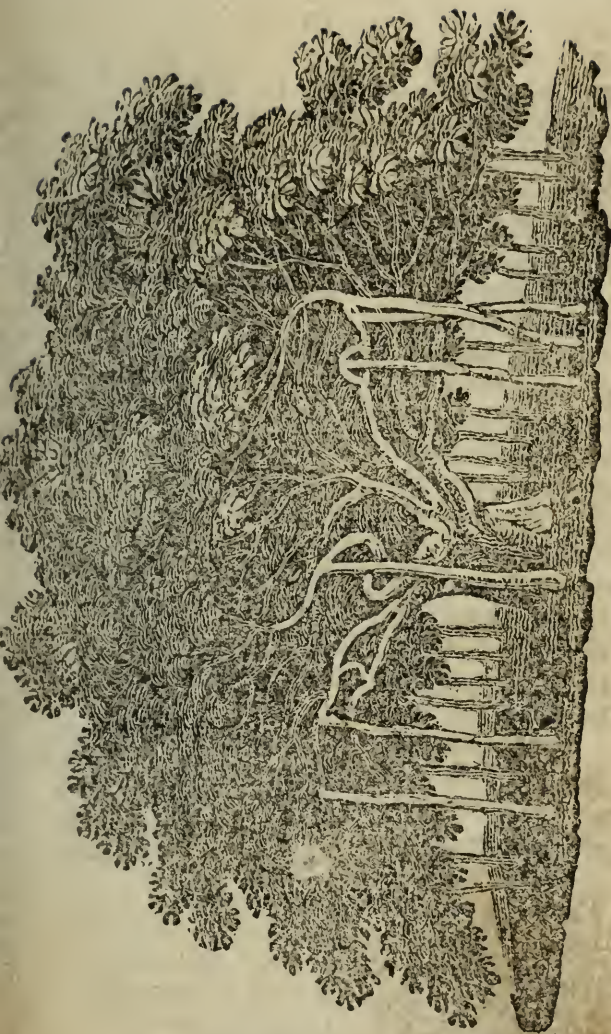
cord, and this use is marked, in common speech, by various expressions—to hold out the olive-branch, signifies peaceful intentions, and a wish for reconciliation; and this application of it is sanctified by an event which is familiar to most people: When the anger of God Almighty had punished the wickedness of man by a flood, an olive-branch was the indication to Noah and those with him in the Ark, that the waters had decreased from off the face of the earth, and that the soil was once more permitted to bring forth the fruit-bearing tree for the support of Animals.



THE BANYAN TREE, OR INDIAN FIG.

THE Banyan Tree, or Indian Fig, is a native of several parts of the East Indies. It has a stem, branching to a great height and vast extent, with heart-shaped entire leaves, ending in acute points. This tree is beautifully described by MILTON:—

There soon they choose
The fig-tree: not that kind for fruit renowned;
But such as, at this day, to Indians known
In Malabar or Decan, spreads her arms,
Branching so broad and long, that in the ground
The bending twigs take root, and daughters grow
About the mother tree, a pillar'd shade
High over arched, and echoing walks between.
There oft the Indian herdsman, shunning heat,
Shelters in cool, and tends his pasturing herds
At loop-holes cut through thickest shade.



THE BANYAN TREE.

Indeed, the Banyan Tree is the most beautiful of Nature's productions, in that genial climate, where she sports with so much profusion and variety. Some of the trees are of amazing size and great extent, as they are continually increasing, and, contrary to most other things in animal and vegetable life, they seem to be exempt from decay.

Every branch from the main body throws out its own roots; at first in small tender fibres, several yards from the ground: these continually grow thicker, until they reach the surface; and there striking in, they increase to large trunks, and become Parent trees shooting out new branches from the top: these in time suspend their roots, which swelling into trunks, produce other branches; thus continuing in a state of progression, as long as the earth the first parent of them all, contributes her sustenance.

The Hindoos are peculiarly fond of the Banyan Tree. They look upon it as an emblem of the Deity; from its long duration, its outstretching arms, and overshadowing beneficence. Near these trees, the most esteemed Pagodas are generally erected; under their shade, the Brahmins spend much of their time in religious solitude: and the natives of all casts and tribes are fond of recreating in the cool recesses, beautiful walks, and lovely openings, of this shady canopy, impervious to the hottest beams of the sun. One of these trees is mentioned by an ancient writer, to have co-

covered five acres of ground and to have extended its branches so far, that ten thousand men might easily have encamped under it.

A remarkably large tree of this kind is distinguished by the name of Cubbeer Burr, which was given it in honour of a famous saint. It was once much larger than at present; yet what remains is about 2000 feet in circumference, measured round the principal stems; the overhanging branches, not yet struck down, cover a much larger space. The chief trunks of this single tree (which in size greatly exceed our English elms and oaks) amount to 50; the smaller stems, formed into strong supporters, are more than 3000; and every one of these is casting out new branches and hanging roots, in time to form trunks, and become the parents of a future progeny.

Cubbeer Burr is famed throughout Hindostan for its great extent and beauty: the Indian armies generally encamp around it: and at stated seasons, solemn Hindoo festivals are held there, to which thousands of votaries repair. It is said that 7000 persons find ample room to repose under its shade. The English gentlemen, on their hunting and shooting parties, used to form extensive encampments, and spend weeks together under this delightful avilion; which is generally filled with green wood pigeons, doves, peacocks, and a variety of feathered songsters: crowded with squirrels, snakes, and families of monkeys, performing their antic tricks: and shaded by bats of large

size, many of them measuring upwards of six feet from the extremity of one wing to the other.

This tree not only affords shelter, but sustenance to all its inhabitants ; being covered amidst its bright foliage with small figs of a rich scarlet, which are exceedingly pleasant to the taste.

In the neighbourhood of the tree which we have been describing, a certain Indian Chief resided some years ago, who was extremely fond of field sports. He used frequently to encamp under it in magnificent style, having a saloon, dining room, drawing room, bed chamber, bath kitchen, and every other accommodation, all in separate tents : yet did this noble tree cover the whole, together with his carriages, horses, camels, elephants, guards and attendants ; while its spreading branches afforded shady spots for the tents of his friends, with their servants and cattle.

I have often (says Mr. Forbes, whose account we give) admired the parental affection of those monkeys which fill the branches of the tree, to their young offspring. They may be seen teaching them to select their food, to exert themselves in jumping from bough to bough, and then in taking more extensive leaps from tree to tree ; encouraging them by caresses when fearful, and menacing and even beating them, when refractory. Knowing by instinct the malignity of the snakes, they are

most vigilant in their destruction ; they seize them, when asleep, by the neck, and running to the nearest flat stone, kill them by frequently striking their heads against it. When convinced that the venomous fangs are destroyed, they toss the reptiles to their young ones to play with, and seem to rejoice in the destruction of their enemy.

On a shooting party under this tree a sportsman, not long since, killed a female monkey : and carried it to his tent, which was soon surrounded by 40 or 50 of the tribe, who made a great noise, and, in a threatening manner, advanced towards it. On presenting his fowling-piece, they retreated and appeared irresolute ; but one, which from his age and station in the van, seemed the head of the troop, stood his ground, chattering and menacing in a furious manner, nor could any efforts less cruel than firing, drive him off. He at length approached the tent door, when finding his threatenings were of no avail, he began a lamentable moaning, and by every token of grief seemed to beg the body of the deceased. On this, it was given to him, when he embraced it with much appearance of sorrow, and carried it off with a sort of triumph to his expecting comrades.



THE SUGAR CANE.

This plant, which has become of such vast importance to mankind, is found in several parts of the world. It has been seen by travel-

lers in Upper Egypt, in Africa, in Japan, in the South Sea Islands, and we are even told that it grows in Sicily.

The account of a plant of such consequence, producing so much revenue to our country, and affording employment, both in its cultivation and produce, to so many thousands of our fellow-creatures, must not be slightly passed over: we shall therefore describe the different states it goes through, from the time it is planted in the ground till it reaches our market as sugar.

The Sugar Cane which yields us such an agreeable juice, is like the reeds we see in morasses and on the edges of lakes, except that the skin of these latter is hard and dry, and their pith void of juice, whereas the skin of the Sugar Cane is soft, and the pith very juicy, though in a greater or less degree according to the goodness of the soil, its exposure to the sun, the season it is cut in, and its age. It is topped by a bunch of leaves or blades, sharply notched at the edges like a saw. The body of the Cane is strong but brittle, and contains a soft pithy substance, which affords a large supply of juice. The joints of the Cane are generally from one to three inches in length, and about an inch in diameter; they shoot up sometimes to the height of seven feet, exclusive of the top which bears the leaves. The plants when seen collectively, have a very pretty effect, and a field of them in the month of November, in full blossom, is one of the most

beautiful productions that the pen can describe. When ripe, their colour is of a bright golden yellow, and when exposed to the sun, it is in many parts very beautifully streaked with red. The top is dark green at first, but at length becomes a brownish yellow. From the center of the leaves, shoots up an arrow like a silver wand, from two to six feet in height, producing from its summit, a plume of delicate white feathers, which are fringed with yellow.

We shall now proceed to the manner in which it is cultivated for commercial purposes, after which, we shall give a short description of the mode of making sugar, as it is practised at present in the West Indies.

The quantity of land intended to be planted, being cleared of weeds, is divided into plots of about 20 acres, each of which is subdivided by means of a line and wooden pegs, into small squares of three feet and a half, and in every square, two cuttings are placed at the depth of six inches, and covered with earth. In twelve or fourteen days, the young sprouts begin to appear; and as soon as they rise a few inches above ground, should be carefully cleared of weeds, and earthed. The lateral suckers, which spring up after the canes begin to joint, are now removed, as they seldom come to maturity, and only serve to draw nourishment from the original plant.

The best season for planting is between the months of August and November, the Canes being thus less liable to be injured by the hea-

vy rains and high winds with which the West India Islands are so frequently visited.

All the precautions, however, which can possibly be taken by the most experienced planter, will not always secure a crop. The Sugar Cane is subject to a disease called a blast, for which no remedy has hitherto been found: it consists of millions of little insects, whose proper food is the juice of the Cane, in search of which they wound the tender blades, and consequently destroy the vessels. The growth of the plant is thus checked, until it withers or dies in proportion to the degree of the ravage.

These insects are not the only enemies which the planters have to contend with. The Canes are likewise much damaged by monkeys and rats, which however are more easily destroyed. The former come down from their retreats in silent parties, during the night, and having posted sentinels, to give the alarm if any thing approaches, they destroy incredible quantities of the Cane by their gambols, as well as by their greediness. It is in vain to lay traps for these creatures, however baited, and the only way to protect the plantations, is to set a numerous watch, well armed with fowling-pieces and provided with dogs. The negroes on the different plantations, who think their flesh very good eating, are always ready to perform this part of the service.

In the lowland plantations, the rats also do a vast deal of mischief. They are said to have

been introduced from Europe by the shipping, and have since multiplied prodigiously, breeding in the ground under loose stones and bushes. These, also are considered by the field negroes as choice food, and are even said to be publicly sold in the markets of Jamaica.

The Canes are cut in the British West India Islands, towards the end of February, or in March and April, as they are then as ripe as the nature of the soil will allow them to be: at this season, the nutritive quality of the sugar at once becomes apparent amongst the working negroes and the different animals employed upon the plantations; such indeed is the pleasure they derive from it, that the time of crop in the sugar islands, is the season of gladness and festivity to man and beast; "so palatable, salutary, and nourishing," says Mr. Edwards, "is the juice of the Cane, that every individual of the animal creation, derives health and vigour from its use, in a few weeks after the mill is set in action. The labouring horses, oxen and mules, though almost constantly at work during this season, yet, being indulged with plenty of the green tops of this noble vegetable, and some of the scummings from the boiling house, improve more than at any other season of the year."

The Canes being gathered, are carried to the mill, where the juice is squeezed out by pressing them between huge iron rollers; it is then boiled with lime water, which makes a thick scum rise to the top; the clear liquor is allowed

to run off below, and after repeated boilings, which thicken it very much, it is suffered to crystallize into the appearance of our brown sugar, by standing in a vessel, the bottom of which is pierced with several holes in order that the syrup may drain off; what remains from this process is called molasses, from which rum is obtained by distillation,

To form loaf sugar, which is only the same, cleared of its impurities; the brown sugar is dissolved in water, and being mixed with whites of eggs or bullock's blood, is again put into the boiler; the liquor thus throws up a thick scum to the surface, and the clear substance, rendered thick by boiling, is poured into moulds of the same shape as a sugar-loaf. An additional process however is required to whiten it; for this effect the mould is turned point downwards, and its broad end covered with clay, through which water is made to pass; the water slowly trickling through the sugar, unites with and carries off the matter which discolours it, leaving the whole perfectly white.

Sugar Candy is made by allowing the liquor, which has been thickened by repeated boiling, to cool slowly, Barley Sugar, is sugar melted by heat, and afterwards cooled in moulds of a spiral form.

In several parts of North America, sugar is obtained from the juice of the maple tree by boiling it; it has also been made, in large quantities in Prussia, and France, from an extract of beet root.

The sugar-house of a refiner is a large building, consisting of six or seven floors, and the utensils necessary to perform the different operations, require the aid of various workmen; the pans, coolers, cisterns, syrup-pipes, basons, ladles, skimmers, and sometimes the candy pots are made of copper; pipes, pumps and cisterns made of lead are also used. The iron foundry supplies bars of a triangular form, to be laid under the pans; also the cockle, which is an iron trunk, used to dry the goods in the stove, iron doors, &c.

The carpenter is required to furnish racks, troughs, stools, blocks, coolers, oars and tubs; and backs, to hold the lime water, which contain from thirty to two hundred barrels, employ the back maker. The wicker work consists of refining baskets, scum baskets, pulling up baskets, coal and clay baskets, &c. Thus, we consider the numbers employed in making these different utensils, and also in building the ships used in bringing over the sugar; we may suppose that we do not taste a lump of sugar that is not produced by the labour of a thousand hands.

And yet we too often use the conveniences of life in a careless, wasteful manner, without reflecting one moment on the trouble necessary to procure them.

THE ANCHAR, OR POISON TREE OF JAVA.

THE Anchar is one of the largest trees in the forests of Java; the trunk is circular, straight, and rises completely naked to the height of sixty, seventy, or eighty feet; it is covered with a whitish bark, which, upon being wounded, yields plentifully the juice from which the celebrated poison is prepared. An incision being made into the tree, the sap oozes out, of a yellowish colour from old trees, but paler from those that are young; exposed to the air, its surface becomes brown; the inner bark is close and fibrous, resembling when separated and cleansed, a coarse piece of linen; it has been worked into ropes which are very strong, and by the poorer classes woven into a coarse stuff, which they wear when working in the fields; but it requires much bruising and washing before it can be used, since, even when it appears completely purified, persons wearing this dress, being exposed to rain, are affected with an intolerable itching; it is occasioned by a small quantity of the gum which still adheres to the stuff, and produces, when exposed to wet, this irritating effect.

The stem of the Anchar having risen to the above mentioned height, sends off some stout branches, which divide into smaller ones, forming an irregular crown; the poisonous juice is collected from the bark, which when punctured, will yield a large quantity, so that a cup full may, in a short time, be collected from a full sized tree. The inhabitants however are not easily induced to assist in collect-

ing it, as they fear an eruption of the skin, which is always the consequence of the gum touching them. The Anchar, like the trees in its neighbourhood, is on all sides surrounded by shrubs and plants, and in no instance can it be observed injurious to vegetation. One of the largest trees of the kind is mentioned as being so completely environed by the common shrubs of the forest in which it grew, that it was with difficulty approached ; several vines and climbing plants, also, in perfect health, adhered to it, and ascended to nearly half its height ; this last particular in the history of the tree is interesting, as it disproves an opinion which long prevailed in Europe, that it occasions a barrenness in the ground for a considerable distance round the spot where it grows. No plant would flourish, it was said, even within twelve miles of it ; and even birds had been known to drop dead in their flight, when the dour of the tree was blown upon them by the wind. The account, which was for a long time believed in Europe, is curious, as a proof that mankind are easily imposed upon, and may be useful to relate, if it teaches us that we should always doubt the truth of what appears to be marvellous, unless it is supported by testimony on which we can rely ; it was drawn up by a Dutch naturalist of the name of Foersch, who pretended to have collected the particulars from persons of veracity.

“ I must acknowledge,” says he, “ that I long doubted the existence of this tree, until a stricter inquiry convinced me of my error. I

shall now only relate simple unadorned facts, of which I have been an eye witness ; my readers may depend on the fidelity of my account. In the year 1774, I was stationed at Batavia ; during my residence there, I received several different accounts of the Upas tree, and the violent effects of its poison ; they all then seemed incredible to me, but raised my curiosity in so high a degree, that I resolved to investigate this subject thoroughly, and to trust only to my own observation. In consequence of this resolution, I applied to the Governor General for a pass to travel through the country ; my request was granted, and having procured every information, I set out on my expedition ; I had procured a recommendation from an old Malayan priest to another priest, who lives on the nearest habitable spot to the tree, which is about 15 or 16 miles distant. The latter proved of great service to me in my undertaking, as he is appointed by the emperor to reside there, in order to prepare for eternity the souls of those who, for different crimes, are sentenced to approach the tree and to procure the poison.

“The Upas Tree is situated in the island of Java, about 27 leagues from Batavia ; it is surrounded on all sides by a circle of high hills, and the country round it, to the distance of 10 or 12 miles from the tree, is entirely barren ; not a tree nor a shrub nor even the least plant or grass is to be seen. I have made the tour all round this dangerous spot at about 18 miles distance, and I found the aspect of the country on

all sides equally dreary ; the easiest ascent of the hills is from that part where the old ecclesiastic dwells ; from his house, the criminals are sent for the poison, into which the tops of all warlike instruments are dipped ; the malefactors, who for their crimes are sentenced to die, are the only persons who fetch the poison, and this is the only chance they have of saving their lives. After sentence is pronounced on them by the judge, they are asked in court, whether they will die by the hands of the executioner, or go to the Upas Tree for a box of poison ; they commonly prefer the latter proposal, as there is not only some chance of preserving their lives, but also a certainty, in case of their return, that a provision will be made for them in future by the emperor. They are then provided with a silver or tortoise-shell box in which they are to put the poisonous gum, and are properly instructed how to proceed while they are on their dangerous expedition ; among other particulars, they are always told to attend to the direction of the winds, as they are to go to the tree before the wind so that the pestilential smell may be blown from them ; they are told likewise to travel with the utmost dispatch, as that is the only method of ensuring a safe return ; they are afterwards sent to the house of the priest, to which place they are commonly attended by their friends and relations ; here they generally remain for some days in expectation of a favourable breeze, during which the ecclesiastic prepares them for their future fate, by prayers and admonitions.

“When the hour of their departure arrives, the priest puts on them a long leather cap, with two glasses before their eyes, which generally comes down as far as their breast, and also provides them with a pair of leather gloves; they are then conducted by the priest and their friends and relations, about two miles on their journey. Here the priest repeats his instructions, and tells them where they are to look for the tree; he shews them a hill which they are to ascend, and tells them, that on the other side, they will find a rivulet which they are to follow, and which will conduct them directly to the Upas; they now take leave of each other, and amidst prayers for their success, the delinquents hasten away.

“The worthy old ecclesiastic has assured me, that during his residence there for upwards of thirty years, he had dismissed above 700 criminals in the manner which I have described, and that scarcely 2 out of 20 have returned. I was also present at some of these melancholy ceremonies, and desired different delinquents to bring with them some pieces of the wood, or a small branch or some leaves of this wonderful tree; I have also given them silk cords to measure its thickness; I never could procure more than 2 dry leaves that were picked up by one of them on his return; and all I could learn from him concerning the tree itself was; that it stood on the border of a rivulet, that it was of a middling size, that 5 or 6 young trees of the same kind stood close to it; but that no

other shrub or plant could be seen near it, and that the ground was of a brownish sand, full of stones, almost impracticable for travelling, and covered with dead bodies.

“ However incredible it may appear, this is certain, that from 15 to 18 miles round this tree, not only no human creature can exist, but also no living animal of any kind has ever been discovered ; I have also been assured by several persons of veracity, that there are no fish in the waters, nor has any rat, mouse, or any other kind of vermin been seen there ; and when any birds fly so near this tree that the effluvia reaches them, they are immediately killed by the poison. This circumstance has been ascertained by different delinquents, who in their return, have seen the birds drop down, and have picked them up dead, and brought them to the old ecclesiastic, I have said that malefactors are instructed to go to the tree with the wind and to return against the wind. When the wind continues to blow from the same quarter, while the delinquent travels 30 or 36 miles, if he be of a good constitution, he certainly survives ; but what proves most destructive is, that there is no dependence on the wind, in that part of the world, for any length of time ; it never blows a fresh, regular gale, but is commonly a current of light, soft breezes, which make their way through the different openings of the adjoining mountains.

“ In the year 1776, I was present at the execution of thirteen criminals. It was in the

forenoon when they were led into an open space ; there the judge passed sentence upon them, by which they were condemned to suffer death by a lancet poisoned with Upas. Thirteen posts had been previously erected, each about 5 feet high, to which they were fastened and their breasts stripped naked ; in this situation they remained a short time in prayer, until a signal was given by the judge to the executioner, on which the latter produced an instrument, much like the spring-lancet used by farriers for bleeding horses : with this instrument, it being poisoned with the gum of the Upas, the unhappy culprits were lanced in the middle of their breast, and the operation was performed on all in less than two minutes. My astonishment was raised to the highest degree when I beheld the sudden effects of the poison, for in 16 minutes by my watch, which I held in my hand, all the criminals were no more ; their pain began in five minutes after the wound had been inflicted, and continued increasing till death released them from suffering."

