

WILD FLOWERS
OF THE BRITISH ISLES

H. ISABEL ADAMS





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WILD FLOWERS OF THE BRITISH ISLES

ILLUSTRATED AND WRITTEN
BY H. ISABEL ADAMS, F.L.S.
REVISED BY JAMES E. BAGNALL, ALS.



VOL. II ORDER XLII: CAMPANULACEÆ TO ORDER LXXXVI:
ARACEÆ COMPLETING THE BRITISH WILD FLOWERS WITH THE
EXCEPTION OF WATER PLANTS AND TREES

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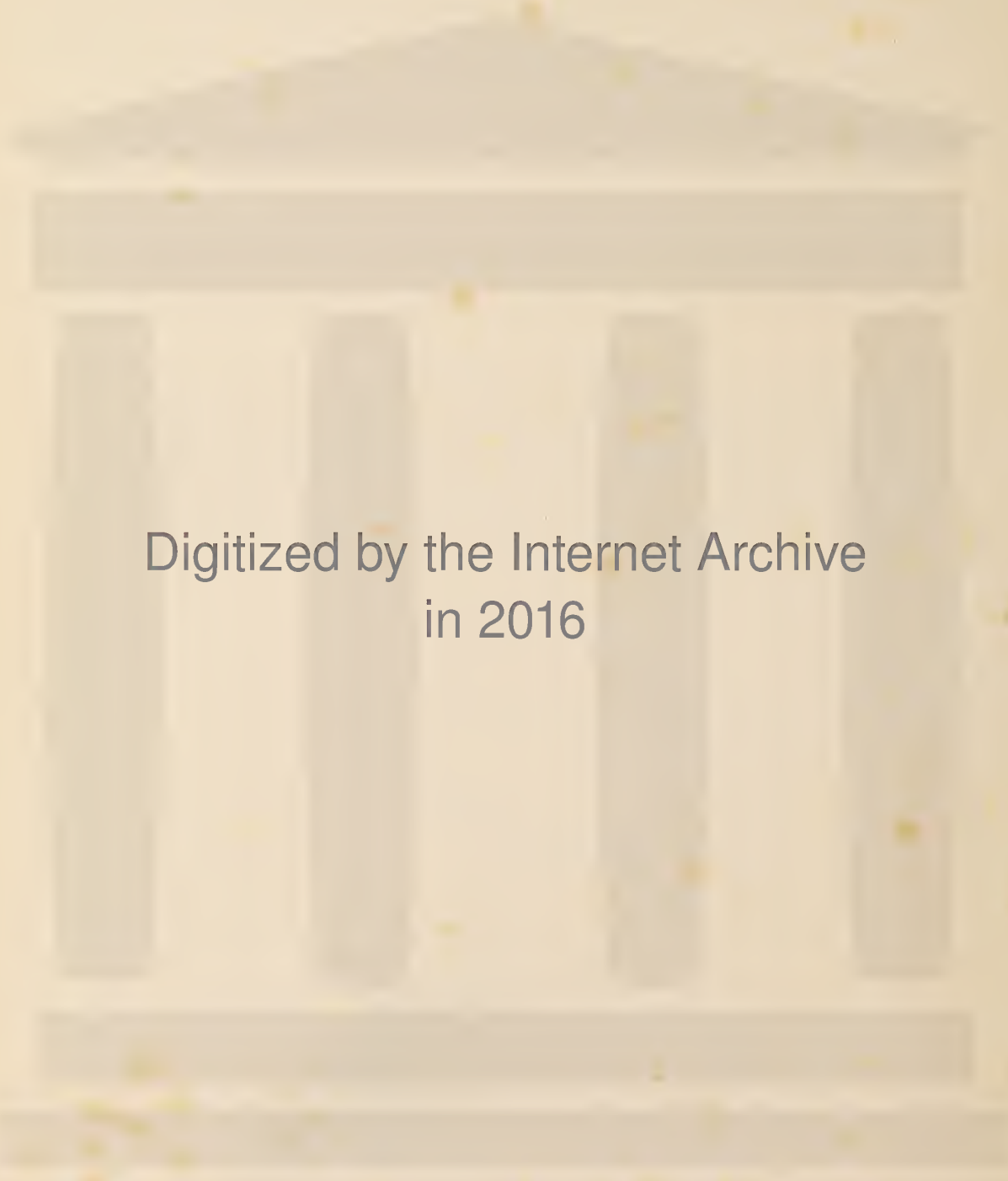
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Bobby

March

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DESCRIPTIONS OF BOTANICAL TERMS

The Vegetable Kingdom is divided into two great groups—plants with flowers (Phanerogams) and those without flowers (Cryptogams). It is with the first group only that this book deals.

The flowering plants (Phanerogams) are divided into natural groups, according to their structure, called **Families** or **Orders**. Every Family is further divided into groups (genera), each one of which is called a **genus**, and each genus is composed of individual plants called **species**. A further subdivision of the species into **varieties** is made in some instances, but descriptions of varieties have not been given in this work. In describing the members of each family, in every instance, first the English or popular name of the flower is given and then the scientific name, followed by the abbreviation of the name of the botanist who first named the genus or species, as given in the last (the 10th) edition of the London Catalogue of British Plants.

The construction of the plants with which we have to deal is quite simple. They all consist of a **root**, **stem**, **leaves** with or without **stipules** or **sheaths**, **flowers** with or without **bracts**, and **fruits**.

The **root** is the descending part of the plant, which penetrates the earth, and absorbs food for the nourishment of the plant.

The **stem** is the ascending portion of the plant and may be branched or unbranched; it bears the leaves, flowers, and fruit, and conducts the food to them from the root. When a stem runs along the ground and produces roots and leaves which form another plant it is said to be a **runner**.

A **node** or joint is the point on the stem at which a leaf or leaves are given off.

The **axil** is the upper angle made by the leaf-stalk with the stem.

The **leaf** is a flat, usually thin structure, consisting of a spreading blade (*lamina*), attached with or without a stalk (*petiole*) to the stem, on which it is arranged in different ways.

A **leaf** is:—

simple when the blade consists of a single piece, as in the Periwinkle or Foxglove;

compound when the blade is divided into distinct leaflets; when divided to the midrib into distinct leaflets the leaf is said to be **pinnate**, as in the Jacob's Ladder; and when divided to the base into distinct leaflets the leaf is said to be **palmate**, as in the Bog-bean;

entire when the margin of the blade is not cut nor lobed, as in the Forget-me-not;

serrate when the margin is slightly cut into sharp teeth, as in each leaf of the Dead-Nettles;

lobed when the margin is more or less deeply cut into **segments** or lobes, but not divided into distinct leaflets, as in the Wild Hop.

A **stipule** is a scale- or leaf-like body situated at the base of the leaf-stalks, or on the joints (nodes) of the stem ; when present there are generally two to each leaf.

A **sheath** is the flattened and expanded base of the leaf-stalk, which sometimes, as in the *Persicaria* (*Polygonum*), completely surrounds the stem.

A **flower**, when perfect, is composed of four parts, the **calyx**, **corolla**, **stamens** and **pistil**, which are placed together in circles, and usually situated on the top of a flower-stalk (*peduncle*) ; sometimes, however, they are found placed immediately upon the stem, when they are said to be *sessile*. In the Arum Family the flowers are clustered together round a spike called a **spadix**, and are often surrounded with a coloured bract called a **spathe**.

The **calyx** is the outermost, and consists of a circle of leaf-like parts called **sepals** they are usually green, but sometimes they are brightly coloured, as the petals are, and then they are called *petaloid* ; they may be free from one another or entirely or more or less united, and they vary in shape.

The **corolla** is inside the calyx and is composed of a circle of leaf-like parts called **petals**, which are usually gaily coloured and of a more delicate consistency than the sepals ; they may be free from one another or entirely or more or less united, and they vary very much in shape.

Sometimes the calyx and corolla are not distinguishable from one another, or one or other is absent, and the collective term **perianth** is then used.

These two circles of organs are the floral leaves which protect the essential organs of the plant. They are of no vital use, and all flowers do not have them. They are for the protection of the stamens and pistil, and their beautiful colours and markings are to attract insects which take the pollen from one flower to another and so fertilise the plant.

The **stamens** come next and consist of a varying number of stalks, called **filaments**, each surmounted with an oblong or rounded case, called an **anther**, which contains the pollen ; sometimes the filaments are long and thread-like, sometimes they are united entirely, or more or less, into a sheath surrounding the pistil ; the anthers vary in size and shape and may also be free from one another or united together. The stamens are the male or fertilising organs.

The **pistil** forms the centre of the flower and is composed of one or more **carpels** which may be free from one another, or entirely, or more or less, united together ; each carpel consists of a seedcase, called the **ovary** (which contains the ovules or unfertilised seeds) ; a stalk-like column, of varying length, called the **style**, which is occasionally absent ; and crowning all a structure varying in shape known as the **stigma** ; when mature the stigma becomes sticky, and to it adhere the grains of pollen, brought by insect or wind, which are necessary to fertilise the ovules and so develop the seeds. The pistil is the female or fruit-bearing organ.

In the Orchid Family the stamens and pistil are combined into a **column**, which is composed of the seedcase at the base, a prolongation into the usually solitary stamen at the top, and the stigma, consisting of a sticky surface, below. The pollen coheres into club-shaped masses called **pollinia**, which are often supported by a stalk which is called the **caudicle**. Sometimes there is a projection, called the **rostellum**, below the anther and above the stigmatic surface.

A flower is said to be **perfect** when all the parts are present, as in the Heath or Fox-glove, and **imperfect** when any of the parts are wanting, as in the Spurge or Crowberry. It is said to

be **regular** when the petals are all the same shape and size, and **irregular** when they differ in shape and size.

The **receptacle** is the expanded apex of the flower-stalk on which the parts of the flower are placed; it may be flat, convex, or concave; when convex it is sometimes very little larger than the top of the stalk, but at other times it is greatly expanded, as in the Teazle and Daisy Families (Dipsacæ and Compositæ), when instead of one flower a whole colony of little flowers is clustered upon it.

A **bract** is a modified leaf borne on the flower-stalk, usually much smaller than the ordinary leaf and generally undivided; sometimes scale-like; it may be green, or coloured as the petals, when it is said to be petaloid; there may be one or more up the flower-stalk, as in the Field Convolvulus, or there may be many immediately surrounding the flower or flower-cluster, as in the Sheep's-bit or Common Thrift.

The **fruit** is the seedcase (ovary) and other parts of the flower which remain and develop with it after the ovules have been fertilised. The ovules, when fertilised, develop into the seeds. Fruits are **dry**, or **succulent**; they may split when ripe, to free the seeds, when they are said to be *dehiscent*, or they may simply decay, when they are said to be *indehiscent*.

The principal kinds of dry fruits are:—

The **achene**, a small, dry, 1-seeded fruit, consisting of a single carpel, which does not open to free the seed but decays (*indehiscent*); as in the Buttercup.

The **follicle**, a dry, many-seeded fruit, consisting of a single carpel which opens (*dehisces*) down one side to free the seeds; as in the Columbine and the Marsh Marigold.

The **pod** or **legume**, a dry, few- or many-seeded, 1-celled fruit, more or less flattened, consisting of one or two carpels and opening (*dehiscing*) down both sides, when ripe, to free the seeds; as in the Pea.

The **siliqua**, a long, and the **silicula**, a short, dry, few- or many-seeded fruit, consisting of two carpels; divided lengthwise into two cells by a thin partition (*replum*), to either side of which the seeds are attached; and opening (*dehiscing*) from the base to the apex by two valves. Examples of the siliqua are to be found in the Wall-flower, Stock, Cabbage, &c., and of the silicula in Sweet Alyssum, Shepherd's Purse, &c.

The **capsule**, a dry, roundish, many-seeded fruit, consisting of several united carpels, opening (*dehiscing*) from the top by valves or pores; as in the Gentian or Harebell.

The **nut**, a hard, dry, 1-seeded fruit, not opening but decaying to free the seed (*indehiscent*); it is frequently surrounded with a hard membranous structure called the *cupule*, as in the beech or hazel.

The principal kinds of succulent fruits are:—

The **berry**, a more or less round, fleshy fruit, the seeds being embedded in the fleshy substance; as in the Bilberry.

The **drupe**, a roundish fleshy fruit, consisting of a fleshy juicy exterior and an inner hard stone containing one or rarely two seeds; as in the Plum.

The fruit of the Blackberry, Raspberry, &c., consists of a number of small drupes clustered together on an elongated receptacle.

The **pome**, a fleshy fruit consisting of a fleshy, juicy exterior (formed by the upgrowth of the receptacle), enclosing one or several brittle, horny, one- or two-seeded seedcases; as in the Apple and the Pear.

THE BELL-FLOWER FAMILY

[ORDER XLII. CAMPANULACEÆ]

CALYX of 5 **SEPALS**, united into a tube which adheres to the seedcase, and separating into 5 teeth, remaining with the fruit (persistent).

COROLLA of 5 **PETALS**, united into a tube and separating into 5 equal lobes, bell-shaped (campanulate); except in the genus *Lobelia* when the lobes are unequal, the corolla being then 2-lipped (bilabiate); remaining with the fruit (persistent), inserted in the throat of the calyx-tube at the top of the seedcase (epigynous).

STAMENS 5, alternating with the lobes of the corolla, filaments free in British species, anthers free except in the genera *Lobelia* and *Jasione* when they are united into a ring round the style; inserted with the corolla, but distinct from it, at the top of the calyx-tube (epigynous).

PISTIL of 2, 3, or 5 **CARPELS**, united into a 2-, 3-, or 5-celled seedcase (ovary)

and tapering into 1 style which is surmounted by a 2-, 3-, or 5-cleft stigma, according to the number of cells in the seedcase.

FRUIT a capsule, 2-, 3-, or 5-celled, many-seeded, crowned with the withered calyx-teeth and corolla, opening at the top by valves or at the side by clefts or fissures.

FLOWERS blue, purple, or white in the British species, usually in elongated clusters, rarely solitary, and more rarely collected into heads.

STEMS frequently full of a milky juice.

LEAVES alternate, entire or toothed, without stipules.

DISTINGUISHED from other plants bearing flowers with 5-lobed calyces and corollas by the 5 stamens inserted with the corolla at the top of the seedcase, by the capsular fruit opening at the top or side, and by the alternate leaves.

AMONG the flowers with united petals the Bell-flower Family is easily recognised by the position and number of its stamens:—they are inserted with the corolla at the top of the seedcase, and they are always five in number, that is, equal to the lobes of the corolla, never twice their number, as is the case with some orders near akin.

It is an extensive natural order, flourishing in temperate climates in both hemispheres and in mountainous districts even in the tropics; its species are to be found scattered all over Europe and in the cooler parts of Asia and America; they thrive in sheltered places, in copses and woods, and by river-banks, but are to be found even on the high part of the lower Alps, above the tree line as high as vegetation will flourish, where they add their share to the wonderful wealth of colour that carpets the mountain-side—the mountain-side that from below looks a quiet grey but close by unfolds a splendour of colour. The species native to our isles are all blue or white, but in foreign countries brightest blue, purple, scarlet, and yellow run riot.

Many of these species are cultivated in gardens and greenhouses, such as the scarlet and blue *Lobelias*, and many different kinds of Bell-flowers (*Campanulas*). The stems and roots of this order abound in a milky or acrid juice, usually harmless, which in some of the more powerful foreign species is employed as a medicine, and in the *Lobelia* genus is a venomous poison. The roots of the Rampion (*Campanula Rapunculus*) were cultivated as a vegetable.

Taken as a whole, however, this order is a harmless and also a rather useless one from a utilitarian point of view.

The Goodenias and Scævolas, natives of Australia, grown in greenhouses, belong to the family Goodeniaceæ, an order very near akin to the Bell-flower Family.

TABLE SHEWING THE DIFFERENT STRUCTURE IN THE DIFFERENT GENERA.

- I. **LOBÉLIA.** Corolla irregular, 2-lipped (bilabiate); anthers united into a tube round the style; style with a fringe of hairs below the stigma; capsule opening at the top by 2 or 3 valves.
- II. **SHEEP'S-BIT (JASÍÓ'NE).** Flowers and fruits clustered in heads; corolla deeply cut into 5 narrow, spreading lobes; anthers united into a ring at the base; capsule opening at the top by 2 short broad valves.
- III. **WAHLENBERG'IA.** Corolla bell-shaped; anthers free; capsule opening at the top by 3 teeth.
- IV. **RAMPION (PHYTEU'MA).** Flowers and fruits clustered in heads or spikes; corolla cylindrical, deeply divided into 5 narrow lobes; anthers free; capsule bursting at the sides.
- V. **BELL-FLOWER (CAMPAN'ULA).** Corolla bell-shaped; anthers free; capsule opening at the side by clefts, or at the top by valves.
- VI. **VENUS' LOOKING-GLASS (LEGOU'SIA).** Corolla with a very short tube, and a flat star-like limb (rotate); capsules long and narrow, opening towards the top by clefts.

I. LOBÉLIA. Linn.—Flowers generally blue or lilac, in narrow terminal clusters (racemes), each flower having a small bract at its base. Calyx-tube adhering to the seedcase and separating into 5 teeth, remaining with the fruit (persistent); corolla-tube separating into 2 lips, the upper lip cut to the base into 2 erect or recurved lobes, and the lower lip less deeply cut into 3 spreading lobes, inserted in the throat of the calyx-tube (epigynous); stamens 5, the anthers united into a tube round the style, the 2 lower ones often bearded at the apex, inserted with the corolla at the top of the seedcase (epigynous); carpels 2 or rarely 3, united into a seedcase with as many cells as there are carpels, and 1 style which has a fringe of hairs round the stigma. Fruit a many-seeded capsule with as many cells and opening at the apex by as many valves as there are carpels. Herbs with, in the British species, undivided leaves.

(1) **Water Lobelia.** (*Lobélia Dortman'na.*)—Water plant. Capsule drooping, longer than the calyx; leaves quill-like.

(2) **Acrid Lobelia.** (*Lobélia úrens.*)—Capsule erect, shorter than the calyx; leaves oblong.

1. Water Lobelia. (*Lobélia Dortman'na.* Linn.)—A submerged water plant, with the almost leafless flowering-stems rising 6–8 inches above the water. The flowers drooping (as just described above), $\frac{3}{4}$ –1 inch long, of a pale lilac colour, the corolla 2-lipped (bilabiate), 3–15 in a long, loose, simple, erect cluster (raceme); the capsule drooping, longer than the calyx; the leaves entirely submerged, nearly cylindrical, hollow, composed of 2 parallel tubes, all growing from the root in tufts and forming a dense green mat at the bottom of the water. [Plate 1.

Not uncommon in the shallows of mountain lakes with clear, gravelly bottoms. In Wales, Shropshire, and Cumberland; Scotland; and Ireland. July—August. Perennial.

2. Acrid Lobelia. (*Lobélia úrens.* Linn.)—Flowers $\frac{1}{2}$ – $\frac{3}{4}$ inch long, erect, 2-lipped (bilabiate), purple, in long rather dense clusters (racemes). [As described in the genus *Lobelia.*] Capsules erect, shorter than the calyx. Stems 1–2 feet high, simple or slightly branched, erect,



and angular, with an acrid, milky juice; the lower half leafy, the leaves being narrowly oblong, slightly toothed, and stalkless (sessile), smaller and far apart as they near the flower-spike, larger, more stalked, and nearer together lower down, and clustering into almost a rosette at the root.

Very rare. On bushy heaths near Axminster in Dorsetshire, and in Cornwall. August—September. Perennial.

II. SHEEP'S-BIT. (JASÍ'ONE. Linn.)—Flowers small, blue or lilac, stalkless, crowded together into dense round terminal heads, surrounded by several sepal-like bracts (the involucre). Calyx-tube separating into 5 narrow teeth, remaining with the fruit (persistent); corolla divided almost to the base into 5 slender spreading lobes, inserted at the top of the calyx-tube; stamens 5, with the anthers united at the base into a ring round the style, inserted at the base of the corolla; carpels 2, united into a roundish seedcase, and a long slender style, surmounted with a club-shaped stigma. Fruit a roundish capsule, 2-celled, many-seeded, opening at the apex by 2 very short broad teeth. Herbs with the root-leaves often in rosettes. The flower-heads resemble the Daisy, or more especially the Scabious family, but are at once distinguished from either by the 2-celled many-seeded capsules.

Sheep's-bit, Sheep's Scabious. (Jasí'one montána. Linn.)—The only British species. As just described. The flower-heads are $\frac{1}{2}$ –1 inch across, lilac-blue; the numerous stems are from a few inches to over 1 foot high, simple or slightly branched, the side stems usually procumbent; the leaves of the root (radical) are in a rosette, lance-shaped, almost tapering into a stalk, wavy, and clothed with short white hairs; those of the stem are narrower and stalkless (sessile). The whole plant is remarkably like a starved Scabious, but is easily distinguished by its united anthers and many-seeded little capsules. [Plate 2.

Common in sandy districts, sand dunes, dry heaths, and waysides; in England, south and centre of Scotland, and in Ireland. June—September. Biennial or annual.

III. WAHLENBERG'IA. Schrad.—A genus resembling *Campanula* in all save the capsule which opens by 3 teeth at the apex. Calyx-tube short and broad with 5 slender teeth, remaining with the fruit (persistent); corolla bell-shaped, with 5 lobes, inserted on the top of the calyx-tube; stamens 5, with the anthers free, inserted at the base of the corolla; carpels 3. Capsule roundish, 3-celled, many-seeded, opening at the top by 3 teeth. Herbs with usually alternate leaves.

Ivy-leaved Bell-flower. (Wahlenberg'ia hederácea. Reichb.)—The only British species. As just described. A remarkably beautiful, fragile little plant, with solitary pale lilac-blue flowers, $\frac{3}{8}$ inch long, on long slender hair-like stalks, drooping in bud and becoming erect in flower; the creeping stems and brittle, interlacing, thread-like branches vary from a few inches to 1 or 2 feet long: when growing with any undergrowth of long grass or bracken the delicate stems lift themselves up with the aid of the surrounding vegetation and often attain to 18 inches in height; at other times they trail over damp rocks to a considerable length, festooning them with their fresh green foliage. The leaves are very smooth, roundish, or heart-shaped, with a few shallow pointed lobes. The whole plant is fragile in the extreme and of a bright tender green. (*Campanula hederacea.* Linn.) [Plate 2.

Local. On damp heaths, bogs, and wet places; common in the south-west of England, but rare elsewhere; rare in Scotland; and common in the south-east of Ireland. July—September. Perennial.

IV. RAMPION. (PHYTEU'MA. Linn.)—Flowers rather small, blue, purple, or straw-coloured, in dense terminal heads or spikes, with several sepal-like bracts at the base. Calyx-tube 5-toothed, remaining with the fruit (persistent); corolla cylindrical and curved in bud, deeply divided into 5 narrow lobes, which at last are spreading, inserted in the throat of the calyx-tube; stamens 5, anthers free, inserted at the base of the corolla; carpels 2 or 3, united into a seedcase, a hairy style, and a 2-3-lobed stigma. Capsule oval, 2-3-celled, many-seeded, crowned with the calyx-teeth, bursting open at the sides into 2 or 3 slits. Herbs often having enlarged roots.

- (1) Round-headed Rampion. (*Phyteu'ma orbiculáre*.)—Round heads of deep blue flowers.
- (2) Spiked Rampion. (*Phyteu'ma spicátum*.)—Spikes of yellowish-white or pale dull blue flowers.

1. Round-headed Rampion. (*Phyteu'ma orbiculáre*. Linn.)—As just described. This is a plant which cannot be mistaken; its deep blue flowers are massed together into a few round heads, $\frac{1}{2}$ –1 inch long in flower, which become longer and oblong in fruit, and terminate the solitary stem which is slightly branched at the top. The stem is 6–18 inches high, erect, and leafy at the base, the leaves becoming small, distant, and stalkless towards the top; the root-leaves and lower stem-leaves are egg-shaped (ovate) or lance-shaped, on long stalks, with scalloped edges, and the stem-leaves are stalkless (sessile), strap-shaped, pointed, and nearly entire. [Plate 2.

Local, rare. Only found on the chalk downs of Hampshire, Sussex, Surrey, Wilts, and possibly Kent. July—September. Perennial.

2. Spiked Rampion. (*Phyteu'ma spicátum*. Linn.)—A larger species with oblong heads of yellowish-white or pale dull blue flowers, which become spike-like; taller and stouter stems, from 18 inches to 3 feet high; and larger, more heart-shaped lower leaves. Formerly cultivated for its edible root.

Very rare. A doubtful native. Only found in Sussex. May—July. Perennial.

V. BELL-FLOWER. (CAMPAN'ULA. Linn.)—Flowers conspicuous, bell-shaped (campanulate), blue, purple, or white, usually in terminal clusters. Calyx-tube terminating in 5 teeth, remaining with the fruit (persistent); corolla bell-shaped, with 5 broad, shallow lobes, inserted on the top of the calyx-tube; stamens 5, anthers free, inserted with but not adhering to the corolla; carpels 2–5, united into a seedcase, and 1 hairy style, which is surmounted with a 2-5-lobed stigma. Capsule 2-5-celled, many-seeded, crowned with the calyx-teeth, and usually opening by clefts at the side. Herbs or undershrubs, usually with alternate leaves.

Capsules opening at the base by clefts; upper stem-leaves egg-shaped, lance-shaped, or strap-shaped, toothed, and stalkless.

- (1) Clustered Bell-flower. (*Campan'ula glomeráta*.)—Flowers stalkless, in compact clusters; corolla-bell narrow, with short lobes; leaves heart-shaped at the base.
- (2) Nettle-leaved Bell-flower. (*Campan'ula Trachélium*.)—Flowers shortly stalked, in looser clusters; corolla-bell broader, with short lobes; leaves covered with short stiff hairs.
- (3) Giant Bell-flower. (*Campan'ula latifólia*.)—Flowers large, shortly stalked, usually solitary in the axils of the upper leaves, forming a leafy cluster; corolla-bell narrow with short erect lobes.
- (4) *Creeping Bell-flower. (*Campan'ula rapunculoïdes*.)—Flowers smaller, shortly stalked, solitary in the upper leaf-axils, forming a long cluster; corolla-bell broad with short lobes.

- (5) Harebell. (*Campan'ula rotundifolia*.)—Flowers on long stalks, solitary or in loose clusters of 2 or 3; corolla-bell broad, with very short recurved lobes; upper stem-leaves strap-shaped and stalkless.

Capsule opening at the top by clefts; upper stem-leaves narrow and stalkless.

- (6) Peach-leaved Bell-flower. (*Campan'ula persicifolia*.)—Flowers as broad as long, solitary; corolla-bell with very short lobes.
- (7) *Rampion Bell-flower. (*Campan'ula Rapun'culus*.)—Flowers smallish, shortly stalked, forming long clusters; the corolla-bell lobed halfway down.
- (8) Spreading Bell-flower. (*Campan'ula pat'ula*.)—Flowers few, on long stalks, in a very loose cluster; the corolla-bell broad and lobed halfway down.

1. Clustered Bell-flower. (*Campan'ula glomerata*. Linn.)—As just described.

The flowers are $1-1\frac{1}{4}$ inches long, stalkless (sessile), narrowly bell-shaped, of a deep violet-blue, in small tight clusters in the axils of the upper leaves, the main terminal cluster forming a head, which is apparently surrounded by leafy bracts. The capsule is short, broad, and erect, and opens by clefts at the base. The stout erect stem is 1-2 feet high, simple, hairy, leafy; the leaves are egg-shaped (ovate) or lance-shaped, and heart-shaped (cordate) at the base, roughly hairy, and with scalloped edges; the root and lower stem-leaves have long stalks, and the upper are stalkless and clasp the stem with their heart-shaped bases.