This account was for thirty years believed in Europe, for though the whole appeared extraordinary, no sufficient reason could be assigned, why the relator should invent such a falsehood ; we are now convinced, from the statement of more accurate travellers, that a tree is found in Java, the poison of which is of the most venomous description, but that it causes no barrenness in its vicinity, since se-

Several creeping plants are found twining them-
 selves round its branches, without experiencing
 any injury from the noxious quality of its sap ;
 and that the collecting of the gum is not at-
 tended with the danger which is here descri-
 bed. When the poison of the Anchar is given
 to the lower animals, its effects are very rapid,
 tho' the force with which it acts, is sometimes
 found to vary with the size of the blood vessel
 wounded, and the quantity of poison carried in-
 to the circulation ; in general, it causes death
 in 26 minutes, sometimes in half that time. A
 buffalo, one of the largest quadrupeds of the
 Island, died in about two hours. The effects
 upon the human system, it is not easy to deter-
 mine; the only credible information on the sub-
 ject, is given by one who had an opportunity
 of personally observing the effect of the poi-
 soned darts, which were used by the natives of
 Macassar in their attacks on Amboyna in 1650.
 Speaking of their operation, he says, the poi-
 son touching the warm blood is instantly car-
 ried through the whole body, so that it may be
 felt in all the veins, causing an excessive burn-
 ing, which is followed by fainting and death.
 After proving mortal to many of the Dutch
 soldiers at Amboyna, an infallible remedy was
 found in a certain root, which, if timely applied,
 counteracted its poisonous effects. This is a
 striking proof, that in the wise arrangement
 of providence, there is no evil without a reme-
 dy: the bad passions of mankind have applied
 the juices of this tree to a mischievous purpose,

but we find an antidote growing in the very neighbourhood. It may also be remarked that such baneful trees as the Anchar, are not commonly found, whilst on the other hand Divine goodness has produced in the greatest plenty, and in all countries, those which are useful and beneficial.



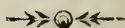
PAPYRUS.

ALTHOUGH the Papyrus has long ceased to be useful, it still deserves to be noticed, since it was from this plant that the ancients manufactured their paper; independant of which, it was applied by the Egyptians to other useful purposes: the roots served them for fire wood and were frequently formed into different domestic utensils—of the stems plaited together they made a kind of boat; and from the inner bark they made their sails, mats, their clothes cordage, and the coverlets of their beds. The boats made of the Papyrus were like great baskets, covered over with a plaister of resin to keep out the water: it was probably in a vessel of this kind that Moses was exposed, when found by Pharaoh's daughter, on the banks of the Nile. Lastly, the inhabitants of that part of Africa which borders on the Nile, were accustomed to eat the lower parts of the stem after baking it to render it more palatable and Bruce assures us, that in Abyssinia they pursue the same practice.

The Papyrus is no longer manufactured into paper ; that which is prepared from old linen being found better adapted for the purpose of writing on : it may be interesting, however, to know the manner in which it was made, as it was undoubtedly by far the most useful application of the plant. For this purpose, the thick part of the stalk being cut in two, the thin skin between the pith and the bark was stripped off by a pointed instrument. This was squared at the sides, so as to be like a ribband, then laid upon a smooth table, and cut to the length that the leaf was required to be, generally about a foot long, and half a foot broad ; on both sides of these leaves they wrote with a reed, as is still practised by the Egyptians and Abyssinians, making use of an ink so durable, that what was written eleven centuries ago, is still as legible as ever.

Formerly the Papyrus grew to the height of fifteen feet ; at present none are seen to rise above ten feet, probably because they are allowed to grow too thick together, without being weeded. The stalk is of a deep green, thickest at the bottom, and tapering to the top. Its form is triangular ; and it is observed that growing generally in rivers, where the violence of the stream would be likely to bear it down, the point of the triangle, and not the side, always faces the current, (just as we construct the buttress of a bridge, to diminish the pressure of the water,) an instance of the wisdom and design which are observable in all the

works of Providence ! The head is composed of a number of filaments, like blades of grass, each about a foot long ; and the root large and strong, though not perhaps so much so as when the plant was fifteen feet high : it is still, however, hard and solid near the heart, and works with the turning loom tolerably well, as it did formerly, when they made cups of it.



THE CORK TREE.

THIS tree, which is a kind of Oak, is so sensible of cold, that it cannot bear the frosts of the northern parts of France ; to the south, however, it flourishes in great perfection, and is also found in Italy and Spain. In the hard winter of 1709, most of the Cork Trees in France were destroyed, but the damage was in time repaired, and they, at length, became as numerous as before. The various uses to which the bark of this tree is applied, are well known. The acorns, which have a sweetish taste, not only serve to feed hogs and poultry, but are likewise useful to mankind, who, in time of scarcity, have used them as food.—When the trees have attained the age of twelve or fifteen years, the bark is removed for the first time ; but the cork, at this time, is only fit to burn. Seven or eight years after, it is again removed, but still it is far from being of a good quality, and is only fit for buoys and other common purposes. This operation is repeated when the trees are about thirty years old, and

then the bark is found to be of a superior nature, and fit for all the purposes to which cork is applied. It should be remarked, that the best bark is obtained from the oldest trees, and that the removal of this substance is far from proving injurious to the plant; since a Cork Tree that is barked every eight or nine years, will live for 150 years, and some times longer.

In July and August, the persons employed upon the Cork Trees begin to strip off the bark. With a small hatchet, they slit the bark from the top of the tree to the bottom, and then make an incision round the trunk, at each end of the slit. After this is done, the bark is well beaten, in order to loosen it from the tree, and then raised from the wood. In this part of the business, the people are careful not to damage the fine skin that adheres to the body of the tree, lest they should be deprived of a future harvest; for when this is removed, the cork ceases to grow until it is renewed, which does not happen for many years. The cork is cut into pieces of four or five feet in length, and afterwards scraped, to render the surface even. The pieces are then steeped for some time in water, and covered with heavy stones on purpose to flatten them; after which they are placed on burning coals, which has the effect of making the cork closer, and of improving its quality.

The bark of cork is of use in medicine, when burnt and powdered; but it is chiefly employed in making soles for shoes, and to stop bottles.

The Spaniards burn it, to make that kind of

light black, called Spanish black, used by painters. The Egyptians used to make coffins of cork, which, being lined with a resinous substance, preserved the dead bodies for a long time uncorrupted. The Spaniards line the stone walls of their houses with cork, which not only renders them very warm, but corrects the dampness of the air.

By far the most useful employment of cork, has been, within a few years, in the construction of life-boats, many of which are stationed along the coasts of our island, to assist ships in distress. The sides of the life boats are lined with cork, and the whole is thereby rendered so light, that even in the most dreadful storm it will keep afloat. If the waves should upset it, it rights itself immediately; and as the intrepid sailors, who venture out in it to save the lives of their fellow creatures, lash themselves to their seats, there is no danger of the sea washing them overboard; so secure, therefore, do they feel themselves, that they consider it unnecessary to put on the cork jackets which are provided for them.

Should a vessel appear in danger of being wrecked, they will row out to her without apprehension, and seldom fail in bringing the crew in safety to shore.

The first life-boat was built in Shields, a small town in the North East coast of England, and its usefulness has been so great, as to save, in that one place, many lives in the course of a few years.

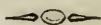
Cork is sometimes prepared without burning,

and in this case, it is merely steeped in water to straighten it : but this, which is called white cork, is by no means so much esteemed as the black. Good cork is supple, and elastic ; neither too woody nor open, and of a reddish colour. That which is yellowish is not of so good a quality ; but the white is far the worst of any.

THE NEPENTHES.

This is a native of India. It is an herbaceous plant, with thick roots, and a simple stem.—crowned with bunches of flowers. The leaves have no footstalks, but partly embrace the stem at the base, and are terminated by tendrils, each of which supports a hollow vessel of an oblong shape, which is covered with a top like the lid of a box. These are amongst the most wonderful of Nature's contrivances, and afford a striking example of that benevolent design with which every thing that the universe contains, was created. The singular appendages which are continued from the extremities of the leaves, are so many urns, containing a clear, wholesome, and well tasted water. In the morning, the lid is closed, but it opens during the heat of the day, and a portion of the water evaporates ; this is replenished in the night, and each morning, the vessel is full, and the lid shut. The plant grows in sultry climates, where the traveller is frequently in want of refreshment, and gladly avails himself, of the water which this vegetable affords,

each of the little vessels containing about the measure of a wine glass. It seems also to be designed for the comfort and preservation of more than the human species, since, from the marks of teeth upon the vessel, it is evident that beasts often supply their wants at the same plenteous source.



BAOBAB TREE.

THE tree which goes by the name of the Baobab, is one of the largest productions of the vegetable world. It is of African origin, and grows in Senegal. ¹¹⁶ But what is highly remarkable in this species, is that, notwithstanding its immense size, a trifling injury is sufficient to destroy it. We are told it thrives best in moist and sandy situations: though it is occasionally found in stony districts. If this tree be wounded in the principal root, (even the least scratch is pernicious,) it soon begins to rot, and the evil spreading to the trunk, quickly destroys the tree. Besides the rot which attacks the trunk when the root is cut, the Baobab is subject to another evil, not so common, indeed, but equally as fatal. This is a kind of mouldiness which spreads over all the woody part and so softens it, that the tree no longer preserves its usual consistence. In this state, the trunk, monstrous as it is, can no longer resist the violence of the winds, but falls a sacrifice to the first storm that blows.

In its native country, the seed of the Baobab,

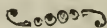
sown in a sandy earth, where there is plenty of moisture, will vegetate in the course of seven or eight days: and in a month, the young tree will be a foot high. In the first summer, its height will be increased to five or six feet, and its stem to an inch, or an inch and a half in diameter. In this manner, the plant continues progressively to increase, till from a slender stick, it becomes, in time, a most prodigious tree. Some of those which Adamson saw in Senegal, measured 27 feet in diameter, and Ray says that between the rivers Niger and Gambia, their dimensions are so monstrous, that 17 men, joining hands, could hardly surround one of them: from which we may conclude, that the largest of these trees was about 85 feet in circumference. Although the Baobab is very tender and easily injured, it must survive a vast number of years, or it could never arrive at the amazing size we have just stated.

The fruit, which is thick and oval, contains a number of seeds, enclosed within ten separate chambers, and the white spongy flesh which surrounds these seeds, is of an acid and agreeable flavour: this, however, is only when it is eaten fresh, as it loses much of its goodness by keeping.

This tree is reckoned one of the most useful and salutary of any that grow in Senegal. The Negroes make great use of its leaves, which they dry in a shady place, and grind to a green powder. This powder, which they use daily in their food, is not eaten to improve the flavour of their meat, but to moderate the

excessive perspiration to which they are subject in that hot country, by lowering the circulation of the blood. They also make a drink of the leaves, to preserve them from the fevers which are common to the country. The fruit too is much esteemed, and is scarcely less useful than the leaves; since the fleshy part of it serves them for nourishment, either eaten alone or in milk. It is, likewise, an object of some importance when considered in a commercial light: for the Mandingoes carry it to the eastern and central parts of Africa, whilst the Moors and Arabs trade with it to Morocco. In this manner, it has been spread over Egypt, and all the eastern shore of the Mediterranean Sea.

The bark of the husk, and the fruit itself when spoiled, serve the negroes for soap: and all the preparation required, is to boil it with Palm oil which is turning rancid.



THE ALOE.

THE fine appearance which this plant makes, during the time it is in flower, and the uses it serves, entitle it to a place amongst the most remarkable vegetable productions. Its tall stem and large head of blossom, which, from the rarity of its appearance, has been said to appear but once in a hundred years, are also calculated to attract our attention. The Aloe is a native of the southern parts of America, and has been introduced into several parts of Europe: the stem generally rises upwards of twenty feet, and branches out on every side

towards the top, so as to form a sugar loaf appearance. The slender shoots are garnished with greenish yellow flowers, which come out in thick clusters at every joint, and give a continuation of flowers for nearly three months, in favourable seasons, if the plant is protected from autumnal colds. When the blossom appears, the gardener who possesses the plant, announces it in the newspapers, as an object of public curiosity. The vulgar opinion, however, that it flowers but once in a century, and that its blooming is attended with a noise like the report of a cannon, are without foundation; the fact is, that the time which the plant takes to come to perfection, varies with the climate. In hot countries they grow fast, and flower in a few years: but in colder climates, where their growth is slow, it will be much longer before they arrive at perfection.

The leaves of the American Aloe are five or six feet long, from six to nine inches broad, and three or four inches thick. They contain a great number of fibres, which when separated and manufactured, serve the purpose of hemp, being made into cordage and packing cloths, and have the advantage of not rotting with the water. To extract the flax, the leaves are passed through rollers, and afterwards washed and combed: they manufacture it, also, into fishing-lines, bowstrings, stockings, and hammocks, while another kind has leaves, which, like those of the wild pine and banana, hold rain water, and afford a valuable refreshment to travellers in hot countries.

The American Aloe must not be confounded with the medical Aloe, which is a different plant: however, as it bears the same name, we shall describe it here.

The great benefit, which mankind has derived from the medical Aloe, has caused it to spread from Africa, where it is native, to India, Persia, Arabia, the southern parts of America, and the West Indies. In the latter place, they are planted at any season of the year, in rows, like cabbages, and during their growth, are kept carefully free from weeds.

About twelve months after they are in the ground, the leaves are cut and placed in tubs, which receive the jelly like liquor contained in them: this liquor is boiled till it becomes of a proper consistence, in which it is packed for exportation. This kind of Aloe is a tree as tall as that which bears olives, and of the same shape: under its bark, it contains three sorts of wood: the first is called eagle-wood, and is black, solid, and weighty: this they use as beams for the roofs of their houses. The second is of a tawny colour, as light as rotten wood, and is esteemed in Europe an excellent drug: it burns like wax, and when thrown into the fire, spreads a most agreeable perfume. The leaves of the tree serve instead of slates, for covering houses; they are also formed into the shape of dishes and plates, and when they have been well dried, may be used at table. When they have been stripped of their nerves and fibres, these are manufactured into a thread; which is used in the same manner as hemp.

The points which rise on the branches, serve for nails, darts, and awls. If an incision be made in the tree, by cutting out the buds, a sweet and strong liquor flows from the wound in great abundance, which proves a very pleasant liquor to drink, and, after some time, changes into an excellent vinegar. The wood of the branches is good to eat, and has the flavour of candied citron. The very roots are likewise useful, and frequently ropes are made of them. In a word, a whole family may be supplied with food, a habitation, and raiment, by an Aloe.

THE BAMBOO

GROWS in the East Indies; it is the largest kind of cane, and tapers gradually to the top, where it bears a blossom like our reeds, which it resembles also in the manner of its growth. Unlike the different kinds of reeds, however, with which we are acquainted, this grows to the size of a tree, and has a stem of proportionate thickness. In Malabar, it rises to the height of 66 feet, attains the age of 60 years, and blows but once in its life. The stems, when young, are almost solid, but as they grow older become hollow, except at the joints. When whole, they serve for the sides of ladders, for the masts and yards of small vessels, for water pipes, and for the joists and beams of houses. The use of so much bamboo, however, in the construction of these last, becomes a great evil in case of fire, for the air contained

within the hollow part of the stems, when heated, expands or becomes rarefied, and bursts with a violent and dangerous explosion. They are also used in the East as poles to support a sort of bed or litter, called a palanquin, which is carried about by men, and used like sedan chairs in this country, only that the palanquin bearers put the poles on their shoulders, instead of holding them in their hands like our chairmen. The natives also make use of the buds and suckers as an article of food; they cut about a foot of the young shoot from near the top, and having steeped it in water, they boil it gently, and then cutting it in slices, preserve it in vinegar; it is served up with meat, and eaten as cabbage.

There is another kind of Bamboo growing in India which rises to the height of 80 feet, and measures from 12 to 18 inches in diameter. The wood of this species is so extremely light and strong, that the Indian wine dressers, who are employed to collect the palm wine, make bridges of it from one tree to the other, which enable them to pass and collect the juice without descending to the ground. The upper joints of this being open, serve the inhabitants as measures for their liquors; whilst the lower being plain and solid, and very durable, are used for stakes, of which the Macassars form a defensive wall, that answers the purpose of a rampart, and can even be made proof against a cannon ball.

The wood of the Bamboo which grows in the Moluccas, is so very hard as to throw out

sparks of fire when struck with a steel, as flint would. It would be endless to mention all the uses to which the ingenuity of the inhabitants has applied it ; they manufacture it into flints, chairs, walking sticks, baskets, mats, tobacco-pipes, arrows, and excellent pikes, which they throw with so much force, as to pierce through the body of a man, after the pointed end has acquired the necessary degree of hardness by being gently heated in the fire.

Among the many uses to which the Chinese apply the Bamboo, by far the most extraordinary is the manufacture of paper ; for this purpose, they chuse the shoots of the first year, and steep them for some days in a pond of muddy water, till the hard and firm parts are separated, and nothing but the fibres remain, these, after being bleached and reduced to a pulp, are boiled in large coppers, and afterwards beaten with a heavy pestle. After mixing gum water, the remainder of the process resembles our mode of manufacturing paper ; the workmen dip their moulds (which however are not made of wood, but of Bamboo,) into the vessels containing the pulp, and raise a thin plate of the liquor, which almost immediately becomes paper. When the Chinese wish to make paper of an extraordinary size, they use a vessel and frame in proportion.



THE COCOA-NUT TREE.

THE COCOA-NUT TREE.

THE Cocoa-nut grows upon a tree whose trunk rises to the height of 60 feet. This trunk is nearly of the same thickness from top to bottom, though it has been observed of the form of an apothecary's pestle, smaller at the middle than at either end. No leaves or branches grow from it throughout all the length; but at the top, there are fastened to the trunk, by strong fibrous substances, about 50 leaves, if they may be so called, 14 or 15 feet long. From these, the larger leaves or rather branches, smaller leaves strike out, which are 3 or 4 feet in length. The trunk generally inclines to one side, which is supposed to be occasioned by the weight of the fruit when the tree is young. The fruit grows at the very top, in clusters of about a dozen nuts in each. Of the bark of the tree, the Indians make ropes: the leaves are used for making mats, baskets and brooms, and by the East Indians for writing on, like paper, while the young and tender ones at the top, are an excellent substitute for cabbage.

Many of the trees are not permitted to bear fruit, but the bud, from which the blossoms and nuts would spring, is tied up, and a small incision being made at the end, there oozes out a cool pleasant liquor, called toddy: this, when first drawn, is cooling and salutary, but, by distillation, produces an intoxicating liquor.

The nut appears much larger than it really is, being surrounded by a thick husky coat: when this is stripped off, the shell appears, which is hard, black or dark brown, and very strong. The kernel of this nut is of a very uncommon form; not round and distinct as is usual, but attached to the inside of the shell all round about it, to the thickness of nearly half an inch, forming as it were an inside coat; within this kernel, is a hollow space filled with a liquid called the milk: large nuts contain of this fluid nearly three half pints; almost all hold more than a pint. The milk is a little acid, very agreeable, cooling, and exceedingly wholesome; but if it be pleasing to us, when brought to these cold climates by a tedious voyage, what must it be to the natives of those hot and parched countries where it grows naturally. Exhausted by the heat of the sun, and worn out by fatigue, the poor Negro has but to gather one or two cocoa-nuts. The kernel serves for good food, and the milk for a most delicious and refreshing drink. In short, there are few of the necessaries and even conveniencies of life, but are derived from the different parts of this tree. It supplies the inhabitants with bread, milk, and oil; it affords them a strong spirit, vinegar and barm—timber to build their huts, and thatch to cover them; the shell is a useful article among their household vessels, and the coarse fibrous husk surrounding it, as well as the bark, is made into mats, cloth, and cordage; which last is of every degree of fineness, from the smallest

twine to the largest cable, and is far more durable than that made from hemp. We are told of people, who, every year, cross over to the Cocoa-nut Islands, and having cut down a tree, with the bark spin a yarn with which they sew the plants together, and so build a ship. Of the same wood, they cut and round away a mast;—of the bark and fibrous covering of the shell, they weave the sails and cordage, & having thus completed their vessel, they load her with a cargo of arrack, vinegar, oil, coarse sugar, cocoa-nuts, cordage, black paint, and several other inferior articles, all of them the produce of this tree. During their voyage, and the whole time employed in building the ship, the cocoa-nut tree furnishes them with fruit, milk, vegetables and clothing—and thus the bountiful care of Providence is seen everywhere, to furnish to man the means of support and happiness.

But the difficulty is to gather the nuts: they grow at the top of a tree 60 feet high, whose trunk is smooth, and without a branch by which one might climb. The ingenuity of man has not, however, failed him here; for the Indian contrives a mode of gaining his prize at any height, although alone. He makes a hoop of some very pliable rods, about the tree, wide enough to contain both the trunk and his own body, and strong enough to sustain his weight. When the hoop is finished, he puts himself into it, so far that it may come below his shoulders; he then presses against the tree with his hands, his knees and feet, and consequently presses

back against the hoop: by this means, the hoop is kept firm in its place, and by moving his hands and feet a little, he forces himself upwards, (like a sweep-chimney) till he gradually reaches the top.



THE BREAD FRUIT.