Not common. Dry pastures, especially on a chalky or sandy soil; widely spread over England, except in the western counties, rare in Ireland, and only to be found in the east of Scotland. July—October. Perennial.

2. Nettle-leaved Bell-flower, Wild Canterbury-bell, Great Throat-wort.

(*Campan'ula Trachelium*. Linn.)—Flowers $1\frac{1}{4}-2$ inches long, shortly stalked, widely bell-shaped, bluish-purple, rather lighter in colour than those of the Clustered Bell-flower (*Campanula glomerata*), 2 or 3 together, rarely solitary, in the axils of the upper leaves and terminating the stem. Capsule nodding, opening by clefts at the base. [As described in the genus *Campanula*.] The stem is 18 inches to 3 feet high, erect, stout, and leafy; the leaves resemble those of the Common Nettle and are covered with short stiff hairs, the lower leaves are on long stalks, broadly heart-shaped and doubly toothed, while the upper become stalkless and narrower. The whole plant is of a deep green colour and is remarkably rough to the touch on account of the strong short hairs which cover the leaves. [Plate 1.

Not uncommon. Woods and hedges. Common in the south of England, becoming rarer in the north; a doubtful native in Scotland and only found as far north as Lanark and Fife; in Ireland only found in Kilkenny. July—October. Perennial.

3. Giant Bell-flower. (*Campan'ula latifolia*. Linn.)—A most beautiful species with

large blue or white bell-shaped flowers, with erect corolla-lobes, $1\frac{1}{2}-2\frac{1}{2}$ inches long, shortly stalked, and solitary in the axils of the upper leaves and terminating the stem, so forming an erect and simple leafy cluster. The capsules are short and open by clefts at the base. [As described in the genus *Campanula*.] The stem is solitary, 2-4 feet high, stout, erect, and very leafy; the leaves being broadly lance-shaped, narrowed at the base, doubly toothed, the lower leaves stalked and the upper stalkless.

Not uncommon. Frequent in woods and bushy places in northern England, becoming more rare in the Midlands and rare in the south; frequent in central and southern Scotland; and not a native in Ireland. July—August. Perennial.

4. ***Creeping Bell-flower.** (*Campanula rapunculoïdes*. Linn.)—Not a native. Flowers $1\frac{1}{4}$ – $1\frac{3}{4}$ inches long, bright purple, drooping, shortly stalked, solitary in the axils of the leaves, and terminating the main stem, so forming a long simple leafy cluster. Capsules nearly round, opening by clefts at the base. [As described in the genus *Campanula*.] Stem 1–2 feet high, erect, solitary; the root and lower leaves on long stalks, scalloped, and broadly heart-shaped, graduating into the upper stem-leaves which are stalkless and lance-shaped. Very rare, local. Naturalised in cultivated fields, woods, and hedges. In Bedfordshire, Nottinghamshire, and Yorkshire; and in Scotland in Fifeshire, Edinburgh, and Perth. July—August. Perennial.

5. **Harebell.** (*Campanula rotundifolia*. Linn.)—Flowers $\frac{3}{4}$ –1 inch long, pale blue, rarely white, drooping on slender stalks, solitary or 2 or 3 in a loose cluster. Capsule oval, drooping, opening by clefts at the base. [As described in the genus *Campanula*.] Stems 6–18 inches high, slender, and wiry, with a few narrow, pointed, nearly stalkless leaves; the root-leaves on long stalks, roundish or heart-shaped, scalloped or toothed, fading before the flowers open; the root creeping.

This graceful little plant is the Bluebell of Scotland, and in spite of its delicate fragile appearance thrives in exposed situations and on poor soil. [Plate 2.

Very common all over the British Isles, on heaths, mountain-sides, pastures, &c. July—September. Perennial.

6. **Peach-leaved Bell-flower.** (*Campanula persicifolia*. Linn.)—Not considered native by most botanists. The flowers are 1 – $1\frac{1}{4}$ inches long, and are at once distinguished from every other British species by being as broad as long; the bell-shaped corollas of all our other *Campanulas* are longer than they are broad. The flowers are of a pale bright blue or white, and are usually solitary, terminating the stems. The capsule is erect, and opens by clefts at the top. [As described in the genus *Campanula*.] The stems are 9–18 inches high, rather slender, and wiry; the leaves of the root and lower stem are narrow, rather oblong, slightly toothed, and narrowing into an indistinctly winged stem; and those of the upper stem are stalkless, very narrow, and remote; they are all shiny and rather leathery.

Very rare. Naturalised in woods; at Thorpe Arch, Yorkshire, and near Cullen, Banffshire. July—August. Perennial.

7. ***Rampion Bell-flower.** (*Campanula rapuncululus*. Linn.)—Flowers small, $\frac{3}{4}$ inch long, shortly stalked, and usually very numerous, pale lilac-blue, in simple or compound clusters up the stem, making a close or loose cluster (raceme or panicle). The bell-shaped corolla is divided halfway down into 5 lobes, far more deeply than in any other species except the Spreading Bell-flower. Capsule erect, opening by clefts at the top, just under the persistent calyx-teeth. [As described in the genus *Campanula*.] Stem 2–3 feet high, erect, but rather slender, hairy, very leafy; the root-leaves have long stalks, and are oval or egg-shaped with slightly scalloped margins, the upper ones are stalkless, narrower, and more pointed; and the root is thick and fleshy, and was at one time much used in salad or boiled as a vegetable; for its sake the plant was cultivated in many kitchen gardens, and it is an unquestioned escape from cultivation where it occurs in England, though it has now well established itself in certain places.

Local. Waysides, banks, and borders of fields. Naturalised in many counties, the principal ones being Kent, Surrey, Worcester, Stafford, Warwick, Denbigh, and Yorkshire. July—August. Biennial.

8. **Spreading Bell-flower.** (*Campanula patula*. Linn.)—Flowers $\frac{3}{4}$ –1 inch long, few, purplish-blue, on long stalks, forming a very loose terminal cluster (panicle). The corolla broad





and divided halfway down into 5 broad spreading lobes. Capsule narrower than in the other species, opening at the top just below the persistent calyx-teeth. [As described in the genus *Campanula*.] Stems 1-3 feet high, erect, and hairy, with many spreading branches; the root-leaves oblong or slightly broader, stalked, and scalloped, and the stem-leaves narrower, almost stalkless, and nearly entire. [Plate 1

Rare. Hedges, bushy places, and copses, chiefly in southern and central England. July—August. Perennial or annual.

VI. VENUS' LOOKING-GLASS. (LEGOUSIA. Durande.)—Flowers purple or white, in terminal clusters. Calyx-tube cylindrical, spreading at the top into 5 teeth, remaining with the fruit (persistent); corolla with a short tube, spreading out into a flat round limb (rotate) with 5 shallow lobes, inserted on the top of the calyx-tube; stamens 5, the anthers free, inserted at the base of the corolla; carpels 3-5. Capsule long and narrow, longer than the persistent calyx 3-5-celled, many-seeded, opening by clefts towards the top, between the persistent calyx-teeth. Small herbs differing from the *Campanulas* in their long, narrow capsules and flat spreading corollas. (*Specularia. Heist.*)

Small-flowered Venus' Looking-glass. (Legou'sia hýbrida. Delarbre.)—The only British species. As just described. The flowers are small and purple, solitary, or 2 or 3 together, terminating the stem and branches, and are easily distinguished by their long narrow calyx-tubes and by the calyx-teeth being longer than the round flat corolla; the narrow capsules are triangular, 3-celled, and open by 3 clefts close under the calyx-teeth; the stem is 3-18 inches high, often solitary, erect, or the side ones, when present, procumbent at the base, hairy, and wiry; the root-leaves are roundish, with short stalks, fading before the flowers come out, and the stem-leaves are oblong and wavy, becoming stalkless at the top. (*Specularia hýbrida. DC.; Campanula hýbrida. Linn.*) [Plate 2.

Not uncommon in the south and east of England in cornfields, very local elsewhere, local in Scotland. June—September. Annual.

THE CRANBERRY FAMILY

[ORDER XLIII. VACCINIACEÆ]

THIS is a small order which is frequently united with the Heath Family (Ericaceæ), but which differs from it in one essential—the calyx-tube being united with the seedcase, while the withered calyx-teeth crown the fruit instead of the calyx being entirely free from the seedcase and persisting at the base of the fruit as in the Heath tribe. Members of this family are to be found in all quarters of the globe; those in the British Isles are all dwarf shrubs, but in other countries there are tall trees. The species found in the British Isles, and in fact in all temperate zones, thrive in peat-bogs and in the decaying vegetable matter of woods and heaths, and frequently have what is botanically called “a social habit,” meaning that many plants of the same species grow together and often cover considerable areas of ground. They are to be found as far north as Greenland, where the Bog Whortleberry (*Vaccinium uliginosum*) is abundant, while other species grow on mountains in the tropics.

A few species are cultivated for their beauty, but their chief value lies in their pleasant edible fruits. Besides those grown in the British Isles, we receive quantities of Bilberries from different countries in Europe and Cranberries from Russia and Chicago.

I. **VACCINIUM.** Corolla bell- or urn-shaped, with 4 or 5 segments.

II. **CRANBERRY (SCHOL'LERA).** Corolla flat and spreading, deeply divided into 4 reflexed segments, with a very short tube.

I. VACCINIUM. Linn.—Flowers small, white or pink, in the British species, solitary in the axils of the leaves or in compact terminal clusters. Calyx of 4-5 sepals, united into a tube which combines with the seedcase, and separating at the top into 4-5 teeth, which are sometimes so small as to be hardly visible; corolla of 4-5 united petals, bell- or urn-shaped, with 4-5 small lobes at the top, inserted at the top of the calyx-tube (epigynous); stamens 8-10, the anthers 2-celled, sometimes with 2 horns on the back; each cell is prolonged at the top into a tube which opens at the apex by a pore to discharge its pollen; carpels 2-5, united into a 2-5-celled seedcase, a style, and clustered stigma. Fruit a fleshy, juicy berry, crowned with the calyx-teeth, 2-5-celled, with several developed or undeveloped seeds in each cell. Shrubs with alternate leaves.

(1) Cowberry. (*Vaccinium Vitis-Idæa*.)—Flowers bell-shaped, several together in terminal drooping clusters; anthers not horned on the back; leaves evergreen; berries red.

THE CRANBERRY FAMILY. (ORDER XLIII. VACCINIACEÆ.)

CALYX of 4 or 5 SEPALS united into a tube which adheres to the seedcase and separating at the apex into 5 teeth which are sometimes minute.

COROLLA of 4 or 5 PETALS, as many as the sepals, united into a tube and separating into as many lobes as there are petals, bell- or urn-shaped, or flat and spreading (rotate), inserted at the top of the calyx-tube (epigynous).

STAMENS 8-10, double the number of the petals; the anthers 2-celled, opening at the top by 2 pores and often spurred on the back; inserted with but distinct from the corolla at the top of the calyx-tube (epigynous).

PISTIL of 4-5 CARPELS, united into a 2-5-celled seedcase, and a simple style crowned with a pin-head-like stigma.

FRUIT a juicy berry, 2-5-celled, with several small seeds in each cell, the berry crowned with the faded calyx-teeth.

FLOWERS in the axils of the leaves, or in small compact terminal clusters.

STEMS woody.

LEAVES alternate, undivided, often evergreen.

DISTINGUISHED from the Bell flower Family (Campanulacæ) by the anthers discharging their pollen by 2 pores at the apex, by the fruit being a berry and by the wiry stems; and from the Heath Family (Ericacæ) by the calyx-tube being combined with the seedcase the calyx teeth crowning the berry instead of the calyx being free from & at the base of the fruit.

Many botanists place the Cranberry with the Heath Family.



Flowers globular ; anthers with 2 horns on the back ; leaves deciduous ; berries black.

- (2) Bilberry. (*Vaccin'ium Myrtil'lus*.)—Flowers solitary in the axils of the leaves ; leaves toothed ; stems angular.
- (3) Bog Whortleberry. (*Vaccin'ium uliginósum*.)—Flowers solitary or 2 or 3 together in the axils of the leaves ; leaves entire ; stems round.

1. Cowberry, Red Whortleberry. (*Vaccin'ium Vitis-Idæa*. Linn.)—As just described. The flowers are about $\frac{1}{4}$ inch long, pink, bell-shaped, and usually with only 4 lobes, 5-12 together in dense terminal drooping clusters (racemes) ; the anthers have no horns on the back ; the berries are red ; the stems are 6-10 inches high, wiry, straggling, branched, and rather closely packed with deep shining evergreen, oblong leaves, which are very shortly stalked, and are similar to those of the Box.

These berries are sometimes used for cooking instead of Cranberries. After exposure to frost they become very acid, and in Sweden, especially, are made into preserve and jelly, which is commonly eaten with roast meat. The preserved fruit is also considered to be an excellent remedy for sore throats and coughs. Grouse are specially fond of the berries. [Plate 3. Common on mountain heaths in the north and west of England, Cannock Chase, Wales, and Ireland. June—September. Perennial.

2. Bilberry, Whortleberry, Whinberry. (*Vaccin'ium Myrtil'lus*. Linn.)—Flowers about $\frac{1}{4}$ inch long, greenish-white or flesh-coloured, globular with 5 very short reflexed lobes, shortly stalked, solitary in the axils of the leaves ; the anthers with two curved horns on the back. [As described in the genus *Vaccinium*.] Berries round and black, covered with a bluish bloom. Stems from 6 inches to 2 feet high, erect, angular, woody, much branched ; with egg-shaped (ovate), toothed, shining, shortly stalked leaves, which are not evergreen (deciduous), and become a most glorious rose-red in the autumn.

The berries of this species are very well known in the British Isles and are universal favourites in tarts and preserve. [Plate 3.

Very common in woods and on heaths in all parts of England except the south-east, and in Wales, Scotland, and Ireland. April—June. Perennial.

3. Bog Whortleberry. (*Vaccin'ium uliginósum*. Linn.)—A similar plant to the Bilberry but smaller, with the flowers shortly stalked, solitary or 2 or 3 together, the calyx and corolla 4- or 5-lobed, the stems round, and the leaves not toothed and more strongly veined.

Rare. Bogs and mountainous districts in the north of England, fairly common in Scotland, not recorded from Ireland. May—June. Perennial.

II. CRANBERRY. (*Schol'lera*. Roth.)—Flowers solitary, on long stalks. Calyx of 4 sepals, united into a tube which is combined with the seedcase, and separating at the top into 4 lobes ; corolla of 4 petals, united into a very short tube and spreading into 4 reflexed segments (rotate) ; stamens 8, the anthers 2-celled, without horns on the back, each cell being prolonged at the top into a tube which opens at the apex by a pore to discharge its pollen ; carpels 4 ; fruit a berry, round, 4-celled, and many-seeded, crowned with the calyx-teeth. Slender undershrubs with small alternate evergreen leaves.

Cranberry. (*Schol'lera Oxycoc'eus*. Roth.)—The only British species. As just described. The solitary flowers are about $\frac{1}{4}$ inch long, bright rose-colour, drooping on long

slender stalks ; the corolla deeply divided into 4 narrow, long, reflexed segments ; the berries red ; the stems slender and wiry, very much branched, with small evergreen leaves, egg- or lance-shaped, with their edges entire and rolled back, of a deep shining green. (*Vaccinium Oxycoccus*. L.) The berries are much used for cooking purposes : they have a very sharp acid taste and a rather peculiar flavour, and are used in tarts, in this country generally mixed with apples. They used to be very abundant in the Fen country, but improved drainage has destroyed their haunts, and the Cranberries we now buy in England come from Russia and America. [Plate 3. Uncommon, though widely distributed all over the British Isles. Peat-bogs, principally in the north of England and the south of Scotland. June—August. Perennial.

THE HEATH FAMILY

[ORDER XLIV. ERICACEÆ]

CALYX of 4 or 5 **SEPALS**, which are wholly free from the seedcase, united at the base and separating into 4 or 5 lobes, remaining with the fruit (persistent), inserted below the seedcase (inferior).

COROLLA of 4 or 5 **PETALS**, usually urn-shaped (urceolate) or bell-shaped (campanulate) with 4 or 5 lobes, inserted below the seedcase (hypogynous).

STAMENS 8-10, with their anthers 2-celled and opening at the top by 2 pores, rarely by slits, often spurred on the back, inserted with the corolla, or slightly adhering to its base, below the seedcase (hypogynous).

PISTIL, usually of 4 or 5 **CARPELS**, united into a seedcase (ovary), a simple style, and stigma.

FRUIT a capsule, opening by valves, or a berry, 3-5-celled, many-seeded, situated above the insertion of the calyx, corolla, and stamens (superior).

FLOWERS in small terminal clusters (racemes) or in the axils of the leaves.

STEMS woody.

LEAVES, often evergreen, generally opposite, in pairs, sometimes with more than one pair in a circle (whorl).

DISTINGUISHED from all other Families with united sepals and petals by the insertion of the calyx, corolla, and stamens below the seedcase; by the anthers usually opening by pores at the apex; and by the superior fruit with the withered calyx at its base.

THE Heath Family is easily recognised from those nearest akin to it by the stamens, usually opening to free the pollen by pores situated at the apex of the anthers, and by the fruit, which is always superior, with the withered calyx at the base.

The species are found widely distributed over both hemispheres. Heath (*Erica*) and Heather (*Calluna*) have, like so many of the last family (*Vacciniaceæ*), a "social habit," and cover large districts, especially thriving on mountains and high moorlands. The beautiful *Ericas* cultivated in greenhouses are natives of South Africa, where they cover vast areas of ground and make beautiful otherwise desolate places. *Rhododendrons*, *Azaleas*, and *Kalmias* are natives of America. *Loiseleuria* or—though it is not a true *Azalea*—*Azalea procumbens*, as it is again called, has a wide distribution: it is found in the Arctic regions, in Scotland, and on mountains in central and southern Europe. In Australia the Heath tribe is not represented, its place being taken by the *Epacridaceæ*, an order similar in all essentials and only differing in the structure of the anthers, which are 1-celled and open down the centre by 2 valves. Different genera of this tribe cover and glorify the hills and wastes of Australia as our Heaths and Heathers transform our quiet mountain-sides into a splendour of purple and red. Many genera are cultivated in greenhouses, the Heath-like *Epacris*, *Styphelia*, *Diacophyllum*, and *Leucopogon*.

Except for the beauty of the flowers very few members of this family have any special value. Some species of *Kalmia* and *Azalea* possess poisonous narcotic properties;

in fact, the very honey of the Trebizonde bees that feed largely on *Azalea pontica*, and the Canadian partridge that feeds on the berries of certain species of *Kalmia*, are both said to be poisonous to human beings.

Flowers globular, in clusters; anthers usually spurred on the back, opening by pores at the top; leaves often evergreen.

I. **STRAWBERRY-TREE** (*ARBÚTUS*). Fruit a fleshy berry, granulated, 5-celled, many-seeded.

II. **BEAR-BERRY** (*ARCTOSTAPHÝLOS*). Fruit a fleshy berry, smooth, 5-celled, with 1 seed in each cell.

III. **ANDROMÉDA**. Fruit a dry capsule, 5-celled, many-seeded, opening by 5 valves down the middle of the cells (loculicidal).

Flowers in clusters; anthers not spurred; fruit a dry capsule, many-seeded, opening by valves by the splitting of the cell-wall partitions (septicidal).

IV. **TRAILING AZALEA** (*AZÁLEA*). Flowers widely bell-shaped; calyx and corolla 5-lobed; stamens 5, anthers short, not spurred, opening lengthwise by slits; capsule opening by 2 or 3 valves.

V. **SCOTCH MENZIESIA** (*BRYAN'THUS*). Flowers urn-shaped; calyx and corolla 5-lobed; stamens 10, anthers short, opening by pores at the top; capsule 5-valved.

VI. **ST. DABEOC'S HEATH** (*DABEC'IA*). Flowers urn-shaped; calyx and corolla 4-lobed; stamens 8, anthers elongated into horns, arrow-shaped at the base, opening at the top by pores; capsule 4-valved.

Flowers in clusters; calyx and corolla 4-lobed; stamens 8, anthers often spurred at the base, opening by pores at the top; leaves small.

VII. **HEATHER** (*CALLÚNA*). Flowers bell-shaped; corolla deeply lobed; fruit a dry 4-celled capsule, with few seeds, opening by 4 valves by the splitting of the cell-wall partitions (septicidal).

VIII. **HEATH** (*ERÍ'CA*). Flowers bell-shaped, urn-shaped, or tubular; fruit a dry 4-celled capsule, opening by 4 valves down the middle of the cells (loculicidal).

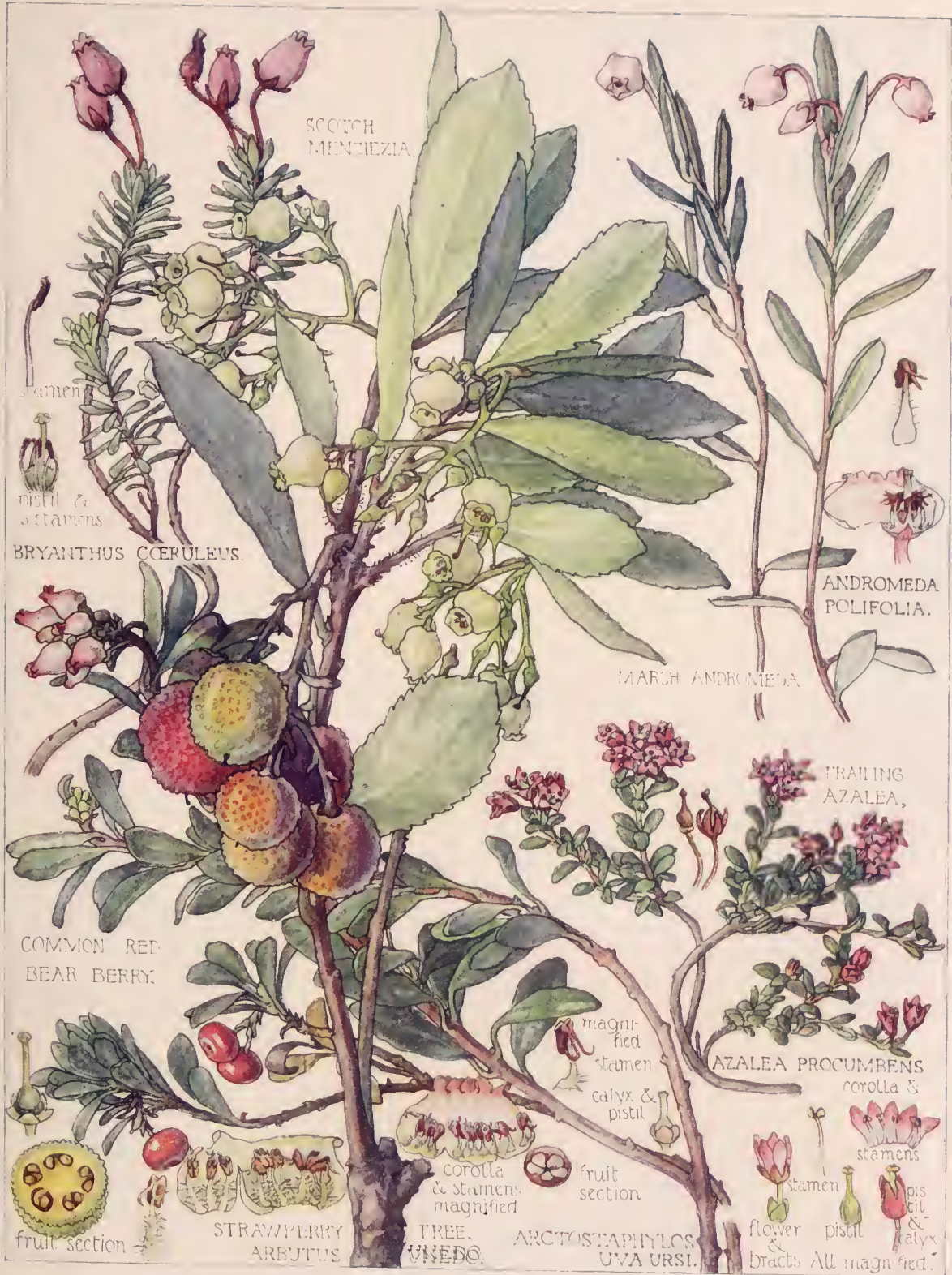
Flowers with 5 distinct petals; calyx 5-lobed; stamens 10, anthers not spurred, opening by pores; fruit a dry capsule, opening by 5 valves down the middle of each cell (loculicidal).

IX. **WINTER-GREEN** (*PYRÓLA*). Flowers in clusters; anthers short; stigma broad with 5 blunt lobes.

X. **SINGLE-FLOWERED WINTER-GREEN** (*MONÉSES*). Flower solitary; petals spreading, united at the base; anthers elongated into horns; stigma with 5 long pointed lobes.

I. STRAWBERRY-TREE. (*ARBÚTUS*. Linn.)—Flowers globular, white or pink, in terminal clusters (panicles). Calyx of 5 small sepals united at the base, free from and inserted below the seedcase (inferior); corolla globular with 5 reflexed teeth, not remaining with the fruit (deciduous), inserted below the seedcase (hypogynous); stamens 10, enclosed in the corolla, the filaments short, and the anthers 2-celled, spurred on the back, each cell opening at the top by a pore, inserted with the corolla (hypogynous); carpels 5; fruit a rough granulated berry, 5-celled, each cell containing several seeds. Shrubs or small trees, with alternate evergreen leaves.

Strawberry-tree. (*Arbútus Unédo*. Linn.)—The only British species. As just described. A very beautiful evergreen tree or shrub, with clusters of drooping waxy-white



SCOTCH
MENTIEZIA

stamen
pistil &
stamens

BRYANTHUS CAEULEUS

ANDROMEDA
POLIFOLIA

MARCH ANDROMEDA

TRAILING
AZALEA

COMMON RED
BEAR BERRY

AZALEA PROCUMBENS
corolla &
stamens

fruit section

STRAWBERRY
ARBUTUS

TREE
ARBUTUS

ARCTOSTAPHYLOS
UVA URSI

stamen
pistil
calyx
bracts All magnified

corolla
& stamens
magnified

fruit
section

magni-
fied
stamen
calyx &
pistil



flowers, about $\frac{1}{2}$ inch long, which bloom at the same time as the fruit, formed the year before, ripens. The fruit eventually is of the deepest red, though going through all stages of yellow, orange, scarlet, and rose before it reaches its final colour; it somewhat resembles a strawberry in appearance, though not in flavour, as it is most insipid, or in consistency; its name Unedo, "One I eat," which was given to it by Pliny, is indicative of its unattractiveness as a food. The leaves are shortly stalked, $1\frac{1}{2}$ –3 inches long, oblong, acute, and sharply toothed.

The tree is a favourite in shrubberies and borders; its creamy-white flowers and clusters of gorgeous-coloured berries form a strong contrast against its glossy dark green leaves, and it is quite a feature in places such as Bournemouth, where it is largely cultivated. [Plate 4.

Very rare. Only truly native about the lakes of Killarney. September—October. Perennial.

II. BEAR-BERRY. (ARCTOSTAPH'YLOS. Adans.)—A genus similar to the Strawberry-tree (*Arbutus*), the only essential difference being in the fruit, which is smooth and has only 1 seed in each of its 5 cells.

Flowers pink or white, in short terminal clusters (racemes). Calyx of 4 or 5 sepals, united at the base, free from the seedcase and inserted below it (inferior); corolla globose, with as many teeth as there are sepals, not remaining with the fruit (deciduous), inserted below the seedcase (hypogynous); stamens 8 or 10, the anthers 2-celled, each cell spurred on the back, opening at the top by a pore, inserted below the seedcase (hypogynous), generally adhering to the corolla; carpels 4 or 5, united; fruit a cluster of smooth, 5-celled berries, with 1 seed in each cell. Small shrubs or undershrubs with alternate often evergreen leaves.