THIS invaluable vegetable grows upon a tree about the size of a middling oak. The leaves of this tree are from one and a half, to two feet long, about one foot broad in the middle, and smooth like those of the fig-tree; and the fruit, which is about the size of a child's head, hangs from the boughs like apples. It does not grow spontaneously, but must have been planted; the growth is, however, so rapid, as to require but a few months to bring it to perfection, and a man might easily plant ten of them in an hour. Such is the abundance of the produce, that a man who plants a dozen, may be almost said to have done his duty to his family and posterity. The bread-fruit is round, or nearly so, and between seven and eight inches in diameter; it is covered with a thin skin, and has a core within, the size of which is about two inches and a half long, and half an inch thick. Between the skin and the core lies the part of the fruit which is fit for use; this is as white as snow when first opened, and is nearly as firm as freshly baked bread, having a sweetish taste like that of a Jerusalem artichoke. It is in season for about seven months in the year, and during the whole of that time supplies



THE BREAD FRUIT TREE.

kind of food both wholesome and pleasant, to the inhabitants of the South Sea Islands, who also make cloth of the bark of the tree, and use the wood in building their huts and canoes.

It is dressed in a great variety of modes; the simplest is that of cutting it into three or four parts, after the core and skin have been removed, and roasting them till they are thoroughly dry. In this state, it is rather insipid in taste, but is still very eatable. Sometimes it is baked in an oven; but then it is soft, and bears a great resemblance to a boiled potato. If dressed in this manner, the natives are obliged to prepare it from day to day, as it soon becomes harsh and dry; this defect, however, is easily remedied, by cutting the fruit into slices, and drying them by the sun. When thus prepared, it will last for a considerable time, and tastes very much like brown bread.

But the most useful mode of dressing it for keeping, is to make it into what is called mahie. Mahie is thus made; the fruit being gathered before it is quite ripe, is laid in heaps and covered with leaves; it is left in these heaps until it ferments, when it becomes disagreeably sweet; the core is then taken out entire, the skin is stripped off, and the fruit is thrown into a pit; the bottom and sides of this pit are carefully covered with fine grass. The fruit, being covered over with leaves, is loaded with stones to press it close; it then undergoes a second fermentation, and becomes rather sour, and very pleasing to the palate. It is then bruised, and afterwards rolled up in balls,

which being wrapped closely in leaves, will continue fit for use a long time.

THE BANANA.

This is of the same kind with the fruit we have described, but it is smaller in size, ^{more} domestic and more pleasant in flavour. This fruit is short and rounder, about four or five inches long, like a cucumber. The stalk rises to 12 or 15 feet in height, and the leaves are about two yards long and a foot broad; if it be cut down, there shoot up from the root, a great many suckers, which, in eight months, will themselves produce fruit; and by reason of this very useful property, a succession of it may be had ripe through all the months in the year. This is the more necessary, as the fruit cannot be used green. When ripe, it is taken either raw or roasted in slices, and is relished by all classes of people. When the natives in any of the West India Islands intend to go on a long journey or voyage, they generally lay in a stock of loaves, made from the Banana in a peculiar manner. They squeeze the fruit when quite ripe, through a fine sieve, expose it to the sun until it is sufficiently dry, and then wrap it in leaves. In this state, it has an agreeable acid taste, and will continue fit for use a long time.

THE PALM TREE.

THIS tree, called also the date tree, from the fruit which it bears, grows in most of the countries of the East: it has been also transplanted into the West Indies, but rather unsuccessfully, as it does not grow to its usual size, and its numbers have of late years very much diminished. In the islands of the South Sea, the trunk grows to a height of 50 or 60 feet; and in Arabia, where particular attention is paid to its cultivation, it sometimes reaches 100 feet. The trunk is round, upright and regular; except for many lumps which grow upon it, where old leaves have fallen off during the growth of the tree. When arrived at its full size, there are not any leaves upon it except at top, where they grow in a cluster, hanging down like an umbrella.

These leaves ought rather to be called branches, for they are very strong, and are from eight to nine feet in length. Besides the leaves, there shoot up from the bottom of the trunk, suckers which are from 4 to 5 feet long.

The fruit, called dates, grows like an acorn; it is solid, tough and firm, and has a kernel which is hard and agreeable to the taste.

The palm tree has a very remarkable property, that every part of it is useful. To begin with the trunk; its wood is tough, strong, and fit to be made into every instrument of husbandry: it lasts a long time, even when exposed to every change of the weather, so that it is often called "incorruptible." It serves

also for fuel; it burns at first slowly, but its coals last a long time and are very hot. The inside of the young trees is good food, and is called the marrow; the young leaves also, and flowers, are used for the same purpose, and are very palatable when eaten with lemon juice. The old leaves or branches are dried in the sun, and their fibres, being taken out, are woven into mats and other articles of domestic use. The Otaheitans make their mats of these fibres, and it is surprising how serviceable such mats are: though coarse, they make a warm durable clothing for the natives. Some smaller leaves, or fibres, which grow at the root, are dried and twisted into mats.

From the trunk, also, is obtained a very pleasant and wholesome liquor, like milk. To obtain this, the branches at the top are all cut off, deep cuts are then made in the tree, out of which the juice drops or distils. This juice is carefully preserved as it comes out, and having had a little time to rest and ferment, is fit for use.

The fruit is eaten when young and fresh, in which case it is very good food: or, if allowed to ripen, when it becomes hard it is dried, and then ground into meal, which lasts for a long time without turning, and is much relished.— Thus this vegetable, and the camel, seem granted by a bountiful Providence to the Arabs, in place of the many advantages which other nations enjoy from their situation. Of the camel it is said, that every part of its frame (its hair, its bones, its skin, its flesh) is useful,

and that even its excrements serve various purposes, particularly in medicine; while we have just seen that the date tree supplies meat and drink and clothing, that its very flowers serve as food, and its leaves answer many ends.

There is no tree known which is so durable and hardy as the Palm. Braving all the severity of the weather, it preserves its original vigour for several centuries; so that the natives never remember to have seen a Palm Tree wither, unless it had been injured by some instrument. When this happens, the tree is cut down to the root; it is then burnt on the spot and its ashes are covered with a layer of earth from the middle of which, a new shoot soon arises, and becomes strong in the course of a few years. As the Palm Tree is sometimes called Phœnix in the Scriptures, perhaps the fabulous history of the Arabian bird of that name reviving from its ashes, is founded on this circumstance.

This tree, as it is well known, is become the symbol of every thing great and wonderful among men. It signifies victory, triumph, duration, innocence, justice, and particularly the fertility of Judea. When the Romans made themselves masters of Jerusalem, they struck some medals, on which was represented a beautiful woman sitting at the bottom of a Palm Tree, which she was bedewing with her tears, and below were these words in Latin, “Judea subdued.”

THE WAX TREE.

THIS singular shrub, which grows in North America, produces a berry which affords a useful kind of wax; the manner of gathering and preparing which is thus described. Towards the end of Autumn, when the berries are ripe, a man quits his house with his family, and betakes himself to some island or spot on the sea coast, where the Wax Tree grows in abundance; he carries with him pots for boiling the berries, and a hatchet for building a cabin to shelter him during his residence there, which usually continues three or four weeks, then cuts trees and constructs a hut, whilst his children gather the berries. A tree tolerably productive yields about seven pounds, When a sufficient quantity of berries is collected, the family employs itself in extracting the wax. A certain portion of the berries is put into the pot, and a sufficient quantity of water is poured on them, till it covers them about six inches; the whole is then put on the fire and boiled, the berries being stirred and pressed from time to time against the sides of the vessel, in order to detach the wax from them; soon after, it is seen floating on the surface, in the form of grease, which is collected with a spoon, and strained through a coarse cloth to separate any impurities that may be mixed with it. When these berries cease to yield any more wax, they are removed with a ladle, and fresh ones put into the same water; the same process is thus

repeated, and when a certain quantity of wax has been obtained, it is put to drain on a piece of linen, in order to separate the water which may be mixed with it; it is then dried and melted, after which it is strained a second time, to render it perfectly pure; and finally, made into cakes for use.

The Chinese collect wax from certain trees, which is considered fully equal to that made by bees. This, however, is not the produce of a vegetable, but an insect; yet as the wax is always confined to particular trees, which, in the country, derive their name from the circumstance, we shall add a short account of them.

There are two kinds of trees in China which yield the substance we have mentioned; one short and bushy, and growing in a sandy soil; the other rising much taller, and found in moist places. It is said that the former, being of a shrubby nature, is easily cultivated, so that walls may be covered with it, or hedges formed of it in the fields; it seems also well calculated to thrive in any situation, since it is said equally to endure heat and cold, and to grow with the least culture in the most barren soil.

According to the account which has been given of the wax, the small insects that make the wax do not naturally frequent the trees which we have mentioned, but are placed upon them, and once the tree has been stocked, it will always retain them. Towards the beginning of winter, small swellings are perceived upon the surface, which continually grow larger, till they become the size of a small

walnut; these are the nests, filled with the eggs of these little insects. As soon as the tree begins to shoot forth its blossoms, the insects are excluded from the eggs, and this is the time to place nests on those trees, that have none; the Chinese make small layers of straw, on each of which they put seven or eight nests, and tie these to the branches, taking care to place the nests immediately on the bark — After the insects are hatched, they run upon the branches, spread themselves over the leaves, and pierce the bark, under which they retire, but always issue forth at the proper season for making the wax.

It is about the middle of June that this wax begins to appear on the branches; at first, a few threads, like those of soft wool, are perceived rising from the bark round the body of the insect; these, by degrees, form a kind of down, which gradually becomes thicker, and increases in size during the heat of the Summer; the crust at last entirely covers the insect, defending it not only from the heat, but likewise from the rain and ants.

The Chinese assure us, that if the wax was left on the tree, the little insects would not make their nests; on which account, they are careful to gather it before the frost commences.

The wax thus produced, is carried to Court, and reserved for the use of the Emperor and his chief nobles; it is considered as a precious article, esteemed as an excellent remedy in several diseases; and when applied to wounds, is said to make the flesh heal in a very short time.

THE FIR TREE.

THIS tree is so well known, that we need not enter into any description of its appearance; it is found in most parts of Europe, Asia, and America, and being of a hardy nature, and requiring but little care during its growth, is generally planted in exposed situations. In the Highlands of Scotland, the Fir grows naturally; large Forests of it can also be found in Germany, in the Alps of Switzerland, in the Pyrenees which divide France from Spain, and in the northern parts of Europe and Asia.

The timber of the Fir Tree, which we call deal, is either red, yellow, or white, and is said to afford the best masts for the navy.

The people employed for the purpose of selecting them, are careful to chuse those trees which are remarkable for their beauty and height, and the yellowness of their bark. It is not in the midst of the forest, but on the shores, that the finest trees are found; they are generally observed to grow in a coarse sandy soil. Those which are from a foot and a half to two in diameter, are called masts; and under those dimensions, spars.

It is also the principal timber employed about buildings, for flooring, planks, beams and rafters. It has the advantages of being cheap, light, and easily worked, but is apt to split, and is extremely inflammable.

Large and extensive woods of these trees are also found in North America, where some of

them are said to grow to the height of 200 feet ; and one is mentioned, as measuring nearly eight feet in diameter at the lower end.

Another kind of Pine Tree is the Larch, which is a native of the Swiss and Italian mountains, but is now become very common in Great Britain and Ireland. In Switzerland, the inhabitants cover the roofs of their houses with shingles, made of Larch ; these are cut in pieces of a foot square, and joined to the rafters. At first, the roof appears white, but in two or three years, becomes of a jet black, and all the joints being stopped by the rosin which the sun extracts from the wood, the roof is rendered impervious to the wind and rain.

In Switzerland, great quantities of turpentine are collected from the different kinds of Fir, by persons whose employment it is to extract this useful commodity, Each provides himself with a *horn* of tin, ending in a sharp point, and a bottle of the same metal, which he fastens to his girdle. From the nature of his employment, he acquires a wonderful dexterity in climbing ; he will mount in a very short time to the top of the tallest trees, by cramp irons fixed to his shoes, which pierce the bark of the Fir, while he clasps the trunk with his knees and one hand, the other being employed to carry the horn.

The turpentine flows from little bladders or swellings on the bark of the trees which the people burst with the sharp end of the horn ; into this vessel, the turpentine is received as it runs from the wound, and when full, it is

emptied into the bottle, which hangs at their girdle.

The different kinds of Pine produce abundance of pitch, tar and rosin, and the manner in which these substances are procured from it shall now be described.

The people employed to collect the turpentine, usually chuse such trees as are about four or five feet in circumference. At the foot of the tree, they make a hole in the ground, large enough to contain nearly a quart of the juice: an incision is then made with a sharp instrument in the foot of the tree, which is occasionally enlarged to facilitate the discharge.— From this, there immediately flows a juice in the form of very transparent drops. In the following year, another wound is made in a similar manner, and thus they annually collect the resin for twelve or fifteen years, each succeeding wound being higher than the former, and about a foot distance from the other.

When a sufficient quantity of juice has been collected in this manner, it is thickened by boiling, and afterwards strained to clear it. The next process it undergoes is distillation, which separates the turpentine into two substances; the part which passes from the still in a sort of stream, and is collected in another vessel, is the oil of turpentine, which is used in medicine; the remainder is the common rosin.

Tar is chiefly obtained from old pieces, by burning them in a close smothered heat: for the purpose of extracting this useful material, a furnace is constructed in the form of an egg,

and capable of holding a considerable quantity of wood; the inside is then filled with billets, cut of a proper length, and placed in rows, one upon the other; the upper layer is covered with sces well pressed down, leaving only one place open, by which the fire may be introduced to light the wood; when the billets are lighted, the tar begins to ooze from these, and flowing to the bottom of the furnace, is carried from them through a pipe into vessels placed to receive it; by this simple process, all our tar, which is so much used for ships and for preserving wood from the action of the weather is prepared. After all the tar is run off, the furnace is carefully closed, and the whole left in this state for some days; after which it is opened, and the wood found in a state of charcoal.

Pitch is nothing but the tar we have been describing, thickened by boiling till it becomes a solid mass,

Having thus given a short account of the manner in which these trees are made to yield their most useful products, we shall conclude our account by describing, the nourishment which some nations in the north of Europe derive from them.

We are informed by Linnæus, that the Laplanders, during a great part of the winter, and even sometimes through the whole year, eat a preparation of the inner bark of the Pine, which they call bark bread; this substance is made in the following manner: after a selection of the tallest trees, the dry and scaly ex-

ernal bark is taken off, and the soft, white and juicy coat inside is collected and dried when the natives are about to use it, it is slowly roasted on the coals, and then ground into powder, which they knead with water into cakes, and bake in an oven.



THE SUGAR MAPLE.

THE Sugar Maple Tree grows in great quantities, in all the middle and eastern parts of North America; but those of New York and Pennsylvania are said to yield the most sugar. They sometimes form thick groves of five or six acres, but are generally interspersed with some of the common forest trees.

In twenty years, this tree is supposed to arrive at its full growth; it is then as tall as an oak, and from six to nine feet in circumference. The beautiful white blossom which it puts forth before a single leaf makes its appearance, is sufficient to distinguish it immediately from the rest of its companions. The sugar with which the several branches are impregnated, affords the cattle and sheep a considerable share of nourishment during the winter.

It is a happy circumstance, that this Maple Tree, far from being injured by tapping, is improved by it, so that a single tree has not only survived, but flourished after 42 tapplings in the same number of years. The oftener it is tapped, the more sugar is obtained from it.

and this is proved, from the superior excellence of those trees which have been pierced in a hundred places by the bird called the woodpecker, which feeds upon the juice. The sap of those trees, also, is much sweeter to the taste, than that obtained from trees which have not been previously wounded, and affords more sugar.

The season for tapping the trees is in February, March and April ; and a tree of an ordinary size will yield, in a good season, from twenty to thirty gallons of sap, from which are made from four to five pounds of sugar; an auger hole is bored in the tree to the depth of two inches, and a spout introduced into this, through which the liquor flows. The tree is first tapped on the south side, and when the discharge of its sap begins to lessen, an opening of the same kind is made on the north side, from which an increased discharge takes place ; to receive the sap, troughs, large enough to contain three gallons, are placed beneath the spout, which are carried every day to a large receiver.

The Maple Tree continues to yield its sap, during the whole of the Summer and part of the Autumn ; but what flows after April is not fit for the manufacture of sugar.

It is not, however, without its use, as it affords a wholesome drink in harvest, which is extremely grateful to the taste.

The principal method of making sugar from the sap, is by boiling ; and the Americans have found from experience, that the sap should be

ver be kept longer than twenty-fours, after it is collected, before it is put on the fire. During the boiling, they add butter, hogs-lard or tallow, to prevent the pan or kettle from boiling over, and fresh eggs or new milk are mixed with the juice, in order to clarify it.

The quantity, however of these ingredients, is not great, since a spoonful of slacked lime, the white of one egg. or a pint of new milk, will be sufficient to clarify fifteen gallons of sap.—The sugar, after it has been sufficiently boiled is conducted through the remaining process nearly in the same manner as in the West Indies; it will therefore be unnecessary in this place to repeat what has been said under the description of the sugar cane.

When we consider, that the Sugar Maple juice is collected at a season when not a single insect exists to feed upon it, and before any of the dusts of plants can float in the air and mix with it; that many millions of acres in North America are covered with it, and that those trees are improved by repeated tapping, while the process of collecting the juice and preparing the sugar is so simple, that any one may carry it on without expense; we are led to acknowledge, that this tree is the gift of a kind and bountiful Providence, which in all countries invites the industry of mankind, and repays him by every thing which can conduce to his support and comfort.

It may be interesting to state the calculation given by Dr. Rush, of the quantity of Sugar which the United States might produce,

th for home consumption and for selling to
 er countries. There are at least, he says,
 a millions of acres in New York and Pensyl-
 nia, which produce the Sugar Maple Tree,
 the proportion of thirty trees to one acre ;
 w supposing one person to attend 150 trees,
 d each tree to yield 5lbs of sugar in a season,
 e labour of 180,000 persons would produce
 5 millions of lbs. of sugar, which would leave
 millions of lbs. or above 100,000 hogsheads
 exportation to foreign countries. Besides
 e profit arising from the sugar, the after-sap
 the Maple makes an excellent vinegar ; a
 asant summer beer may likewise be made
 m the molasses, and a spirit distilled from
 e sap.

he nourishment afforded by sugar, is known
 be very considerable ; hence it is preferred
 the Indians in their excursions from home.
 ey are said to mix a certain quantity of Ma-
 e Sugar, with an equal quantity of Indian
 rn, dried and powdered. Thus provided,
 e Indians make long journeys, and when fa-
 ued by travelling, will recruit their strength
 th a few spoonfuls of this nutritious food,
 xed with about half a pint of spring water.



THE LAUREL.

THIS shrub is too common to require a par-
 ular description of its form. It is sufficient
 say, that its bark is thin and green, its wood
 ong and pliant, its flower whitish yellow ;

and the fruit an oval berry, of a bluish black colour when ripe.

Entire forests of the Laurel are found in Africa. In the temperate and cold parts of Europe, it is cultivated as an ornament to our gardens. It flowers in March and April, and ripens its berries in Autumn. All parts of it have a fragrant smell; the leaves, bruised between the fingers, have it in a high degree, and are sharp and bitter to the taste; they likewise serve to season our food, and, when distilled, they give a powerful oil. The berries, which are employed in medicine, have a strong but agreeable smell.

As the Olive was the sign of peace among the ancients, the Laurel was the emblem of victory and war. A crown of the leaves was the reward of their conquerors; and even the arms of the soldiers were ornamented with the same. How much more pleasing it is to think of the former than the latter. The Olive reminds us of peace, and gentleness, and happiness: the Laurel, on the contrary, of war, and violence, and bloodshed. It has been already mentioned, that when the wickedness of mankind had caused the flood, an olive leaf was the pledge of restored peace and favour with God; for, when the dove returned to Noah in the evening, "and lo! in her mouth was an olive leaf plucked off;" he then understood that the waters were abated, and the earth was again become habitable.

Several species of Laurel are of considerable service to mankind, particularly the Cinn

non and Camphor Trees, of which we shall proceed to give a short account.

THE CINNAMON TREE is a native of India, and grows in great abundance in the island of Ceylon; the principal woods or gardens of this plant lie in the neighbourhood of Columbo, and occupy a tract of country from twelve to fifteen miles in length. Nothing (says a traveller) can be more delightful to the eye than the prospect which stretches round Columbo; the low cinnamon trees, which cover the plain, allow the view to reach the groves of evergreens, which are bounded on every side by extensive ranges of cocoa and other large trees. The whole is diversified with small lakes and green marshes, skirted all round with rice and pasture fields.

This plant has a large root, and divides itself into several branches, covered with a bark, which, on the outer side, is of a grayish brown, and, on the inside, has a reddish cast. The body of the tree, which grows to the height of from four to ten feet, is covered, as well as its numerous branches, with a bark, which at first is green, and afterwards red. The leaf is longer and narrower than the common bay tree; and is three-nerved, the nerves vanishing towards the top. When first unfolded, it is of a flame colour: but after it has been for some time exposed to the air, and grows dry, it changes to a deep green on the upper surface, and to a lighter on the lower. The flowers are small and white, and grow in large bunches at the extremity of the branches; they have an

agreeable smell, something like that of the lily of the valley. The fruit is shaped like an acorn, but is not so large ; it is gathered by the natives for the purpose of extracting an oil from it. This they use for their hair and body, on great occasions, and, when mixed with cocoa oil, for burning in their lamps. When left to cool, the oil hardens into a white substance, of which candles are made that have an agreeable smell, and are burned only by the chief men in Ceylon

The Cinnamon is the under bark of the tree. The best season for separating it from the outer bark, which is gray and rugged, is the Spring, when the sap flows in the greatest abundance. It is cut into thin slices, and exposed to the sun, and curls up in drying. The old trees produce a coarse kind of Cinnamon : the spice is in perfection only when the trees are not older than three or four years. When the trunk has been stripped of its bark, it receives no farther nourishment ; but the root is still alive, and continues to throw out fresh shoots. The Cinnamon is not reckoned excellent, unless it be fine, smooth, brittle, thin, of a yellow colour, inclining to red, fragrant, aromatic, and of a poignant, yet agreeable taste. Judges give the preference to that, the pieces of which are long, but slender. That which comes to us, is generally mixed with the cassia bark ; but this last is easily distinguished. Cinnamon splinters in breaking, and has a roughness along with its aromatic flavour ; while the cassia breaks smooth, and has a gummy taste.

innamon is extremely useful in medicine, and more grateful both to the palate and stomach than most other substances of this class. The leaves of this tree, either fresh or dried, are so strongly impregnated with the flavour, as to afford a good substitute for the bark, both in cookery and medicine. Distilled, they give an excellent simple and spirituous water, and an essential oil.

When the bark has been stripped from the cinnamon trees, and dried, the next step is to examine its quality. This is the task of the East India Company's surgeons, and must be an extremely distressing office, for, when continued for a short time, it strips the skin from the tongue and under part of the mouth, and causes such an intolerable pain, as renders it impossible to continue the process above two or three days successively.

THE CAMPHOR TREE is of a moderate size and delicate shape; it has a straight trunk, divided at the top into many little branches.—The leaves are oval shaped, and, when rubbed between the fingers, give a strong smell of camphor. The white flowers grow in clusters of fifteen or eighteen on each stalk; they are succeeded by a blackish fruit, above the size of a pea, which both smells and tastes of camphor; it is composed of a soft pulpy substance, which is purple, and has the taste of cloves and camphor :) and of a kernel of the size of a pepper-corn, which is without taste.

The Camphor, though solid, is the essential oil of this tree, and is obtained from it by distillation: in the East Indies.

In China, some of these trees are found above one hundred cubits in height, and so thick, that twenty persons cannot enclose them. The tree is there called *tchang* : and it is said that the trunk, when old, emits sparks of fire, but of so subtle a nature, as not even to injure the hair of those who are near it. Common Camphor costs only a penny the ounce at Pekin. The method used by the Chinese for obtaining Camphor is as follows:—They take some branches fresh from the *tchang*, chop them very small, and lay them to steep in spring water, for three days and three nights. After they have been soaked in this manner, they are put into a kettle, where they are boiled for a certain time, during which they keep constantly stirring them with a stick made of willow. When they perceive that the sap of these small chips adheres sufficiently to the stick in the form of a white frost, they strain the whole, taking care to throw away the dregs and refuse. This juice is afterwards poured gently into an earthen bason, well varnished, in which it is suffered to remain one night. Next morning it is found coagulated, and formed into a solid mass. To purify this first preparation, they procure some fine earth, which, when pounded, and reduced to a very fine powder, they put into the bottom of a bason made of copper ; over this layer of earth, they spread a layer of camphor, and continue thus until they have laid four strata. The last, which is of very fine earth, they cover up with the leaves of the penny-royal plant ; and over

the whole, they place another bason, joining it very closely to the former, by means of a kind of red earth that cements their brims together. The bason, thus prepared, is put over a fire, which must be managed so as to keep up an equal heat: experience teaches them to observe the proper degree. But above all, they must be very attentive lest the plaister of fat earth which keeps the basons together, should crack or fall off, otherwise the spirit would evaporate and the whole process be spoiled.—When the basons have been exposed to the necessary heat, they are taken off, and left to cool; after which they are separated, and the sublimated Camphor is found adhering to the cover. If this operation be repeated two or three times, the Camphor is found purer, and in larger pieces. Whenever it is necessary to use any quantity of this substance, it is put between two earthen vessels, the edges of which are surrounded with several bands of wet paper. These vessels are kept for about an hour over an equal and moderate fire; and when they are cool, the Camphor is found in its utmost perfection, and ready for use. This method of procuring Camphor, even from the heart of the tree, may be practised in all seasons of the year: which would not be the case, were it extracted like other resinous substances that only flow during a certain short space of time. Besides, by lopping the branches of the Camphor Tree, less hurt is done to it than by making incisions, which are always hazardous.

THE MANIHOT.

THE Manihot grows in South America, and is of singular importance to the inhabitants since its roots, properly prepared, afford them a very wholesome and nourishing food. The usual height of the plant is about six or seven feet; and the stem, which is covered with a shining green or reddish bark, is full of a soft pith. The flowers are of a red or pale yellow colour; the fruit is smooth, and composed of three husks, each containing a seed of a gray colour, marked with little spots.

This useful shrub is cultivated in Asia, Africa and America, particularly in the West Indies. It appears strange that any plant should yield a wholesome nourishment and a mortal poison at the same time; yet this is the case with the Manihot, though the different products are separated by a very simple process; it is only necessary to press out the poisonous juice contained in the roots, and afterwards to dry the solid part that remains, in order to convert it into flour, of which the Negroes make their Bread. Though a slight mistake might produce fatal consequences, yet so certain are they to succeed in extracting the poisonous juice from this plant, that it never proves injurious to any one. They generally form the dry raspings of the root into flat cakes, called cassavi; though in several parts of America, they bake the raspings in grains or lumps, which are eaten in the same manner as rice.

When the plants are sufficiently ripened, the Negroes cut off the stems close to the ground, and dig up the roots, which are carried to an out-house, where the bark is pared off with a knife. These parings after being washed and grated, are put into sacks or mats, and exposed to the action of a strong press for several hours. In this manner, the poisonous juice is sufficiently expressed from the wood, which is afterwards made into cassavi. This process is also very simple: the grated root, in its prepared state, is laid over a fire on a plate of iron, to the thickness of two fingers, and then flattened with a large wooden knife. In this state, it is left, till the under side is sufficiently done, when it is merely turned, that both sides may be equally baked. The flat cake, which is thus formed, after being cooled in the air, acquires a firm consistence, and takes the name of cassavi bread.

The cassavi is seldom eaten without a second preparation; this is merely to dip it in water or broth, which causes it to swell considerably, and in this state, it forms a solid and wholesome nourishment, which the natives of South America, and particularly the Negroes, prefer to other bread.

The juice which is pressed from the root of the Manihot, carries with it a fine white meal, which appears, when dried, like starch. This kind of flour is used for the most delicate pastry, and answers all the purposes of wheaten flour.

It is in the juice of the Manihot, freshly expressed, that the poison is found; and its na-

ture is so deadly, as to destroy life in a very short time. In one instance, when it was taken accidentally, it produced death in six minutes.

THE BETEL TREE.

THE Betel is a species of palm, well known in India, for the constant use the people there make of the nut. This tree, which is tall, straight, and slender, has six or eight leaves growing on the top; each about six feet long, and winged; the side of the leaf stalk is angular and it widens at its base into a tough sheath, which embraces the trunk of the tree, and is so strong and close in its texture, that the natives use it to hold their victuals and drink, which it does as effectually as a bladder. The nuts, as they are called, grow at the top in clusters like those of the cocoa, but are no larger than a small hen's egg. Between the outward bark and the stone, is found a juicy pulp, which they mix occasionally with their Betel; but the nut is the principal object of their attention, and from its general use, forms an important article of traffic among them.

The Areca or Betel nut is not chewed alone, but mixed with the leaf of a kind of pepper, which, from being constantly used for this purpose, has obtained the name of Betel Leaf, and the natives are said to prepare their Areca-

by cutting it in slices, sprinkling it with slack-
ed lime, and wrapping it up in some of these
leaves. This they chew as we do tobacco,
keeping it in their mouths till it no longer re-
tains any flavour. The chewing of Betel is in
general use among the Indians, who introduce
it both morning and evening. They carry
it with them when they go abroad, and it is
considered a mark of civility to offer it to those
they meet. It serves this indolent people, to
fill up an idle hour, like tobacco in Europe;
and like others, who are always ready with an
apology for a favourite indulgence, they pre-
tend that the stomach is strengthened, and
the constitution improved by chewing Betel.

The constant use of this luxury is so hurtful
to the teeth, that the Indians frequently lose
them before they are thirty years old. The
wood affords a highly desirable timber, and is
used for rafters in houses, and for paling to
enclose in their grounds.



THE MANGROVE.

THE Mangrove is a native of the East Indies,
and always found in moist and marshy places
near the sea, where the tide can wash its stem.
It grows to the height of ten or twelve feet,
and is divided into a vast number of branches
which extend on all sides, and are thickly co-
vered with leaves six inches long; the trunk
and lower branches send out several plant

shoots, which descend to the ground, and then take root; these become in time so interlaced as to form a thick grove, somewhat resembling the banyan tree.

The manner in which Nature conducts the seed of the Mangrove to the earth, is exceedingly curious: the fruit produces a single seed, enclosed in an oval case, which, when ripe, begins to sprout without falling from the tree; a little root appears from the top of the case, from whence it proceeds in the form of a woody thread, till it is about a foot long; in this state the seed hangs, till, by its weight, added to the continual moving of the branches, which are shaken by the slightest breath of air, it is disengaged, and falls to the ground: the seeds are said to fall in the most favourable position for taking root, which may easily be the case, when the ground is constantly moist and soft enough to receive any impression, which is the case where these trees are found.

The bark, which the Chinese employ to strike a black die, gives out a strong smell of sulphur; and the wood, which has the same odour, burns very briskly, and with a bright flame.

In consequence of the Mangrove Trees growing, as it were, in the water, they become the retreat of fishes, and especially of oysters; these last deposit their spawn upon the stems and branches, which, in time, become loaded with them; and the oysters, gathered from such situations, may be readily known by pieces of

the wood which are generally attached to the shells.

THE POISON ASH.

THE Poison Ash grows naturally in Virginia, Pennsylvania, Carolina, and Japan, rising twenty feet and upwards. The bark is brown, inclining to gray. The footstalks become of a bright purple before they fall off. Professor Kalm says, "an incision being made into the tree, a whitish yellow juice, which has a nauseous smell, comes out between the bark and the wood. This tree is not known for its good qualities, but greatly so for the effect of its poison; which, though it is noxious to some people, yet does not in the least affect others; and, therefore, one person can handle the tree as he pleases, cut it, peel off its bark, rub it, or the wood, upon his hands, smell it, spread the juice upon his skin, and make more experiments, with no inconvenience to himself.—Another person, on the contrary, dares not meddle with the tree, while its wood is fresh, nor even expose himself to the smoke of a fire which is made of this wood, without soon feeling its bad effects; for the face, the hands, and frequently the whole body, swell excessively, and are affected with very acute pain. Sometimes bladders, or blisters, arise in great plenty, and make the sick person look as if he was infected with the leprosy. In some people, the external thin skin peels off in a few

days, as is the case when a person has scalded or burnt any part of the body. Nay, the nature of some persons will not even allow them to approach the place where the tree grows, or to expose themselves to the wind when it carries the effluvia, or exhalation, of this tree with it, without letting them feel the inconvenience of the swelling just described. Their eyes are sometimes shut up for one, or two, or more days together, by the swelling. I know (says the Professor) two brothers, one of whom could not come near it without swelling. I have known old people who were more afraid of this tree than of a viper, and I was acquainted with a person, who, merely by the noxious exhalations of it, was swelled to such a degree, that he was as stiff as a log of wood, and could only be turned about in sheets." In some places, this tree is rooted out, on purpose that its poison may not affect the workmen. The natives are said to distinguish it in the dark, by its extreme coldness to the touch; and the thickened juice of this tree is said to be the fine varnish of Japan, with which they blacken their different utensils.

But the Japan Varnish is very inferior to what the Chinese obtain from a tree known in the country by the name of *Isi-chu*. As this is possessed of similar properties with the preceding, it will not be improper to describe it under the same head. The bark and leaves of the *Isi-chu* resemble those of the ash; and the trunk, which, when full grown, is about

two feet in circumference, seldom exceeds twelve or thirteen feet in height.

The Chinese do not procure varnish from the tree, until its trunk is about five inches in diameter, which it seldom attains before seven or eight years. To cause the gum to flow, they make several rows of incisions round the trunk; these they make with one hand, and with the other, hold a shell, the edges of which they insert into the opening, where it remains without any support. This is always done towards evening, and, in the morning, they collect the varnish that has flowed during the night; the following evening, the shells are again inserted, and the operation is continued to the end of summer.

While this varnish distils, it gives out a malignant vapour, the bad effects of which can only be prevented by great precaution: when the workmen are going to fix their shells to the trees, they rub their faces and hands with rape-oil, which they do with still greater care, when they collect in the morning, what has distilled during the night. They cover their faces with a mask, in which there are holes to see through; they have also separate coverings for the rest of their body. The labourer, who should attempt to collect varnish without using these precautions, would soon be punished for his rashness, and the most dreadful effects ensue. The disorder shews itself by blisters of a bright red colour, which spread in a very short time; the skin bursts, and the whole body appears covered with a leprosy.

When the labourers collect this gum, they carry, suspended from their girdles, a vessel made of leather; with one hand, they detach the shells, and scrape them with a small iron instrument, which they hold in the other; it is then purified by straining through a cloth, and sold to the druggist for the purposes to which it is applied.



BUTTER TREE.

THIS singular tree is as yet but imperfectly known; all the information we have hitherto obtained respecting it, being from the account of Mungo Park, who mentions it in his travels into the interior of Africa. It appears that the tree is of moderate size, and produces a fruit, which ranks it amongst the first of African vegetables, in point of utility.

When Park had reached the district of Bambarra, in the interior of Africa, he found the people busily employed in collecting the fruit of the Shea Tree, from which the vegetable butter is prepared. It is not cultivated by the natives, but is found growing naturally in the woods; its usefulness, however, is acknowledged by the natives, since in clearing ground for cultivation, every tree is cut down but the shea. The tree itself, says Park, very much resembles the American Oak; and the fruit, (from the kernel of which, being first dried in the sun, the butter is prepared by boiling

it in water,) has somewhat the appearance of a Spanish Olive.

The kernel is shut up in a sweet pulp, under a thin green rind; and the butter produced from it, besides the advantage of keeping the whole year without salt, is whiter, firmer, and of a richer flavour, than the best butter I ever tasted from cow's milk; the preparation of this commodity seems to be among the first objects of African industry in this and the neighbouring states, and it constitutes the main article of their inland commerce.



THE COFFEE TREE.

THE Coffee Tree, whose seeds or berries afford a well-known and agreeable liquor, is a native of Arabia Felix, wher it generally rises to the height of seven or eight, and sometimes twelve feet, with a trunk from ten to fifteen inches in circumference.

It is covered with a gray smooth bark, and shoots out, through the whole length of its stem, a growth of branches, which are always opposite to each other; and the leaves, which resemble those of the bay tree, arranged in pairs in the same manner. From the bottom of the leaves spring fragrant white flowers, very much like those of the jasmine; and when these flowers, or blossoms, drop off, they leave a small fruit behind, which is green at first, but reddens as it ripens, and is like a cherry

both in shape and colour. Two, three, or more of these berries grow together, on the same part of the twig; each coated with a husk or tegument, enclosing another and finer skin, in which two seeds or kernels are contained, which are what we call coffee.

The drink made of coffee-berries has been common in Europe above a hundred years, and much longer among the Turks.

The Coffee plant was first brought into France from Batavia, by the famous traveller M. Thevenot, about the beginning of the century before last; and a Greek, called Pasqua, who was brought to England as a servant in 1652, first set up the profession of a coffee-house keeper, and introduced the use of the liquor into these countries.

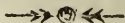
When the coffee plant that we have mentioned, arrived in Paris, the King of France caused it to be carefully nursed in the royal gardens at Paris, and that one may be considered the parent of all those that were afterwards planted in the French West India Islands. It was carried there by a gentleman who, during a long passage, in which water fell so short as to be given out in daily portions to each of the passengers, shared his allowance with the plant which was under his care, and by this means succeeded in bringing it alive to its destination; there the most favourable soil and situation was chosen, the tree was carefully attended till it bore fruit, and the seeds given to the different inhabitants of the place, with directions for its cultivation.

Formerly, great quantities of Coffee were annually imported into Europe from Arabia ; at present, however, that of the West Indies is considered nearly as good, and being considerably cheaper in price, it has entirely supplanted the other.

It is principally in the district of Mocha, in Arabia, that the Coffee plant is cultivated on a large scale ; the principal care required to ensure the success of a coffee plantation being to supply a sufficient quantity of water ; and for this purpose, the Arabians are in the habit of throwing stones into the trenches which are dug for the plants, probably to prevent the moisture from evaporating. When the season for gathering the fruit (which is in May,) arrives, they spread pieces of cloth under the Coffee trees, in order to catch the fruit, which readily falls to the ground when the tree is shaken. The crop is then placed on a mat to dry, and the pods forced open by passing over them a heavy roller of wood. The seeds are then stripped of their covering and separated into winnowing fans, and finally dried again. It may also be remarked, that it matters little whether the Coffee be old or new, provided it has been gathered when perfectly ripe, and is used soon after being roasted.

The inhabitants of the East are so fond of Coffee, that, with them it is considered the principal beverage ; they are in the habit of taking three or four ounces a day without either milk or sugar, but perfumed with cloves, cinnamon, and other fragrant spices. The

Arabs roast the husks as we do the berries ; and the drink made of them, having a little tartness, is cooling and pleasant in the heat of Summer.



THE COTTON TREE.

THERE are three sorts of Cotton Trees ; one creeps on the earth, like a vine ; the second is thick, like a bushy dwarf tree ; and the third, is as tall as an oak. All the three, after they have produced very beautiful flowers, are loaded with a fruit as large as a walnut, whose outward coat is entirely black. This fruit, when it is fully ripe, opens, and discovers a down extremely white, and which is called Cotton.

The tree which produces this useful and valuable merchandize, grows commonly in several places in the Levant, and of the East and West Indies. Its fruit is of an oval form, about the size of a nut, which through the heat of the sun, opens in several places, and discovers the Cotton through the clefts. The Cotton of the first sort of plant, which creeps on the ground, is esteemed the best ; its produce near Smyrna is greater than any where else, tho' its quality is inferior : they sow the seeds (which are little beans, and found in each of the pods) in June, and gather it in October ; and the soil is so favourable, that they can have three crops in a year.

THE Cotton is separated from the seeds by means of mills, which pull out and loosen the

down; it is then in a state fit to be sent from the planter to the manufacturer. The farther operations it undergoes, are picking, cleaning, carding and roving, which last brings off the fibres longitudinally in a continued loose line. These are next twisted and drawn out, so as to make thread or yarn, and the material is then consigned to the weaver. The vast extension of the cotton manufacture in this country, has caused these preparatory operations to be performed by a system of complex machinery, the invention of which has exercised all the ingenuity of the ablest mechanics. The fabrics made from Cotton, are probably more various and numerous than from any other material: they comprehend stockings, waistcoats, calicos, muslins, velvets, thicksets, &c. in short, stuffs of all degrees of fineness, from the transparent muslin of a robe or a turban, to the thick plush and warm bed quilt. The commerce of Great Britain has of late years been peculiarly indebted to the cotton manufactory, which produces clothing for people of all ranks, from Russia to Guinea, and unites elegance with cheapness, in an unrivalled degree. Great quantities of the native fabrics of the East are also imported into Europe; some of these, by the advantage of an excellent material and incomparable manufacture, dexterity and patience in the workmen, though made with very simple machinery, surpass in fineness and beauty, anything of European manufacture. The natives are said to perform their finest work in moist cool places, under ground, which makes the cotton hold together, so as to draw out to the

thinnest threads; and the soft and delicate fingers of the Indian women give them the sense of feeling, to a degree of niceness much beyond that of our common people. It is propable that cotton, at present, clothes more people in the world than any other substance; its peculiar advantages, besides cheapness, are the union of warmth with lightness, whence it is fitted for a great variety of climates; to the hot it is better adapted than linen, on account of its absorbing quality, which keeps the skin dry and comfortable. The woolliness of cotton gives a kind of nap to the clothes made of it, which renders them soft to the touch, but apt to attract dust; in the fine muslins this is burned off, by passing them between red-hot cylinders with such velocity as not to take fire; which, we may conceive, considering the combustibility of cotton, to be a very nice operation; a readiness to catch fire is indeed a dangerous quality of this material, and many fatal accidents have arisen from it, since the prevailing use of muslins in women's dress. Much mischief has also proceeded from colds taken in these delicate garments, which are by no means fitted to protect the wearers from the inclemencies of our variable climate.

The downy matter surrounding the seeds in some other plants, has been employed for the same purpose as cotton, and by proper preparation, has, in some instances, succeeded very well; but in some cases, it is too brittle or of too short a staple, to be used with advantage, in the form of thread; it has, however, afforded a

useful material for stuffing beds and pillows, and for quilting ; in this way the down of a plant growing copiously upon some of our bogs, called cotton grass, has been employed by the neighbouring poor.

Having thus given the natural history of the Cotton plant, and briefly described the changes it undergoes in its passage through the hands of the manufacturer, as well as the various uses to which his ingenuity and industry have enabled it to be applied ; we shall now add the *Travels of a Pound of Cotton*, as the best means of showing the prodigious advantages of commerce and manufactures. If many of the improvements of modern life are so many ways of providing luxuries or even superfluities to the rich, we must always, at the same time, recollect, that the preparation of these articles gives employment and support to the industrious artisan, and furnishes him also with an abundance of additional employments.