- (1) Black Bear-berry. (*Arctostaph'ylus alpina*.)—Flowers white; berries black; leaves thin, toothed, deciduous.
- (2) Red Bear-berry. (*Arctostaph'ylus Uva-ur'si*.)—Flowers rose-colour; berries red; leaves thick, entire, evergreen.

1. Black Bear-berry. (*Arctostaph'ylus alpina*. Spreng.)—As just described. The flowers are about $\frac{1}{4}$ inch long, globular, hairy within, white, 2 or 3 together in a drooping terminal cluster; the fruit is a smooth bluish-black berry; the whole shrub is low and prostrate, with strongly veined leaves of a shiny green, which are thin in texture, wrinkled, and toothed, falling off in the autumn (deciduous).

Rare. On dry barren places on mountains and heaths in the centre and north of Scotland and in Shetland. May—July. Perennial.

2. Red Bear-berry. (*Arctostaph'ylus Uva-ur'si*. Spreng.)—A similar shrub to the last, differing in the flowers being rose-coloured and more numerous, there being 4–8 in a cluster; in the berries being shiny and of a bright scarlet; and in the leaves being thick, leathery, and evergreen, with entire margins, and glandular dots on the under surface. This species with its prostrate branches thickly covered with the dark shining evergreen leaves often covers large tracts of country.

The leaves are strongly astringent and are still used in medicine, and the berries are a favourite food of grouse and moor-fowl. The plant when in fruit might be mistaken for the Cowberry (*Vaccinium Vitis-Idæa*), but is at once recognised by the sepals being at the base of the berry, not crowning it as in the Cowberry. [Plate 4.

Abundant on mountainous heaths from Derby northward to Scotland, Orkney, and Shetland, and in Ireland. May—June. Perennial.

III. ANDROM'EDA. Linn.—Another genus similar to the Strawberry-tree (*Arbutus*), from which it chiefly differs in the fruit, which is a dry 5-celled capsule, opening by 5 valves down the middle of the cells (loculicidal).

Flowers globular, white or pink, in terminal clusters. Calyx of 5 sepals, united at the base, entirely free from and inserted below the seedcase (inferior); corolla globular or urn-shaped with 5 reflexed teeth, not remaining with the fruit (deciduous), inserted below the seedcase (hypogynous); stamens 10, the anthers 2-celled, opening at the apex by 2 pores, sometimes spurred on the back; carpels 5; fruit a dry 5-celled, many-seeded capsule, opening by 5 valves down the middle of the cells (loculicidal). Trees, shrubs, or herb-like undershrubs, growing in damp places, generally in peat-bogs.

Marsh Andromeda. (*Androm'eda Polifolia*. Linn.)—The only British species. As just described. A well-known plant in bogs in the north. The flowers are $\frac{1}{4}$ inch long, waxy, flesh-colour, 2–8 in drooping terminal clusters; the stems are slender and wiry, seldom more than 6 inches high; the leaves are evergreen, oval-lance-shaped, with the entire margins rolled back, smooth, and of a shining green above and whitish beneath. [Plate 4.

Rare. In peat-bogs and on damp moors; in central and northern England, southern and central Scotland (not extending north of Perth and Renfrew), and Ireland. May—September. Perennial.

IV. AZÁLEA. Linn.—A genus consisting of the one species:—

Trailing Azalea. (*Azálea procum'bens*. Linn.)—Flowers small, bell-shaped, rose-colour, in short terminal clusters. Calyx red, deeply lobed into 5 segments, free from and inserted below the seedcase (inferior); corolla widely bell-shaped, $\frac{1}{3}$ inch across, 5-lobed, not remaining with the fruit (deciduous), inserted below the seedcase (hypogynous); stamens 5, the anthers without spurs and opening lengthwise by slits; carpels 2 or 3; fruit a dry capsule, of a crimson colour, 2–3-celled, and many-seeded, opening by the same number of valves by the splitting of the partitions of the cell-walls (septicidal). This pretty prostrate little shrub grows in dense masses in the Highlands of Scotland, forming large dark green patches; the stems are woody, prostrate, and tangled, and the leaves are evergreen, dark and shining on the upper surface, and densely felted underneath with short wool, opposite, oval or oblong, with the margins strongly rolled in. (*Loiseleuria procumbens*. Desv.)

This plant differs from the true Azalea—though classified as such by Linnæus—by its anthers opening lengthwise by slits instead of at the apex by pores, and by its opposite leaves.

[Plate 4.

Rare. Rocky places on mountain summits in the Scotch Highlands, from Stirling northwards. May—June. Perennial.

V. BRYAN'THUS. S. G. Gmel.—Flowers urn-shaped, in terminal clusters (umbellate racemes). Calyx deeply 5-lobed, free from and inserted below the seedcase (inferior); corolla urn-shaped, 5-lobed, not remaining with the fruit (deciduous), inserted below the seedcase (hypogynous); stamens 10, anthers short, opening at the top by pores; carpels 5, with the stigma target-shaped (peltate) and having 5 tubercles; fruit a 5-celled, many-seeded capsule, opening by 5 valves by the splitting of the partitions of the cell-walls (septicidal). Small evergreen shrubs with alternate leaves.

Scotch Menziesia. (*Bryan'thus cœrúleus*. Dippel.)—The only British species. As just described. The inflated, urn-shaped flowers are about $\frac{1}{2}$ inch long, purplish, on long stalks, in

terminal clusters (racemose umbels); the stalks, sepals, and capsules are covered with minute gland-tipped hairs. The shrub is much branched, the branches rarely more than 6 inches long, and prostrate at the base; and the leaves are evergreen, strap-shaped, blunt, green on both sides, the edges not rolled in, but fringed with minute glandular hairs. (*Bryanthus taxifolius*. A. Gray; *Menziesia cærulea*. Swartz; *Phyllocoe cærulea*. Bab.) [Plate 4.]

Very rare. On moors on the Sow of Athol in Perthshire. June—July. Perennial.

VI. DABÆC'IA. D. Don.—A genus (united with *Bryanthus* by some botanists) consisting of the one species :—

St. Dabeoc's Heath. (*Dabæc'ia cantab'rica*. Rendle and Britten.)—The flowers are very beautiful and larger than any of the preceding species in this order, being $\frac{1}{2}$ – $\frac{5}{8}$ inch long, crimson or rarely white, narrowly urn-shaped, and drooping, 3–16 in a terminal, 1-sided, loose cluster (raceme). Calyx deeply 4-lobed, free from and inserted below the seedcase (inferior); corolla narrowly urn-shaped, 4-lobed, not remaining with the fruit (deciduous), inserted below the seedcase (hypogynous); stamens 8, the anthers opening at the top by pores, arrow-shaped at the base; carpels 4, the stigma indistinctly 4-lobed; capsule 4-celled, opening with 4 valves by the splitting of the partitions of the cell-walls (septicidally). This small shrub is from 9 inches to 2 feet high, and is covered with gland-tipped hairs; the leaves are evergreen, very narrow when young owing to the edges of the leaves being so much rolled in and becoming broader when old as the leaves unroll, the upper surface sparingly covered with gland-tipped hairs and the under surface densely felted with white wool. (*Menziesia polifolia*. Sm; *Dabæcia polifolia*. Don.; *Boretta cantabrica*. O. Kuntze.)

Very rare. On boggy heaths in the west of Ireland in Connemara. August. Perennial.

VII. LING, HEATHER. (**CALLÚNA.** Salisb.)—A genus consisting of the one species :—

Ling, Heather. (*Callúna vulgáris*. Hull.)—Flowers small, bell-shaped, lilac, usually drooping, with 4 green bracts at the base of each flower, in close erect terminal and axillary spike-like clusters (racemes). Calyx divided into 4 lobes, white or pink (petaloid), longer than the corolla, free from and inserted below the seedcase (inferior); corolla widely bell-shaped, cleft to the base into 4 lobes, remaining with the fruit (persistent), inserted below the seedcase (hypogynous); stamens 8, anthers opening by 2 pores at the top, and having 2 appendages at the base; carpels 4; fruit a dry 4-celled capsule, with a few seeds in each cell, opening by 4 valves down the partitions of the cell-walls (septicidally). A heath-like little shrub with woody stems, from 9 inches to 2 feet high, much branched, covered with pairs of small oval stalkless (sessile) leaves, which are densely packed on the short barren branches. (*Calluna Erica*. D. C.)

Heather is one of the mountain flowers which gives an especially pleasant flavour to honey, and sheep fed on hills where it is abundant are considered better than our pasture-fed cattle. In Scotland it is used for thatching houses, weaving into fences, making besoms, scrubbing-brushes, baskets, and many other things. The bell-shaped corollas remaining with the fruit, often until the next year's flowers come out, give a soft colour to the mountain-side during the cold winter months.

[Plate 5.]

Very common On heaths and mountains; all over the British Isles. June—August. Perennial.

VIII. HEATH. (**ERI'CA.** Linn.)—Flowers urn-shaped, bell-shaped, or tubular, usually drooping, with bracts at the base of each flower, in terminal and axillary spike-like clusters

(racemes). Calyx with 4 lobes entirely free from and inserted below the seedcase (inferior); corolla urn-shaped, bell-shaped, or tubular, with 4 teeth or lobes, remaining with the fruit (persistent), inserted below the seedcase (hypogynous); stamens 8, the anthers opening by 2 pores at the top, and often having 2 spurs at the base; carpels 4; fruit a dry 4-celled, many-seeded capsule, opening by 4 valves down the middle of the cells (loculicidal). Shrubs, much branched and usually low-growing, with small entire leaves, almost always with their margins rolled back (revolute) so that they appear extremely narrow, usually in clusters of 3 or 4 in circles (whorls) round the stems.

Anthers included in the corolla.

- (1) Fringed-leaved Heath. (*Eri'ca ciliáris*.)—Flowers rose-red, in dense, 1-sided, spike-like clusters; anthers without spurs; style protruding; leaves 3-5 in whorls, edges rolled in (revolute).
- (2) Cross-leaved Heath. (*Eri'ca Tet'ralix*.)—Flowers rosy, in short, drooping, 1-sided clusters (heads); anthers with long spurs; leaves 4 in a whorl, edges much rolled in (revolute).
- (3) Mackay's Heath. (*Eri'ca Mackáyi*.)—Like the last, differing in the shorter wider corolla and broader leaves with the margin less rolled in.
- (4) Fine-leaved Heath. (*Eri'ca cinérea*.)—Flowers purplish, in elongated terminal clusters; anthers with short spurs; style protruding; leaves 3 in a whorl, flat, edges not rolled in.

Anthers without spurs, protruding from the corolla; style protruding.

- (5) Cornish Heath. (*Eri'ca vágans*.)—Flowers bell-shaped, small, pink, in leafy spike-like clusters; leaves 4-5 in a whorl, edges slightly rolled in (revolute).
- (6) Mediterranean Heath. (*Eri'ca mediterránea*.)—Flowers small, narrowly urn-shaped, pink, in terminal clusters; leaves 4 in a whorl, edges not rolled in.

1. Fringed-leaved Heath. (*Eri'ca ciliáris*. Linn.)—As just described. This is a very beautiful species with long, one-sided, spike-like clusters of large rose-red flowers about $\frac{1}{2}$ inch long; the sepals are small and fringed with hairs; the anthers without awns and included in the urn-shaped corolla, from which the style protrudes. The stems are straggling, from 9 inches to 1 foot high; the leaves are egg-shaped, with rolled-in margins, fringed with gland-tipped hairs (ciliate), and are placed in circles (whorls) of 3-4 together up the stem.

Very rare. On sandy heaths; in Cornwall near Penryn, Truro, and St. Agnes; in Dorset, near Wareham; and recorded (but now probably extinct) from the vicinity of Clifden, Co. Galway.

2. Cross-leaved Heath. (*Eri'ca Tet'ralix*. Linn.)—This species is easily recognised by its short one-sided clusters (heads) of drooping rose-coloured or white flowers $\frac{3}{8}$ inch long, which have their anthers with long spurs, included with the style in the inflated urn-shaped corolla; by the downy capsules; and by the narrow leaves, which have their margins strongly rolled in, and are placed cross-wise in whorls of 4; the leaves are fringed with hairs and are always downy above when young and on the midrib underneath; the stems are wiry, 9-18 inches high, the leaves being crowded together on the barren shoots, but more distant on the flowering stems.

[Plate 5.

Common. On heaths; generally distributed all over the British Isles. July—September. Perennial.



3. Mackay's Heath. (*Eri'ca Mackáyi*. Hook.)—A very similar species to the last, the Cross-leaved Heath (*Erica Tetralix*)—regarded by Sir John Hooker merely as a variety—differing chiefly in having a shorter and wider corolla; shorter and broader leaves, which are of a darker green and not downy; and in the capsule being smooth and not downy.

Very rare. Wet moors between Roundstone and Clifden and between Carna and Lough Sheedah, Co. Galway. July—September. Perennial.

4. Fine-leaved Heath. (*Eri'ca cinérea*. Linn.)—The commonest British Heath. The flowers are $\frac{1}{4}$ inch long, purplish-crimson, rarely white, urn-shaped, less inflated than in the Cross-leaved Heath (*Erica Tetralix*), in dense whorled clusters (racemes) terminating the stem and branches; the anthers with short spurs at the base, enclosed in the corolla, and the style protruding. [As described in the genus Heath (*Erica*).] A small bush, from 6 inches to 2 feet high, frequently covering large tracts of country; the stems are stout and woody, and the leaves are finer and more pointed than in any other British species, flat and narrow, the edges not rolled in, generally 3 in a circle (whorl), with clusters of small leaves in their axils.

[Plate 5.

Very common. Heaths and mountain-sides all over the British Isles. July—September. Perennial.

5. Cornish Heath. (*Eri'ca Vágans*. Linn.)—Flowers small, $\frac{1}{6}$ inch long, bell-shaped, in dense leafy tapering clusters; the corolla is pink, rose-colour, or pure white, and differs from all the preceding species in being bell-shaped and open at the mouth when the flower first opens and afterwards globular; the anthers have no spurs and protrude beyond the corolla. [As described in the genus Heath (*Erica*).] A small compact shrub, 1–3 feet high, much branched and very leafy in the upper part; the leaves 4–5 in circles (whorls), narrow, with slightly rolled-in edges.

[Plate 5.

Local. Covering thousands of acres on the Goonhilly and other downs at the Lizard in Cornwall. July—September. Perennial.

6. Mediterranean Heath. (*Eri'ca mediterránea*. Linn.)—Flowers small, $\frac{1}{5}$ inch long, pink, narrowly urn-shaped, in rather dense terminal clusters (racemes); the calyx-lobes are narrow and pointed and of a pink colour (petaloid); the anthers are not spurred and only protrude slightly beyond the corolla and open throughout more than half their length. [As described in the genus Heath (*Erica*).] The stems are from 18 inches to 5 feet high and form a compact bush; the leaves, in whorls of 4, are narrow and flat, the edges not rolled in. (*Erica carnea*, v. *mediterranea*. Benth. and Hook.; *Erica hibernica*. Syme.)

Very rare. On mountain bogs in the west of Co. Mayo and Co. Galway. April—May. Perennial.

IX. WINTER-GREEN. (*PYRÓLA*. Linn.)—Flowers white or pink, with a small bract at the base of each flower, in short or elongated clusters (umbels or racemes) on leafless, erect stalks (scapes). Calyx 5-lobed, entirely free from and inserted below the seedcase (inferior); corolla of 5 distinct petals, not remaining with the fruit (deciduous), inserted below the seedcase (hypogynous); stamens 10, inserted by the corolla below the seedcase (hypogynous), anthers 2-celled, not lengthened into horns, opening by pores close to the insertion of the filaments; carpels 5, the style long and often curved, and the stigma with 5 short blunt lobes; fruit a capsule, roundish, 5-lobed, 5-celled, many-seeded, opening by 5 valves down the middle of the cells (loculicidal). Low herbs with short, almost woody, unbranched stems, and roundish or egg-shaped evergreen leaves, chiefly from the root.

- (1) Round-leaved Winter-green. (*Pyróla rotundifólia*.)—Flowers expanded, pure white, in a long cluster; stamens all turned upwards; style long, protruding, bent downwards, then turned up at the apex; stigma with a raised border; leaves roundish and blunt.
- (2) Intermediate Winter-green. (*Pyróla média*.)—Flowers globular, pinkish, in a shorter cluster; stamens curved in round the style; style shorter and straighter; stigma with a raised border, protruding; leaves blunt.
- (3) Lesser Winter-green. (*Pyróla mínor*.)—Flowers smaller, globular, pinkish, in a still shorter cluster; style straight, no longer than the stamens; stigma without a raised border and included in the corolla; leaves blunt.
- (4) One-sided Winter-green. (*Pyróla secun'da*.)—Flowers small, bell-shaped, greenish-white, in a short cluster, all turning to one side; style straight, protruding; leaves egg-shaped and pointed.

1. Round-leaved Winter-green. (*Pyróla rotundifólia*. Linn.)—As just described. The flowers are $\frac{1}{2}$ inch across, pure white, 10–20 in a long cluster (raceme) terminating a leafless stalk (scape) of from 5 inches to 1 foot high, on which are a few scale-like bracts; the calyx-lobes are lance-shaped and pointed; the pure white petals are roundish, and expanded; the stamens all turned upwards; the style much longer than the stamens and protruding beyond the petals, bent downwards and curved up at the apex, terminating with a stigma edged with a raised border, above and inside which are 5 blunt erect lobes. The leaves are all on long stalks in a rosette, roundish, 1–2 inches broad, thick, entire or slightly scalloped.

A variety—*Pyrola rotundifolia*, v. *maritima*—with broader egg-shaped sepals, many bracts on the flower-stalk, and smaller leaves is found on sandhills in Lancashire. [Plate 5.

Rare. In woods and moist shady places recorded in many counties from Kent to Forfar, and in Ireland in West Meath. July—September. Perennial.

2. Intermediate Winter-green. (*Pyróla média*. Swartz.)—A very similar species to the last, the Round-leaved Winter-green (*Pyrola rotundifolia*), but with a shorter cluster of flowers, the flowers being less expanded, more globular, and so about $\frac{2}{3}$ inch across, tinged with pink; the stamens not bent upwards but curved in regularly round the style, which is shorter and straighter; and the capsule crowned with the elongated style.

Rare. On heaths; in Sussex, Worcestershire, and the north of England; Scotland; and in the north and west of Ireland. July—August. Perennial.

3. Lesser Winter-green. (*Pyróla mínor*. Linn.)—A species resembling the last in its globular flowers, which are, however, rather smaller, about $\frac{1}{4}$ inch across, pale pink, and in a still shorter cluster (raceme); the style is straight, much shorter, no longer than the stamens; the stigma is much broader and without the raised border which characterises both the last species, and is included in the corolla instead of protruding beyond it; the style, though crowning the capsule, does not lengthen with the maturing of the fruit.

Not uncommon. In woods and bushy places and on heaths. Frequent in Scotland and the north of England, rare in the south of England and in Ireland. June—August. Perennial.

4. One-sided Winter-green. (*Pyróla secun'da*. Linn.)—A species resembling the last, the Lesser Winter-green (*Pyrola minor*), but differing in having smaller flowers which are slightly bell-shaped and of a greenish-white, numerous, and crowded into a short terminal cluster, all turning to one side of the stem (secund); the sepals are very small; the stamens are nearly as long as the style, which is straight and protrudes beyond the petals; the stigma,

like the Lesser Winter-green, has no projecting border, but it protrudes beyond the petals; the style elongates with the maturing of the capsule; the stem is more leafy; and the leaves are egg-shaped, pointed, and more distinctly toothed.

Rare. On rocky ledges and woods in mountainous districts, in the north of England, Scotland, and in the north-east of Ireland. July. Perennial.

X. SINGLE-FLOWERED WINTER-GREEN. (MONÉSES. Salisb.)—A genus differing from the Winter-green (*Pyrola*) in having a solitary flower, with the petals flat and spreading, and united at the base, and in each anther-cell being prolonged into a horn, opening at the top by a pore.

Single-flowered Winter-green. (Moneses Grandiflora. Gray.)—The only British species. A very beautiful little plant with a single flower, $\frac{3}{4}$ –1 inch across, pure white, and very fragrant, on a stalk 2–3 inches high, which has a roundish bract a little below the flower; the stamens are shorter than the petals and lie on them, instead of surrounding the pistil as in the Winter-green (*Pyrola*); the style is straight, much longer than the stamens, and the stigma is large with 5 erect lobes and without the raised border which is to be found in some species of the Winter-green (*Pyrola*). The stem is leafy and the leaves are roundish, toothed, and smooth. (*Moneses uniflora. A. Gray; Pyrola uniflora. Linnæus; Pyrola grandiflora. A. Gray.*) Very rare. In pine woods in Scotland. July. Perennial.

THE BIRD'S-NEST FAMILY

[ORDER XLV. MONOTROPACEÆ]

THIS family is frequently united with the Heath Family (Ericaceæ), from which it differs but slightly in the structure of its flowers, the principal difference being in the opening of the anthers transversely by valves instead of at the apex by pores, as is usual in the Heath tribe. Notwithstanding the similar structure of the flowers the members of the Bird's-nest Family are strikingly different from those of the Heath Family in habit and appearance. They are saprophytes—thick, fleshy, succulent plants of a pale yellowish-white or brown colour, without any leaves, their place being taken by scale-like bracts. They are called saprophytes because they are forced to live on decaying vegetable matter, as their cells contain little or none of that matter—chlorophyll—which gives to plants their restful green colour and enables them to take in and digest the simple inorganic food material on which they live. They therefore have to obtain their food partially digested, and this they succeed in finding in woods in the decaying leaves which cover the ground. The order is a very small one and is widely distributed in temperate regions in Europe, North Asia, and North America.

BIRD'S-NEST. (MONÓTROPA. Linn.)—Flowers drooping, bell-shaped, fleshy-white or cream-colour, in long erect clusters (racemes) or solitary. The terminal flower has 5 sepals, petals, and carpels, and 10 stamens, while the others have 4 sepals, petals, and carpels, and 8 or only 6 stamens. [As described on Plate 6.] Pale brown or yellowish fleshy juicy herbs, deriving their food from the decaying vegetable matter that surrounds their roots (saprophytes); the stems are unbranched (simple) and leafless, terminating in a single flower or a long cluster of shortly stalked flowers; the place of the leaves is taken by brownish or yellowish scale-like bracts. (*Hypopitys. Scop.*)

Yellow Bird's-nest, Pine Bird's-nest, Fir-rape. (Monótropa Hypópitys. Linn.)—The only British species. As just described. The flowers are creamy-white, varying in number from 2 or 3 to a dozen, in a cluster, which is drooping until after the flowers are fertilised, when it becomes erect; the sepals are rather shorter than the petals; the anthers open transversely by 2 unequal valves; and the stigma is concave and finally 5-lobed. The stems are 3-15 inches high, solitary or several together, thick, fleshy, yellowish-white, and are clothed throughout with creamy-brown fleshy scales instead of leaves. The whole plant turns dark brown when faded. (*Hypopithys multiflora. Scop.; Hypopitys Monotropa. Crantz.*)

The Bird's-nest must not be confused with the Bird's-nest Orchid (*Neottia Nidus-avis*), which has a perianth of 6 lobes, or with the Broom-rapes (*Orobanche*), whose petals are united and divided into 2 lips (bilabiate). [Plate 6.]

Local. In woods at the roots of fir and beech trees, scattered over England, not uncommon in the southern counties, only found in the southern counties of Scotland, and very rare in Ireland. June—August. Perennial.

THE BIRD'S-NEST FAMILY (ORDER XIV. MONOTROPACEAE.)

CALYX of 4 or 5 SEPALS scale-like, coloured like petals (petaloid), united at the base or free, wholly free from and inserted below the seedcase (inferior)

COROLLA of 4 or 5 PETALS the same number as the sepals, united at the base or free, bell-shaped (campanulate), each petal having a pouched honey-bearing base, inserted below the seedcase (hypogynous).

STAMENS 8 or 10, twice as many as the petals, with their anthers kidney-shaped (reniform), 1-celled and splitting cross-wise (transversely) to free the pollen, inserted with the corolla below the seedcase (hypogynous).

PISTIL of 4 or 5 CARPELS, the same number as the petals, united into a seedcase, a short style and a broad stigma.

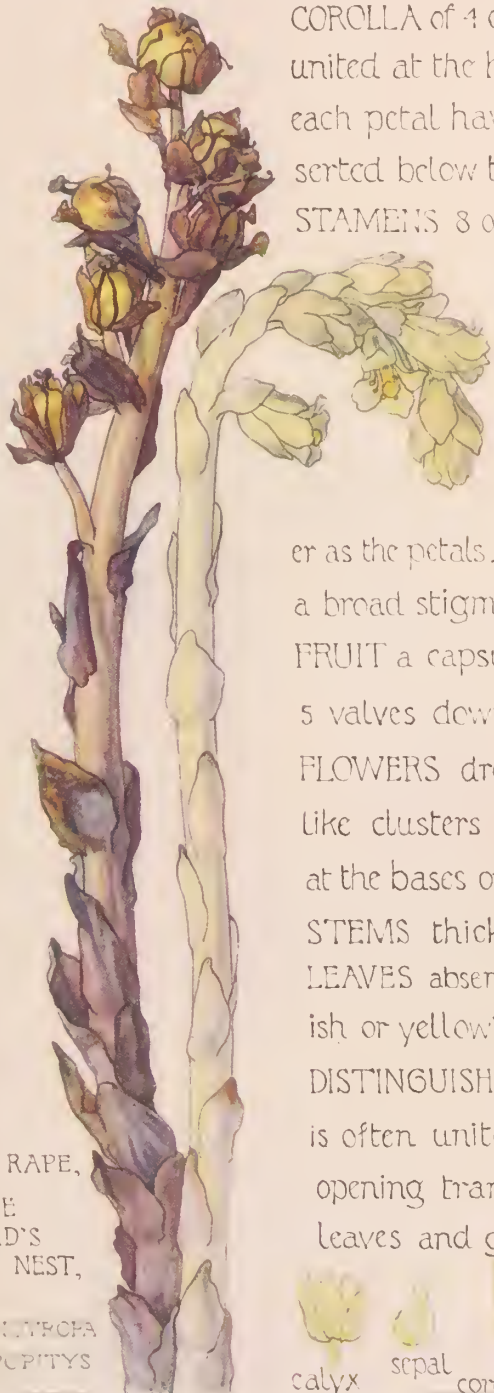
FRUIT a capsule, 4- or 5-celled, many-seeded, opening by 5 valves down the middle of each cell (loculicidal).

FLOWERS drooping, flesh-colour or yellowish, in spike-like clusters (racemes) or solitary, with fleshy bracts at the bases of the flowers.

STEMS thick and fleshy.

LEAVES absent, their place being taken by small brownish or yellowish scales or bracts.

DISTINGUISHED from the Heath Family, with which it is often united, by the 1-celled kidney-shaped anthers opening transversely by slits, and by the absence of leaves and green colouring matter.



FIR RAPE,
PINE
BIRD'S
NEST,

MONOTROCHA
HYPOPHYTES



calyx sepal corolla petal stamens & pistil pistil fruit section of fruit.