There was sent off for London lately, from Paisley, in Scotland, a small piece of muslin, about one pound weight, the history of which is as follows :—The cotton came from the East Indies to London ; from London it went into Lancashire, where it was manufactured into yarn ; from Manchester it was sent to Paisley, where it was woven ; it was sent into Ayrshire next, where it was tamboured ; afterwards it was conveyed to Dumbarton, where it was hand-sewed, and again returned to Paisley, whence it was sent to a distant part of the county of Renfrew to be bleached, and was return-

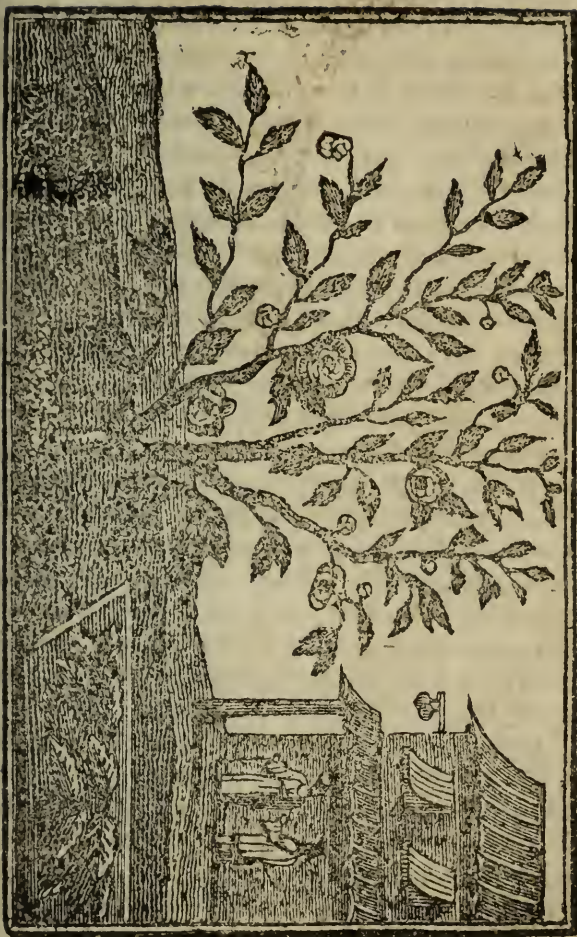
ed to Paisley; it was then sent to Glasgow to be finished, and from Glasgow was sent by the coach to London. It is difficult to ascertain the time precisely, which was necessary to bring this article to market; but it may be pretty near the truth to reckon it three years from the time it was packed in India, till it was fit for sale as cloth in the merchant's warehouse in London. It must have travelled 5000 miles by sea and 900 by land, and perhaps was afterwards shipped for some part of South America, which would add about 5000 miles more to these distances. It contributed to the support of at least 150 different people, whose services were employed in the carryings and manufacture of this small quantity of cotton, and by which the value was increased 2000 times.



THE TEA PLANT.

OF all the vegetable productions of China, the Tea Plant deserves particular notice, as its leaves afford, by infusion, a favourite liquor which is used daily among us, by people of almost all ranks and conditions.

This shrub, which seems to be a species of myrtle, seldom grows beyond the size of a rose-bush, or at most, six or seven feet in height. It thrives best in a gravelly soil, and is usually planted in rows upon little hills, about three or four feet distant from each other. The larger leaves are about two inches long and one broad; from a small beginning, they become round and broad, and then taper to a point,



THE TEA PLANT.

they are notched at the edges like rose or sweet briar leaves, the teeth being close together, but of different sizes. Each leaf has one very conspicuous nerve in the middle, which is answered by a deep furrow on the other side, and branches into five, six or seven cross ribs; when of the full size, they resemble the leaves of the black cherry-tree, both in figure and colour, but when young, and before they are fit to be gathered, they are not unlike the leaves of the common spindle-tree, except in colour. The shrub is an evergreen, and bears a small fruit containing several round blackish seeds, about the bigness of a large pea, but scarcely above one in ten comes to perfection. By these seeds the plant is propagated, nine or ten of them being put into a hole together; and the shrubs thence arising are afterwards transplanted into proper ground. They thrive best when exposed to the south sun, and yield the best Tea; but there is a sort that grows without cultivation, which, though less valuable, often serves the poorer class of people.

It was formerly supposed that the varieties of Tea which are sold in Europe were from different kinds of the plant; this, however, is a mistake; the product of the same plant differing in colour and fragrance according to the difference of soil, the time of gathering, and the method of preparation.

The first gathering is in March, when the plant has sent forth but few of its leaves, and then but two or three days old: at this time they are small, green and tender; the Tea

which is made from them, is reckoned the best, and from its scarcity, is reserved for princes and rich people : for this reason it is called Imperial Tea.

The greatest care, is taken, in Japan, to preserve this precious shrub ; the care of these plants is entrusted to people who are ordered to guard the leaves from dust, and to defend them from the severity of the weather ; they gather them with the greatest nicety and never touch them but with very fine gloves. When this choice Tea has undergone the process necessary for its preparation, it is escorted by a strong guard to the Emperor's Court, and kept for the use of the Emperor's family. The popular opinion, that the green colour of this sort of Tea is occasioned by the use of copper plates, is altogether unfounded ; every leaf, says Sir George Staunton, passes through the fingers of a female, who rolls it up almost to the form it had assumed when first budding on the branch. It is afterwards placed on thin plates of earthenware or iron. It is confidently said in the country, that thin plates of copper are even used for that purpose. The colour of the green Tea is thought to be derived from the early period at which the leaves are plucked, when, like unripe fruit, they are generally green and sharp. The second gathering is made about the end of March : the leaves, in this season, are large, without having lost any of their flavour ; they, however, differ with regard to their ripeness, some being arrived at perfection, while others have not attained

their full growth. Nevertheless they are gathered promiscuously : but sorted afterwards according to their size and quality; the youngest, particularly, are carefully separated, and are often sold for the first gathering, or Imperial Tea.

The third gathering takes place in June, when the leaves have acquired their full size and thickness. This is the most abundant crop, but at the same time, it is the coarsest tea, and is chiefly consumed by the common people. After the leaves are gathered, they are carried to the drying houses to be prepared for use. These are buildings which have been erected at the public expense, and thither every private person, who has no convenience of his own for curing the fresh gathered Tea, may carry them to be dried : they contain a great number of stoves, each having at the top, an iron plate, into which, when heated to a proper degree, the leaves are thrown. During the operation, the roaster keeps them continually stirring with his hands, that they may be thoroughly and equally dried. He then takes them out with a shovel like a fan, and hands them to the rollers, who roll them in the palm of their hands in one direction till they are cooled. They are now fit for use, and being packed in chests lined with lead, and covered over with large leaves, they are sent into Europe for sale.

Tea was introduced into Europe in the year 1610, by the Dutch East Indian Company. In 1666, it was sold in London for sixty shillings

a pound, and continued at that price till 1703.

The Tea leaf, as well as that of tobacco, affords a striking example of the power of habit over mankind. About two hundred years ago, the Europeans used neither; to-day, there is scarcely a poor tradesman but prefers the liquor procured from the Tea plant, which affords no nourishment whatever, to the bounteous supply which is furnished by the cow. It is not to be wondered at that the inhabitants of China should indulge in it; the plant grows in their country, and indeed, when we consider one circumstance in their situation, we must acknowledge, that Providence has displayed much goodness in scattering this plant with so much profusion amongst them. The water of the country is said to be unwholesome and nauseous, and therefore, without some corrective, would be unfit for domestic purposes.

But it appears singularly absurd that so many working people, living at a distance of five or six thousand miles from Peking, should spend a considerable part of their earnings to procure a plant, which, as it is sold to them, is often mixed with very injurious substances, and is no nourishment to the body, but rather hurts the constitution, if freely indulged in.



THE OAK.

THE Oak stands at the head of our native timber trees, as well on account of its utility, as of the grandeur of its figure : it reaches a bulk scarcely inferior to the Baobab, which is the largest tree in the forest ; and by its vast arms, which it throws out on every side, it forms a mass, which impresses the spectator with the ideas of strength and durability.

Some centuries ago, there were great forests of Oak in different parts of Ireland, and the timber was so much esteemed, as to be sent into other countries, where it was employed in buildings. In proportion, however, as the country became more peopled, and the arts of agriculture advanced, these have disappeared : the natural consequence of such improvements, being to clear the ground for the purpose of drawing more land into cultivation. We may follow up this observation by remarking, that man is not the being to whom the plantation of forests was consigned ; corn, indeed, and vegetables, and a few low trees, have been subjected to his industry, in order to exercise and occupy him in a useful manner ; but let us turn our attention to those extensive forests which cover the face of uninhabited countries ; who planted those mighty Oaks which grow, without number, where man has not yet been able to penetrate ? Who conducted them to perfection ? What gardener, but God, was competent to prune their redundant growth, and to afford them their stated refreshment of

water? The Almighty has given existence and growth to every other plant, but the forest alone may be considered as his garden; he diffuses their minute seeds over the surface of a whole country; his wise precaution has furnished various means, by which they are conducted to a soil favourable for their growth; He alone draws from them those vast bodies, which rise to such a height in the air, fastens them with so much strength in their several situations, and enables them to resist the winds; He alone selects genial dews and ample rains, to array his trees with verdure, and to impart to them strength and durability.

The uses of the Oak Tree are very various, and comprehend almost every part of it; the acorns, which, in common with the nuts of other trees, are called mast, are said to have been the earliest food of mankind; and in some of the warm climates, they are in use for that purpose. In England, they are valued as the food of swine, of which large droves are sent to fatten in the oak woods during the weeks in Autumn, when the ripe acorns begin to fall.

In Mr. Gilpin's remarks on forest scenery, there is a very entertaining account of the management of the hogs, during their autumnal visit to the woods, from which the following account is extracted:—

“The first step the swineherd takes, is, to look out for some close sheltered part of the forest, where there is a conveniency of water, and plenty of oak or beech mast, the former of which he prefers, when he can have it in

abundance. He next fixes on some spreading tree, round the bole of which, he wattles a slight circular fence of the dimensions he wants; and, covering it roughly with boughs and sods, he fills it plentifully with straw or fern.

“ Having made this preparation, he collects his little colony among the farmer, with whom he commonly agrees for a shilling a head, and will get together a herd of five or six hundred hogs. Having driven them to their destined habitation, he gives them a plentiful supper of acorns or beech mast, which he had already provided, sounding his horn during the repast. He then turns them into the litter, where, after a long journey and a hearty meal, they sleep most deliciously.

“ The next morning, he lets them look a little around them, shews them the pool or stream where they may occasionally drink, leaves them to pick up the offals of the last night's meal, and, as evening draws on, gives them another plentiful repast under the neighbouring trees, which rain acorns upon them for an hour together, at the sound of his horn. He then sends them again to sleep.

“ The following day, he is, perhaps, at the pains of procuring them another meal, with music playing as usual. He then leaves them a little more to themselves, having an eye, however, on their evening hours. But as their bellies are full, they seldom wander far from home, retiring, commonly, very orderly and early to bed.

“ After this, he throws his sty open, and

leaves them to provide for themselves ; and henceforward has little more trouble with them, during the whole time of their migration. Now and then in calm weather, when masts fall sparingly, he calls them together, perhaps by the music of his horn, to a meal which he gathers for them ; but in general they need little attention, returning regularly home at night, though they often wander in the day, two or three miles from their sty.—There are experienced leaders in all herds, which have spent this roving life before ; and can instruct their juniors in the method of it.—By this management, the herd is carried home to their respective owners in such condition, that a little dry meal will soon fatten them.”

Every part of the Oak abounds in a juice which is applied to various purposes. The bark is particularly valuable on this account, which renders it so useful for tanning leather ; the small twigs, and even the leaves of the Oak may be applied to a similar purpose. Galls, which are a swelling, formed in warm countries on the Oak by means of an insect, are much used in dying, on account of their property in striking a deep black, with the addition of virriol of iron. The Oak apples, as they are improperly called, formed in the same manner on our trees, possess a similar property in a less degree. Oak saw-dust is the principal material used in dying fustians. It gives all the varieties of drab colours, and shades of brown, according as it is managed and compounded.

But it is by the use of its wood, that the Oak

has acquired its chief fame, and especially for the important purposes of ship building. It is to this tree we are indebted for those mighty vessels which resemble floating cities, and bear the produce of our country from one end of the Globe to the other.

Let India boast her plants, nor envy we
The weeping amber and the balmy tree,
While by our *Oaks* the precious loads are borne;
And realms commanded which those trees adorn.

Oak timber is best fitted for ships of war, on account of its strength and durability, and also by the property of not readily splintering, a circumstance of much consequence since the invention of cannon. If not entirely built of Oak, therefore, which, from the present scarcity of that timber, is seldom done, ships have always their sides planked with it. Oak timber is likewise preferred for many other services. In house building it is used for doors and window frames. When more plentiful, floors and staircases, were also made of it. In machinery, no other wood is equal to it, where a great stress is to be borne, as in mill work, steam engines, &c. It is used for the bodies of carts and waggon; also for gates, posts, and ladders. In the country, it is a common material for furniture, its durability being thought a sufficient compensation for the difficulty of working it. Coopers also employ it for their largest vessels, and for well-buckets and water pails.

We shall conclude our history of this noble tree, by mentioning a few instances of the great size and age which it is capable of attaining.

Close by the gate of the water-walk, at Magdalen college, Oxford, grew an oak, which perhaps stood there a sapling, when Alfred the Great founded the University. This period only includes a space of nine hundred years, which is no great age for an oak. It is indeed, a difficult matter to ascertain the age of a tree.

But this tree, can almost produce historical evidence for the age assigned to it. About five hundred years after the time of Alfred, William of Wainfleet, Dr. Stukely tells us, expressly ordered his college to be founded near the *great oak*: and an oak could not, he thinks, be less than five hundred years of age, to merit that title, together with the honour of fixing the scite of a college. It was afterwards much injured in Charles the Second's time, when the present walks were laid out, its roots were disturbed, and from that period it declined fast, and became reduced, by degrees, to little more than a mere trunk. The oldest members of the university can scarcely recollect it in better plight. But the faithful records of history have handed down its ancient dimensions. Through a space of sixteen yards, on every side from its trunk, it once flung its boughs, and under its magnificent pavilion, could shelter with ease three thousand men, though, in its decayed state, it could for many years, do little more than shelter some luckless individual, whom the driving shower had overtaken in his evening walk. In the summer of the year 1788, this magnificent ruin fell to the ground, alarming the college with its

rushing sound. It then appeared how precariously it had stood for many years. Its grand tap root was decayed, and it had hold of the earth only by two or three roots, of which, none was more than a couple of inches in diameter. From a part of its ruins a chair has been made for the president of the college, which will long continue its memory.

In a park, near Deal, in the county of Kent in England, are oak trees, the most remarkable for height, and size in the kingdom. They are distinguished by appropriate names, but the most remarkable of them are those called *Majesty*, *Stately*, and *Beauty*.—*Beauty* is sixty-three feet from the ground, whilst the uniformity of its branches, and the regularity of its bark are beautiful beyond conception. The circumference of this tree, five feet from the ground, is fifteen feet, nine inches; its solid contents, bark not included, twelve ton, twenty five feet! *Stately*, at four feet from the ground, measures in circumference, eighteen feet, and its solid contents, twelve ton, thirty-three feet, one inch, bark not included! But *Majesty*, the most wonderful of all these trees, has, eight feet from the ground, a circumference of twenty-eight feet, four inches; and, at twenty-eight from the ground, fifteen feet, six inches. It has one arm which contains sixty-eight feet, eleven inches; another, sixty-four feet, two inches, a third, sixty feet, nine inches, and several others of nearly equal dimensions. The total contents of this huge bulk of timber are thirty-six tons, twenty-eight feet, four inches, bark not included

THE CHESTNUT.

THIS Tree is called the Spanish Chestnut, as growing in the greatest perfection in Spain, where the climate is warmer than with us. It flourishes also in other parts of the South of Europe, and affords a wholesome and nutritive food. The appearance of an aged Chestnut is striking and majestic. It throws out arms equal in size to those of the oak, and they often shoot across each other, so as to produce an uncommon effect; the deep furrows of the rugged trunk, sometimes form a kind of network by interlacing. The branches are richly clothed with long jagged leaves, of a pleasant green, and the head is tufted and spreading. In Autumn, the leaves fade to a gold yellow, affording a conspicuous variety of tinge in the woods. In Italy, an ordinary sized Chestnut will measure twenty-five feet in circumference, at the distance of three feet from the ground.

Among the mast bearing trees, this may be reckoned the most valuable, since its nuts are excellent food for man, as well as for other animals. In many parts of the South of Europe, they afford as much support to the poor, as the potato does in Ireland: like that useful and nourishing root, the chestnut yields a fine mealy substance, of which bread is made. In this country, the fruit seldom comes to maturity.

The wood of the chestnut is strong and durable, and is used for most of the purposes in which oak is employed. It is preferable to

any for making tubs and vessels to hold liquors, as not being liable to shrink after being once seasoned.

Few trees arrive at a greater age than the Chestnut. At Tortworth, in Gloucestershire, one of the counties in England, there is one, fifty-two feet round, which is proved to have stood ever since the year 1150, and it was then so remarkable, that it was called the *great Chestnut of Tortworth*. It fixes the boundary of the manor, and is probably nearly one thousand years old. As an ornamental tree, the Chestnut, though unequal to the oak, the beech, and the esculus, has a degree of greatness belonging to it, which recommends it strongly to the gardener's attention. Its uses have been highly extolled, and it may deserve a considerable share of the praise which has been given to it. As a substitute for the oak, it is preferable to the elm: for door-jambs, window-frames, and some other purposes of the house-carpenter, it is nearly equal to the oak itself; but is very apt to be shakey, and there is a deceitful brittleness in it, which renders it unsafe to be used as beams, or in any other situation where an uncertain load is required to be borne. It is universally allowed to be excellent for liquor casks, as not being liable to shrink, nor to change the colour of the liquor it contains: it is also strongly recommended as an underwood for hop-poles, stakes, &c. Its fruit too is valuable, not only for swine and deer, but as human food, bread is said to have been made of it. Upon the whole, the Chestnut

whether in the light of ornament or use, is most undoubtedly an object of great admiration.

But the size of the Tortworth Chestnut, is not to be compared with that to which this tree grows on Mount Etna in Sicily. One of these is of such extraordinary dimensions, as to excite the admiration of every traveller who visits that part of the world.

This tree is reported to be one hundred and sixty feet in circumference, but quite hollow within, which however affects not its verdure: for the Chestnut Tree, like the willow, depends upon its bark for subsistence, and by age loses its internal part. As the cavity of this enormous mass is very considerable, the people have built a house in it, where they have an oven for drying nuts, almonds, chestnuts, &c. of which they make conserves. They frequently supply themselves with wood from the tree which encircles their house, so that it seems likely, in a short time, to go to ruin through the ingratitude and thoughtlessness of its inhabitants.

Besides this, there are abundance of other trees of the same species in the neighbourhood, very remarkable for their size, all very beautiful and straight, and almost as smooth as polished marble. One of these measured thirty-eight feet in circumference, and there were a number of others nearly of the same size. Among these, there were seven standing together, which have received the name of the *seven brethren*: another is denominated

the ship, from the general figure of its top which has some slight resemblance to a ship. Its diameter is twenty-five feet, so that the circumference cannot be less than seventy-five feet. The Chestnut Trees thrive very well in this country, and are carefully cultivated by the inhabitants. They are worked into hoops for casks, and a considerable trade carried on in this article.

THE FOUNTAIN TREE.

In Glass's history of the Canary Island there is the following account of a tree, which supplies water in sufficient abundance for the consumption of the people, on the Island where it grows.

The district in which this tree stands is named Figulatre, near to which, and in the cliff or steep rocky ascent surrounding the whole island, is a narrow gutter or gulley, which commences at the sea, and continues to the summit of the cliff, where it joins or coincides with a valley which is terminated by the steep front of a rock.

"On the top of this rock, grows a tree called, in the language of the ancient inhabitants, Garse, (sacred or holy tree) which for many years has been preserved sound, entire and fresh. Its leaves constantly distil such a quantity of water, as is sufficient to furnish drink to every living creature in Hierro; and



THE FOUNTAIN TREE.

ture having provided this remedy for the drought of the island. It is situated about a league and a half from the sea. It is distinct from other trees, and stands by itself. The circumference of its trunk is about twelve spans, the diameter four, and in height from the ground to the top of the highest branch forty spans: the circumference of all the branches together, is one hundred and twenty feet — The branches are thick and extended; the lowest commence about an ell from the ground. Its fruit resembles the acorn, and tastes something like the kernel of a pine apple, but is softer and more aromatic. The leaves of this tree resemble those of the laurel, but are larger, wider, and more curved; they come forth in perpetual succession, so that the tree always remains green. On the north side of the trunk, are two large tanks, or cisterns, of rough stone, or rather one cistern divided, each half being twenty feet square, and sixteen spans in depth. One of these contains water for the drinking of the inhabitants; and the other that which they use for their cattle, washing, and such like purposes. Every morning, near this part of the island a cloud or mist arises from the sea, which the south and easterly winds force against the fore-mentioned steep cliff, so that the cloud, having no vent but by the gutter, gradually ascends it, and from thence advances slowly to the extremity of the valley, where it is stopped and checked by the front of the rock, which terminates the valley, and then rests upon the thick leaves

and wide-spreading branches of the tree, from whence it distils in drops, during the remainder of the day, until it is at length exhausted, in the same manner that we see water drip from the leaves of trees after a heavy shower of rain. This tree yields most water in those years when the Levant or easterly winds have prevailed for a continuance, for by these winds only, the clouds or mists are drawn thither from the sea.

“ A person lives on the spot near where this tree grows, who is appointed by the Council to take care of it, and its water; and is allowed a house to live in, with a certain salary. He every day distributes to each family of the district, seven pots or vessels full of water. besides what he gives to the principal people in the island.

TREE YIELDING WATER, IN AMERICA.

In Cockbourn's Voyages, we find the following account of a dropping tree, near the mountains of Vera Paz, in America.

“ On the morning of the fourth day, we came out on a large plain, where were numbers of fine deer, and in the middle stood a tree of an unusual size, spreading its branches over a vast compass of ground. Curiosity led us up to it; we had perceived at some distance off, the ground about it to be wet, at which we began to be somewhat surprised, as well knowing there had no rain fallen for nearly six

months past, according to the certain course of the season in that latitude: that it was impossible to be occasioned by the fall of dew on the tree, we were convinced, by the sun's having power to exhale all moisture of that nature, a few minutes after its rising. At last to our great amazement, as well as joy, we saw water dropping, or, as it were, distilling fast from the end of every leaf of this wonderful tree; and it may well be supposed how thankfully we partook of this refreshing supply; having for four days suffered much, from want of water.

“ We could not help looking on this as liquor sent from heaven to comfort us under our great extremity. We caught what we could of it in our hands, and drank very plentifully of it, liking it so well, that we could hardly prevail with ourselves to give it over.

” A matter of this nature could not but excite us to make the strictest observations concerning it; and accordingly we staid under the tree nearly three hours, and found we could not fathom its body in five times. We observed the soil where it grew to be very stony; and upon the nicest inquiry we could afterwards make, both from the natives of the country, and the Spanish inhabitants, we could not learn that there was any such tree known throughout New Spain, nor perhaps all America over.

THE TALLOW TREE.

THE Tallow Tree grows in great plenty in China, and produces a substance much like our tallow, and serving for the same purposes.

It is about the height of a cherry tree ; its leaves in form of a heart, of a deep shining red colour, and its bark very smooth. Its fruit is enclosed in a kind of pod or cover, like a chestnut, and consists of three round white grains, of the size and form of a small nut, each having its peculiar chamber, and within that, a little stone.—This stone is encompassed with a white pulp, which has all the properties of our tallow, as to consistence, colour and even smell ; and accordingly the Chinese make their candles of it, which would doubtless be as good as those in Europe, if they knew how to purify their vegetable, as well as we do our animal tallow, and make their wick as fine. All the preparation they give it, is to melt it down, and mix a little oil with it, to make it softer and more pliant. It is true, the candles made of it, yield a thicker smoke, and give a dimmer light than our's ; but these defects are owing in a great measure to the wicks, which are not of cotton, but only a little rod or witch of dry light wood, covered with the rind of a rush, wound round it, which being very porous, serves to filtrate the minute parts of the tallow, attracted by the burning wick, and which by this means is kept burning.

Another method of extracting the tallow, is to bruise the husk and seeds together, and

boil them in water, the fat or tallow rises to the surface and is skimmed off, and this, when cool condenses into tallow, and being mixed with a little linseed oil and a small portion of wax, is made into candles.

THE CASHEW-NUT TREE.

THIS tree grows naturally in the West Indies, and arrives at the height of twenty feet, in those places of which it is a native, but cannot be preserved in Britain without the greatest difficulty. Its fruit is as large as an orange; and is full of an acid juice, which makes an agreeable and refreshing drink when mixed with water. At the end of this fruit grows a nut, of the size and shape of a hare's kidney. The shell is very hard; and the kernel, which is sweet and pleasant, is covered with a thin film. Between this and the shell, is lodged, a thick, black, inflammable liquor, of such a burning nature in the fresh nuts, that if the lips chance to touch it, blisters will immediately follow. The kernels are eaten raw, roasted, or pickled. The liquor, just mentioned, is much used by the West-India young ladies, but they give us a very indifferent opinion of their good sense, when, for the sake of a mere outside, they can endure such acute pain as they suffer in applying it to their faces.—When they fancy themselves too much tanned, by the scorching rays of the sun, they gently scrape off the thin outside of the nut, and then

rub their faces all over with the stone. Their faces immediately swell and grow black : and the skin being poisoned by the caustic oil above mentioned, will, in the space of five or six days, come entirely off in large flakes, so that they cannot appear in public in less than a fortnight ; by which time, the new skin looks as fair as that of a new born child. The negroes of Brazil cure themselves effectually of disorders in the stomach, by eating the yellow fruit of this tree ; the juice of which promotes the free circulation of the blood, and thus removes the complaint. The milky juice of this tree, will stain linen of a good black, which cannot be washed out.

THE CAOUTCHOUC, INDIA RUBBER, OR SYRINGE TREE.

In Cayenne, and other parts of South America, the Syringe Tree is a native, and possesses the most singular properties.—No substance is yet known which is so pliable, and at the same time so elastic. This substance oozes out, under the form of a vegetable milk, from incisions made in the tree, and is chiefly gathered in time of rain, because, though it may be collected at all times, it flows then most abundantly. The means employed to make it such as we see it in the shops are kept a profound secret ; but it is affirmed, that it thickens and hardens gradually, by being exposed to the air ; and as soon as it acquires a

solid consistence, it manifests a very extraordinary degree of flexibility and elasticity. Accordingly, the Indians make boots of it, which water cannot penetrate, and which, when smoked, have the appearance of real leather. Bottles are also made of it, to the necks of which are fastened hollow reeds, so that the liquor contained in them may be squirted through the reeds, or pipes, by pressure, whence it obtained the name of Syringe Tree. One of these, filled with water, is always presented to each of the guests, at their entertainments, who never fail to make use of it before eating. Flambeaux, an inch and a half in diameter, and two feet long, are likewise made of this resin, which give a beautiful light, have no bad smell, and burn for twelve hours. A kind of cloth is also prepared from it, which the inhabitants of Quito apply to the same purposes as our oil cloth and sail cloth. It is formed by means of moulds, into a variety of figures for use and ornament; and the process is said to be thus:—The juice, which is obtained by incision, is spread over pieces of clay formed into the desired shape; and as fast as one layer is dry, another is added, till the vessel be of proper thickness: the whole is then held over a strong smoke of vegetables on fire, whereby it is hardened into the texture and appearance of leather; and before the finishing, while yet soft, is capable of having any impression made on the outside, which remains ever after. When the whole is done, the inside mould is picked out.

Among us it is made great use of by painters and others, for rubbing out black lead pencil marks; it is also made into tubes and employed in various complaints by Surgeons



THE CLOVE TREE.

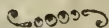
THE Clove Tree resembles, in its bark, the olive; and is about the height of the laurel, which it also resembles in its leaves. No verdure is ever seen under it. It has a great number of branches, at the extremities of which are produced vast quantities of flowers, that are first white, then green, and at last pretty red and hard. When they arrive at this degree of maturity, they are, properly speaking, *cloves*. As they dry, they assume a dark yellowish cast, and, when gathered, they become of a deep brown. The season for gathering the cloves is from October to February. The boughs of the tree are then strongly shaken, or the cloves beat down with long reeds. Large cloths are spread to receive them, and they are afterwards either dried in the sun, or in the smoke of the bamboo cane. The cloves which escape the notice of those who gather them, or are purposely left on the tree, continue to grow till they are about an inch in thickness; and these falling off, produce new plants, which do not bear in less than eight or ten years. Those, which are called *mother cloves*, are inferior to the common sort; but are pre-

served in sugar by the Dutch; and, in long voyages, eaten after their meals, to promote digestion.

The Clove, to be in perfection, must be full sized, heavy, oily, and easily broken; of a fine smell, and of a hot aromatic taste, so as almost to burn the throat. It should make the fingers smart, when handled, and leave an oily moisture upon them, when pressed. In the East-Indies, and in some parts of Europe, it is so much admired, as to be thought an indispensable ingredient in almost every dish. It is put into their food, liquors, wines, and enters likewise into the composition of their perfumes. Considered as a medicine, cloves are very hot, stimulating aromatics, and possess, in an eminent degree, the general virtues of substances of this class. No plant, or part of any plant, contains such a quantity of oil as cloves do. From sixteen ounces, Newman obtained by distillation, two ounces and two drachms; and Hoffman obtained an ounce and a half of oil from two ounces of the spice. The oil is specifically heavier than water. Cloves acquire weight by imbibing water; and this they will do at a considerable distance. The Dutch, who trade in cloves, make a considerable advantage by knowing this secret. They sell them always by weight; and when a bag of cloves is ordered, they hang it for several hours before it is sent in, over a vessel of water, at about two feet distance from the surface. This will add many pounds to their weight, which the unwary purchaser pays for on the

spot. This dishonesty is sometimes practised in Europe, as well as in the spice islands: but the degree of moisture must be more carefully watched in the latter; for there a bag of cloves will in one night's time, attract so much water, that it may be pressed out of them by squeezing them with the hand.

The clove tree is a native of the Molucca islands, particularly of Amboyna, where it is principally cultivated. It is never propagated in Europe. At Amboyna, the Company have allotted to the inhabitants 4000 parcels of land, on each of which they were allowed to dwell; and about the year 1720, compelled to plant about 125 trees, amounting in all to 500,000. Each of these trees, produces annually, on an average, two pounds of cloves; and consequently the collective produce must weigh more than a million. The cultivator is paid with the species that is constantly returned to the company, and receives some unbleached cottons, which are brought from Coromandel.

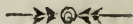


THE PALMETTO TREE.

THERE are two species of this tree, the most remarkable of which, is that which is a native of the West Indies, and warm parts of America, also of the corresponding latitudes of Asia and Africa.—It never rises with a tall stem; but when the plants are old, their leaves are five or six feet long, and upwards of two feet broad: these spread open like a fan, having many foldings, and at the top are deeply di-

vided, like the fingers of a hand. This plant the Americans call *thatch*, from the use to which the leaves are applied. Mr. Adamson describes a species of this tree, which grows naturally at Senegal, whose trunk rises from fifty to sixty feet in height; from the upper end of the trunk issues a bundle of leaves, which, in turning off, form a round head; each leaf represents a fan, of five or six feet in expansion, supported by a tail of the same length. Some of these trees are loaded with fruit, which succeed each other uninterruptedly almost the whole year round. It is said to be of the bigness of an ordinary melon, but rounder. It is enveloped in two skins, as tough as leather, and as thick as strong parchment: within, the fruit is yellowish, and full of filaments, fastened to three large kernels in the middle. The negroes are very fond of this fruit, which, when baked under the ashes, is said to taste like a quince.

The little palmetto may be easily raised in this country from seeds brought from America; but, as the plants are tender, they must be constantly kept in a bark stove.



THE WHITE FIG, OR PLANTAIN TREE

THE delicious figs, which the inhabitants of Ceylon are so fond of seeing grow round about their cottages, are in high estimation with them. These figs are not of the same sort as those that are natives of Portugal, and

are cultivated in Germany, but differ from them totally. Of these there are above twenty different species, all of which have an agreeable sweet taste. They differ much, however, as well in degrees of sweetness as in magnitude. The fruit of some are nine inches long, some six, others again but half that length; at the same time, they are as thick as the arm of a child that is twelve months old. The skin is yellow throughout the whole substance; the inner part, which partakes more of a mealy, than of a watery nature, is perfectly white. About fifty of these figs, more or less, in proportion as they are of a larger or smaller sort, hang on one stalk. The tree that bears them is not of a woody nature, but consists rather of a spongy substance, and must be watered constantly; and, indeed, the best sort is always found near springs. It bears figs on one stalk only, after which it dies. But in the mean while, the stem produces so many young shoots, that you may well afford to give it respite, and in a short time, you will have more figs from its new offspring. The leaves of this tree have a beautiful appearance, and are of a very soft texture and substance. They are often above four feet long, and more than two feet in breadth, and serve the country people for plates and dishes at their meals. The inhabitants consider these figs as a capital present, as they are well apprized that the Europeans are very fond of them. The *Rollawei* is very apt to fall foul on these figs, whilst the country people are asleep in their beds: on which ac-

count they are obliged to gather them, almost through the whole country, before they are quite ripe. The fruit, when ripe and tender, is used as a medicine by the black doctors, and is found very excellent and efficacious in many disorders. The blossom is also eatable, and is frequently pickled. All parts of this tree are useful: good and pleasant wine is made of its fruit, and its leaves are put to various uses:

THE MAHOGANY TREE.

Is a native of the warmest parts of America, and grows also in the island of Cuba, Jamaica, Hispaniola, and the Bahama Islands. It abounded formerly in the low lands of Jamaica; but it is now found only on hills, and places difficult of access. This tree grows tall and straight, rising often sixty feet from the spur to the limbs; and is about four feet in diameter. The foliage is a beautiful deep green, and the appearance made by the whole tree is very elegant. The flowers are of a reddish or saffron colour, and the fruit of an oval form, about the size of a turkey's egg. Some of them have reached to a monstrous size, exceeding one hundred feet in height. In felling these trees, the most beautiful part is commonly left behind. The negro workmen raise a scaffolding of four or five feet from the ground, and hack up the trunk, which they cut into blocks. The part below, extending to the root, is not

only of larger diameter, but of a closer texture than the other parts, most elegantly diversified with shades or clouds, or dotted like ermine with spots; it takes the highest polish, with a singular lustre. This part is only to be come at by digging below the spur, to the depth of two or three feet. and cutting it through; which is so laborious an operation, that few attempt it, except they are curious in the choice of their wood, or to serve a particular purpose. The mahogany tree thrives in most soils; but varies in texture and grain, according to the nature of the soil. On rocks it is of a smaller size, but very hard and weighty, and of a close grain, and beautifully shaded; while the produce of the low and richer lands is observed to be more light and porous, of a paler colour, and open grain; and that of mixed soils, to hold a medium between both. This constitutes the difference between the Jamaica wood and that which is collected from the coast of Cuba, and the Spanish main: the former is found mostly on rocky eminences; the latter is cut in swampy soils near the sea coast.—The superior value of the Jamaica wood, for beauty of colouring, firmness, and durability, may therefore be easily accounted for. This wood is generally hard, takes a fine polish, and is found to answer better than any other sort, in all kinds of Cabinet ware. It is very strong timber, and was frequently used for building, in Jamaica, in former times. It is said to be used sometimes in ship building; a purpose for which it would be remarkably

adapted, if not too costly ; being very durable, capable of resisting gun-shots, and burying the shots without splintering.



THE CASTOR OIL PLANT

THIS plant is a native of America, and of such speedy growth, that in one year it arrives at its full height, which seldom exceeds twenty feet. The trunk is rather woody ; the pith is large, the leaves broad, and shaped like a hand ; the flower-spike is simple, and thickly set with yellow blossoms, in the shape of a cone ; the capsules are triangular and prickly, containing three smooth, gray, mottled seeds. When the bunches begin to turn black, they are gathered, dried in the sun, and the seeds picked out. They are afterwards put up for use, as wanted, or for exportation.

Castor Oil is obtained either by expression or by boiling. The first method is practised in England : the latter in Jamaica. It is common first to parch the nuts or seeds in an iron pot over the fire ; but this gives the oil a burnt taste, smell, and colour ; it is therefore best prepared in the following manner : A large iron pot or boiler is first made ready, and half filled with water. The nuts are then beaten, in parcels, in deep wooden mortars, and after a quantity is beaten, it is thrown into the iron vessel. The fire is then lighted, and the liquor gently boiled for two hours, and kept constantly stirred. About this time, the oil be-

gins to separate, and swims on the top, mixed with a white froth, and is skimmed off till no more rises. The skimmings are heated in a small iron pot, and strained through a cloth. When cold it is put up in jars, or bottles, for use.

Castor oil, thus made, is clear and well flavoured, and, if put into proper bottles, will keep sweet for years. The expressed castor oil soon turns rancid, because the gummy and sour parts of the nut are squeezed out with the oil. On this account, the preference is given to well-prepared oil by boiling. An english gallon of the seeds yields about two pounds of oil, which is a great proportion.

About 40 years ago, the planters in America, imported train oil for lamps, and other purposes about sugar works. It is, however, now found, that the castor oil can be procured as cheap as the fish oil of America; and it burns clearer, and has not any offensive smell. This oil, too, is fit for all the purposes of the painter, or for the apothecary, in ointments and plaisters, and as a medicine for many internal complaints it is highly valuable, and used with remarkable success. All oils are noxious to insects, but the castor oil kills and expels them, almost immediately.

THE MIMOSA, OR SENSITIVE PLANT.

THE Sensitive Plants are so called, because they possess a kind of motion, by which the leaves and stalks are contracted and fall down upon being slightly touched, or shaken with some degree of violence.

The contraction of the leaves and branches of the sensitive plant, when touched, is a very extraordinary appearance. Different reasons has been given for it by botanists ; but since none of them are satisfactory, we shall content ourselves with describing this singular property

It is difficult to touch the leaf of a healthy sensitive plant so delicately that it will not immediately collapse, the smaller leaves moving at their base, till they come in contact, and then applying themselves close together. If the leaf be touched with a little more force, the opposite leaf will exhibit the same appearance. If a little more force be applied, the partial footstalks bend down towards the common footstalk, from which they issue, making with it, a more acute angle than before. If the touch be more violent still, all the leaves situated on the same side with the one that has been touched, will instantly collapse, and the partial footstalk will approach the common footstalk to which it is attached, in the same manner as the partial footstalk of the leaf approaches the stem or branch from which it issues ; so that the whole plant, from having its branches extended, will immediately appear like a weeping birch.

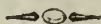
Winds and heavy rains make the leaves of the sensitive plant contract and close ; but no such effect is produced from slight showers.

At night, or when exposed to much cold in the day, the leaves meet and close in the same manner as when touched, folding their upper surfaces together, and, in part, over each other, like scales or tiles, so as to expose as little as possible of the upper surface to the air. The opposite sides of the small leaves do not come close together in the night ; for, when touched, they apply themselves closer together. Dr. Darwin kept a sensitive plant in a dark place for some hours after day-break ; the leaves and foot-stalks were collapsed as in its most profound sleep ; and, on exposing it to the light, above twenty minutes passed before it was expanded.

The leaves only of the sensitive plant shut up in the night, not the branches ; and if it be touched at this time, the branches are affected in the same manner as in the day, shutting up or approaching to the stalk of the trunk, in the same manner, and often with more force. It is of no consequence what the substance is with which the plant is touched, it answers alike to all ; but there may be observed a little spot, distinguishable by its paler colour, in the articulations of its leaves, where the greatest and nicest sensibility is evidently placed.

The parts of the plant which have collapsed, afterwards unfold themselves, and return to their former expanded state. The time required for that purpose varies, according to the

vigour of the plant, the season of the year, the hour of the day, and the state of the atmosphere. Sometimes half an hour is requisite, sometimes only ten minutes. The order in which the parts recover themselves varies in like manner; sometimes it is the common foot-stalk, sometimes the rib to which the leaves are attached, and sometimes the leaves themselves are expanded, before the other parts have made any attempt to be re-instated in their former position.



THE JAKE TREE.

THE Jake Tree, or Sauer Sack, is chiefly found in the island and gardens of Ceylon. The fruit grows on a tolerably large tree, to the thickness of a stout lusty man, hanging on it like a well stuffed sack. It is green, and divided into a number of partitions; in each of which there is a kernel in colour and taste perfectly resembling the chestnut. The fruit itself is agreeably sweet, and grows to the size of a large water-bucket, weighing, perhaps, twenty pounds. The Dutch have given it the name of *sour sack*, to signify, that on account of its great size, it must be sour sauce for the tree to bear the weight of it, and the English seamen, by a corruption of the term have called it *sour jack*.



THE JAKE TREE.

THE WILD PINE.

THIS curious plant is a native of Jamaica, and is so contrived, by the great Author of nature, as to be of the greatest use to the inhabitants of that hot climate, where there is a scarcity of water; for its leaves are channelled, so as to catch and convey water down into their reservoirs, which reservoirs are so made as to hold much water, and to close at top, when full, to hinder its evaporation. And in scarcity of water these reservoirs are not only sufficient for the plants themselves, but likewise are very useful to men, birds, and insects, which come in troops to them, and seldom go away without refreshment. Dampier, in his Voyage, says, "The wild pine is a plant so called, because it somewhat resembles the bush that bears the pine; they are commonly supported, or grow from some bunch, knot, or excrescence of the tree, where they take root, and grow upright. The root is short and thick, from whence the leaves rise up in folds, one within another, spreading off to the top. They are of a good thick substance, ten or twelve inches long; the outside leaves are so compact, as to contain the rain water, as it falls; they will hold a pint and a half, or a quart, and this water refreshes the leaves, and nourishes the root. When we find these pines (says our traveller) we stick our knives into the leaves, just above the roots, and that lets out the water, which we catch in our hats, as *I have done many times, to my great relief.*"

One contrivance of nature in this vegetable very admirable. The seed has many long threads of *tomentum*, not only that it may be carried every where by the wind, but also, that it may, by those threads, when driven through the boughs, be held fast, and stick to the arms, and outstretching parts of trees. So soon as it sprouts, although it be on the under part of a bough, its leaves and stalk rise perpendicularly, or straight up; because, if it had any other position, the cistern, or reservoir (before mentioned, by which it is chiefly nourished) made of the hollow leaves, could not hold water, which is necessary for the nourishment, and life of the plant. Many vines, in dearth of water, are preserved by means of this plant.

THE WATER WITH.

THE Water With is also a native of Jamaica. It has a trunk as thick as a man's leg, and in most respects, resembles the common vine.— But what renders it remarkable is, that growing on dry hills, in the woods, where no water is to be found, its trunk, if cut in pieces, two or three yards long, and held by either end to the mouth, affords so plentifully, a limpid, innocent water, or sap, as to give new life to the thirstiest traveller, or hunter. For these valuable properties, it is very much celebrated by the inhabitants of the island.