THE THRIFT FAMILY

[ORDER XLVI. PLUMBAGINACEÆ]

A SMALL group of herbs and undershrubs inhabiting salt marshes and sea-shores, and occasionally to be found on high mountains, in most of the temperate parts of the world. Many species are found on the shores of the Mediterranean and in the salt steppes of the East. A few species are cultivated in gardens and several exotic ones are to be found in hot-houses, notably the *Plumbagos* from which the name of the family is taken. Many species, when found in their native stations, contain iodine, others are very acrid, and others powerfully astringent.

- I. SEA-LAVENDER (*LIMÓNIUM*). Flowers in 1-sided clusters (panicles) or spikes; petals united at the base; styles smooth; capsules decaying to free the seed.
- II. THRIFT (*STATICE*). Flowers in dense round heads with a membranous tubular sheath; petals scarcely united even at the base; styles hairy below; capsules decaying to free the seed.

I. SEA-LAVENDER. (*LIMÓNIUM*. Hill.)—Flowers of various colours, 2 or 3 together in little spikelets, with a bract at the base of each flower and 2 bracts at the base of each spikelet, forming 1-sided branched clusters (panicles) or spikes. Calyx-tube separating into 5 lobes, membranous, free from and inserted below the seedcase (inferior); corolla of 5 petals, united at the base, tube-shaped, remaining with the fruit (persistent), inserted below the seedcase (hypogynous); stamens 5, inserted with the corolla below the seedcase (hypogynous); carpels 5, styles 5, smooth; fruit a capsule, 1-celled and 1-seeded, decaying to free the seed (indehiscent). Herbs with oblong, fleshy leaves all from the root (radical.) (*Statice*. Linn.)

Instead of fading and losing their colour in the usual way of flowers, the bracts and petals of members of this genus become dry and membranous, keeping their delicate colour for many months, and so have become a rather favourite decoration in rooms in the autumn and winter when fresh flowers are scarce.

Calyx 5-lobed with 5 minute intermediate teeth; leaves veined from the midrib to the margin (pinnately).

- (1) Common Sea Lavender. (*Limónium vulgáre*.)—Spikelets densely packed together in short, spike-like branches at the top of the flowering stems; leaves oblong, 2-6 inches long.

- (2) Few-flowered Sea-Lavender. (*Limónium húmile*.)—Spikelets remote from one another, whole flower-cluster looser and longer; leaves narrower and pointed.

Calyx 5-lobed, without intermediate teeth; leaves not veined from the midrib to the margin.

- (3) Rock Sea-Lavender. (*Limónium binervósum*.)—Spikelets densely packed together, cluster loose and long, all the branches flowering; leaves small.
- (4) Matted Sea-Lavender. (*Limónium bellidifólium*.)—Spikelets dense but few, cluster very long, the branches starting from the base, zigzag, the lower ones not flowering; leaves small.

1. Common Sea-Lavender. (*Limónium vulgáre*. Miller.)—As just described. The flowers are of a bluish-lilac colour, with a green bract coloured at the edge below each flower, in 1-3-flowered spikelets arranged in 2 rows in dense, short, spreading, spike-like branches near the top of an angular leafless stalk (scape) 6-12 inches or more high; the membranous calyx-tube separates into 5 lobes, with 5 minute intermediate teeth. The leaves are in tufts, all from the root, and are 2-6 inches or more long, oblong, entire, smooth, and fleshy, with a short point at the tip and narrowing into a long stalk at the base; they have a prominent midrib and are strongly veined from the midrib to the margins (pinnately), though, owing to the fleshiness of the leaves, the side veins are not visible in fresh specimens. (*Statice Limonium*. Linn.) [Plate 7. Common on muddy sea-coasts in England and Ireland, and in eastern Scotland. July—November. Perennial.

2. Remote-flowered Sea-Lavender. (*Limónium húmile*. Miller.)—A very similar species to the last, by some botanists regarded merely as a variety. The spikelets are often only 1-flowered and are distant from one another instead of being packed closely together, while the whole cluster is looser, the stem not quite so angular, and the branches of it longer. The leaves are narrower and more pointed. (*Statice Bahusiensis*. Fries.; *Statice rariflora*. Drejer.) Less common than the preceding species, growing with it in similar situations. July—November. Perennial.

3. Rock Sea-Lavender. (*Limónium binervósum*. C. E. Salmon.)—A species resembling the Common Sea-Lavender (*Limonium vulgare*), but having rather larger flowers of a darker bluish-purple, clustered more densely together up each individual branch, but arranged in a looser and much longer cluster, the branches starting from near the base of the stem and the lowest branches bearing no flowers; the calyx-lobes without the intermediate teeth; the leaves with long stalks, much smaller, lance-shaped (obovate), narrowing at the base into the stalk (spathulate), and sometimes showing a vein on each side of the midrib parallel to it, but never veined from the midrib to the margin (pinnate). (*Statice binervis*. Syme; *Statice intermedia*. Syme; *Statice Dodartii*. Gir.; *Statice auriculafolia*. Vahl; *Limonium occidentale*. O. Kuntze.)

***Limónium recurvum*. C. E. Salmon** is a very similar species, but bearing flowers on all the branches of the flower-cluster and with inversely egg-shaped leaves, found only on cliffs in Portland Island.

Not uncommon. On rocks and cliffs by the sea, in the south of England, extending to Lincolnshire on the east coast and to Cumberland on the west, in Scotland only found on the west coast up to the Mull of Galloway, and in Ireland sparingly distributed over the whole coast. July—August. Perennial.

4. Matted Sea-Lavender. (*Limónium bellidifólium*. Dum.)—A somewhat similar plant to the last—the Rock Sea-Lavender (*Limonium binervosum*)—but with much smaller, pale lilac-coloured flowers; the flowering stem rough and much branched almost from the base

THE THRIFT FAMILY. (PLUMBAGINACEÆ. ORDER XLIII)

CALYX of 5 or 10 SEPALS, united into a tube & separating into 5 or 10 lobes, membranous, often coloured like petals (petaloid), remaining with fruit (persistent), entirely free from & inserted below the seedcase (inferior).

COROLLA of 5 PETALS, free, or united at the base, sometimes united into a tube with a 5-lobed limb, inserted below the seedcase (hypogynous).

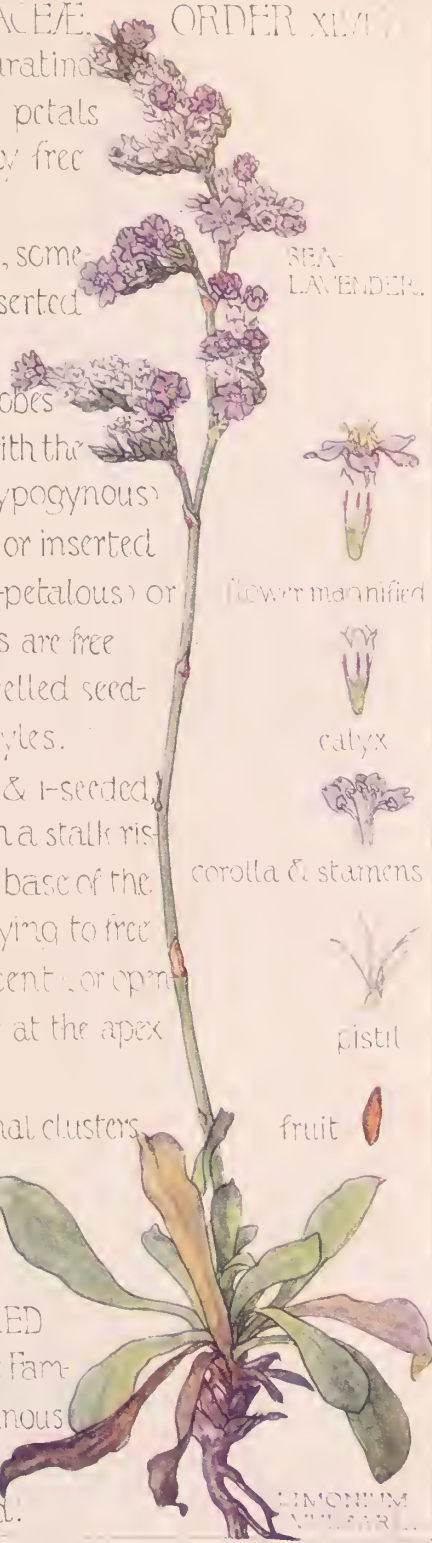
COMMON THRIFT, SEA-PINK STAMENS 5, opposite the lobes of the corolla & inserted with the corolla below the seedcase (hypogynous) when there is a corolla-tube, or inserted on the base of the petals (epi-petalous) or between them when the petals are free
CARPELS 5, united into a 1-celled seedcase & separating into 5 styles.

FRUIT a capsule, dry, 1-celled, & 1-seeded, the solitary seed hanging on a stalk rising from the base of the capsule, decaying to free the seed (indehiscent), or opening irregularly, or at the apex by 5 valves

FLOWERS in terminal clusters, spikes or heads.

LEAVES undivided & fleshy.

DISTINGUISHED from the Primrose Family by the membranous calyx, the 5 styles & the solitary seed.



SEA-LAVENDER.

flower magnified



calyx



corolla & stamens



pistil



fruit



flower magnified



calyx magnified



flower natural size



corolla & stamens magnified



pistil & bract magnified



fruit magnified

STATICE MARITIMA.



flower bract

outer bracts

LIMONIUM VULGARE.

into zigzag branches, the lower ones bearing no flowers; the bracts with broader white scarious margins than in any other native species; and the leaves smaller and usually with no veining except the midrib. (*Statice capsia*. Willd.; *Limonium reticulatum*. Miller; *Statice reticulata*. Linn.)

Rare. In sandy salt marshes, where it is fairly dry, round the Wash, in Norfolk, Cambridge and Lincolnshire. July—August. Perennial.

II. THRIFT. (STATICE. Linn.)—Flowers pink, purple, rose-colour, or white, clustered together in a dense, round, terminal head on a long leafless stalk from the root (scape); the flowers are mixed with membranous bracts, the outside ones surrounding the whole cluster and forming a kind of outer calyx (involucre), while the two outermost of all unite and lengthen into a tubular sheath down the upper part of the flower-stem. Calyx-tube with 5 teeth, dry and membranous, free from and inserted below the seedcase (inferior); corolla of 5 petals, not united, only adhering at the base, inserted below the seedcase (hypogynous); stamens 5, inserted on the base of the petals or between them; styles 5, hairy below; fruit a 1-seeded capsule, decaying to free the seed. Herbs with the leaves all from the root (radical). (*Armeria*. Linn.)

(1) Common Thrift. (Stat'ice marit'ima.)—Calyx-teeth short; leaves narrow, with 1 vein.

(2) Plantain-leaved Thrift. (Stat'ice plantagin'ea.)—Calyx-teeth long; leaves broader, with 3 or 5 parallel veins.

1. Common Thrift, Sea-Pink. (Stat'ice marit'ima. Miller.)—As just described. The flowers are pink, rarely white, in dense heads terminating the leafless stalks (scapes), which are 6–12 inches high, smooth or downy; the fruit is rather longer than the dry membranous, shortly-toothed calyx-tube, which remains with and almost forms wings round it. The leaves are all from the root, forming dense tufts; they are narrow, fleshy, downy, and always have one prominent vein or midrib. (*Statice Armeria*. Linn.; *Armeria maritima*. Willd.)

This little plant is a common favourite in cottage gardens for bordering owing to its compact growth. [Plate 7.]

A form—var. **Statice planifolia**—with broader leaves, the earlier ones with 3 parallel veins, is found on mountain tops, and is frequently classed as a variety. (*Armeria planifolia*. Syme.) Common on muddy or sandy sea-shores, and on maritime rocks in England, Scotland, and Ireland; also on rocks and damp places on the top of some of the Scotch mountains. April—October. Perennial.

2. Plantain-leaved Thrift. (Stat'ice plantagin'ea. All.)—A very similar species to the last, the flower-stems usually taller, the calyx-teeth much longer, and the leaves much broader and with 3 or 5 parallel veins. (*Armeria plantaginea*. Willd.)

Local. Sandy pastures by the sea in Jersey. June—August. Perennial.

THE PRIMROSE FAMILY

[ORDER XLVII. PRIMULACEÆ]

THIS family is easily recognised from all others whose flowers have united petals, except one exotic family of shrubs, by the stamens being opposite the corolla-lobes and by the fruit being 1-celled and having numerous seeds attracted to a central column.

Its members inhabit the temperate zones of the Northern Hemisphere, and though some of the species are so well known in our own isles, yet it is in Alpine districts that the order is seen to best advantage. High up in the Alps, Pyrenees, and Himalaya, on the bleak mountain-sides, protected by the snow from the icy cold of winter, they blossom forth in the summer sun into a blaze of yellow, violet, mauve, pink, blue, and white. There species of *Primula*, *Soldanella*, *Aretia*, and *Androsace* abound in the glory of perfection.

The *Auricula*, a favourite flower of cultivation of the 15th century, owes its parentage to the *Primula pubescens*, a native of the Tyrol. The *Polyanthus* is a species cultivated from the *Cowslip* (*Primula veris*). Besides the varieties obtained from these two garden flowers many species of *Primula* and *Cyclamen* are grown in greenhouses.

This order is possessed of no important medicinal properties.

Calyx-tube free from the seedcase. Capsule opening by valves.

- I. PRIM'ULA. Flowers in clusters; calyx tubular with 5 short teeth; corolla with a long cylindrical tube; capsule opening at the top by 5 valves, which are sometimes cleft; leaves only from the root.
- II. HOTTON'IA. Water plant. Flowers in clusters; calyx divided nearly to the base; corolla-tube short; capsule opening by 5 valves, which remain united at the top and base, so only shew as clefts in the side.
- III. CYC'LAMEN. Flowers solitary; corolla-tube bell-shaped, the lobes long and turned back, wing-like; capsule opening at the top by 5 valves; leaves only from the root; root tuberous.
- IV. CHICKWEED WINTER-GREEN (TRIENTÁLIS). Flowers in a terminal umbel, surrounded by a whorl of leaves; parts of the flower usually in sevens; capsule opening at the top by 5 rolled-back valves which fall off.
- V. LOOSESTRIFE (LYSIMACH'IA). Flowers yellow, in clusters or solitary in the axils of the leaves; capsule opening at the top by 5 or rarely by 2 valves, or indehiscent.

THE PRIMROSE FAMILY
PRIMULACEÆ
ORDER XVIII.

CALYX of 5, rarely 4, 6, or 7, SEPIALS, united into a tube at the base & spreading into the same number of lobes or teeth, remaining with the fruit, quite free from & inserted below the seedcase, except in the Brookweed (Samolus) when the calyx-tube adheres to the lower part of the seedcase.

COROLLA usually of 5 PETALS the same number as the sepals, or 6, as in the Sea Milk-wort (Glaux), united into a tube at the base & separating into the same number of lobes, salver- or funnel-shaped, inserted below the seedcase (hypogynous) or in the Brookweed inserted at the top of the calyx-tube (perigynous).

STAMENS usually 5 the same number as the sepals, inserted on the corolla-tube opposite the lobes.

PISTIL of usually 5 CARPELS, the same number as the sepals with a 1-celled stigma, 1 style, & a pin-head-like seedcase.

FRUIT a capsule, 1-celled, many-seeded, the seeds attached to a central column (placenta), opening by as many valves as there are carpels or twice as many, or opening transverse with a lid.

FLOWERS in terminal clusters or in the leaf axils.

LEAVES usually undivided, no stipules.

DISTINGUISHED from other families with united petals by the stamens being opposite the corolla-lobes, & by the construction of the fruit.



COWSLIP.

PRIMULA VULGARIS

PRIMULA FARINOSA BIRD'S-EYE PRIM ROSE

PRIM ROSE,

fruit calyx pistil corolla & stamens

PRIMULA ELATOR.

OX-LIP

VI. SEA MILKWORT (GLAUX). Flowers solitary in the axils of the leaves; sepals coloured like petals; corolla 0; capsule few-seeded, opening at the top by 5 valves.

Capsule splitting in two crosswise, the upper part falling off like a lid.

VII. PIMPERNEL (ANAGAL' LIS). Flowers solitary in the axils of the leaves; petals only united at the base.

VIII. BASTARD PIMPERNEL (CENTUN' CULUS). Flowers minute, solitary in the axils of the leaves; petals shorter than sepals; parts of the flower usually in fours.

Calyx-tube adhering to the seedcase.

IX. BROOKWEED (SAM' OLUS). Flowers in terminal and axillary clusters; capsule opening at the top by 5 teeth.

I. PRIMULA. Linn.—Flowers yellow, mauve, or red, in clusters of long or shortly stalked flowers all rising from the same point (umbels) on a leafless stalk (scape). Calyx of 5 sepals united into a tube and separating into 5 teeth, distinct from and inserted below the seedcase (inferior); corolla of 5 petals united into a long narrow tube and spreading into a flat 5-lobed limb, salver- or funnel-shaped, inserted below the seedcase (hypogynous); stamens 5, either included in the corolla-tube or projecting from it, inserted on the corolla-tube, opposite to the centre of the lobes; carpels 5, the stigma included in the corolla-tube or projecting beyond it; fruit a 1-celled, many-seeded capsule, opening at the top by 5 valves which are sometimes cleft. Herbs with the leaves all from the root (radical).

The position of the stamens and stigma is very interesting in many of the species: when the stamens are short and are included in the corolla-tube the style is long and the stigma projects beyond the throat of the tube; when the stamens are long and project beyond the corolla-tube the style is short and the stigma is halfway down the tube. Such plants are said to be dimorphous. The reason for this strange disposition of these parts was explained by Darwin, who discovered how it was connected with the fertilisation of the plants. Lord Avebury, in his book on "British Wild Flowers in Relation to Insects," aptly explains what takes place. He says: "An insect thrusting its proboscis down a primrose of the long-styled form would dust its proboscis at a part which, when it visited a short-styled flower, would come just opposite the head of the pistil, and could not fail to deposit some of the pollen on the stigma. Conversely, an insect visiting a short-styled plant would dust its proboscis at a part further from the tip; which, when the insect subsequently visited a long-styled flower, would again come just opposite the head of the pistil. Hence we see that by this beautiful arrangement, insects must carry the pollen of the long-styled form to the short-styled, and *vice versa*." This is one of the many wonderful methods nature uses to ensure the best fertilisation and so produce the healthiest offspring.

Calyx-tube angular; leaves wrinkled, hairy beneath, not mealy; corolla-lobes slightly notched.

- (1) Primrose. (*Prim'ula vulgaris*.)—Flowers large, pale yellow, on long stalks, apparently solitary; throat of the corolla-tube with 5 scale-like folds.
- (2) Cowslip. (*Prim'ula véris*.)—Flowers shortly stalked, bright yellow, in a cluster terminating a long leafless stalk; throat of the corolla-tube with 5 scale-like folds.
- (3) Oxlip. (*Prim'ula elátior*.)—Flowers shortly stalked, pale yellow, in a 1-sided cluster terminating a long stalk; corolla-tube without the scale-like folds.

Calyx-tube not angular; leaves not wrinkled, mealy beneath; corolla-lobes deeply notched.

- (4) Bird's-eye Primrose. (*Prim'ula farinósa.*)—Flowers shortly stalked, pale lilac, in a cluster terminating a longer stalk; corolla-lobes narrow; leaves narrow.
- (5) Scottish Bird's-eye Primrose. (*Prim'ula scot'ica.*)—Flowers shortly stalked, blue-purple, in a cluster terminating a longer stalk; corolla-lobes broad, touching one another; leaves broad.

1. Primrose. (*Prim'ula vulgáris.* Huds.)—As just described. One of our best known and earliest spring flowers. The flowers are 1-2 inches across, sweet-scented, of a pale greenish-yellow, singularly bright and pure for so delicate and complex a colour; they appear to be solitary on long hairy pink stalks, hardly rising above the leaves, but they are really in a cluster (umbel) on such short leafless stalks (scapes) as to appear sessile; the calyx-tube is angular, 5-sided, with long shaggy hairs, the lobes pointed; the spreading limb of the corolla is flat, the lobes notched, and the throat of the tube is contracted and has 5 scale-like folds; the capsule opens at the top by 5 teeth. The leaves are all from the root in a rosette, egg-shaped, with the broad end at the top (obovate), and narrowing gradually to the base, slightly toothed, very much wrinkled, hairy beneath. (*Primula acaulis.* Linn.; under *Primula veris.* Hook.) [Plate 8.

Very common. Woods, hedge-banks, and meadows; commonly distributed over England, Scotland, and Ireland. March—June.

2. Cowslip, Paigle. (*Prim'ula veris.* Linn.)—The general growth is similar to that of the last species, but the flowers are smaller, $\frac{1}{2}$ - $\frac{3}{4}$ inch across, more or less drooping, sweet-scented, funnel-shaped, not spreading, bright yellow, with an orange mark at the base of each corolla-lobe, in clusters (umbels) on short stalks all rising from the same point on a long erect downy stalk 4 inches to 1 foot high, rising above the leaves; the calyx is larger and more inflated, with short broad obtuse teeth; and the leaves are abruptly contracted at the base. (*Primula officinalis.* Jacquin.) [Plate 8.

Common, though rather local. On meadows, banks, pastures, in England, Scotland, and Ireland; not so common in Scotland as in England. April—May. Perennial.

3. Oxlip. (*Prim'ula elátior.* Jacquin.)—A species similar to the Cowslip (*Primula veris*), with the clusters like those of the Cowslip, except that the flowers droop all to one side of the stem and are larger, each individual flower being more like a small Primrose, though the lobes are narrower, and there are no folds round the throat of the corolla, neither is the tube contracted; the calyx-teeth also are longer and narrower and very pointed. There are many intermediate forms between the Cowslip and the Oxlip which are generally called Oxlips, but the true Oxlip has the above characteristics. [Plate 8.

Local. In woods in some of the eastern counties, in Cambridgeshire, Suffolk, Hertfordshire, and Essex. April—May. Perennial.

4. Bird's-eye Primrose. (*Prim'ula farinósa.* Linn.)—A lovely little flower with a compact cluster (umbel) of small pale lilac flowers with a yellow eye, terminating an erect stalk, 2-8 inches high; the calyx narrowly bell-shaped, not angular; the leaves all in a rosette, small and egg-shaped, with the broad end at the apex, almost imperceptibly narrowed at the base into a wing down the stalk, not wrinkled, and more or less thickly covered with a white mealy down. [Plate 8.



CHICKWEED
WINTER-
GREEN,

TRIENTALIS
EUROPEA.

WATER
VIOLET,

HOTTONIA PALUSTRIS

IVY-
LEAVED
CYCLAMEN.

CYCLAMEN
HEDERÆ-
FOLIUM.



Rare, local. In mountain pastures; not uncommon in the north of England, abundant in some parts of the Lake district, rare in Scotland, and not recorded from Ireland. June—July. Perennial.

5. Scottish Bird's-eye Primrose. (*Primula scotica*. Hook.)—A very similar species to the last, but easily distinguished from it: the flowers are a deeper blue-purple, the corolla-lobes broader, touching one another; the leaves are broader and oblong; and the whole plant is much smaller, the flower-stalks not more than 4 or 5 inches high. An interesting characteristic of this plant, which is never observed in *Primula farinosa*, is that though the stamens vary in length the styles vary with them.

Very rare, local. Sandy heaths in the Orkney Isles, Sutherland, and Caithness. May—September. Perennial.

II. WATER VIOLET. (*HOTTONIA*. Linn.)—A genus consisting of 2 species only, the one native to Great Britain and the other to North America.

Flowers lilac or white, clustered in circles (whorls) round the stalk, forming erect clusters (racemes). Calyx of 5 sepals united at the base, entirely free from and inserted below the seedcase (inferior); corolla of 5 petals, salver-shaped, united into a short tube and spreading into a flat 5-lobed limb, inserted below the seedcase (hypogynous); stamens 5, varying in length as in the *Primula*; carpels 5, the style varying in length as in the *Primula*; fruit a round 1-celled, many-seeded capsule, opening by 5 valves, which remain united at the top and the base and only open down the sides. Water plants with submerged, finely divided leaves.

Water Violet. (*Hottonia palustris*. Linn.)—A very beautiful water plant, as just described, with lilac flowers, $\frac{3}{4}$ inch across, with a yellow eye, 3–8 in circles (whorls) up the long, round, solitary leafless stem (scape), which rises from the centre of a whorl of entirely submerged leafy branches, the leaves being crowded, alternate, deeply and finely lobed towards the midrib (pinnatifid). [Plate 9.]

Rare, local. In ponds, ditches, and dykes, widely though sparsely distributed over England, very rare in the western counties, not found in Scotland, and only recorded from Co. Down in Ireland. May—June. Perennial.

***III. CYCLAMEN.** Linn.—Flowers drooping, purplish, lilac, crimson, pink, or white, generally with deep crimson spots at the base of the lobes, solitary, terminating long leafless stalks (scapes), which twist spirally when in fruit. Calyx deeply 5-lobed, entirely free from and inserted below the seedcase (inferior); corolla with a short bell-shaped tube and 5 long reflexed twisted lobes, inserted below the seedcase; stamens 5; carpels 5; fruit a round, fleshy capsule, 1-celled and many-seeded, opening at the top by 5 valves. Herbs with the leaves on long stalks, all from the root, broad, often marked with pale green or white; and with large tuber-like underground stems.

Ivy-leaved Sow-bread, Ivy-leaved Cyclamen. (*Cyclamen hederæfolium*. Aiton.)
—The only species found in Great Britain, but not a native. As just described. The solitary flowers are white or pink on stalks 4–9 inches long; the leaves, which are produced after the flowers, are heart-shaped (cordate), slightly angular, toothed, of a shining dark green with wavy white markings; and the enlarged underground stem is brown, broadly turnip-shaped, and intensely acrid. (*Cyclamen europæum*. Linn.) [Plate 9.]

Very rare. In woods and on banks in Kent, Sussex, and Surrey. August—September. Perennial.

IV. CHICKWEED WINTER-GREEN. (TRIENTÁLIS. Linn.)—A genus consisting of the one European species:—

Chickweed Winter-green. (Trientalis Europæa. Linn.)—A very delicate and beautiful little plant, consisting of a cluster of 1-4 white flowers, each on a slender stalk, all rising from the same point at the top of the stem (umbel), surrounded by a circle (whorl) of oval pointed spreading leaves; the stem is unbranched and erect, 3-6 inches high, and has only 2 or 3 small alternate leaves below the terminal cluster. Sepals 7, united at the base, free from and inserted below the seedcase (inferior); petals 7, united at the base, inserted below the seedcase (hypogynous); stamens 7; carpels 5; fruit a roundish, rather fleshy capsule, 1-celled, few-seeded, opening at the top by 5 rolled-back valves which fall off. [Plate 9.

Rare. In woods in the northern counties of England, in Yorkshire and northern Lancashire, in Scotland, and in Orkney; not recorded from Ireland. June—July. Perennial.

V. LOOSESTRIFE. (LYSIMACH'IA. Linn.)—Flowers yellow in the British species, either solitary in the axils of the leaves, or in terminal and axillary clusters. Calyx of 5 sepals, rarely 6, only united at the base, entirely free from and inserted below the seedcase (inferior); corolla of 5 petals, rarely 6, united at the base and spreading out star-like (rotate) or cup-shaped or bell-shaped, inserted below the seedcase (hypogynous); stamens 5, rarely 6; carpels 5; fruit a roundish, 1-celled, usually many-seeded capsule, opening at the top by 5 valves, which are often 2- or 3-cleft, or rarely by 2 valves. Herbs with entire, opposite, or whorled leaves.

Flowers in clusters; stems erect.