A similar plant, discovered in the woods of Amboyna, is thus described by a celebrated traveller. "I saw in the woods of this island, a plant, or tree, in substance much like the body of our ivy—bare, without sprig or sprout; the one end fast in the ground, the other fixed to the limb of a great tree. This rope is of firm, solid wood, without any concavity, and yet yieldeth excellent, good, fair, and sweet water, and as fresh as from the fountain; nor doth it herein admit of any distinction or difference, unless that it is more delicate. According to your companies, cut more or less thereof, distributing to every one the quantity of two foot, or thereabouts, and they will have sufficient; for every piece will run to the value of a pint, or nearly, and that in an instant, affording an admirable refreshment to those that travel those high and dry mountains, as I myself did find by good experience."

THE PEPPER PLANT.

THE chief sorts of pepper are two, the one round, and the other long. The round pepper grows chiefly in some of the Molucca islands, and in Java and Sumatra shooting up high, and is supported as hops are in Europe. The outside of the leaves is of a deep, but the inside of a more pale, green colour. The fruit hangs like currants, only the branches are much bigger and longer. The berries, or pepper-corns are at first green, but grow black in colour

as they grow ripe, which is in the summer months. The berries are gathered and dried in the sun, which makes the outward shell so shrivelled. But when this black shell is taken off, before it is dried in the sun, it makes another sort of pepper, called white pepper; which is sharper, and also pleasanter of taste, than the black, and often used in India, by persons of quality, instead of salt, with their meat. The peeling of this outer black skin is done when the pepper is over ripe, and after it has been steeped in salt water; for, by this infusion, the outward skin aforesaid, swells, so that the white pepper-corns within may be taken out with little or no trouble, which are afterwards dried again in the sun. Not only the berries, which are properly called Pepper, have a fiery, hot taste, but also the leaves, and the whole growth, have the same virtue.

Besides these plants just mentioned, there grows in India a sort of long pepper, called, by the Indians. *pimpilim*, which is never used in meats, but only in medicine, especially in treacle, and other antidotes against poison; and this appears to be done not without great reason, in consequence of its very great strength, which single quality makes it sell at a dearer rate than the other. This pepper grows in great abundance in Bengal, and is transported from thence to Europe. In shape, (except in the fruit) this plant is like unto that of the round pepper, only it creeps along upon the ground, or runs up against lower poles than those of the other pepper. The leaves

of it are also more tender than the other, of a darker green, and have longer stalks.



THE NUTMEG TREE.

THE trees that bear nutmegs are natives of Ceylon, in the East Indies; they also grow in the Indian seas. They are in shape something like our pear trees, and have an ash-coloured bark, with a spongy wood. The flowers, or blossoms, are yellow, with five leaves, not unlike those of cherries; to these succeed the fruit, hanging to a stalk. It is sometimes like a walnut, and the kernel, or nutmeg, is covered with three coats, the first of which is fleshy, soft, and juicy; about as thick as a man's finger, but downy and red, and variegated with yellow, gold colour, and purple spots, like a peach. When it is ripe, it gapes spontaneously, and is of an austere taste. The nutmeg is very firm and compact, and yet is very easily pounded in a mortar. It is wrinkled without, and is somewhat of an ash colour, but within is variegated with a whitish yellow and a bay colour, running in veins without any regularity. Under the first coat, or cover, there is another covering, like network, or rather divided into several parts, which is of an oily clammy consistence, and as it were cartilaginous, but thin, of an agreeable aromatic smell, and of an acrid aromatic taste, with a sort of bitterness. It is of a saffron colour, and is what we call mace. Between the

clefs of this. there is seen a third covering which is a hard, woody, thin shell, of a dusky reddish colour, and brittle, and in this the nutmeg is contained. It is soft at first, but grows dry and hard in time. The taste and smell are too well known to need a description. Nutmegs abound with essential oil, which may be gained by distillation, and every pound will yield an ounce: besides which, there is another oil, which will swim on the surface of the water, and is thick, like suet, but has little virtue. Every sixteen ounces of nutmeg will yield three ounces and two drachms of oil, by expression, of the consistence of suet, which has both the smell and taste of the nutmeg. The principal use of nutmegs is as a spice. They are, however, sometimes used with success to promote digestion, or to remove flatulency, and other complaints; but the immoderate use of them is very bad, for they will affect the head, and produce sleepy diseases, which have been found by experience in the East Indies to cause death.



THE MANNA TREE.

IN Calabria and Sicily are two sorts of ash trees, on the boughs and leaves of which, manna is found in the Summer months, unless prevented by rain. When the weather is dry, it flows from the trunk and large boughs of these trees spontaneously, from about the twentieth of June to the end of July, and from

noon till evening, in the form of a limpid fluid, which hardens into various grumes, and grows white and dry. They gather it the next day, scraping it off with wooden knives, if the weather is fair; but if it should chance to rain, the manna is lost. When July is past, they make incisions in the bark of these trees, and from noon till evening, a liquid flows out, which hardens into thick lumps, which are sometimes very large, and require a day or two to bring them to a proper consistence; this is redder than the former, and is sometimes blackish, on account of the earth and other filth mixed therewith.

The Calabrian manna is sometimes in grains, sometimes in tears, and sometimes in small lumps; it is brittle and whitish, while fresh, and somewhat transparent; but in time grows reddish, and in moist weather turns to the consistence of honey; it is as sweet as sugar, with a kind of acidity. That is the best which is white or yellowish, light and concreted into grumes, in the shape of icicles; but that which is fat, like honey, or blackish and dirty, is not good; for sometimes this is counterfeited with coarse sugar, honey, and a little scammony; likewise that which is white, opaque, solid, heavy, and not in the shape of icicles, is bad, because it is nothing but sugar and manna boiled together. This counterfeit sort may easily be distinguished from the true, by its density, weight, opacity and taste.

The virtues of this valuable gum are well known from its various uses in medicine, which are too numerous to be here inserted.

It is very scarce, on account of the difficulty of gathering it, and is held in great estimation, not only by the Calabrians, but by most civilized nations.

THE WHITE POPPY.

OPIMUM is the juice of the White Poppy, with which the fields of Asia Minor are in many places sown, as ours are with corn. When the heads are ripening, they wound them with an instrument that has five edges, which, on being struck into the head, makes at once five long cuts in it; and from these wounds the opium flows, and is next day taken off by a person who goes round the field, and put up in a vessel, which he carries, fastened to his girdle. At the same time that this opium is collected, the opposite side of the poppy-head is wounded, and the opium collected from it the next day. They distinguish, however, the produce of the first wounds from that of the succeeding ones; for the first juice afforded by the plant is greatly superior to what is obtained afterwards. After they have collected the opium, they moisten it with a small quantity of water, or honey, and work it a long time upon a flat, hard, and smooth board, with a thick and strong instrument of the same wood, till it becomes of the consistence of pitch; and then work it up with their hands, and form it into cakes, or rolls, for sale. Opium is at present in great esteem, and is one

of the most valuable of all the simple medicines.

The best opium in the world is said to come from Patna, on the river Ganges, where, at least the greatest traffic of it is made, and from whence it is exported all over India; though in some parts, especially on the Malay coasts, it is prohibited under pain of death, on account of the madness, which is sometimes occasioned by it; notwithstanding which severe prohibition, however, it is plentifully smuggled into all those countries. The soil about the Ganges is accounted the best for producing the strongest kind of opium; of which the following remarkable instance is related. "A nabob of these parts, having invited an English factory to an entertainment, a young gentleman, a writer to the Company's service, sauntering about the garden, plucked a poppy, and sucked the head of it. In consequence of this, he fell into a profound sleep, of which the nabob being apprised, and likewise informed of the particular bed out of which he had taken the flower, expressed his sorrow; acquainting his friends at the same time, that the poison was too strong to admit of any remedy; which accordingly proved true, and the unfortunate gentleman never awoke."

THE MAGNEY, OR MATI TREE.

THIS tree yields to none in point of utility, It grows copiously in New Spain, and affords water, wine, oil, vinegar, honey, syrup, thread, needles, &c. The inhabitants plant more or

less of them next to every house; it grows as well in the fields, provided it has proper attendance and care. It has broad and thick leaves, with sharp points, which serve for needles; and the points being torn off, there follows out of the leaf, a tough kind of hair fit for sewing. The branches are cut off when still young and tender, and a cavity being left in the tree, a liquor comes out like water, fresh and sweet: if boiled, it acquires the quality of wine; in length of time it turns to vinegar, and if continued longer boiling, and strained, it resembles honey; but if only half-boiled, it is not unlike a syrup. In short, there are nineteen several services which this tree, though but small, yields to the inhabitants. The leaves serve for covering their houses, and a fine yarn may be spun out of them for their vestments. Out of its roots, strong and thick ropes are made, and it is further remarkable, that each plant, though small, (being cut off very young) produces several barrels of liquor, each containing two Spanish arobes, or about eight gallons of our measure.

THE TULIP TREE.

THIS tree is a native of most parts of America. It rises with a large upright trunk, branching forty or fifty feet high. The trunk, which often attains to a circumference of thirty feet, is covered with a gray bark. The branches, which are not very numerous, of the two

years old wood, are smooth and brown; while the bark of the summer's shoots is smoother shining, and of a bluish colour. They are very pithy; their young wood is green, and, when broken, emits a strong scent. The leaves grow irregularly on the branches, on long foot-stalks. They are of a particular structure, being composed of three lobes, the middlemost of which is shortened in such a manner that it appears as if it had been cut off and hollowed at the middle. The two others are rounded off.— They are about four or five inches long, and as many broad; they are of two colours; their upper surface is smooth, and of a stronger green than the lower. They fall off pretty early in autumn, and the buds for the next year's shoots soon after begin to swell, and become dilated, insomuch, that by the end of December, those at the ends of the branches will become nearly an inch long, and half an inch broad. The flowers are produced in July, at the ends of the branches; they somewhat resemble the tulip, which occasions its being called the tulip tree. The flowers are succeeded by large cones, which never ripen in England.

The tulip tree, in those parts of America where it grows common, affords excellent timber for many uses; particularly the trunk, which is frequently hollowed, and made into a canoe sufficient to carry many people; and for this purpose no tree is thought more proper by the inhabitants of those parts. With us, it may be stationed among trees of forty feet growth.

A remarkably fine tree of the above description is now in a flourishing state at Waltham Abbey, in Essex, and is much resorted to by curious visitants, during the time it is in blossom.

THE WHITE CEDAR, OR JUNIPER TREE.

THIS tree grows in the swamps and other parts of America, and when left to grow up, is as tall and thick as the largest fir-trees; they preserve their green leaves both in winter and summer, and the tall ones have no branches on the lower part of the stem.

The white juniper, or cedar, as it is called by many, is one of the trees which most resist putrefaction. When it is made use of above ground, it will last longer than under ground, therefore it is employed for many purposes: it makes good fences, and posts which are to be put into the ground. It likewise makes good canoes. The young trees are made use of for hoops, round barrels, tuns, &c. because they are thin and pliable; the thick and tall trees afford timber and wood for coopers' work.—The houses which are built of it surpass, in duration, those which are built of American oak. This tree affords the best kind of shingles, which are preferred to all others for several reasons. First, they are more durable than any others made of American wood, (the red species of this tree excepted.) Secondly, they are very light, so that no strong beams are re-

quisite to support the roof. For the same reason, it is unnecessary to build thick walls, because they are not pressed by heavy roofs.—When fires break out, it is less dangerous to go under, or along the roofs, because the shingles, being very light, can do little hurt by falling; and they suck the water, being somewhat spongy, so that the roofs can be easily wetted in case of fire, and their fatness prevents the water from injuring them, by its speedy evaporation. When they burn and are carried about with the wind, they have commonly what is called a dead coal, which does not easily set fire where it alights. The roofs made of these shingles can easily be cut through, if required, because they are thin, and not very hard; for these qualities, the people in the country, and in the towns, are very desirous of having their houses covered with white cedar shingles, if the wood can be got. Therefore, all churches, and the houses of the more substantial inhabitants of the towns, have shingle roofs. In many of the provinces of New York, (where the white cedar does not grow) the inhabitants have their houses roofed with it, and for this purpose, great quantities of shingles are annually exported from many parts of New Jersey, to the town of New York, from whence they are distributed throughout the whole province. A quantity of this wood is likewise exported every year to the West Indies, for shingles, pine-shingles, &c. &c.

All the inhabitants are of opinion, that the

water in the cedar swamps, is wholesomer than any other drink ; it creates a great appetite, which they endeavour to prove by many examples. They ascribe this quality to the water itself, which is filled with the rosin of the trees, and to the exhalations which come from the trees, and can easily be smelled. They likewise affirm that this water is always very cold, in the hottest seasons ; this may be partly owing to the continual shade it is in, and many people go to these cedar swamps, and use the waters for the recovery of their appetite.

THE RED JUNIPER, OR CEDAR TREE.

THIS tree is also frequently found in America, Canada, and other parts. It is so called from its wood being very fine and red within. The Swedes call it red juniper ; the English, red cedar. At its first growth, it bears great similarity to the white cedar tree before described ; but after it is grown up, it gets quite different leaves. The berries exactly resemble that of the white, both in colour and shape, but are not so big, though the red grows very tall. They are likewise found on the same ground as the others ; sometimes they are standing together in clusters, especially on the rising banks of rivers, and are sometimes met with on poor, dry, and sandy heaths. Towards Canada, they are seen on the steep sides of the mountains, where they grow promiscuously with the common juniper. Of all the woods in America, this is, without exception, the

most durable, and it is therefore made use of in all cases where other timber rots. Some people say, that if iron be put into the ground along with a pole of cedar, the iron would be half corroded by rust, in the same time that the wood would be rotten. It is, like the white cedar, made use of for shingles, canoes, yachts, and various other purposes. The heart of this tree is of a very fine red colour, and whatever is made of it looks very fine, and has a very agreeable and wholesome smell; but the colour fades by degrees, otherwise the wood would be more frequently made use of by cabinet makers. Its very pleasant smell, particularly when fresh, induces many people to put the shavings and chips of it among their linen, to secure it against being worm-eaten, and from many noxious insects. Many also get desks, &c. made of it, with the same view; but it is only useful for this purpose as long as it is fresh, for it loses its smell after some time, and is then no longer good for keeping off insects. The seats of the gentry, in many parts of Philadelphia, have frequently an avenue, with a row of these trees planted on both sides, leading from the high road to their houses, which has a very grand effect. The lower branches are generally cut, and only a fine crown left, which in winter, when most other trees have lost their leaves, adds greatly to their beauty, and makes them look very fine. This tree is of very slow growth, and is propagated chiefly by birds, which eat the berries, and void the seeds entire.

FLAX.

IN a description of those plants, which, by the goodness of an all bountiful Providence, supply food, clothing and medicine, to man, every thing in short, which is necessary for health and enjoyment, it would be improper to omit the Flax. It is true but little can be said upon the appearance of a production, which grows in most parts of the kingdom, which shall be new to the young reader; but there are few, perhaps, so well acquainted with its history and usefulness, as to know all the different purposes to which it is applied. In its first stage, it gives employment to the husbandman; it next affords a profitable employment to his wife and female children, and afterwards to the manufacturer and the merchant; it is peculiarly the manufacture of Ireland, procuring for us, in exchange, the produce of other countries, and at last, when it has been worn to shreds, and is no longer fit for clothing, the very rags are converted into the paper on which we write. The seeds, when pressed in a mill, yield linseed oil, so much used by painters, and the refuse forms what are called oil cakes, with which cattle are fattened.

Flax is an annual plant, rising on a single stalk to a moderate height, and crowned with handsome blue flowers, succeeded by globular seed-vessels: it is cultivated more or less in most of the countries in Europe, and succeeds best in a strong loamy soil with a good deal of moisture; it is suffered to grow till the seeds

are ripe, and is then plucked up by the hand, laid in little bundles to dry, deprived of its seed vessels, and then put into pits of water to rot ; the purpose of this part of the process is to dissolve a gummy matter which holds the fibres together ; it is the most disagreeable thing belonging to the management of the Flax, since the smell arising from it while rotting, is extremely offensive, and prejudicial to the health, and the infected water always kills the fish which swim in it. Indeed it is much to be wished, that some other mode of loosening the fibres from the other parts of the stalk, were invented. It should be remembered, however, that the steeping of Flax in running water, is far more dangerous than the way above mentioned ; the smell which rises from the Flax left to steep in stagnant pools, sufficiently indicates how much the water is affected by it ; how dangerous then must it be to soak the bundles in a stream or rivulet, which carries off the noxious parts, and mixes them with the water which is to be used for drinking. When the Flax has lain long enough, it is taken out, washed, dried, then beaten with mallets, combed, and by various other operations so prepared, that the long fibres are got by themselves, clean and loose, in which state, they are shining, soft to the touch, and yet strong : it is this which the manufacturers call Flax ; the shorter and coarser fibres, separated by the comb, are called tow. The staple of Flax is longer or shorter, coarser or finer, according to the soil in which it is grown, and

the methods used in dressing it. The operation of spinning, which it next undergoes, consists in drawing out with the fingers several of the fibres together, and twisting them: this was originally done by means of a distaff, on which the flax was fastened, and which was stuck in the girdle, while one hand of the spinner was employed in drawing out and twisting the thread, and the other in winding it upon a reed or spindle; but this method has long given way to the use of a simple machine, (called a spinning wheel,) in which the twisting and winding are performed by means of a wheel turned by a treadle. Of late, also, a double wheel has been used, which gives employment to both hands, enabling the spinner to draw out two threads instead of one, and thus increasing the profit. Spinning has been a part of the domestic occupation of women from the earliest ages, and notwithstanding the modern use of compound machinery, the spinning of Flax is usually performed by them at home in the old way; the spinning wheel is a pleasing object in cottage scenery, and it is desirable that some employment should be reserved in a simple state, which may fill up the vacant hours of rural life, and offer some reward to humble industry. The product of spinning is thread, which is more or less fine according to the dexterity of the spinner and the nature of the material. Some thread, closer twisted than the rest, is kept for needle-work; but the greater part is made up in bundles, called linen yarn, and committed to the weaver.

To perform the process of weaving, the threads which form the length of a piece of cloth are first disposed in order, and strained by weights to a proper tightness, and this is called the warp,

These threads are divided by an instrument, called a reed, into two sets, each composed of every alternate thread, and while, by the working of a treadle each set is alternately thrown up and down, the cross threads, called the woof or weft, are inserted between them, by means of a little instrument sharp at both ends, called a shuttle, which is briskly shot from one of the weaver's hands to the other, and carries the thread with it; this is the simplest kind of weaving. But numberless are the additional contrivances made for all the curious works wrought in the loom, which have been the objects of human ingenuity for many ages.

The linen fabrics are of all degrees of fineness, from coarse sheeting to cambric, almost emulating a spider's web. They are brought to that extreme whiteness, which we so much admire, by the process of bleaching; this consists in their exposure to the action of the sun and air, with frequent watering, and often with the help of some acid liquor, which quickens the operation, but is apt to injure the cloth, if not applied with great caution.—The value that can be given to a raw material by manufacturing, is, in few instances, more strikingly exemplified than in the conversion of Flax, which might have been bought for a few pence, into Point or Brussels lace, some

of which sells for several guineas a yard. Indeed if you look at a plant of Flax growing, and then at the linen of your shirt, you cannot fail to be struck with admiration of human skill and industry.

Linen is one of the comforts of civilized life. It is cooler and more cleanly than any other wearing material, as it is free from downiness, and presents a smooth surface.

We therefore prefer linen for our under garment, but it would be too cold for our climate, did we not cover it with others of a warmer nature.

When Linen is so much worn as to be no longer fit for clothing ; when it has passed from one poor person to another, till at length it has dropped in tatters, it by no means ceases to be useful. Every good housewife should have a bag expressly for keeping old rags in ; they will be bought from her, by the rag gatherer, who sells them again at the paper mills, when they are converted into that beautiful and valuable substance called paper.

The paper maker gives them first to women to sort, according to their different degrees of fineness, who also carefully cut out the seams, which they throw into a basket for other purposes ; they then put them into the dusting engine, a large, circular wire sieve, from which they receive some degree of cleaning.

The rags are next conveyed into a large trough, or cistern, into which a stream of clear spring water is constantly flowing, In this cistern is placed a cylinder about two feet long,

set thickly round with rows of iron spikes, standing as near as they can to one another without touching : at the bottom of the trough are corresponding rows of spikes. The cylinder is made to whirl round with inconceivable rapidity, and thus these iron teeth tear the cloth in every possible direction ; till by the assistance of the water, which continually flows through the cistern, it is reduced to a fine pulp ; and by the same process all its impurities are cleansed away, and it is restored to its original whiteness. This process takes about six hours.

This fine pulp they next put into a copper, of warm water. It is already the substance of paper, and the form must now be given to it : for this purpose, they use a mould made of wire, strong one way, and crossed with finer. This mould they just dip horizontally into the copper, and take it out again. It has a little wooden frame on the edge, by means of which it retains as much of the pulp as is wanted for the thickness of a sheet, and the superfluity runs off through the interstices of the wires.

Another workman receives it, opens the frame, and turns out the thin sheet (which has now shape, but not consistence) upon soft felt placed upon the ground ready to receive it : on that are placed, another piece of felt, and then another sheet of paper, and so on till they have made a pile of forty or fifty. They are then pressed with a large screw-press, which, forcibly squeezing the water out, immediately gives them consistence.

Much, however, still remains to be done.—The felts are removed, and the paper dexterously taken up with an instrument in the form of a T, three sheets at a time, and hung on lines to dry. After hanging a week or ten days, any knots or roughness it may still have, are carefully picked off, and it is then sized.