- (1) Tufted Loosestrife. (*Lysimach'ia thyrsoflóra.*)—Flowers in axillary clusters; corolla lobed almost to the base into narrow segments with a minute tooth between each segment; the stamens longer than the petals.
- (2) Great Yellow Loosestrife. (*Lysimach'ia vulgaris.*)—Flowers in terminal and axillary clusters; corolla widely bell-shaped, lobed into broad segments, without any teeth between the lobes.
- (3) *Punctate Loosestrife. (*Lysimach'ia punctáta.*)—Flowers in terminal and axillary clusters; calyx- and corolla-lobes fringed with gland-tipped hairs, without any teeth between the lobes.
- (4) *Ciliated Loosestrife. (*Lysimach'ia ciliáta.*)—Flowers on long stalks in leaf-axils forming a loose leafy terminal cluster; stamens 10, only 5 with anthers; leaves slightly heart-shaped, with the stalks fringed with hairs.

Flowers solitary in the axils of the leaves; stems procumbent.

- (5) Creeping Jenny. (*Lysimach'ia Nummulária.*)—Flowers cup-shaped; calyx-lobes broad.
- (6) Yellow Pimpernel. (*Lysimach'ia nemórum.*)—Flowers starry; calyx-lobes narrow.

1. Tufted Loosestrife. (Lysimach'ia thyrsoflóra. Aiton.)—As just described. The flowers are small, $\frac{1}{4}$ inch across, yellow spotted with orange, in dense clusters in the axils of the leaves, but always shorter than the leaves; the upper part of the stem is very leafy and destitute of flowers; the corolla-lobes are long and strap-shaped, with a minute tooth between each lobe; the filaments of the stamens are united at the base into a short ring; all the parts of the flower are frequently in sixes. The stem is 1-2 feet high, undivided (simple), erect, and downy; and the leaves are stalkless (sessile), lance-shaped, and densely sprinkled with black dots.



LYSIMACHIA
NUMMULARIA.
CREEPING
JENNY.

MONEY-
WORT,
HERB-
TWO-
PENCE

LYSIMACHIA
NEMOROSUM

PUNC
LOOSE-
STRIFE

TATE

WOOD LOOSE STRIFE.

LYSIMACHIA
PUNCTATA.

corolla &
stamens,
calyx,
of Creeping
Jenny

Rare. In marshes, on wet banks of rivers and canals, in northern England, and central Scotland; not recorded from Ireland. June—July. Perennial.

2. Great Yellow Loosestrife. (*Lysimach'ia vulgaris*. Linn.)—A very beautiful plant with large flowers, about $\frac{1}{2}$ inch across, widely bell-shaped, bright yellow, in clusters in the axils of the leaves and terminating the stem, forming a more or less dense, rather spike-like leafy cluster (panicle); the corolla-lobes without any alternating teeth; the stamens with the filaments united at the base into a tube round the seedcase. [As described in the genus Loosestrife (*Lysimachia*).] The stem is 2–4 feet high, erect, stout, usually branched; and the leaves are egg- or lance-shaped, stalkless (sessile), opposite, or 3 or 4 in a circle (whorl).

Rather common. By the sides of rivers and ditches; generally distributed throughout England and Ireland, rare in Scotland. July—August. Perennial.

3. *Punctate Loosestrife. (*Lysimach'ia punctáta*. Linn.)—Not a native. A similar species to the last, with larger flowers, stained with red in the centre, $\frac{3}{4}$ –1 inch across, in clusters in the axils of the leaves and terminating the stem; the sepals are narrower, the sepals and petals sprinkled with glands on the outside and fringed with gland-tipped hairs; the leaves are shortly stalked; and the whole plant is more downy. [Plate 10.

Very rare. An escape established near Dulverton in Devon, and in the south-west of Scotland. July—August. Perennial.

4. *Ciliated Loosestrife. (*Lysimach'ia ciliáta*. Linn.)—Not a native. Another similar species with large flowers, about 1 inch across, pale yellow with red centres, not fringed with gland-tipped hairs, on long stalks in the axils of the leaves; the lobes of the corolla are slightly scalloped; and the stamens are 10 in number, though only half have anthers; the leaves are slightly heart-shaped, with stalks fringed with hairs.

Very rare. An escape established in shady places near Serbergham in Cumberland and near Kingcausie in Kincardineshire. July—August. Perennial.

5. Creeping Jenny, Money-wort, Herb-twopence. (*Lysimach'ia Nummulária*. Linn.)—A very common favourite, with pretty yellow cup-shaped flowers, $\frac{3}{4}$ inch across, solitary or in pairs in the axils of the leaves towards the middle of the stems; calyx-lobes broad; without a tooth between the corolla-lobes; the corolla and the filaments of the stamens dotted with glands, the latter united at the base into a short ring. [As described in the genus Loosestrife (*Lysimachia*).] The stems are prostrate, trailing, often rooting at the nodes; and the leaves are opposite, egg-shaped (ovate), blunt, shortly stalked, and shining; frequently turning a lovely rose-pink colour in the autumn. [Plate 10.

Not uncommon. In damp woods, on banks by streams and ditches; generally distributed through England, not native in Scotland or Ireland. June—July. Perennial.

6. Yellow Pimpernel, Wood Loosestrife. (*Lysimach'ia nemórum*. Linn.)—A species with delicate yellow flowers $\frac{1}{2}$ inch across on long slender stalks, solitary in the axils of a few of the leaves in the middle of the stem; the calyx-lobes very narrow and pointed; the corolla flat and starry (rotate), without a tooth between the lobes; the filaments of the stamens not united at the base; the capsule round, much shorter than the sepals, with 5 valves, but often opening lengthwise into 2 parts, and sometimes decaying to free the seeds (indehiscent). [As described in the genus Loosestrife (*Lysimachia*).] The stems are procumbent at the base, 6 inches to 1 foot long, and brittle; the leaves are opposite, egg-shaped (ovate), pointed, very shortly stalked, and glossy. [Plate 10.

Common. In moist woods and shady places; generally distributed over the British Isles. May—August. Perennial.

VI. SEA-MILKWORT. (GLAUX. Linn.)—A genus consisting of the one species:—

Sea-Milkwort. (Glaux maritima. Linn.)—This species is distinguished from all the other species belonging to the Primrose Family by the absence of any corolla. The small flowers are solitary in the axils of the leaves. The calyx is bell-shaped, 5-lobed, pale pink becoming crimson towards the centre (petaloid), taking the place of the petals; corolla 0; stamens 5, inserted below the seedcase (hypogynous); carpels 5; fruit a capsule, 1-celled, few-seeded, opening at the top by 5 valves. A low, procumbent, fleshy, glossy little plant growing in thick patches in the grass; the stems are 3-12 inches long, and are rather densely covered with small, oval or oblong, entire, stalkless leaves. [Plate 11.]

Common on muddy or sandy salt marshes all round the coast of Great Britain and along the sides of tidal rivers; also inland in Worcestershire and Staffordshire, where the soil is saturated with salt. May—July. Perennial.

VII. PIMPERNEL. (ANAGAL' LIS. Linn.)—Flowers brightly coloured, solitary, on slender stalks, in the axils of the opposite leaves. Calyx of 5 narrow sepals, only united at the base, entirely free from and inserted below the seedcase (inferior); corolla of 5 petals, united at the base, though not into a tube, spreading star-like (rotate), rarely funnel-shaped, inserted below the seedcase (hypogynous); stamens 5, inserted on the base of the corolla (epi-petalous); carpels 5; fruit a round capsule, 1-celled, many-seeded, splitting in two crosswise (transversely), the upper part falling off like a lid. Slender herbs with opposite leaves.

- (1) Scarlet Pimpernel. (*Anagal'lis arven'sis.*)—Flowers generally scarlet, spreading star-like (rotate); petals fringed with minute gland-tipped hairs; stems prostrate.
- (2) Blue Pimpernel. (*Anagal'lis fœm'ina.*)—Flowers blue, spreading star-like (rotate); petals without gland-tipped hairs; stems erect.
- (3) Bog Pimpernel. (*Anagal'lis tenel'la.*)—Flowers pale pink, funnel-shaped; stems prostrate.

1. Scarlet Pimpernel, Poor Man's Weather-glass. (Anagal'lis arven'sis. Linn.)—As just described. A very well known and attractive little plant which has received its name of "Poor Man's" or "Shepherd's Weather-glass" from the sensitiveness of its little scarlet flowers, which close at the approach of rain. The flowers are about $\frac{1}{2}$ inch across, bright scarlet with a crimson stain in the centre, rarely pink or white; the petals, spreading star-like (rotate), are fringed with minute gland-tipped hairs; the stems are prostrate, 6 inches to about 1 foot long, much branched, 4-winged, fleshy, and brittle; and the leaves are opposite or rarely in circles (whorls) of 3 or 4, egg-shaped (ovate), pointed, and stalkless. [Plate 11.]

Very common. In cultivated ground, way-sides, and waste places, generally distributed over England, Ireland, and Scotland, except in the extreme north of Scotland. May—October. Annual.

2. Blue Pimpernel. (Anagal'lis fœm'ina. Mill.)—A similar species, with bright blue flowers, the petals not fringed with gland-tipped hairs, and the stems erect. (*Anagallis cœrulea. Schreb.*)

Rare. In cultivated ground, &c.; in England, extremely rare in Scotland and Ireland. May—October. Annual.

3. Bog Pimpernel. (Anagal'lis tenel'la. Linn.)—A beautiful little bog plant. The fragile flowers are funnel-shaped, $\frac{1}{2}$ inch long, pale pink with deeper pink veins, solitary, on slender stalks in the axils of the leaves; the filaments of the stamens are very hairy, and are united at the base into a tube; the capsule is shorter than the calyx-segments; the stems are 2-8 inches long, very slender, and creeping; and the leaves are opposite, roundish, and stalked. [Plate 11.]



SEA-MILK-WORT,
BLACK SALT-WORT,

pistil,

two stamens & lobes,

whole flower,

& flower section magnified

CLAY MARITIMA.

SCARLET PIMPERNEL.

POOR MAN'S WEATHER-GLASS.

ANAGALLIS ARVENSIS.

BROOK-WEED.

BASTARD PIMPERNEL.
CLAYTONIA MINOR.

COMMON VALERIAN.

BOG PIMPERNEL.
ANAGALLIS TENELLA.



Not uncommon in bogs and wet places, in England and Scotland, more abundant on the west coasts; frequent in Ireland. June—August. Perennial.

VIII. BASTARD PIMPERNEL. (CENTUN'ULUS. Linn.)—Flowers minute, solitary in the axils of the leaves. Calyx of 4, rarely 5, sepals, united at the base only, entirely free from and inserted below the seedcase (inferior); corolla of 4, rarely 5, petals, united into a short inflated tube and spreading into 4 or 5 lobes, inserted below the seedcase (hypogynous); stamens 4, rarely 5, inserted in the throat of the short corolla-tube; carpels 4, rarely 5; fruit a round capsule, 1-celled, many-seeded, splitting in two crosswise (transversely), the upper part falling off like a lid. Small-annual herbs with the leaves alternate except at the base of the stems when they are opposite.

Bastard Pimpernel, Chaffweed. (Centun'culus minimus. Linn.)—The only British species. As just described. A very small plant with minute, almost stalkless flowers, shorter than the leaves; the pale pink corolla is shorter than the sepals; as is the round, usually reddish capsule; the stems are from $\frac{1}{2}$ to 2, rarely 3, inches high, with a few egg-shaped, pointed leaves. [Plate 11.

Rare. In damp places, where water has lain in the winter; widely distributed in England and Ireland, not recorded from the north of Scotland. June—July. Annual.

IX. BROOKWEED. (SAM'OLUS. Linn.)—A genus distinguished from all others belonging to the Primrose Family by the calyx-tube adhering to the lower half of the seedcase. Flowers small, in terminal clusters (racemes). Calyx of 5 sepals, united into a tube which adheres to the seedcase and separating into 5 teeth (superior); corolla of 5 petals, salver-shaped, with a short tube, inserted on the upper part of the calyx-tube (perigynous); stamens 5, alternating with 5 scale-like stamens without anthers; carpels 5; fruit a capsule, 1-celled, many-seeded, opening at the apex by 5 teeth. Herbs with alternate leaves.

Brookweed. (Sam'olus Valeran'di. Linn.)—The only British species. As just described. The flowers small, $\frac{1}{8}$ inch across, white, in terminal and axillary clusters, crowded at first and becoming longer in fruit; the stems stiff and erect, from 3 or 4 inches to nearly a foot high, and the leaves inversely egg-shaped (obovate) or oblong, blunt, fleshy, those of the stem stalkless, and those of the root in a rosette and narrowing into a stalk. The whole plant is smooth and of a bright green. [Plate 11.

Common. Watery places, by the sides of ditches, especially near the sea. Generally distributed over England, Ireland, and Scotland, chiefly on the west coast, not found in the north of Scotland. June—September. Perennial.

THE PERIWINKLE FAMILY

[ORDER XLIX. APOCYNACEÆ]

ONLY two members of this tribe are found in the British Isles and but few in Europe, its true home being in the tropics, where it is represented by numerous herbs, creepers, shrubs, and trees, which are usually evergreen.

Many species are cultivated in greenhouses, such as the beautiful but poisonous Oleander (*Nerium Oleander*), an evergreen shrub of southern Europe, the Mandevilla, Allamandas, and Dipladenias of South America, and various other exotic species. Many members are poisonous; the Landolphia of Africa, the Hancornia of Brazil, and the Willoughbeia of the Malay Peninsula yield india-rubber; while *Strophanthus hispidus* and *Aspidosperma Quebracho* are useful in medicine.

A purely exotic tribe very near akin to the Periwinkle Family is the Asclepias Family (*Asclepiadaceæ*), many members of which adorn our greenhouses. They differ from the Periwinkle Family in the stamens having no filaments, the anthers adhering to the strange table-like prolongation of the stigma, and in the curious disposition of the pollen, which hangs in two bags on the under side of each anther, rather like the pollinia of the orchids. The members of the order are generally climbers or epiphytes. The best known hot-house representative genera being the *Stephanotus*, *Asclepias*, the *Stapelia* (leafless succulent cactus-like inhabitants of South Africa), *Hoya*, *Cynanchum*, and *Periploca*.

PERIWINKLE. (*VIN'CA*. Linn.)—The only genus found in the British Isles. The flowers are funnel- or salver-shaped, blue, purplish, or white, solitary, on long slender stalks, in the axils of the leaves. Calyx of 5 sepals, long and narrow, only united at the base, remaining with the fruit (persistent), free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a long funnel-shaped tube and spreading into 5 flat lobes, twisted in bud, inserted below the seedcase (hypogynous); stamens 5, included in and inserted on the corolla-tube (epi-petalous); carpels 2, uniting above the 2 seed-cells into a style which is crowned with a ring-like stigma; fruit of 2 erect, slender, many-seeded follicles, which open down one side to free the seeds. Slender herbs with opposite entire leaves and often with trailing stems.

- (1) *Greater Periwinkle. (*Vin'ca májor*.)—Flowers large; calyx-lobes as long as the corolla-tube and fringed with hairs; leaves large and broad, fringed with hairs.
- (2) Lesser Periwinkle. (*Vin'ca mínor*.)—Flowers smaller; calyx-lobes shorter than the corolla-tubes and not fringed with hairs; leaves smaller and narrower and not fringed with hairs.

THE PERIWINKLE FAMILY (ORDER XLV, APOCYNACEÆ.)

CALYX of 5, rarely 4 SEPALS, united at the base, remaining with the fruit (persistent), entirely free from and inserted below the seedcase (inferior).

COROLLA of 5, rarely 4 PETALS, salver- or funnel-shaped united at the base into a tube, often twisted in bud, inserted below the seedcase (hypogynous)

STAMENS 5, rarely 4, alternating with the petals, inserted on the corolla-tube (epipetalous).

PISTIL of 2 CARPELS, separate at the base and united only at the upper end, with one style surmounted with a stigma which has below it a ring-shaped border.

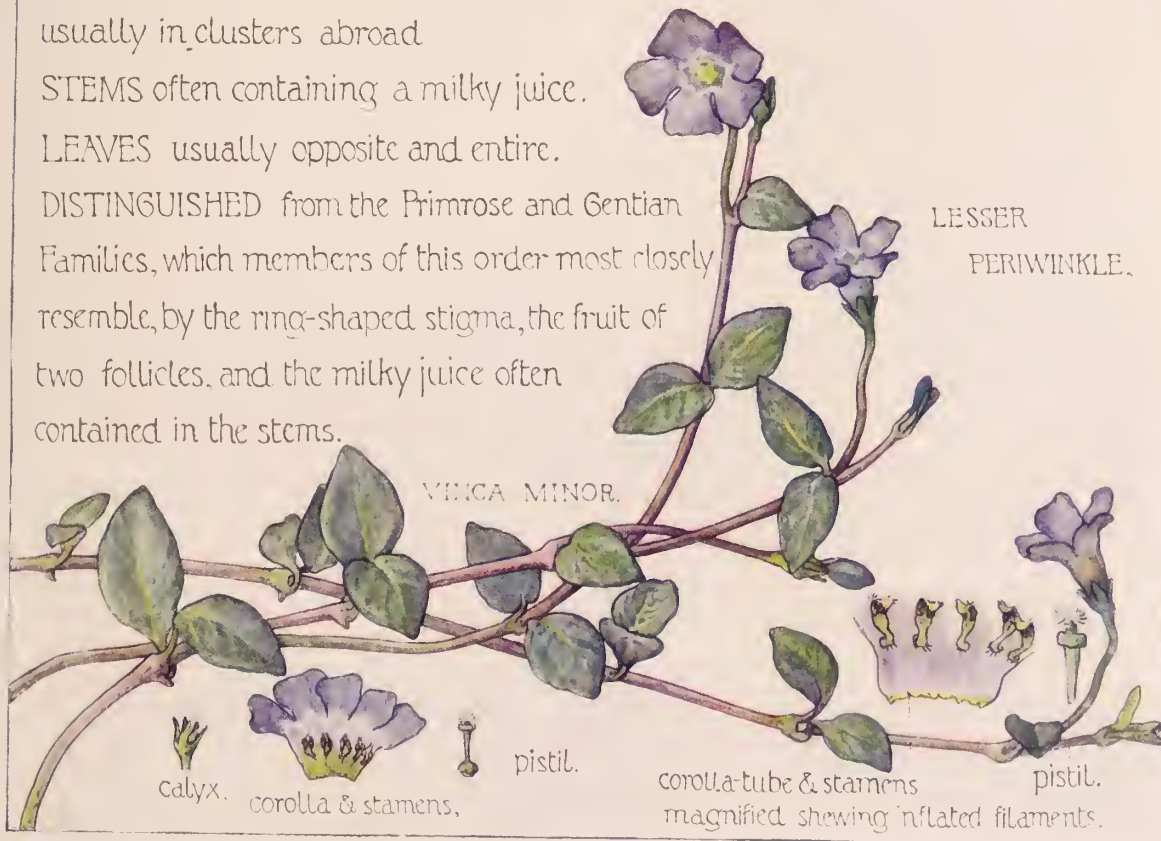
FRUIT of 2 follicles (dry 1-celled many-seeded fruits opening down one side) with seeds which have a plume of hairs at the apex.

FLOWERS often showy, solitary in the axils of the leaves in the British species, usually in clusters abroad.

STEMS often containing a milky juice.

LEAVES usually opposite and entire.

DISTINGUISHED from the Primrose and Gentian Families, which members of this order most closely resemble, by the ring-shaped stigma, the fruit of two follicles, and the milky juice often contained in the stems.





1. ***Greater Periwinkle.** (*Vin'ca mājor.* Linn.)—As just described. A creeping evergreen plant with large purplish-blue flowers, $1\frac{1}{2}$ –2 inches across, solitary, in the axils of the leaves, on stalks shorter than the leaves; the calyx-lobes are nearly as long as the corolla-tube, and are fringed with hairs; the corolla-tube is broadly funnel-shaped, though slightly contracted at the top, and the limb is flat and spreading. The stems are trailing, erect when in flower, otherwise prostrate; and the glossy evergreen leaves are 2–4 inches long, egg-shaped, shortly stalked, entire, and fringed with hairs.

Not a native. Naturalised in many places in England and the south of Scotland. April—May. Perennial.

2. **Lesser Periwinkle.** (*Vin'ca mīnor.* Linn.)—A species with far more claim to being a native, though probably an escape from cultivation. Very similar to the Greater Periwinkle, but with smaller flowers, about 1 inch across, rarely white, on longer stalks in proportion to the leaves; the calyx-lobes shorter and not fringed with hairs; the corolla-tube more open; the stems thinner, more wiry, and rooting at the nodes; the flowering stems short and erect; and the leaves much smaller and narrower, and not fringed with hairs. [Plate 12.

Not uncommon. In woods and on shady banks throughout England, sometimes covering the ground in woods in the west of England with its creeping stems covered with their shining evergreen leaves. March—June and often again in the autumn. Perennial.

THE GENTIAN FAMILY

[ORDER L. GENTIANEÆ]

CALYX of 4 or 5, rarely 6-8 **SEPALS**, free or united at the base, remaining with the fruit (persistent), entirely free from and inserted below the seedcase (inferior).

COROLLA of 4 or 5, rarely 6-8 **PETALS**, the same number as the sepals, usually twisted in bud, united into a tube at the base, the limb salver-, funnel-, or rarely cup-shaped, sometimes fringed at the top of the tube below the spreading lobes, inserted below the seedcase (hypogynous).

STAMENS 4, 5, or 6-8, the same number as the petals and alternating with them, inserted in the corolla-tube (epi-petalous).

PISTIL of 2 **CARPELS**, uniting into a 1-celled or imperfectly 2-celled seedcase

and 1 or 2 styles crowned with a stigma which is frequently 2-lobed.

FRUIT a capsule, 1- or imperfectly 2-celled, many-seeded, usually opening at the top with 2 valves.

FLOWERS brilliantly coloured, usually in forked clusters with the central flower opening first (cyme).

STEMS with a bitter watery juice.

LEAVES opposite, entire, and usually without stalks (sessile).

DISTINGUISHED from the Primrose Family by the stamens alternating with the corolla-lobes, the usually 2-lobed stigma, and the capsule opening with 2 valves, and distinguished at a glance from the Bellflower Family by the seedcase being free from the calyx.

THE Gentian is a small family but with a wide distribution. It thrives best in temperate climates, though it is to be found nearly all over the world. In North America are to be found the beautiful *Sabbatias*, unfortunately so difficult of cultivation. From S. Africa we obtain the *Chironias* which are grown in greenhouses. But the order is best known by the genus *Gentiana*, which abounds all over temperate Europe and Asia, from the meadows and mountains of the British Isles to the Alps, Caucasus, and Himalaya, where they thrive in similar abodes to those loved by the Primrose tribe, and add their intense dazzling blues and yellow to the mass of colour already there.

Many species of Gentian are cultivated in rock gardens, but they are difficult to rear unless well shielded from cold north and east winds. Most of the members of the order are extremely bitter and some are employed in medicine as tonics.

Capsule opening with 2 valves.

I. **YELLOW-WORT** (*BLACKSTÓNIA*). Flowers in clusters, yellow, star-like (rotate); sepals, petals, and stamens 8 or 6; stigmas 2, each 2-cleft; leaves opposite, often united at the base.



COMMON CENTAURY

PERFOLIATE YELLOWWORT
BLACKSTONEA PERFOLIATA

SLENDER CICENDIA

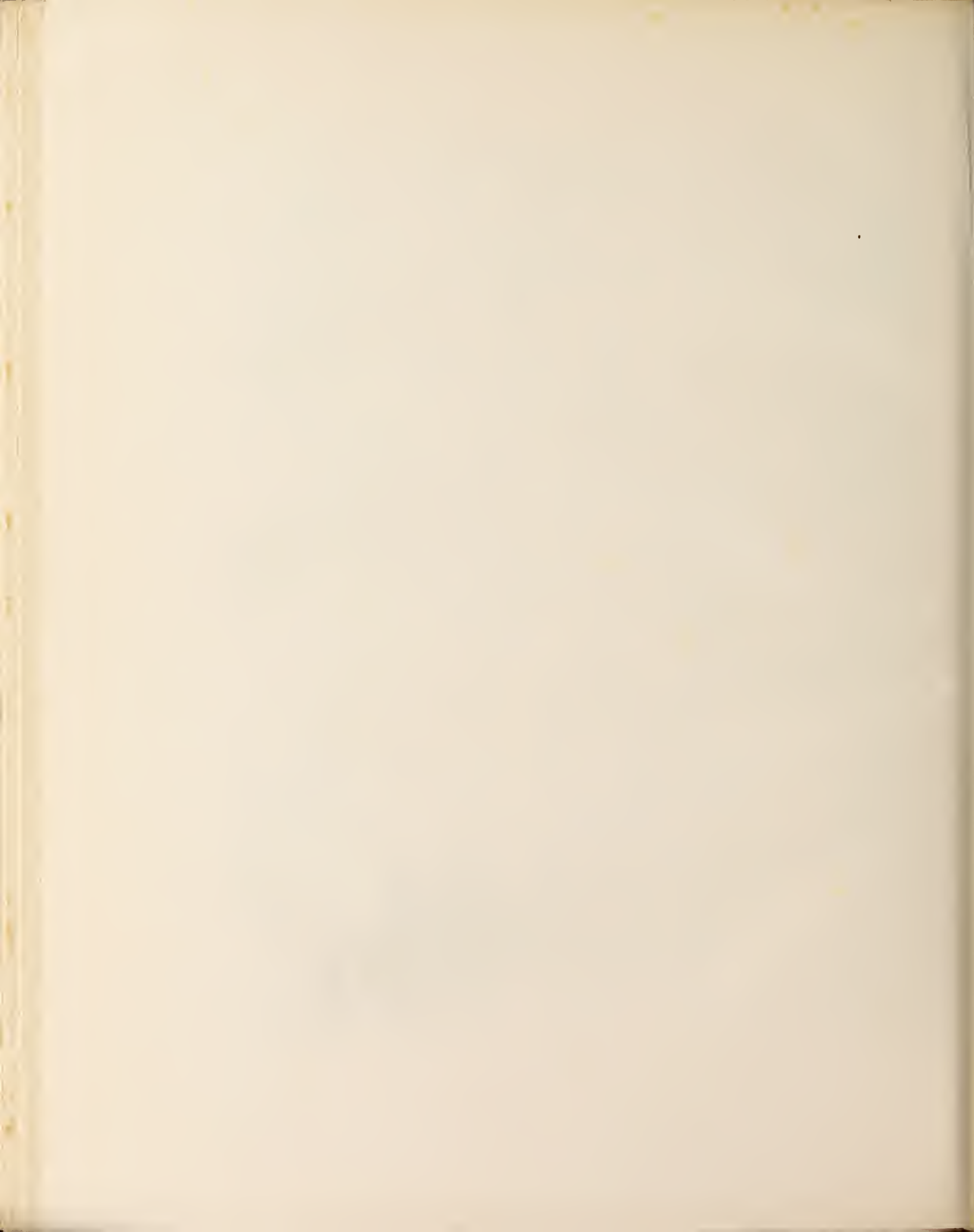
CENTAURIUM UMBELLATUM

MARSH GENTIAN,
GENTIANA PNEUMONANTHE

AUTUMN GENTIAN,
GENTIANA ANJARELLA

MICROCALA FILIFORMIS

BOG BEAN,
GENTIANA TRIFOLIATA



- II. **CENTAURY** (**CENTAÚRIUM**). Flowers in forked clusters, pink; sepals, petals, and stamens 5; corolla-tube long and narrow with the limb salver-shaped; anthers spirally coiled; stigmas 2.
- III. **GENTIANELLA** (**MICROCÁLA**). Minute plant, flowers few, in very loose clusters; calyx tubular, 4-lobed; petals and stamens 4; stem branched only at the top.
- IV. **CICEN'DIA**. Minute plant, flowers few, pink, in very loose clusters; sepals 4, narrow and not united into a tube at the base; petals and stamens 4; stem branched from the base.
- V. **GENTIAN** (**GENTIÁNA**). Flowers solitary or in clusters, mauve or blue; sepals, petals, and stamens usually 5; corolla funnel-, bell-, or salver-shaped, sometimes with the addition of small teeth between each lobe, sometimes fringed with hairs in the throat of the tube.
- VI. **BOG-BEAN** (**MENYAN'THES**). Water plant. Flowers in clusters, white, broadly funnel-shaped; sepals, petals, and stamens 5; corolla-lobes densely covered with thick white hairs; leaves divided to the base into 3 leaflets.