Size is a kind of glue, made from the skins of animals, and without the application of this substance, the paper would not bear ink, but would run and blot, as is the case on common red paper. The sheets are then hung up to dry, and when dry, taken to the finishing room, where they are examined again, pressed in dry presses, (which give them their gloss and smoothness,) counted into reams, and sent to the stationer; from whom we have it, after he has again folded it, and cut the edges. The whole process of making paper takes about three weeks.

HEMP.

HEMP is a much taller and stronger plant than flax. It has a square rough stalk, rising to the height of five or six feet, and sending off branches. Like flax, it is an annual plant, produced from seed. It thrives best in a rich moist soil, especially on the banks of rivers, and it prefers the temperate climates to the hot. When come to maturity, it is plucked up, and made to rot like flax. Its fibrous part consists in the bark surrounding the main stalk,

within which is a hard woody part, of no use. It is therefore necessary, either to strip off the bark, or, by hard beating, to convert the inner matter to a dust, which may fly away. The beating of Hemp with beetles, is a very laborious employment; and is sometimes a punishment for idle and bad people, who are confined in prison for small crimes. Hemp undergoes the same general preparation as flax, before it is consigned to the weaver; but, being of a stronger and coarser texture, it is difficult to get the fine fibres separate from the rest. Hence it is commonly employed in the more homely manufactures, and hempen cloth is seldom made finer than to serve for sheeting, and shirts, for the poorer classes. It is the principal material of sail-cloth, a fabric, the strength of which is required to be proportional to the violence it has to undergo from storms and tempests. Hemp is rendered still more important to navigation, from its use in making cordage. For this purpose, it is taken nearly in a raw state, and twisted first into coarse twine, which is afterwards united to make rope; and several ropes twisted together form a cable, of strength and thickness sufficient to hold the largest man of war at her anchors. The consumption of hemp, in a maritime nation like this, is prodigious; on which account, vast stores of it are constantly laid up in our naval arsenals.

Suppose, (says an ingenious author, who has described the hemp and flax plants which he ranks together,) suppose you were a Chinese, should you not feel

the greatest astonishment, were I to inform you that our Europe produces a little plant, whose fruit is an excellent nourishment to several birds, affords a kind of bread, good to fatten large cattle, and produces an oil that illuminates innumerable families in the night ; that, instead of the men, the European women generally work off the bark of this plant, and manufacture it into those spreading sails, by the aid of which, our ships transport their merchandize to the remotest part of the world, and convey to us whatever we want ; that the same bark is worked into cables, strong enough to bear the weight and force of anchors ; and that ropes, pack-thread and girths are likewise made of its materials : that all these are of constant and universal use, in navigation, commerce, husbandry, and domestic affairs ; that with this very bark, houses are made to shelter our soldiers ; that it likewise affords us the finest ornaments for our tables ; that we also form it into a dress, which accommodates us day and night, and contributes as much to the health of our bodies as the bath itself, to which it now succeeds, and from the trouble and preparation of which it entirely discharges us. In a word, that this bark, according to the different forms given it by Europeans, becomes the most ornamental habit for kings, and furnishes the husbandman and shepherd with a decent attire, at a very inconsiderable expense. These, however, are the benefits we receive from these plants.

THE YAM.

THIS is a large bulbous root, like the potato, but of a much greater size, the common weight being two or three pounds, and some have been found not less than forty-five pounds. It grows upon a long trailing stalk, which spreads or extends along the ground a great way, is jointed in some measure like a cane, and, at the joints, strikes roots into the earth. These roots are at first fibrous, and very thin and small, but as they fasten themselves into the soil, we soon perceive them to enlarge and to produce the yam. They are propagated very much like a potato, by cutting the root into pieces; but care must be taken, as in the potato, to preserve an eye in each. The skin is thick and rough, of a violet colour, but so dark as to appear almost black; but the inside is perfectly white, firm and mealy as that of the potato, but much firmer and closer in the texture. This mealiness does not shew itself at first, but appears upon boiling or being roasted, when it becomes dry and exceedingly nourishing, and much to be preferred to any similar substance in common use. It is therefore never eaten raw, but it may be prepared even by being cut into slices and exposed to the sun.

MAIZE, OR THE INDIAN CORN.

THIS grain grows upon strong upright stalks, much taller than those of any European corn. The head or ear is also much larger than that

of our wheat or barley, being seven or eight inches long, and nearly an inch and a half thick. There are generally upon it, eight rows of grains, very regularly disposed, and in each of these rows, about thirty grains, every one of which is larger than two of the finest wheat. The stalk of the maize is jointed like the sugar-cane, and contains a juice, from which a sirop, like that of sugar, is made. It is planted in rows, distant from each other every way, two or three feet: the seed is put into holes where the rows cross each other; two or three or more grains into each, lest some should fall or be carried off by birds. If one of the grains succeed, it is sufficient. As it grows up, the earth is heaped about it to furnish it with nourishment; and when this has been twice done, the plant is left to itself. When reaped, it ought to be threshed, well dried, then covered up in pits, with hay, dry grass, &c. This grain is of very general use, and is prepared in many ways; but, being of itself very dry, it is mostly, when ground into flour, mixed with other substances, as rice.

THE MOVING PLANT.

THIS singular plant is a native of Bengal in the East Indies — The stem is round, smooth, and branching; the leaves grow three together on the same leaf-stalk, and consist of two small ones, with a third of considerable size in the middle, which is long and tapering to

a point ; the flowers are of the same shape as those of the sweet pea, and grow in clusters at the end of the stalk.

The most extraordinary circumstance in the history of this plant, is the motion which is constantly kept up among its leaves.—It is principally, however, observed in the side leaves. One of these will be frequently agitated, while its opposite companion remains perfectly quiet ; some will move but little, while others are almost turned round. In the day time, the middle leaf is stretched out in a horizontal direction ; but at night it droops, and lies close to the branches. When it is in full vigour, all the leaves are in motion at the same time ; but in places, where it does not enjoy the same advantages of soil and air, the motion is confined, as we have mentioned, to the side leaves.

The cause of this extraordinary property, still remains to be discovered. It seems necessary to the very existence of the plant, since the leaves are always in the greatest agitation when the plant is in full bloom, and this is observed to diminish in proportion as it droops or becomes sickly. That the air does not cause it by striking against the branches, and thus communicating a movement to the leaves, as is seen in the aspen tree, is evident from this circumstance, that the plant continues to move, whether exposed to the open air, or shut up from its influence, in the greenhouse.

The power which actuates this plant is not

easily destroyed, from whatever cause it may proceed: since the leaves of a branch, which has been separated from the parent stem, will continue to move for some days, provided it be kept in water.

THE TOBACCO PLANT.

THIS plant was first discovered in America, by the Spaniards, about the year 1560, and by them imported into Europe. It had been used by the inhabitants of America long before. It was sent into Spain from *Tabaco*, a province of Yucatan, where it was first discovered, and from whence it takes its common name. Sir Walter Raleigh is generally said to have been the first that introduced it in England, about the year 1585, and taught his countrymen how to smoke it.

There are two species of this plant, which are cultivated for common use, and which are distinguished by the names of *Oronoko*, and *sweet scented tobacco*. They differ from each other only in the figure of their leaves; those of the former being longer and narrower than the latter. They are tall, herbaceous plants, growing erect, with fine foliage, and rising, with a strong stem, from six to nine feet high. The stem and branches are terminated by large bunches of flowers, collected into clusters of a delicate red; the edges, when full blown, inclining to a pale purple. They continue in succession till the end of the summer

then they are succeeded by seeds of a brown colour, and kidney-shaped. These are very small, each capsule containing about one thousand: and the whole produce of a single plant, reckoned at about three hundred and fifty thousand.

Tobacco is an annual plant, and those who intend to cultivate it ought to be as careful as possible in the choice of the seeds; in which, however, with all their care, they may be sometimes deceived. The seeds are to be sown about the middle of April, or rather sooner, in a forward season, in a warm, kindly, rich soil, that is not subject to be over-run with weeds. The southern declivity of a hill, or a spot sheltered from the north winds, is the best for tobacco; but, at the same time, the plants must enjoy a free air; for without that, they will not prosper.

Tobacco is subject to be destroyed by a worm, and, without proper care to exterminate this enemy, a whole field of plants may soon be lost. This animal is of the horned species, and appears to be peculiar to the Tobacco Plant, so that, in many parts of America, it is distinguished by the name of the tobacco worm: it is produced from an egg, but is not discernible, till the plants have attained about half their height, when it appears to be nearly as large as a gnat. Soon after this, it lengthens into a worm, and by degrees increases to the bigness of a man's finger. Its body is marked by a number of rings nearly a quarter of an inch asunder, and having at each a pair

of feet or claws, by which it fastens itself to the plant. Its mouth, like that of the caterpillar, is placed under the fore-part of the head, in the situation most favourable for gnawing the leaves. On the top of the head, between the eyes, grows a horn, about half an inch long, extremely firm and sharp pointed. These worms are found in great numbers in July and August, at which time, if a wound is discovered, the leaf must be carefully searched for the cause of it ; it is easily crushed, being to appearance, only a collection of green juice, but the best method is to pull it away by the horn, before it is destroyed.

Among all the productions of foreign climes, introduced into these kingdoms, scarcely any has been held in higher estimation, by persons of every rank, than tobacco. In the countries of which it is a native, it is considered by the Indians as the most valuable offering that can be made to the beings they worship. They use it in all their civil and religious ceremonies. When once the spiral wreaths of its smoke ascend from the feathered pipe of peace, the compact that has been just made, is considered so sacred and inviolable, that few instances have occurred in which it has been violated.

Tobacco is made up into rolls by the inhabitants of the interior parts of America, by means of a machine, called a *tobacco wheel*. With this machine, they spin the leaves, after they are cured, into a twist of any size they think fit ; and having folded it into rolls, of about twenty pounds each, they lay it by for

use. In this state it will keep for several years, and be continually improving, as it always grows milder. The Illinois usually form it into carrots; which is done by laying a number of leaves, when cured, on each other, after the ribs have been taken out, and rolling them round with packthread, till they become cemented together. These rolls commonly measure about eighteen or twenty inches in length, and nine round in the middle part.

Tobacco has been used as a medicine, though it is always applied with caution, on account of the great violence with which it acts on the system. Its more common use, however, is to supply an artificial want, which the force of habit in some people, has rendered it almost impossible to resist, although it may be questioned, whether in the state of snuff, or prepared for chewing or smoking; it be not always (unless used medicinally) productive of ill effects to the constitution. The Indians, poison their arrows with the oil of tobacco, which infused into a fresh wound, occasions sickness, convulsions and death: with what safety, therefore, may the fine powder of the same plant be applied to the internal tender surface of the nose, which is endured with exquisite feeling, and from the delicacy of its structure is exceedingly liable to injury.

By the immoderate use of snuff, the organs of smelling are rendered callous and insensible, and therefore unable to perform their functions. To this bad effect, may be added the stupifying quality of tobacco, by which, not only

the brain and nerves are injured, but also the sight; whilst, from the force with which snuff is usually drawn up the nose, its passage becomes obstructed, and the voice loses its clearness and distinct articulation.

Besides those pernicious qualities, snuff often descends involuntarily into the stomach, creating nausea, loss of appetite, and vomiting. The only advantage indeed of taking snuff, is that of sneezing, which in sluggish habits, will give a powerful concussion to the body, and promote, for the moment, a more free circulation of the blood. But of this benefit, snuff-takers are deprived, from being familiar with its use.

It has been said, that tobacco, when chewed, is a preservation against hunger, but this is a vulgar error, for it may, more properly be said to destroy appetite, by promoting the discharge of that fluid, which is essential to the proper digestion of our food. In smoking, also, the fumes of tobacco induce a kind of insensibility not easily described. It is productive, however, of many disorders of the head and stomach, particularly the last, as may be observed in the effect it has on a person who tries it for the first time.

To conclude, let us remark, in the words of a judicious author, the loss both of time and money occasioned by an indulgence in this useless and hurtful propensity. "Every professed and incurable snuff taker, at a moderate calculation takes one pinch in ten minutes.—Every pinch with the disagreeable ceremony

of blowing and wiping the nose, and other incidental circumstances, consumes a minute and a half. One minute and a half out of every ten, allowing sixteen hours to a snuff-taking day, amounts to two hours and twenty-four minutes out of every day of twenty-four hours, or to one day out of ten; and one day out of every ten, will amount to thirty-six and a half days in the year, or to seven years of wasted time, out of that short life which is allowed us for far other purposes. Compute now the expence, and it will be found that this luxury encroaches as much on the income of the snuff taker, as it does on his time, and; that the time and money thus lost, would have enabled the tradesman to enjoy many real comforts in his family, and perhaps to save up a little store, against a time of sickness or distress.'

THE VALLISNERIA.

THIS plant consists of a small root, with a few long leaves rising from it, and in the midst of them, one single flower, in some degree resembling a stalk of two or three feet in length, but so weak, that it is by no means able to support itself erect. On the top of each stalk is a bunch of jessamine. It appears to be the purpose of nature, and it is absolutely necessary to the well-being of the plant, that every part of it should be under water, except just the flower at the top of each stalk. But these flowers must be always kept above the water;

and the heat of the sun is requisite to the opening of the seeds contained in a cup at the base of them. Now the *Rhone*, wherein this plant grows in great abundance, is a river of very uncertain depth, and that in places very near one another. If the seeds of this plant, or the side-shoots from the root, produce new ones at different depths, how is the flower to be carried to the top, and only just to the top, of the water in each ? The *Rhone* is also, of all rivers, the most apt to be swelled by sudden floods ; in this case, how is the plant that was just flowering in its proper manner, at four feet depth, to be kept in the necessary state of having the flower above water, when the depth is increased to six ? Or how is it to be kept from falling on the surface of the water, and rotting, when the depth decreases, and leaves a foot or two of a naked stalk, which is unable to support itself ? All this is provided for by nature, or rather by God the Creator, who, with apparent wisdom and intention, has made the stalk which supports the flower of this plant of such a form and texture, that at all times, it suits itself to the depth of the water it is in ; for the stalks are not straight, but twisted in a spiral form, in the manner of a cork-screw, or rather in the manner of those springs of wire, which we see made by wrapping the wire round a small stick. By this formation, the stalks of this plant have a power of extending or contracting themselves in length, and this so suddenly, that let the rise or fall be ever so quick, and the variation in the depth,

ever so great, the lengthening or shortening of the stalks accompanies it. Thus the flower of the *Valisneria* (for so this singular vegetable is called) is kept just at the surface of the water, be the depth what it will, or the changes in depth ever so sudden. By this means, the sun has power to ripen the flower, till the seeds are scattered on the surface of the water in perfect ripeness, where they float a little while; but when thoroughly wetted, sink and take root at the bottom. To prove to ocular demonstration, what is said of this plant, several of them have been put into vessels of water. some of them with stalks so long, that one half of them was above the surface of the water; others with them so short, that they were immersed several inches under it; but in a few hours they had each adapted the length of their stalks to the depth, and the flower of every one was floating just on the surface.

VENUS'S FLY TRAP.

THIS is a newly discovered sensitive plant. We have already mentioned that the mimosæ or sensitive plants, close their leaves, and bend their joints, upon the least touch. This is astonishing; but no end or design of nature has yet appeared from these surprising motions: they soon recover themselves again, and their leaves are expanded as before. But the plant we are now going to describe, shews that nature may

have some view towards its nourishment, in forming the upper joint of its leaf, like a machine to catch food. Upon the middle of this, lies the bait for the insect that becomes its prey. Many minute red glands, that cover its inner surface, and which discharge some sweet liquor, tempt the poor animal to taste them; and the instant these tender plants are irritated by its feet, the two lobes rise up, grasp it fast, lock the two rows of spines together, and squeeze it to death. And further, lest the strong efforts for life, in the creature just taken, should serve to disengage it, three small erect spines are fixed near the middle of each lobe among the glands, that effectually put an end to all its struggles. Nor do the lobes ever open again, while the dead animal continues there. The plant however does not distinguish between an animal and any other substance; for if we introduce a straw or a pin, between the lobes, it will grasp it full as fast as if it were an insect. This plant grows in America, in wet shady places, and flowers in July and August. The largest leaves are about three inches long, and an inch and a half across the lobes: the glands of those exposed to the sun, are of a beautiful red colour; but those in the shade are pale, and inclining to green. The roots are scaly, sending forth but few fibres, and are perennial. The leaves are numerous, inclining to bend downwards, and are placed in a circular order; they are jointed and full of sap; the lower joint which is a kind of stalk, is flat, longish, two-edged,

and inclining to heart-shaped. In some varieties, they are notched on the edges near the top. The upper joint consists of two lobes, each lobe is of a semi-oval form, with their margins furnished with stiff hairs, like eyebrows, which embrace or lock in each other when they close: this they do when they are inwardly irritated. If when the lobes have enclosed any substance, it can be shoved out, so as not to strain them, they expand again; but if force is used to open them, so strong has nature formed the spring of their fibres, that one of the lobes will generally snap off, rather than yield.

THE BENT STAR,

THIS plant grows in most places near the sea, and is known to the English by the name of *bent star*, or *mat grass*. It has stiff and sharp pointed leaves, growing like a rush, a foot and a half long: the roots both creep and penetrate deeply into their sandy beds: the stalk bears an ear five or six inches long, not unlike rye, the seeds are small, brown and roundish, By good fortune, no cattle will eat or touch this vegetable, allotted for other purposes, subservient to the use of mankind: It has been recommended to sow this plant on the sandy wilds of Norfolk, that its matted roots might prevent the deluges of sand which that country experiences. Wheresoever this

plant grows, the salutary effects are soon observed to follow. A single plant will fix the sand, and gather it into a hillock ; these hillocks, by the increase of vegetation, are formed into larger, till by degrees, a barrier is often made against the encroachments of the sea, and might often prevent similar calamities, by the growth being encouraged, as appears from the following melancholy instance,

The estate of Coubin, near Fores, in Scotland, was once worth three hundred pounds a year, but at this time is overwhelmed with sand. This strange inundation was still in motion in 1769, chiefly when a strong wind prevailed. Its motion is so rapid, that we are assured, an apple tree has been so covered with it in one season, that only the very summit appeared. This distress was brought on about ninety years ago, and was occasioned by the cutting down some trees, and pulling up the *beet* or *star*, which grew on the sand hills ; which at last gave rise to an act of parliament to prohibit the destruction of this useful plant. Near Dunsanaghy, in the county of Donegal also, the sand is every year advancing upon the cultivated ground, and can only be checked by this little plant. The remedy for such an evil is at least simple, and well deserving of the experiment ; but it has also been always found effectual, so that to neglect it would be in the highest degree culpable.

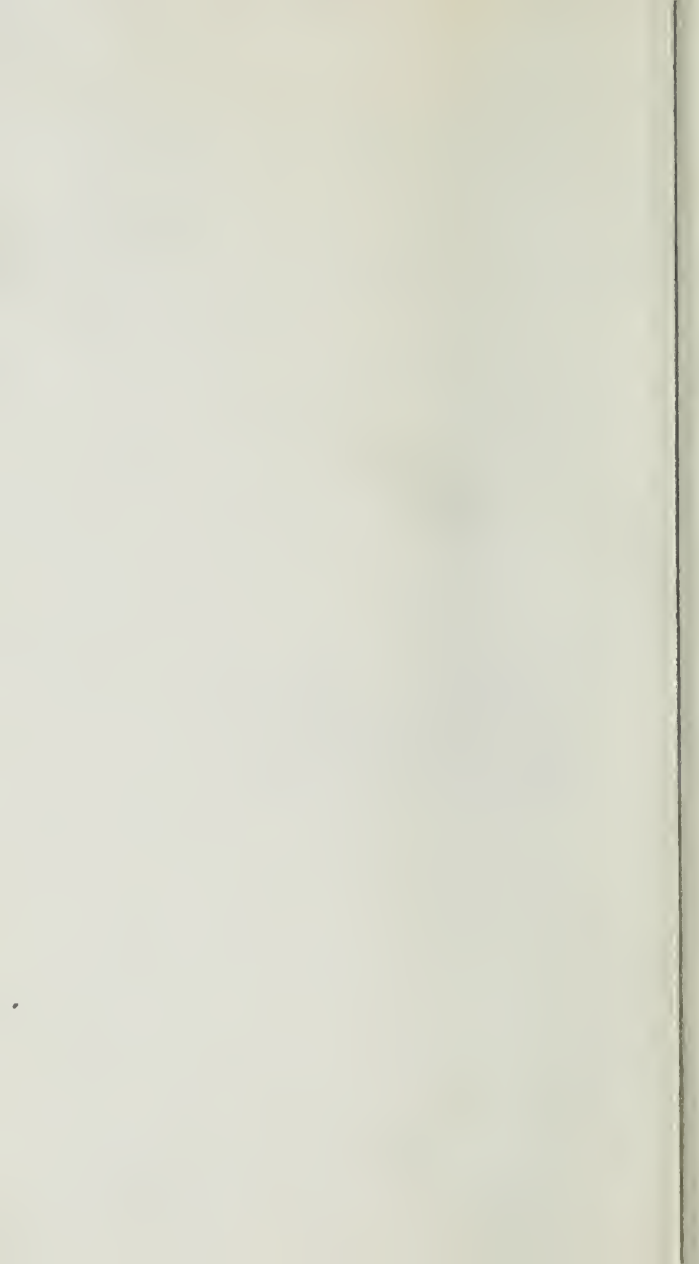
Providence has kindly formed this plant to grow only in pure sand. Mankind was left to make, in after times, an application of it suit-

able to their wants. The sand hills, on a portion of the Flintshire shores, in the parish of Llanasa, are covered with it naturally, and kept firm in their place, and the Dutch perhaps owe the existence of part at least of their country, to the sowing of it on their sand banks.

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