Capsule indehiscent or splitting irregularly.

- VII. **NYMPHOIDES**. Water plant. Flowers in stalkless umbels, star-like; sepals, petals, and stamens 5; corolla-throat fringed with hairs.

I. YELLOW-WORT. (BLACKSTÓNIA. Huds.)—Flowers bright yellow, in terminal forked clusters, the central flower opening first (cymes). Calyx of 8 sepals, occasionally 6, united only at the base, inserted below and free from the seedcase (inferior); corolla of the same number of petals as sepals, united at the base into a short tube, and spreading into an 8- or 6-lobed limb, inserted below the seedcase (hypogynous); stamens 8 or 6, the same number as the sepals; carpels 2, with 1 style and 2 stigmas each 2-lobed; capsule opening by 2 valves by the splitting of the cell-walls (septicidal). Annual herbs with a bluish bloom (glaucous), and often with the stalkless opposite leaves united at the base (perfoliate).

Perfoliate Yellow-wort, Yellow Centaury. (Blackstónia perfoliáta. Huds.)—The only British species. As just described. The brilliant yellow flowers, which are about $\frac{3}{4}$ inch across, only opening in bright sunshine; the stem is 9–18 inches high, erect, and simple, with the root-leaves narrowing into stalks, and the stem-leaves in rather distant pairs, united at the base (connate), so that the stalk appears to pass through them (perfoliate). The whole plant is of a pale green covered with a bluish bloom and is rather fleshy. (*Chlora perfoliata. Linn.*)

[Plate 13.

Local, not uncommon in chalk and limestone districts, in dry pastures and waste places, in England and Ireland; not found in Scotland. June—September. Annual.

II. CENTAURY. (CENTAÚRIUM. Hill.)—Flowers rose, white, rarely yellow, opening only in bright sunshine, in terminal branched clusters, the central flower opening first (cymes). Calyx of 5, rarely 4 sepals, united at the base, free from and inserted below the seedcase (inferior); corolla of 5, rarely 4 petals, united into an elongated cylindrical tube and spreading into a 5- or 4-lobed salver-shaped limb, inserted below the seedcase (hypogynous); stamens 5, rarely 4, with the anthers spirally twisted after shedding their pollen, inserted in the corolla-tube (epi-petalous); carpels 2, with a single style and 2 stigmas; fruit a capsule, 2-celled, opening at the top by 2 valves by the splitting of the cell-walls (septicidal). Herbs with opposite leaves often united at the base, and square stems. (*Erythraea. Rencalm.*)

Stamens inserted on the top of the corolla-tube.

- (1) Common Centaury. (*Centaúrium umbellátum*.)—Outer flowers stalked, calyx not half as long as corolla-tube, corolla-lobes oval.
- (2) Broad-leaved Centaury. (*Centaúrium latifólium*.)—Flowers all stalkless, calyx as long as corolla-tube, corolla-lobes lance-shaped, leaves broadly oval.
- (3) Narrow-leaved Centaury. (*Centaúrium vulgáre*.)—Flowers large and few, $\frac{1}{2}$ inch across, outer stalked; calyx as long as corolla-tube, corolla-lobes oval and blunt, leaves narrow.
- (4) Dwarf Centaury. (*Centaúrium pulchel'lum*.)—Flowers all stalked, calyx rather shorter than corolla-tube, corolla-lobes lance-shaped.

Stamens inserted on the base of the corolla-tube.

- (5) Tufted Centaury. (*Centaúrium capitátum*.)—Flowers with the calyx as long as the corolla, stem unbranched.

1. Common Centaury. (*Centaúrium umbellátum*. Gilib.)—As just described. The flowers are small, about $\frac{3}{8}$ inch across, of an intense pink colour, in numerous clusters of 3 together, the central one stalkless and opening first, and the side ones stalked and with 2 bracts below the calyx, forming a repeatedly forked dense cluster (cyme); the calyx is not half as long as the corolla-tube; the corolla-lobes are oval; and the stamens are inserted on the top of the corolla-tube. The stems are 2–18 inches high, square, the upper part branched; the lower leaves are broadly egg-shaped (ovate) and blunt, while the upper ones are in distant pairs, oblong or oval, and pointed; they all are smooth and have 3–7 strong parallel veins. (*Centaúrium minus*. Moench. method; *Erythræa Centaúrium*. Pers.) [Plate 13.

Common. In fields, meadows, and waste places, especially on chalky soil; in England, Scotland, and Ireland. July—September. Annual or biennial.

2. Broad-leaved Centaury. (*Centaúrium latifólium*. Druce.)—A very similar species, though apparently stunted. The pink flowers are all stalkless, about $\frac{1}{8}$ inch across, in compact headlike terminal clusters, the calyx as long as the corolla-tube, the corolla-lobes lance-shaped, the stems only 2–4 inches high, and the leaves broadly oval, with 5–7 parallel veins. (*Centaúrium minus*. Moench.; *Erythræa latifolia*. Sm.)

Very rare. On sandy ground near the sea between Southport and Liverpool. June—September. Annual.

3. Narrow-leaved or Dwarf Tufted Centaury. (*Centaúrium vulgáre*. Rafn.)—A somewhat similar species to the last, differing in having fewer and larger flowers, about $\frac{1}{2}$ inch across, the outer stalked, the corolla-lobes oval and blunt, the stem 2–6 inches high, and the leaves very narrow, with 3 parallel veins. (*Erythræa littoralis*. Fries.)

Local. On sandy sea-shores, chiefly on the coasts of Carnarvon, Flint, Anglesey, Lancashire, Northumberland, and one or two places in Scotland. July—August. Annual.

4. Dwarf Centaury. (*Centaúrium pulchel'lum*. Druce.)—Another similar species, with fewer small, star-like pink flowers, $\frac{1}{4}$ inch across, all stalked; the calyx rather shorter than the corolla-tube, the corolla-lobes narrowly lance-shaped; the stems very variable in height, sometimes only 1 inch, and in other specimens nearly 1 foot high, branched, and sharply 4-sided; the leaves egg-shaped, the upper ones narrower and more pointed. (*Erythræa ramosissima*. Pers.; *Erythræa pulchella*. Fr.)

Not uncommon on sandy shores or wet sandy inland places in England and Ireland, rare in Scotland. July—September. Annual.

5. Tufted Centaury. (*Centaúrium capitátum*. Rendle and Britten.)—A species differing from all the others in its stamens being inserted on the base of the corolla-tube. The calyx is as long as the corolla-tube, and the stem is unbranched, not more than 3 inches high, with egg-shaped, 3-veined leaves often narrowing into a stalk, those of the root in a rosette. (*Erythræa capitata*. Willd.)

Rare. On downs in the Isle of Wight, Cornwall, Sussex, and Northumberland. July—August. Annual or biennial.

III. GENTIANELLA. (**MICROCÁLA.** Hoffm. and Link.)—Flowers small, about $\frac{1}{4}$ inch across, yellow, on long stalks, in very loose clusters, the central flower opening first (cymes). Calyx of 4 sepals, united into a tube at the base, with 4 short, broad teeth at the top, free from and inserted below the seedcase (inferior); corolla of 4 petals, the tube funnel- and the limb salver-shaped, inserted below the seedcase (hypogynous); stamens 4, inserted in the throat of the corolla-tube; carpels 2, the style simple and the stigma pin-head-like; fruit a capsule, 1- or imperfectly 2-celled, opening at the top by 2 valves. Small annual herbs with entire opposite leaves. (*Cicendia*. Adans.)

Lesser Gentianella. (*Microcála filifórmis*. Hoffm. and Link.)—The only British species. As just described. The small yellow flowers only open in bright sunshine; the stem is 2-6 inches high, erect, slender, and smooth, branched only at the top and that but slightly; and the leaves are few and very small and narrow. (*Cicendia filiformis*. Delarbre.)

[Plate 13.]

Rare. Sandy heaths in the south-west of England and in the south-west of Ireland. July—October. Annual.

IV. CICEŃDIA. Adans.—This genus consists of the one following species. Many botanists place with it the preceding species, *Microcala filiformis*.

Least Cicendia, or Guernsey Gentianella. (*Cicen'dia pusil'la*. Griseb.)—This species differs mainly from the preceding one, *Gentianella* (*Microcala*), in the sepals being free to the base instead of being united into a tube at the base. The flowers are very small and of a pink colour, on long, slender stalks, in such loose clusters as to appear solitary. The whole plant is minute and very inconspicuous; the stems are 1-3 inches high, much branched from the base, with a few pairs of narrow leaves.

Very rare. On damp sandy commons in Guernsey. July—September. Annual.

V. GENTIAN. (**GENTÍANA.** Linn.)—Flowers blue or purple in the British species, either solitary and terminal, or in small clusters in the axils of the leaves forming oblong or spike-like leafy clusters. Calyx of 5, rarely 4 sepals, united into a tube at the base, inserted below the seedcase; corolla of 5, rarely 4 petals, united into a tube and then separating into the same number of lobes, occasionally with alternating teeth, bell-, funnel- or salver-shaped, the throat of the tube contracted and often closed with hairs, inserted below the seedcase (hypogynous); stamens 5, rarely 4, inserted in the corolla-tube (epi-petalous); carpels 2, with the style absent and the 2 stigmas remaining with and crowning the fruit; fruit a capsule, 1-celled, many-seeded, opening from the top down the cell-walls (septicidal) by 2 valves. Herbs with opposite entire stalkless (sessile) leaves.

Flowers few or solitary ; sepals, petals, and stamens 5 ; corolla-throat not fringed with hairs ; 2 bracts at the base of the calyx.

- (1) Marsh Gentian. (*Gentiána Pneumonánthe*.)—Flowers 1-3 at the top of the stem, large.

Flowers solitary.

- (2) Spring Gentian. (*Gentiána ver'na*.)—Flowers large, corolla with 5 minute alternating 2-cleft lobes.
 (3) Alpine Gentian. (*Gentiána nivális*.)—Flowers small, corolla with 5 minute alternating lobes which are 2-cleft.

Flowers numerous, solitary in the axils of the leaves, forming long leafy clusters ; corolla-throat fringed with hairs ; without bracts at the base of the calyx.

Sepals, petals, and stamens 5.

- (4) Common Autumn Gentian. (*Gentiána Amarel'la*.)—Calyx-lobes equal ; corolla-tube rather longer than the calyx.
 (5) Scarce Autumn Gentian. (*Gentiána german'ica*.)—Calyx-lobes unequal ; corolla-tube much longer than the calyx.

Sepals, petals, and stamens 4.

- (6) Field Gentian. (*Gentiána campes'tris*.)—Two outer calyx-lobes much broader than the 2 inner, corolla-tube longer than the calyx.
 (7) Baltic Gentian. (*Gentiána baltica*.)—Two outer calyx-lobes much broader than the 2 inner, corolla-tube shorter than the calyx.

1. Marsh Gentian. (*Gentiána Pneumonánthe*. Linn.)—As just described. The handsomest of all the British species. The flowers are $1\frac{1}{2}$ -2 inches long, bell-shaped, of a vivid deep blue inside, with a greenish broad stripe down the outside of each corolla-lobe, and with 2 narrow bracts at the base of the calyx, solitary or rarely 2 or 3 together in the axils of the upper pair of leaves and terminating the stem. The calyx-lobes are narrow and turned back ; the corolla-tube is much longer than the calyx and not fringed at the throat ; the parts of the flower are in fives. The stem is 3-18 inches high, erect, unbranched, and leafy ; and the leaves are narrow, blunt, shiny, and rather thick. [Plate 13.

Rare, local. On moist boggy heaths in many counties in England ; not a native in Scotland and Ireland. August—September. Annual.

2. Spring Gentian. (*Gentiána ver'na*. Linn.)—A lovely little species [as described in the genus *Gentian* (*Gentiana*)] with a rather large vivid dark blue flower, $\frac{3}{4}$ -1 inch across, terminating the stem, and 2 oval leaf-like bracts just below the calyx, which is 5-cleft ; the corolla-tube has no hairs at the throat, and the corolla-limb is divided into 5 broad blunt lobes, with 5 minute alternating 2-cleft teeth ; the stamens are 5 in number. The plant is densely tufted, often 4 or 5 inches in diameter, throwing up short flowering stems, sometimes so short that the solitary flower appears stalkless (sessile), and sometimes 2 or 3 inches high with 1 or 2 pairs of small leaves below the flower : the leaves are oval or oblong and smooth.

Very rare. On wet rocks in limestone districts, in Teesdale, and in Ireland in Co. Clare and Co. Galway. April—June. Perennial.

3. Small Alpine Gentian. (*Gentiána nivális*. Linn.)—A similar though much smaller species. The vivid deep blue flowers are only $\frac{1}{4}$ inch across, sometimes solitary and

terminating the short erect stem, while at other times the stem is branched at the top and each branch bears a terminal flower so that there appears to be a small terminal cluster. The stems are 1-6 inches high, simple or slightly branched, and the leaves are oblong or egg-shaped, slightly-pointed, in a rosette at the root, and in pairs up the stem.

Very rare. On the summits of mountains in the Highlands. August—September. Annual.

4. Common Autumn Gentian. (*Gentiána Amarella*. Linn.)—Flowers numerous, $\frac{3}{8}$ – $\frac{1}{2}$ inch across, pale, dullish purple, shortly stalked, without bracts at the base of the calyx, solitary in the axils of nearly all the leaves and terminating the stem, forming a long narrow leafy cluster. Sepals, petals, and stamens 5; the calyx tinged with purple and with 5 equal lobes; and the corolla-tube fringed with hairs at the throat. The stems 3-15 inches high, very erect, square, purplish, leafy, and much branched in larger species; and the leaves egg-shaped or lance-shaped, the lower ones blunt and the upper ones pointed. [Plate 13.

Common on dry chalky pastures; distributed throughout England and Ireland, more rare in Scotland. August—September. Annual.

5. Scarce Autumn Gentian. (*Gentiána germaníca*. Willd.)—A very similar species, considered only as a variety by many botanists, differing in having larger flowers, about $\frac{3}{4}$ inch across, with unequal calyx-lobes, and the corolla-tube much longer than the calyx. The whole plant is larger and stouter.

Very rare, local. Dry chalky fields near Tring and in a few other places in England; not recorded from Scotland or Ireland. July—August. Annual.

6. Field Gentian. (*Gentiána campes'tris*. Linn.)—A very similar species to the Autumn Gentian (*Gentiana Amarella*), though it may be at once recognised by the sepals, petals, and stamens being 4 in number instead of 5; and by the 2 outer calyx-lobes being very much larger than the inner, which are very narrow. The corolla-tube is longer than the calyx. The whole plant is also much greener than the Autumn Gentian which is tinged with purple.

Rather common. On dry pastures; generally distributed throughout England, Scotland, and Ireland. July—October. Annual or biennial.

7. Baltic Gentian. (*Gentiána baltica*. Murb.)—A species similar to the last, differing in the calyx being longer than the corolla-tube.

Very rare. Downs in Norfolk, Suffolk, Devon, Cornwall, and North Wales. August—October. Annual.

VI. BOG-BEAN. (*MENYAN'THES*. Linn.)—A genus consisting of the one species:—

Bog-bean, Buck-bean, Marsh Trefoil. (*Menyan'thes trifoliáta*. Linn.)—A water plant, and the only plant in this order with divided leaves in the British Isles. The flowers are especially beautiful, $\frac{3}{4}$ inch across, white, the inner side densely covered with thick white hairs, in an erect cluster, formed of a series of little bunches of 3 flowers, terminating a thick, leafless, fleshy stalk (scape), 6-18 inches high. The calyx is short and divided into 5 broad lobes, free from and inserted below the seedcase (inferior); the corolla of 5 petals, widely bell-shaped, tinged with pink outside, and white inside and densely covered with thick white hairs, inserted below the seedcase (hypogynous); stamens 5, inserted in the corolla-tube; carpels 2, with 1 style and 2 stigmas; capsule 1-celled, many-seeded, opening at the top down the middle of each carpel by 2 valves. The leaves are all from the root on long stalks sheathing at the base, divided to the base into 3 oblong leaflets (trifoliate); the root is thick, with densely matted fibres. [Plate 13.

Not uncommon in wet bogs and shallow pools; distributed all over England, more rare in the south, common in the north, and in Scotland and Ireland. May—July. Perennial.

VII. NYMPHOIDES. Hill.—Flowers generally yellow, in clusters on stalks all starting from the same point (umbels). Calyx of 5 sepals, united at the base and separating into 5 lobes, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a short tube and separating into 5 spreading lobes which are bearded or fringed in different ways; stamens 5, inserted in the corolla-tube (epi-petalous); carpels 2, the style so short as to appear absent, stigmas 2; capsule 1-celled, with 2 or many seeds, decaying to free the seeds (indehiscent), or splitting irregularly without separating into valves. Water plants, with roundish floating leaves. (*Limnanthemum*. S. P. Gmel.)

Water Nymphoides. (*Nymphoides peltatum*. Rendle and Britten.)—The only British species. As just described. A water plant with bright yellow flowers 1-1¼ inches across, on long stalks (as long as the leaf stalks) all rising from the same point among the leaves (sessile umbel); the corolla is strongly fringed at the throat. The stems creep and root at the base, and produce at intervals, tufts of roots and alternate leaves, and send up flowering stems which reach the surface of the water, on which the flowers and leaves float; the leaves are roundish, deeply heart-shaped (cordate), shining green, spotted with purple, and alternate except on the flowering stems when they are opposite. (*Limnanthemum nymphæoides*. Link.; *Villarsia reniformis*, Linn.; *Limnanthemum peltatum*. S. P. Gmel.)

Rare. In ponds and still water and ditches connected with the Thames, in some of the central and south-eastern counties of England, not native in Scotland or Ireland. July—August. Perennial.

THE JACOB'S-LADDER FAMILY. (ORDER LIPOLEMONIACEÆ.)

CALYX of 5 SEPALS, more or less united at the base, remaining with the fruit (persistent), free from and inserted below the seedcase (inferior).

COROLLA of 5 PETALS, united at the base & spreading into a 5-lobed limb which is twisted in bud, inserted below the seedcase (hypogynous).

STAMENS 5, alternating with the corolla-lobes inserted in the corolla-tube (epi-petalous).

PISTIL of 3 CARPELS, united into a 3-celled seedcase, 1 style & a 3-lobed stigma.

FRUIT a capsule, 3-celled, each cell containing 1 or more seeds, opening at the top by three valves down the middle of the cells (loculicidal).

FLOWERS in terminal clusters, some of the foreign species in heads

STEMS having a watery juice.

LEAVES various, without stipules.

DISTINGUISHED BY the 5 sepals, petals, and stamens, the 3-lobed seedcase, 1 style, and 3-lobed stigma & the 3-celled capsule.

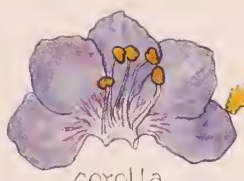


JACOB'S LADLER.

POLEMONIUM CAERULEUM.



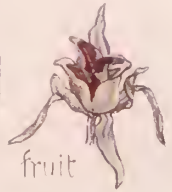
calyx



corolla & stamens



pistil
petal & stamen magnified



fruit

THE JACOB'S LADDER FAMILY

[ORDER LI. POLEMONIACEÆ]

THE Jacob's Ladder Family is a small one, possessing showy flowers, and spread over northern Asia and America and the west of S. America, but unknown in the tropics.

Several genera are cultivated in gardens and greenhouses—Phlox, Gilia, Cobæa, Collomia, and Ipomopsis. None possess any medicinal properties.

JACOB'S LADDER. (POLEMÓNIUM. Linn.)—Flowers showy, blue, purple, or white, in terminal clusters. Calyx of 5 sepals, united into a tube and separating into 5 lobes, bell-shaped, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a short tube and spreading into a broad 5-lobed limb (rotate), inserted below the seedcase (hypogynous); stamens 5, the filaments hairy and so dilated at the base as nearly to close the corolla-tube, all lying on one side of the flower, inserted in the throat of the corolla-tube (epi-petalous); carpels 3, with a single style crowned with a 3-lobed stigma; fruit a many-seeded, 3-celled capsule, opening by 3 valves. Herbs with leaves divided to the midrib into separate leaflets (pinnate).

Jacob's Ladder, Greek Valerian. (Polemónium cœrúleum. Linn.)—As just described. An erect plant with a handsome terminal cluster of numerous bright blue or white flowers, $\frac{3}{4}$ –1 inch across; the stem is 1–2 or even 3 feet high, erect, hollow, and angular; and the leaves are divided or very deeply lobed to the midrib into numerous oblong leaflets with one terminal one (imparipinnate); those from the root form dense tufts and have long leaves divided into many leaflets, while those on the stem are smaller and have fewer leaflets. The root is creeping. [Plate 14.

This plant is a common favourite in gardens. Under cultivation the flowers are often mottled and the foliage blotched with white.

Very rare. In bushy hilly places, chiefly in the north; probably native in Staffordshire, Derbyshire, Yorkshire, and Westmorland, introduced into the other counties where it occurs both in England and Scotland; probably native in Ireland. June—July. Perennial.

THE BORAGE FAMILY

[ORDER LII. BORAGINACEÆ]

THE Borage Family is one of the largest and most natural orders we possess. It is easily recognised by the spirally coiled clusters of flowers, which are usually blue, by the 5 stamens, by the 4-seeded fruit, and the entire rough leaves and succulent stems which are covered with harsh hairs. These hairs usually rise from a swollen base which adds considerably to the roughness of the plant. It is because of this rough hairiness that Linnæus named the order *Asperifoliæ* or Rough-leaved plants.

The members of the tribe are principally natives of the northern temperate zone, and abound in those countries bordering on the Mediterranean, though a few are found in tropical regions.

Some foreign species are cultivated in gardens. The leaves of the Borage (*Borago officinalis*) are employed for flavouring claret cup, and the roots of the Alkanet contain a red matter which is employed as a dye.

Two foreign orders are nearly allied to the Borage and also to the *Convolvulus* tribes, some of the species of which are cultivated in gardens—the *Nemophilas* and *Eutocas*, principally natives of America, and the sweet-scented *Heliotrope*.

- I. V^IPER'S BUGLOSS (*ÉCHIU*M). Flowers large, funnel-shaped, with a bract below each flower; corolla-lobes unequal, slightly 2-lipped, without scales closing the throat; stamens unequal, protruding beyond the corolla-lobes; stigma 2-cleft.
- II. HOUND'S-TONGUE (*CYNOGLOS'SUM*). Flowers funnel-shaped; corolla-throat closed with 5 prominent blunt scales; stamens enclosed in the corolla-tube; nuts covered with hooked prickles, burr-like.
- III. *BORÁGE (*BORÁGO*). Flowers large, star-like; corolla-throat closed with 5 erect short scales; stamens protruding, the anthers forming a cone round the pistil.
- IV. *MADWORT (*ASPERÚGO*). Flowers small, solitary, salver-shaped; calyx with 5 leafy lobes and intermediate teeth, enlarged and netted with veins in fruit; corolla-throat closed with 5 rounded scales; stamens included in the corolla-tube; nuts granulated, flattened.
- V. COMFREY (*SYM'PHYTUM*). Flowers bell-shaped; corolla-throat closed with 5 lance-shaped scales; stamens protruding.
- VI. SMOOTH GROMWELL (*MERTEN'SIA*). Flowers funnel-shaped; corolla-throat not closed with scales; stamens protruding; nuts fleshy.
- VII. *ALKANET (*ANCHÚSA*). Flowers salver-shaped; corolla-tube straight, its throat closed with 5 prominent scales; stamens enclosed in corolla-tube; nuts angular, wrinkled.

THE BORAGE FAMILY. (ORDER LII. BORAGINACEÆ.)

CALYX of 5, rarely 4, SEPALs, sometimes united into a tube & separating into the same number of lobes, remaining and often enlarging with the fruit, free from and inserted below the seedcase (inferior).

COROLLA of 5, rarely 4, PETALS, united into a tube & separating into the same number of lobes, salver- or funnel-shaped, rarely partially 2-lipped, usually with 5 scales in the throat of the tube, inserted below the seedcase (hypogynous).

STAMENS 5, alternating with the corolla lobes and inserted in the corolla-tube (epi-petalous).

PISTIL of 2 CARPELS, so deeply lobed that the seedcase is apparently equally 4-lobed, 4-celled, with a single style, situated in the centre and at the base of the lobes, crowned with an entire or lobed stigma.

FRUIT of 4 little nut-like fruits (cocca), looking like seeds inside the persistent calyx, with 1 suspended seed in each, decaying to free the seeds (indehiscent), in the British species, abroad rarely a berry like drupe with 2 or 4 stones or a capsule.

FLOWERS in 1-sided clusters coiled in bud (scorpioid spikes or racemes), generally blue or purple, though usually red or pink in bud.

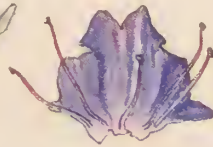
STEMS usually rough with hairs which are sometimes branched.

LEAVES alternate, undivided, usually with entire margins, rough with coarse hairs.

DISTINGUISHED BY the 4 seed-like little fruits (cocca) from every order except the Dead-Nettle Family, & differing from that in the more regularly 5-lobed corolla, the 5 stamens, the 1-sided clusters of flowers coiled in bud, & the alternate leaves.

COMMON
VIPER'S-
BUGLOSS,

ECHIAM VULGARE.



corolla and
stamens



calyx



pistil



fruit



- VIII. **BUGLOSS** (*LYCOP'SIS*). Flowers salver-shaped; corolla-tube curved, limb oblique, throat closed with 5 blunt scales; stamens enclosed in corolla-tube; nuts angular and wrinkled.
- IX. **LUNGWORT** (*PULMONÁRIA*). Flowers salver-shaped; corolla-throat not closed with scales; stamens enclosed in corolla-tube.
- X. **GROMWELL** (*LITHOSPER'MUM*). Flowers salver-shaped; corolla-throat not closed with scales; stamens enclosed in corolla-tube; nuts stony.
- XI. **FORGET-ME-NOT** (*MYOSÓTIS*). Flowers small, salver-shaped; corolla-throat nearly closed with 5 blunt scales.

I. VIPER'S BUGLOSS. (*ÉCHIUM*. Linn.)—Flowers red or pink in bud, becoming purple or blue, in numerous 1-sided clusters, which are coiled in bud, up a thick, erect stem, forming a handsome spike-like cluster. Calyx of 5 narrow hairy sepals, united at the base, free from and inserted below the seedcase (inferior); corolla of 5 petals, funnel-shaped, united into a tube and separating into 5 lobes which are slightly 2-lipped, inserted below the seedcase (hypogynous); stamens 5, on long filaments unequal in length, protruding beyond the corolla, inserted in the corolla-tube (epi-petalous); carpels 2, with a long protruding style and a 2-lobed stigma; fruit of 4 little nuts attached at the base to the flat receptacle. Rather large bristly-hairy herbs or under-shrubs with alternate undivided leaves with entire margins.

- (1) Common Viper's Bugloss. (*Échium vulgáre*.)—Flowers blue, in numerous coiled clusters, forming tall, spike-like clusters; corolla-tube narrow; stamens protruding beyond the corolla.
- (2) *Purple Viper's Bugloss. (*Échium plantagin'eum*.)—Flowers dark violet, in loose branched clusters; corolla-tube broadly bell-shaped; stamens not protruding.

1. Common Viper's Bugloss. (*Échium vulgáre*. Linn.)—As just described. An exceedingly handsome plant with a tall, spike-like cluster, composed of small, 1-sided coiled clusters of rosy-pink buds, which open into large vivid blue flowers with long protruding stamens, each flower having a bract at the base; the stems are stout, 1-3 feet high, covered with bristly spreading hairs, often branched at the base, each branch being covered with flowers; the leaves are narrowly oblong, also covered with minute and long bristly hairs; the lower leaves have short stalks, and the stem-leaves are stalkless (sessile). [Plate 15.

A white variety occurs, which has a shorter corolla-tube.

Not uncommon on chalky and sandy soils. In waste places; abundant in some parts of southern England and in parts of Wales, rare in the north of Scotland, and in Ireland, where it is found chiefly on the east coast. June—August. Biennial.

2. *Purple Viper's Bugloss. (*Échium plantagin'eum*. Linn.)—A very similar species with larger dark violet flowers in spreading clusters, not spike-like; the corolla-tube bell-shaped; the stamens not protruding; and the leaves narrower.

Very rare; probably not a native, but established by waysides and in waste places in Cornwall near Penzance, and in Jersey. June—September. Biennial.

II. HOUND'S-TONGUE. (*CYNOGLOSSUM*. Linn.)—Flowers funnel-shaped, blue, purple, red, or white, in 1-sided clusters coiled in bud (scorpioid racemes). Calyx of 5 sepals, covered with whitish down, united at the base, free from and inserted below the seedcase (inferior); corolla of 5 petals, funnel-shaped, united into a tube and spreading into a 5-lobed limb, the throat of the

tube closed with prominent blunt scales, inserted below the seedcase (hypogynous); stamens 5, very short, included in and inserted on the corolla-tube (epi-petalous); carpels 2, stigma undivided; fruit of 4 little nuts, larger than in most genera in this family, covered with short hooked prickles, and attached by the inner edge to the conical receptacle and to the base of the persistent style. Stout herbs covered with hairs which are softer and more closely pressed to the plant than in other species of the Borage Family, and with alternate, undivided leaves.

- (1) Common Hound's-tongue. (*Cynoglossum officinale*.)—Flowers dull lurid red; leaves white with downy hairs.
- (2) Tuberous Hound's-tongue. (*Cynoglossum montanum*.)—Flowers dull blue; leaves rough with scattered hairs.

1. Common Hound's-tongue. (*Cynoglossum officinale*. Linn.)—As just described. The flowers are rather small, $\frac{1}{4}$ – $\frac{3}{8}$ of an inch across, funnel-shaped, the lobes slightly spreading, of a dull lurid red; the calyx is downy with closely pressed white hairs; and the 4 little nuts which compose the fruit are rather large, red, flattish, with prominent borders, and covered with barbed prickles; the stems are 1–2 feet high, stout, round, and downy, thickly covered with rather large, alternate, narrow, downy leaves, the uppermost stalkless and half clasping the stem and the lower narrowed into short stalks, the root-leaves being larger, oval or lance-shaped, with long stalks. The whole plant is of a greyish-green owing to its being so densely felted with soft downy hairs. [Plate 16.

A variety (*Cynoglossum officinale*, var. *subglabrum*. Syme) almost without hairs, with the leaves green and shining above, has been found in the Isle of Wight.

Not uncommon. Waste places, waysides, sandhills by the sea; throughout England; thinly scattered in the south of Scotland; and only found in the south and east of Ireland. June—July. Biennial or perennial.

2. Green-leaved Hound's-tongue. (*Cynoglossum montanum*. Linn.)—A very similar species, differing in having fewer and smaller flowers of a dull blue with reddish veins, in the nuts having no prominent border, in the stems being more slender, less erect, and the leaves fewer, much greener and very thinly coated with a few scattered hairs, and the upper leaves broader at the base. (*Cynoglossum germanicum*. Jacq.; *Cynoglossum sylvaticum*. Hænke.)

Rare. Woods and shady places, in the southern, eastern, and midland counties of England, unknown in Scotland, and only found near Dublin in Ireland. May—July. Biennial.

III. *BORAGE. (**BORÁGO.** Linn.)—Flowers large, blue, in loose forked clusters (cymes) coiled in bud. Calyx of 5 rather long hairy sepals, only united at the base, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a very short tube and spreading into 5 large, star-like lobes, the throat of the tube being closed with 5 short scales, inserted below the seedcase (hypogynous); stamens 5, not included in the corolla-tube, the filaments very short and forked, and the anthers forming a cone round the pistil, inserted in the corolla-tube; carpels 2; fruit of 4 little nuts, smooth or rough, attached to the flat receptacle and free from the style. Rough hairy herbs with alternate simple leaves.

1. *Common Borage. (**Borágo officinalis**. Linn.)—The only species found in the British Isles, and though not a native yet well established in some localities. As just described. The brilliant blue flowers are about 1 inch across, with spreading pointed lobes, and grow on long stalks in loose drooping clusters; the anthers are purplish-black with a purple horn on the back; the stem is 9 inches to 2 feet high, thick, fleshy, hairy, branched and straggling; the leaves are



COMMON
HOUND'S-TONGUE.

CYNO-
GLOSSUM
OFFICINALE.

fruit,
one stamen
magnified.

COMMON
BORAGE,

calyx
&
pistil

pistil

calyx
& pistil,

corolla, scales, & stamens.

corolla & scales

BORAGO OFFICINALIS.

stalkless and lance-shaped at the top, oblong and slightly stalked lower down, and broader and on long stalks at the base. The stems, leaves, and sepals are all covered with stiff whitish bulbous hairs. [Plate 16.]

A variety with white flowers has been found.

The juice of the Borage has a cool refreshing flavour and is often used in cider and claret cups.

Rare. Not a native. On waste places in several counties of England. June—October. Biennial.

IV. *MADWORT. (ASPERÚGO. Linn.)—A genus consisting of the following species, which differs from the Alkanet (*Anchusa*) in its calyx and growth.

***Madwort. (*Asperúgo procumbens*. Linn.)**—Not a native of the British Isles. Flowers $\frac{1}{8}$ inch across, blue, funnel-salver-shaped, on very short stalks, solitary in the axils of the upper leaves. Calyx of 5 sepals, united into a bell-shaped tube and separating into 5 lobes; after flowering the calyx changes and becomes enlarged, flatter, and with a prominent network of veins; it also becomes 2-lipped, and develops 1 or 2 teeth between each lobe; corolla of 5 petals, united into a funnel-shaped tube and spreading into 5 lobes, the throat of the tube closed with 5 rounded scales, inserted below the seedcase (hypogynous); stamens 5, with short filaments, included in the corolla-tube; carpels 2; fruit of 4 oval nuts with a granulated surface, attached by their inner edge to the conical receptacle. Stems trailing, angular, brittle and fleshy, prickly with rigid curved bristles; leaves lance-shaped, the lower ones narrowed into winged stalks, and the upper with very short stalks, nearly opposite or 3 or 4 in a circle (whorl). The whole plant is rough with prickly hooked hairs.

Not a native. Very rare. Cultivated places and rich waste ground. It has been found in many places in England and Scotland, though it has never established itself in any of these localities, but it is not found in Ireland. May—July. Annual.

V. COMFREY. (SYMPHYTUM. Linn.)—Flowers yellow, purple, pink, or white, in drooping 1-sided clusters coiled in bud, forming short forked terminal clusters (scorpioid racemes). Calyx of 5 sepals, united into a short tube and separating into 5 lobes, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a bell-shaped tube and separating into 5 short lobes, the throat of the tube closed with 5 lance-shaped scales, inserted below the seedcase (hypogynous); stamens 5, protruding beyond the corolla-tube but not beyond the lobes, inserted in the corolla-tube (epi-petalous); carpels 2; fruit of 4 smooth little nuts, attached by the base to the flat receptacle. Coarse hairy plants with alternate entire leaves and enlarged roots.

(1) Common Comfrey. (*Symphytum officinale*.)—Stem 2–3 feet high, branched, winged at the top by the leaves continuing down the stem.

(2) Tuberous Comfrey. (*Symphytum tuberosum*.)—Stem 1 foot high, not branched, and scarcely winged.

1. Common Comfrey. (*Symphytum officinale*. Linn.)—As just described. The flowers purple, pink, or yellowish-white in 2-forked, 1-sided clusters; the stem 2–3 feet high, stout, angular, strongly winged at the top, clothed with thin spreading hairs; and the leaves egg-shaped or lance-shaped, rough with short stiff hairs, the lower ones shortly stalked and the upper ones stalkless and continuing down the stem (decurent). [Plate 17.]

Common. By the sides of rivers, in moist places, and by waysides, in England, Scotland, and Ireland. May—August. Perennial.

2. Tuberous Comfrey. (*Symphytum tuberósum*. Linn.)—A similar but much smaller species, with small, few-flowered clusters; more slender and not such erect stems, only 1 foot high, and neither branched nor winged, and the leaves egg-shaped and hardly continued down the stem.

Rare. In woods and damp shady places in central and northern England, southern Scotland, and in Ireland reported from Ulster and Cork. June—July. Perennial.

VI. SMOOTH GROMWELL. (*MERTENSIA*. Roth.)—Flowers blue or white, pink in bud, in 1-sided clusters coiled in bud. Calyx of 5 rather spreading sepals, united only at the base, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a funnel-shaped tube, the throat of which is not closed by scales but has 5 minute bosses, spreading into 5 lobes, inserted below the seedcase (hypogynous); stamens 5, protruding beyond the tube but shorter than the lobes of the corolla, inserted in the corolla-tube (epi-petalous); carpels 2 with the stigma not divided; fruit of 4 rather fleshy little nuts, attached to the flat receptacle. Herbs often smooth and without hairs (glabrous), and sometimes having a strong bluish bloom (glaucous). (*Pneumaria*. Hill.)

Seaside Smooth Gromwell, Oyster-plant. (*Merten'sia marit'ima*. S. F. Gray.)—The only British species. As just described, with clusters of bright blue flowers which are rose-colour in bud; procumbent, much branched, fleshy stems, from 6 inches to 2 feet long, densely covered with thick, fleshy, egg-shaped leaves, which are covered with hard dots, the lower ones stalked and the upper stalkless. The whole plant is thick and fleshy, without hairs, and covered with a bluish bloom, and when fresh is said to taste of oysters. (*Pneumaria maritima*. Hill.)

[Plate 17.

Rare. On the sea-shore, growing on shingle and sand. Very rare in England; it occurs on the north coast of Wales, Anglesey, and up to Cumberland; more common in Scotland, where it extends north to Orkney and Shetland; local in Ireland on the eastern and northern coasts. May—June. Perennial.

VII. *ALKANET. (*ANCHÚSA*. Linn.)—Flowers purple, blue, or rarely yellow, with a bract below each flower, in 1-sided clusters coiled in bud (scorpioid racemes). Calyx of 5 sepals, united only at the base, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a straight funnel-shaped tube and spreading into a flat 5-lobed salver-shaped limb, the throat of the tube being closed with 5 prominent blunt scales, inserted below the seedcase (hypogynous); stamens 5, very short, included in and inserted upon the corolla-tube; carpels 2; fruit of 4 wrinkled angular little nuts, attached by the base to the flat receptacle. Hairy plants with soft or bristle-like hairs and alternate entire leaves.

- (1) *Common Alkanet. (*Anchúsa officinális*.)—Flowers violet; corolla-tube long; leaves narrow, oblong.
- (2) *Evergreen Alkanet. (*Anchúsa sempervirens*.)—Flowers blue; corolla-tube short; leaves broader, egg-shaped.

1. *Common Alkanet. (*Anchúsa officinális*. Linn.)—As just described. The flowers are violet, in forked clusters; the sepals are narrow and very hairy, longer than the corolla-tube; the scales in the throat of the corolla are hairy; the stems are 1–2 feet high, angular, and softly hairy, and the leaves are narrow or oblong, entire, and softly hairy, the upper ones stalkless and half clasping the stem and the lower ones with very short stalks.





Not a native, very rare. In waste places ; recorded from a few stations in England and Scotland. June—July. Biennial.

2. ***Evergreen Alkanet.** (*Anchúsa sempervirens*. Linn.)—A very similar species, which is also an escape from cultivation, with intense blue flowers, $\frac{1}{3}$ – $\frac{1}{2}$ inch across, a shorter corolla-tube, and broader, egg-shaped leaves. [Plate 18.]

Not a native, rare. By waysides and hedges, widely distributed in England, Scotland, and Ireland. May—August. Perennial.

VIII. BUGLOSS. (*LYCOP'SIS*. Linn.)—A small genus distinguished from the Alkanet (*Anchusa*) by the curved tube of the corolla. Flowers small, with a hairy green bract below each flower, in 1-sided clusters coiled in bud (scorpioid racemes). Calyx of 5 sepals, united only at the base, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a curved funnel-shaped tube and spreading into an irregular oblique 5-lobed salver-shaped limb, the throat of the tube being closed with 5 prominent blunt scales, inserted below the seedcase (hypogynous); stamens 5, very short, included in and inserted upon the corolla-tube (epi-petalous); carpels 2; fruit of 4 wrinkled angular little nuts, attached by the base to the flat receptacle. Hairy plants with soft or bristly hairs and alternate entire leaves.

Small Bugloss. (*Lycop'sis arvensis*. Linn.)—The only British species, with small blue flowers, about $\frac{1}{3}$ inch across, with the corolla-tube curved and the stem 5 inches to 2 feet high, branched, and rather straggling, angular, brittle, and covered with stiff hairs. [Plate 18.] Not common. In cornfields and waste places, generally distributed throughout the British Isles. June—July. Annual.

IX. LUNGWORT. (*PULMONÁRIA*. Linn.)—Flowers of a purplish-red, in 1-sided clusters coiled in bud (scorpioid racemes). Calyx of 5 sepals, united into a bell-shaped tube and separating into 5 lobes, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a long funnel-shaped tube and spreading into a 5-lobed salver-shaped limb, the throat not closed with scales but open, having 5 small hairy bosses, inserted below the seedcase (hypogynous); stamens 5, very short, included in and inserted on the corolla-tube; carpels 2, stigma undivided; fruit of 4 little nuts, smooth and hard, attached by the base to the flat receptacle. Soft hairy herbs with leaves frequently blotched with white and creeping roots.

(1) **Narrow-leaved Lungwort.** (*Pulmonária angustifolia*.)—Flowers blue; leaves narrow, lance-shaped, rarely spotted with white.

(2) **Common Lungwort.** (*Pulmonária officinális*.)—Flowers purple; leaves broad, egg-shaped, always spotted with white.

1. **Narrow-leaved Lungwort.** (*Pulmonária angustifolia*. Linn.)—As just described. The flowers are at first rose-colour, then brilliant blue, fading to purple, very shortly stalked, in terminal forked clusters coiled in bud (scorpioid cymes); the stems are erect, 5–18 inches high, brittle, and hairy; and the leaves are narrowly lance-shaped, narrowing at the base, sometimes spotted with a greenish-white, the upper leaves being stalkless.

Rare. In woods and hedge-banks in the Isle of Wight, the New Forest, Dorsetshire and other counties. February—June Perennial.

2. **Common Lungwort.** (*Pulmonária officinális*. Linn.)—A very similar species, with flowers at first rose-colour and then purple, and with egg-shaped (ovate) leaves always spotted with white. [Plate 18.]

Rare. Generally an escape from gardens and possessing small claim to be counted a native. On rubbish heaps, in woods, and on hedge-banks, in England and the south of Scotland. April—May. Perennial.

X. GROMWELL. (LITHOSPERMUM. Linn.)—Flowers small, blue or whitish, in 1-sided leafy clusters coiled in bud (scorpioid cymes). Calyx of 5 sepals, only united at the base, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a funnel-shaped tube and spreading into a 5-lobed limb, the throat of the tube open, not being closed with scales, but often having 5 small bosses; stamens 5, included in and inserted upon the corolla-tube; carpels 2, with the style undivided; fruit of 4 very hard and stony little nuts, attached at the base to the flat receptacle. Hairy herbs, or undershrubs in some exotic species, with alternate undivided leaves.

- (1) Common Gromwell. (*Lithospermum officinale*.)—Flowers small, yellowish-white; nuts shining grey, smooth; stem erect, stout, and much branched.
- (2) Corn Gromwell. (*Lithospermum arvense*.)—Flowers white; nuts shining brown, wrinkled; stem erect, slender, slightly branched.
- (3) Purple Gromwell. (*Lithospermum purpureo-cœruleum*.)—Flowers large, bright blue; nuts shining white, smooth; flowering stem only erect, barren stems very leafy and prostrate.

1. Common Gromwell, Grey Millet. (*Lithospermum officinale*. Linn.)—As just described. The small yellowish-white flowers are in clusters terminating the erect stem and in the axils of some of the upper leaves; the little grey nuts are very hard, smooth, and shining, and remain on the leafless stems in the autumn; the stems are stout, and erect, 1–3 feet high, branched, and with adpressed hairs; and the leaves are lance-shaped, pointed, stalkless, and with minute hairs. [Plate 18.

Rather rare. Waste places, waysides, and dry open woods; widely spread through England and Scotland, but scarce in Ireland. June—August. Perennial.

2. Corn Gromwell. (*Lithospermum arvense*. Linn.)—A very similar species with larger, whiter flowers; pale brown little nuts, polished but wrinkled; shorter, less rigid, and less rough stems, about 1 foot high, and less branched; and with smaller, narrower, lance-shaped leaves.

Not uncommon. In cornfields, cultivated ground, and waste places; widely spread through England, Scotland, and Ireland. May—July. Annual.

3. Purple Gromwell. (*Lithospermum purpureo-cœruleum*. Linn.)—A very beautiful species with larger bright purple-blue flowers; smooth, white, shining nuts, about as large as a hemp seed; the flower-clusters forked on erect wiry stems, 1–2 feet high, and the barren stems prostrate, arching, and much more leafy; the leaves narrowly lance-shaped and very pointed.

Very rare. In woods on chalk or limestone, in the south of England and Wales. May—July. Perennial.

XI. FORGET-ME-NOT. (MYOSOTIS. Linn.)—Flowers small, pink in bud, and becoming blue, or rarely yellow, with a yellow eye, and white scales, in 1-sided clusters coiled in bud, in the axils of the upper leaves and terminating the stem (scorpioid racemes). Calyx of 5 sepals, more or less united at the base and separating into 5 lobes, free from and inserted below the seedcase



EVERGREEN
ALKANET,

SMALL
BUGLOSS.

COMMON
ECHINWELL
GREY
MILLET,

ANCHUSA
SEMPERVIRENS.

COM-
MON
LUNGWORT,
PULMONARIA
OFFICINALIS.

LYTHOSPHEMUM
OFFICINALE.

LYCOPSIS
ARVENSIS



(inferior); corolla of 5 petals, salver-shaped, united into a short straight tube and spreading into a flat 5-lobed limb, twisted in bud, the throat of the tube nearly closed with 5 blunt scales, inserted below the seedcase (hypogynous); stamens 5, very short, included in and inserted upon the corolla-tube (epi-petalous); carpels 2, with the style undivided; fruit of 4 little nuts, smooth, and attached at the base to the flat receptacle. Softly hairy or nearly smooth herbs, rather weak and straggling, with alternate undivided leaves.

Calyx never divided more than halfway down; hairs on calyx close-pressed and straight.

- (1) Great Water Forget-me-not. (*Myosótis scorpioides*.)—Flowers $\frac{1}{2}$ inch across; calyx divided one-third down into short broad teeth, which are erect in fruit; style as long as calyx.
- (2) Creeping Water Forget-me-not. (*Myosótis répens*.)—Flowers $\frac{1}{3}$ inch across; calyx divided halfway down into narrow pointed teeth, which are spreading in fruit; style not quite as long as calyx.
- (3) Tufted Water Forget-me-not. (*Myosótis cæspitósa*.)—Flowers $\frac{1}{6}$ inch across; calyx divided nearly halfway down into short blunt teeth, which are slightly spreading in fruit; style half as long as calyx.

Calyx deeply divided; with spreading and hooked hairs.

- (4) Wood Forget-me-not. (*Myosótis sylvat'ica*.)—Flowers $\frac{1}{3}$ inch across; calyx-teeth erect in fruit; corolla-limb flat, lobes entire; style not quite as long as calyx.
- (5) Alpine Forget-me-not. (*Myosótis pyrenáica*.)—Flowers $\frac{1}{2}$ inch across; calyx-teeth spreading in fruit; style rather more than half as long as calyx.
- (6) Field Forget-me-not. (*Myosótis arven'sis*.)—Flowers small; calyx-teeth erect in fruit; corolla-limb often concave; style less than half as long as calyx.
- (7) Dwarf Forget-me-not. (*Myosótis collína*.)—Flowers minute, not pink in bud, with a solitary flower some distance below the others in the axil of the uppermost leaf; calyx-teeth spreading in fruit; style rather more than half as long as calyx.
- (8) Parti-coloured Forget-me-not. (*Myosótis versic'olor*.)—Flowers very small, yellow, becoming blue; calyx-teeth closed over fruit; style nearly as long as calyx.

1. Great Water Forget-me-not. (*Myosótis scorpioides*. Linn.)—As just described. The flowers large, about $\frac{1}{2}$ inch across, of a brilliant opaque blue with white scales and a yellow eye, in leafless forked 1-sided clusters, coiled in bud, terminating the stem and branches; the calyx is widely bell-shaped, divided about one-third down into short broad teeth, erect in fruit, and clothed with straight close-pressed hairs; the corolla-tube is much shorter than the spreading limb, the lobes of which are slightly notched; the style is about as long as the calyx; the stems are 6-18 inches high, weak, but ascending, angular, smooth, or with spreading hairs; the leaves oblong, blunt, ending in an abrupt point, the upper narrower, stalkless (sessile), and running down the stem (decurent), and the lower broader and gradually narrowing into a stalk, thinly coated with hairs which are pressed against the leaf (adpressed). The root sends out numerous stout rootlets (stolons) in the autumn. The whole plant is light green and somewhat shining. (*Myosotis palustris*. Hill.) [Plate 19]

Common. In wet ditches and marshes, and by the side of water, all through the British Isles May—September. Perennial.

2. Creeping Water Forget-me-not. (*Myosotis répens.* G. and D. Don.)—A very similar species with rather smaller flowers, $\frac{1}{3}$ inch across, with the calyx more deeply divided, about halfway down, into narrow pointed teeth spreading in fruit, and the style not quite so long as the calyx; the flower-clusters are usually slightly leafy; the leaves pointed; and the whole plant more hairy, dull green, and not shining. (*Under Myosotis palustris.* Benth. and Hook.) Common. In ditches and wet places in Scotland and Ireland, not so plentiful in England. June—August. Perennial.

3. Tufted Water Forget-me-not. (*Myosotis cæspitosa.* F. Schultz.)—Another similar species to the Great Water Forget-me-not (*Myosotis scorpioides*), but with smaller flowers $\frac{1}{4}$ inch across, in clusters with a leaf at the base of each cluster; the calyx divided nearly halfway down into narrow bluntish teeth slightly spreading in fruit; the corolla-tube about as long as the width of the corolla-limb; the style half as long as the calyx; the leaves blunt; the root without enlarged rootlets (stolons); and the whole plant light green and rather shining, though clothed with close pressed hairs. (*Under Myosotis palustris.* Benth. and Hook.) Common. In ditches and wet places; generally distributed throughout the British Isles. May—August. Perennial.

4. Wood Forget-me-not. (*Myosotis sylvatica.* Hoffm.)—A somewhat similar species to the Great Water Forget-me-not (*Myosotis scorpioides*) but with flowers only $\frac{3}{8}$ inch across, the calyx with numerous spreading hooked hairs, and divided nearly to the base into narrow teeth which are erect in fruit; the corolla-limb twice as wide across as the tube is long, the lobes entire, not notched; and the style not quite as long as the calyx. The stems are numerous, roughly hairy, with barren tufts; the leaves are oblong lance-shaped, and thickly covered with short stiff spreading hairs; the root is not creeping and does not give off thick rootlets (stolons); and the whole plant is of a dull green. [Plate 19.

Rare. In woods and shady places; widely distributed but rare in England, more common in the south of Scotland, but not found north of Forfarshire. May—September. Perennial.

5. Alpine or Mountain Forget-me-not. (*Myosotis pyrenæica.* Pourr.)—A similar species to the last, the Wood Forget-me-not (*Myosotis sylvatica*), but with larger flowers, about $\frac{1}{2}$ inch across, of a darker brilliant blue, sweet-scented in the evening; the calyx-teeth spreading in fruit; shorter styles, half the length of the calyx; and shorter and densely tufted stems. (*Under Myosotis sylvatica.* Benth. and Hook.)

Very rare. Limestone and mica-slate rocks on high mountains in Teesdale, Westmorland, and Perthshire. July—August. Perennial.

6. Field Forget-me-not. (*Myosotis arven'sis.* Lam.)—The flowers vary very much in size and colour; they are from $\frac{1}{8}$ to nearly $\frac{1}{4}$ inch across, and though sometimes bright blue, at other times they are very pale and unnoticeable. The calyx is deeply divided, as in the Wood Forget-me-not, into narrow, pointed teeth with hooked hairs, erect in fruit; the corolla has a short, often concave limb, and the tube is shorter than, or only just as long as, the calyx; the style is less than half as long as the calyx; the stem is weak and straggling, and is 6–18 inches high, the leaves are rather narrow, and the whole plant is rough with spreading bristles. [Plate 19.

Very common. Cultivated fields and waste places all over the British Isles. June—October. Annual.

7. Dwarf Forget-me-not. (*Myosotis collina.* Hoffm.)—A remarkably small species with very small deep blue flowers which are scarcely at all pink in bud, and terminate a leafless stem long in comparison with the rest of the plant; the lowest flower is usually separated from all the rest, and is low down the stem or in the axil of the uppermost leaf. The calyx-teeth are deeply



GREAT WATER FORGET-ME-NOT

WOOD FORGET-ME-NOT

DWARF FORGET-ME-NOT
MYOSOTIS COLLINA

MYOSOTIS SCORPIOIDES

FIELD FORGET-ME-NOT or SCORPION GRASS

VERY COLOURED FORGET-ME-NOT

MYOSOTIS SYLVATICA

MYOSOTIS PERSICOLTA

MYOSOTIS ARVENSIS

divided and spread in fruit. The stems are usually only 2-3, seldom more than 6 inches high, and the leafy part of the stem is very short in comparison with the flowering stem. [Plate 19. Common. On heaths, dry banks, waysides, wall-tops, and waste ground; generally distributed in England, also in Scotland except in the north, only recorded from the east of Ireland. April—July. Annual.

8. Parti-coloured Forget-me-not. (*Myosotis versicolor*. Reichb.)—A species somewhat similar to the Field Forget-me-not (*Myosotis arvensis*), but with the flowers always pale yellow when they first open, and sometimes changing to pale blue; the calyx-teeth closing quite over the fruit after flowering; the style nearly as long as the calyx; the whole plant, however, is only from 3 inches to about 1 foot high, and is weaker and less hairy than that of the Field Forget-me-not.

[Plate 19. Common. On dry banks, waysides, wall-tops, cultivated and waste ground, throughout the British Isles. April—June. Annual.

THE CONVULVULUS FAMILY

[ORDER LIII. CONVULVULACEÆ]

CALYX of 5 **SEPALS**, often very unequal, remaining with the fruit (persistent), free from and inserted below the seedcase (inferior).

COROLLA of 4 or 5 **PETALS**, united almost up to the top into a bell-shaped or funnel-shaped tube and dividing into the same number of short lobes, plaited and twisted in bud, inserted below the seedcase (hypogynous).

STAMENS 4 or 5, the same number as the petals, inserted on the base of the corolla-tube (epi-petalous).

PISTIL of 2-4 **CARPELS** united into a seedcase with the same number of cells, a simple style, and 1 or 2 stigmas, entire or 2-lobed.

FRUIT a capsule, 1-4-celled, with a few seeds, often a solitary one, in each cell, opening by valves or bursting transversely.

FLOWERS usually large and very beautiful, generally growing singly or several together in the axils of the leaves, when they usually have 2 large or small bracts at the base of each flower, or in dense heads.

STEMS usually twining and climbing up other plants, often having a milky juice.

LEAVES alternate and without stipules, or absent.

DISTINGUISHED by the corolla being folded longitudinally and twisted; and the seedcase having 1 or 2 erect seeds in each cell. Climbing herbs sometimes parasitic.

THE Convolvulus Family is a large one and is widely spread over the temperate and tropical parts of the world. Most of its members are climbing plants with heart-shaped leaves and large beautiful flowers which are often trumpet-shaped, though some are thread-like parasites with small dense heads of waxy, unpleasant scented flowers.

Some of the tropical species provide our greenhouses with exquisite climbers, such as the Common Morning Glory (*Ipomœa purpurea*). *Ipomœa Batatas*—the sweet potato—is largely cultivated for its edible roots. Several members of the order are employed in medicine—the milky juice in the roots of *Convolvulus Scammonia*, a native of Syria, yields scammony, and some beautiful Mexican climbers, *Ipomœa Purga* being one, yield jalap.

I. **BINDWEED (CALYSTÉGIA)**. Flowers large, solitary, trumpet-shaped; bracts large, embracing the calyx; stigmas oblong or egg-shaped; capsule indistinctly 2-celled.

II. **BINDWEED (CONVOL'VULUS)**. Flowers large, 1-6, but usually 2 together, trumpet-shaped; bracts small, distant from the calyx; stigmas long and narrow; capsule distinctly 2-celled.

III. **DODDER (CUSCÚTA)**. Flowers small, in heads, bell-shaped; corolla-tube with 5 small scales; stigmas 2; leafless parasites with numerous thread-like branches.





I. BINDWEED. (CALYSTÉGIA. R. Brown.)—Flowers showy, trumpet-shaped, blue, purple, pink, white, or pale yellow, solitary in the axils of the leaves, with 2 large leaf-like bracts embracing the base of each flower and nearly hiding the calyx. Calyx of 5 sepals, free or partially united, often unequal, free from and inserted below the seedcase (inferior); corolla of 5 petals, united almost to the top into a trumpet-shaped tube with 5 shallow lobes, 5-plaited, inserted below the seedcase (hypogynous); stamens 5, inserted in the corolla-tube (epi-petalous); carpels 2, with a single style and 2 stigmas; fruit a capsule, 2-celled below and 1-celled at the top, each cell containing 1 or 2 large seeds, decaying to free the seeds, or opening by 2 valves united at the top. Slender twining or prostrate herbs with a milky juice.

- (1) Great Bindweed. (*Calystégia sépium*.)—Flowers 2 inches across, pure white; bracts pointed, heart-shaped at base; stigmas egg-shaped or oblong; leaves large, long, and pointed; stems long, climbing.
- (2) Sea Bindweed. (*Calystégia Soldanel'la*.)—Flowers 1½ inches across, pink; bracts blunt, egg-shaped; stigmas longer and more pointed; leaves small, short and blunt; stems short, not climbing.

1. Great Bindweed, Large Wild Convolvulus. (*Calystégia sépium*. R. Brown.)—As just described. A weed well known for the beauty of its large pure white flowers, its twisting stem which often strangles the plant on which it climbs, and its white fleshy root, which creeps at a considerable depth in the soil, and is extremely difficult to get rid of where it is once well established. The flowers are often 2 inches across and are borne on square stalks; the bracts are heart-shaped (cordate) and pointed, and are as large as or larger than the sepals, and completely envelop the flower when in bud; the stigmas are oblong or egg-shaped; the stem often climbs to the height of 5 feet; and the leaves are large, egg-shaped, triangular, and arrow-shaped at the base. (*Volvulus sepium*. Junger; *Convolvulus sepium*. Linn.) [Plate 20.]

Common. In fields, cultivated and waste ground, hedges, and bushy places; very common in England and Ireland, local in Scotland. June—October. Perennial.

2. Sea Bindweed or Convolvulus. (*Calystégia Soldanel'la*. R. Brown.)—A species with similar-shaped flowers to the last, about 1½ inches across, pale rose-colour with crimson or yellow stripes, on square winged stalks, with blunt egg-shaped bracts below each flower; the stigmas longer and more pointed; the stems not twining or climbing, prostrate, often only a few inches long; the leaves small, fleshy, roundish or kidney-shaped, with round or angular lobes at the base; and the root slender and creeping to a considerable length in the sand. (*Volvulus Soldanella*. Junger; *Convolvulus Soldanella*. Linn.)

Not uncommon on sandy sea-shores in England, Ireland, and southern Scotland. June—August. Perennial.

II. BINDWEED. (CONVOLVULUS. Linn.)—A genus chiefly differing from the last in having 2 small bracts low down on the flowering stalk instead of large ones enveloping the calyx, and in the capsule being definitely 2-celled.

Lesser Bindweed, Field Convolvulus. (*Convolvulus arven'sis*. Linn.)—The only British species. A little plant as well known for its destructive twining stems and creeping roots as the Great Bindweed. The flowers are smaller, 1–1¼ inches across, and with a shorter tube, pale pink or white, with darker red stripes, usually 2 together in the axils of the leaves, sometimes only 1, and rarely 3–6; the 2 bracts are narrow and small, about halfway down the flowering stalk; the stigmas are long and narrow, both longer and narrower than in the Sea

WILD FLOWERS OF THE BRITISH ISLES

Convolvulus (*Volvulus Soldanella*). The stems are twining, trailing along the ground or climbing 2 or 3 feet high by twisting round surrounding plants; the leaves are egg-shaped (ovate), abruptly pointed at the tip, and arrow-shaped (sagittate) at the base; the roots are creeping, and are as difficult to eradicate as those of the Great Bindweed. [Plate 20.

Very common. In fields, cultivated ground, waste places, and waysides; a troublesome weed in England and Ireland, local in Scotland. June—October. Perennial.

III. DODDER. (CUSCÚTA. Linn.)—Flowers small, bell-shaped, white, pink, or flesh-colour, in clusters or heads. Calyx of 4–5 sepals, only united at the base, coloured like petals (petaloid), free from and inserted below the seedcase (inferior); corolla of 4–5 petals, united into a tube and separating into the same number of lobes, with 5 small scales between or below the stamens, remaining with the fruit (persistent), inserted below the seedcase (hypogynous); stamens 4 or 5, inserted in the upper half of the corolla-tube (epi-petalous); carpels 2, with 2 styles, or rarely only 1, and double the number of stigmas; fruit a roundish capsule, 2-celled with 2 seeds in each cell, opening transversely by lids. Leafless annuals with thread-like generally red stems, which twine round other plants to which they attach themselves by false roots and obtain their nutrition from them, severing their connection with the ground (parasites).

Scales in corolla-tube minute; stamens and style included in corolla-tube.

- (1) Greater Dodder. (*Cuscúta europæa*.)—Sepals blunt, shorter than the corolla-tube; corolla-tube cylindrical in flower, only inflated in fruit; scales notched, with rounded spaces between.
- (2) *Flax Dodder. (*Cuscúta Epilinum*.)—Sepals pointed, nearly as long as the corolla-tube; corolla-tube inflated in flower and fruit; scales toothed.

Scales large and prominent, almost closing the corolla-tube; stamens and style slightly protruding beyond the corolla-tube.

- (3) Lesser Dodder. (*Cuscúta Epithymum*.)—Sepals pointed, shorter than the corolla-tube, red; corolla-tube cylindrical in flower, inflated in fruit, scales large, toothed, separated from one another by narrow acute spaces.
- (4) *Clover Dodder. (*Cuscúta Trifolii*.)—Sepals pointed, as long as the corolla-tube, tipped with red; corolla-tube cylindrical in flower, inflated in fruit, scales toothed, separated from one another by wide rounded spaces.

1. Greater Dodder. (*Cuscúta europæa*. Linn.)—As just described. The flowers are very small, yellowish, reddening in some situations, stalkless or on short stalks, clustered together into compact, round, stalkless heads. The sepals are blunt, sometimes only 4 in number, shorter than the corolla-tube, yellowish-white; the corolla-tube is cylindrical at first and becomes inflated in fruit, the lobes are short and broad, and the scales are minute, short, and notched; the stamens are included in the corolla-tube; and there are 2 stigmas which are also included in the corolla-tube. The stems are much branched, greenish-yellow, or reddish.

Rather rare. A parasite found on nettles, thistles, vetches, hop, &c. Sparingly distributed over England, not found north of York, nor in Scotland or Ireland. July—September. Annual.

2. *Flax Dodder. (*Cuscúta Epilinum*. Weihe.)—A species differing from the last in having rather larger, more fleshy, greenish-white flowers, which are, however, fewer in each

cluster, so making the whole flower-head smaller; the sepals are pointed, and are nearly as long as the corolla-tube; the corolla-tube is inflated in flower, and the minute scales are fringed.

All these species are most injurious, this one especially to flax, exclusively on which it is said to grow. The rapidity and luxuriance of their growth makes them dreaded enemies to the growers of the crops on which they feed, as in a week or two a small patch will have extended over several square yards, covering all the surrounding plants, into which they thrust their little suckers, with a tangled mass of green or red thread-like stems, bearing at intervals their round heads of beautiful white or flesh-coloured waxy little flowers, which, however, belie their beauty and testify to their parasitic habits in the unpleasant smell they emit.

Not a native. Introduced into England where flax is cultivated. July—August. Annual.

3. Lesser Dodder. (*Cuscuta Epithymum*. Murray.)—A similar species to the Greater Dodder (*Cuscuta europæa*), but somewhat more delicate and smaller; the flower-heads are similar in their compactness and roundness, but they are smaller, and the individual flowers are only about half as large and are white tinged with pink; the sepals are pointed and red, shorter than the corolla-tube; the lobes of the corolla-limb are pointed and spreading, and the scales in the tube are very large, fringed, incurved, nearly closing the tube, and almost concealing the seedcase, just separated from one another by narrow acute spaces; the stamens and 2 stigmas protrude slightly. The stems are thread-like and red and are much finer than those of the Greater Dodder (*Cuscuta europæa*), though it is the large scales which at once distinguish this from the preceding species. [Plate 20.

Not uncommon. A parasite found on gorse, heath, and thyme throughout England and on into southern Scotland; not recorded from Ireland. July—October. Annual.

4. *Clover Dodder. (*Cuscuta Trifolii*. Babington.)—A very similar species to the last, the Lesser Dodder (*Cuscuta Epithymum*), and by some botanists considered probably as a variety. It has larger flowers and flower-heads; the sepals are only tipped with red; the scales separated widely from one another by rounded cup-like spaces; and the stems form much closer coils, strangling and killing the clover, whereas the Lesser Dodder may be seen for years on the same bushes of gorse and heather and doing them comparatively little harm, which fact is, however, probably due to the strong herbaceous stems of these plants.

Not a native. Introduced with clover, upon which it chiefly preys. July—September. Annual.

THE NIGHTSHADE FAMILY

[ORDER LIV. SOLANACEÆ]

CALYX of 5, rarely 4 or 10 **SEPALS**, usually only united at the base, remaining with the fruit (persistent); free from and inserted below the seedcase (inferior).

COROLLA of 5, rarely 4 or 10 **PETALS**, united into a short tube and spreading into a limb with the same number of equal or nearly equal lobes, plaited in bud, star-like (rotate), salver-shaped or bell-shaped (campanulate), inserted below the seedcase (hypogynous).

STAMENS 5, rarely 4 or 10, as many as the petals and alternating with them, inserted in the corolla-tube (epi-petalous), the anthers opening to free their pollen by pores at the apex or by slits along their inner surface.

PISTIL of 2 **CARPELS**, placed obliquely, uniting into a seedcase and a single style crowned with an entire stigma.

FRUIT a berry or capsule, 2-celled, rarely incompletely 4-celled, with several seeds in each cell attached to a central column (placenta), the berry decaying to free the seeds (indehiscent), the capsule opening from the top by valves or splitting cross-wise and opening transversely by a lid.

FLOWERS showy, solitary, or in forked clusters with the central flower opening first (cymes).

STEMS often with gland-tipped hairs and sometimes with prickles.

LEAVES alternate, often with a smaller leaf in the axil, without stipules.

DISTINGUISHED by the usually regular, 5-lobed corolla, plaited in bud, the 5 stamens, and the oblique position of the carpels, the superior 2-celled ovary, and the alternate leaves.

THE Nightshade Family is a very important one, found in all the temperate parts of the world, though it is most abundant in the tropics.

Many species belonging to tropical or subtropical countries are cultivated in greenhouses and gardens. The Duke of Argyll's Tea-tree (*Lycium chinense*) makes a beautiful hedge or is successful as a creeper; the Tobacco-plant with its sweet-scented tubular flowers, Petunias, Winter Cherry (*Physalis Alkekengi*), Nierembergia, Cestrums, Fabianas, and Nolas all add to the beauty of house and garden. An interesting member of this family is the mandrake (*Mandragora officinalis*), concerning whose roots the fable was told that they shrieked if torn from the earth.

Taken altogether this is one of the most poisonous orders, though it contains a few notable exceptions, one being the Potato (*Solanum tuberosum*), a native of Chili, which was introduced into Spain towards the end of the 16th century, then planted by Sir Walter Raleigh in his estate at Youghal, Co. Cork, and so finding its way into England. Another useful vegetable is the Tomato (*Lycopersicum esculentum*), which is now such a favourite food, and yet less than 100 years ago was believed by botanists to be poisonous unless cooked. The Egg-plant (*Solanum Melongena*) was much used in cooking, especially in France. Cayenne pepper is obtained by grinding the dried fruits of the Capsicum. Another vastly important genus is the Nicotiana—the



DEADLY NIGHTSHADE

pistil

corolla & stamen

calyx

WOODY NIGHTSHADE
SOLANUM DUCAMARA

DEADLY NIGHTSHADE
SOLANUM PUBESENTISSIMUM



Tobacco-plant—which was introduced into Europe about the same time as the Potato, and whose dried leaves provide us with tobacco. Many species are valuable in medicine: *Atropa Belladonna* produces atropine, a substance which has the power of dilating the pupil of the eye and contracting the iris, and is used by oculists; Henbane (*Hyoscyamus niger*) is a powerful narcotic; and the dried leaves of the Thorn Apple (*Datura Stramonium*), made into cigarettes and inhaled, frequently relieve asthma.

Fruit a juicy berry.

- I. NIGHTSHADE (*SOLÁNUM*). Flowers small; corolla star-like (rotate) with a short tube; anthers uniting into an erect cone round the style, each opening at the top by pores; berry roundish.
- II. DEADLY NIGHTSHADE (*AT'ROPA*). Flowers large; corolla bell-shaped with a long tube; anthers opening lengthwise; berry roundish.
- III. *TEA-PLANT (*LÝCIUM*). Flowers small; corolla funnel-shaped with a long tube and spreading lobes; anthers opening lengthwise; berry narrowly oval, pointed.

Fruit a dry capsule.

- IV. *THORN APPLE (*DATÚRA*). Flowers very large; corolla funnel-shaped with a long angular tube; anthers opening lengthwise; capsule generally prickly, imperfectly 4-celled, opening from the top by 4 valves.
- V. HENBANE (*HYOSCÝAMUS*). Flowers large; corolla funnel-shaped with a long tube; anthers opening lengthwise; capsule 2-celled, splitting crosswise and opening by the falling back of the short lid-like upper part.

I. NIGHTSHADE. (*SOLÁNUM*. Linn.)—Flowers white or purple, rarely yellow, in loose, forked clusters, the central flower opening first (cymes). Calyx of 5, rarely 10 sepals, united at the base, free from and inserted below the seedcase (inferior); corolla of 5, rarely 10 petals, star-like (rotate), united into a short tube and spreading into a limb with the same number of lobes, which are often reflexed, inserted below the seedcase (hypogynous); stamens 5, rarely more, with the filaments very short, and the anthers united into a cone round the style, each anther opening by 2 pores at the top, inserted in the throat of and protruding beyond the corolla-tube (epipetalous); carpels 2, with a single style and stigma; fruit a 2- or imperfectly 4-celled fleshy berry, many-seeded, decaying to free the seeds (indehiscent). Herbs or shrubs, or, in exotic species, low trees, with alternate leaves, those near the flowers in pairs, consisting of one large and one smaller leaf.

- (1) Woody Nightshade. (*Solánium Dulcamára*.)—Flowers purple, in forked clusters; fruit oval, red; stems climbing; upper leaves lobed; root creeping.
- (2) Black Nightshade. (*Solánium nígrum*.)—Flowers white, almost in umbels; fruit round, usually black; stems erect; leaves undivided; root not creeping.

1. Woody Nightshade, Bitter-sweet. (*Solánium Dulcamára*. Linn.)—As just described. The flowers are about $\frac{1}{2}$ inch across, in loose, forked, drooping clusters (cymes); the 5 petals are strongly reflexed, purple, each having 2 green spots at the base; the 5 anthers are bright yellow, united into a cone round the style; the berries are oval, fleshy, and of a rosy-scarlet; the stems are climbing or trailing, 3-6 feet or more long, supporting and raising themselves on the surrounding plants, shrubby at the base; the leaves are egg-shaped, pointed, stalked, usually broadly heart-shaped (cordate) at the base, and entire, the upper ones with a small lobe on each side at the base; and the root is creeping.

[Plate 21.]

A variety—*Solanum maritimum*. Bab.—with the leaves and young stems fleshy, usually clothed with curved-in hairs, and with the stem prostrate and profusely branched, occurs on shingly sea-shores in the south of England and the west of Ireland.

Common. In hedges and moist shady places, generally distributed over England and Ireland, more rare in Scotland. June—August. Perennial.

2. Black Nightshade. (*Solanum nigrum*. Linn.)—A species differing from the last in having smaller, white flowers, $\frac{1}{4}$ – $\frac{3}{8}$ inch across, in clusters (cymes), with the stalks so close together as to appear to start all from the same point (umbels); the berries round, usually black, but rarely yellow or red; the stems erect, about 1 foot high, with many spreading branches; the leaves egg-shaped (ovate), stalked, wavy, bluntly toothed; and the root not creeping.

Fairly common. Cultivated ground, waste places, &c.; common in the south of England, less so in the north, and local in Scotland and Ireland. July—October. Perennial.

II. DEADLY NIGHTSHADE. (*ATROPA*. Linn.)—A genus consisting of the one following species, according to some botanists, though others include several foreign herbs and shrubs.

Deadly Nightshade. (*Atropa Belladonna*. Linn.)—The flowers, which are remarkable, are 1 inch long, bell-shaped, of a lurid purple tinged with green, stalked, drooping, and solitary in the axils of the leaves and the forks of the branches. Calyx of 5 sepals, united at the base, broadly bell-shaped, remaining with the fruit, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a long bell-shaped tube and separating into 5 short, broad, slightly unequal spreading lobes, veined, inserted below the seedcase (hypogynous); stamens 5, the filaments long, the anthers whitish and opening lengthwise by slits, not quite as long as the corolla, inserted on the base of the corolla-tube (epi-petalous); the style very long and protruding; the fruit a large roundish, 2-celled, purplish-black berry, highly poisonous; the stems erect, 2–4 feet high, thick, much branched; the leaves large, broadly egg-shaped (ovate), stalked, those of the upper branches with a small leaf, looking almost like a bract, rising from the same point as the large leaf, so that the leaves are placed in unequal pairs alternately from opposite sides of the stem; and the root is thick and fleshy, and gives off numerous thick rootlets (stolons). This is the most dangerous plant we have native to our isles. It is a virulent poison and many deaths have followed on eating the berries, but it must be noted that every part of the plant is poisonous. It is useful in medicine, and is much used by oculists, as it possesses the power of contracting the iris and dilating the pupil of the eye. [Plate 21.

Rare. In waste places and especially among old ruins in chalk and limestone districts. June—August. Perennial.

III. *TEA-PLANT. (*Lycium*. Linn.)—Flowers rather small, stalked, in clusters in the axils of the leaves. Calyx of 2–5 sepals, bell-shaped, remaining with and enclosing the base of the fruit, free from and inserted below the seedcase (inferior); corolla of 5 petals, united into a long tube and separating into a 5-lobed spreading limb, funnel-shaped or salver-shaped, inserted below the seedcase (hypogynous); stamens 5, with long filaments, and anthers opening lengthwise by slits, protruding or included, inserted in the middle or near the base of the corolla-tube (epi-petalous); carpels 2, with a single style and stigma; fruit a 2-celled berry, with several seeds. Shrubs, often spiny, with alternate undivided entire leaves.

***Duke of Argyll's Tea-tree.** (*Lycium chinense*. Miller.)—As just described. The only species found in the British Isles, but not a native. The flowers are $\frac{1}{2}$ inch across, purple, with a pale green throat which is streaked with darker purple; the stamens with fawn-coloured anthers, protruding, inserted in the upper part of the corolla-tube; the berry long, bright red,



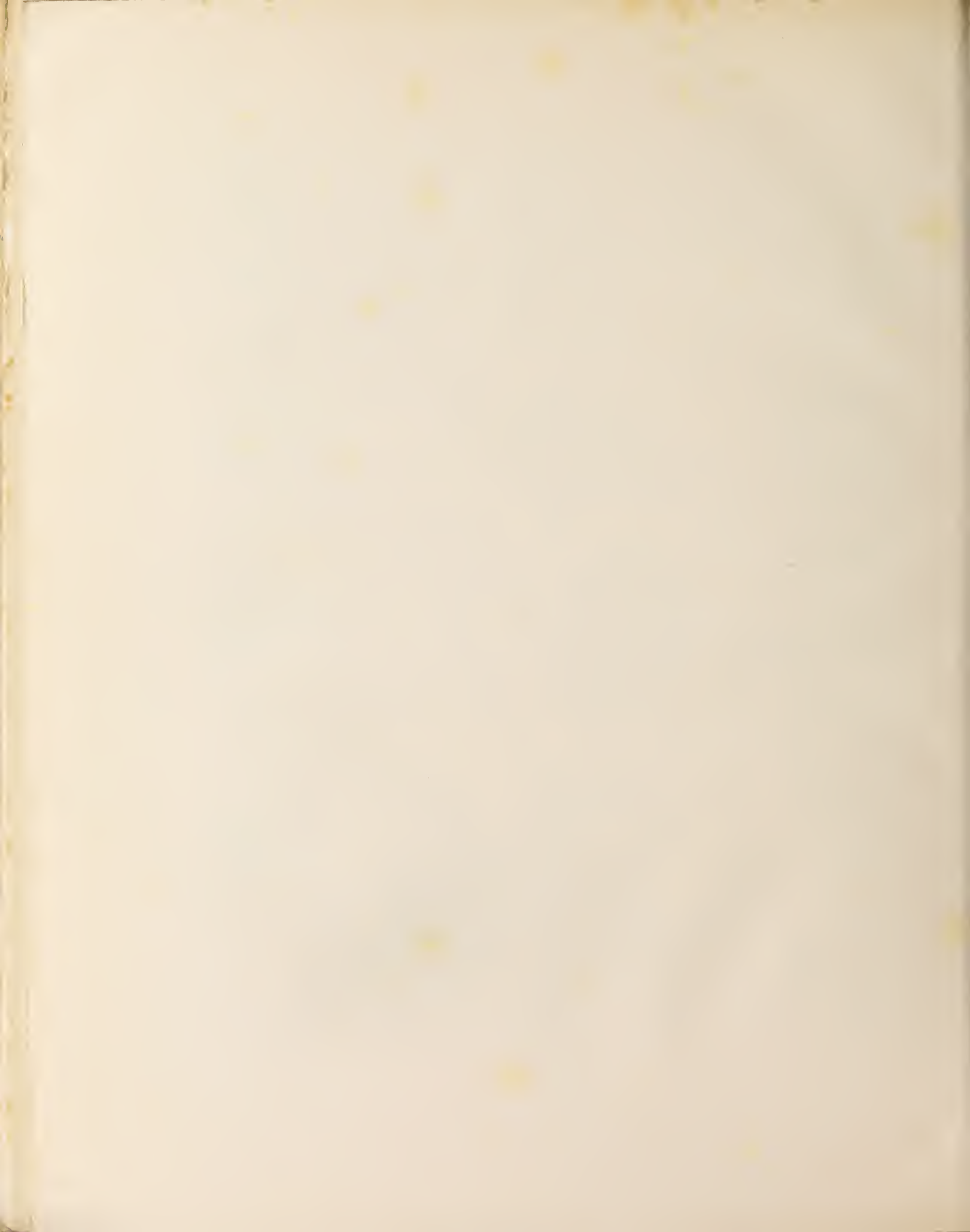
DUKE
OF ARGYLLS
TEA TREE,

LYCIUM CHINENSE.

THORN APPLE,
DATURA STRAMONIUM.

COMMON
HENBANE.

HYOSCYAMUS NIGER.



embraced at the base by the persistent calyx ; the stems are long and slender, sometimes spiny, arching, or straggling on other shrubs ; and the leaves are lance-shaped, smooth, often with small leaves in their axils. [Plate 22.]

Naturalised on the south and south-east coasts of England in hedges and waste places. June—August. Perennial.

IV. *DATÚRA. Linn.—Flowers usually large, white, purple, or red, solitary. Calyx of 5 sepals, united into a long 5-sided tube and separating into 5 short teeth, only the lower part of the tube remaining with the fruit, free from and inserted below the seedcase (inferior) ; corolla of 5 or 10 petals, united into an angular funnel-shaped tube, with the same number of lobes, inserted below the seedcase (hypogynous) ; stamens 5, the anthers opening lengthwise by slits, inserted in the corolla-tube (epi-petalous) ; carpels 2 ; fruit a leathery, many-seeded capsule, generally prickly, 2-celled, each cell being partially divided, opening at the top by 4 valves. Herbs or soft-wooded shrubs.

***Thorn Apple. (Datúra Stramónium.** Linn.)—The only species found in the British Isles, but an alien. As just described. The funnel-shaped flowers are very large, 1½–2 inches long, and are solitary in the axils of the uppermost leaves and the forks of the stem ; the capsule is roundish and is covered with numerous erect, pointed spines ; the thick fleshy stems are from 6 inches to 3 feet high ; and the leaves are large, egg-shaped, smooth, with irregular pointed teeth or lobes.

The whole plant is poisonous, but, as is usual, the fruit with the seeds appears to be more deadly than the other parts, though it is in all respects a very dangerous species. Symptoms of poison have even been observed in people who have sat in a closed room in which have been flowers of the Thorn Apple, and instances of death from eating the seeds have occurred. Its principal use as a medicine is to relieve breathing in asthma cases, for which purpose cigarettes made of the dried leaves are sold. [Plate 22.]

Not a native. Rare. In waste places and cultivated ground ; it has been found in various places throughout England, but does not persist in them. June—July. Perennial.

V. HENBANE. (HYOSCÝAMUS. Linn.)—Flowers yellow or whitish, often veined with purple, in 1-sided clusters coiled in bud (scorpioid racemes). Calyx of 5 sepals, united into a tube and separating at the top into 5 lobes, remaining and increasing in size with the fruit (persistent), free from and inserted below the seedcase (inferior) ; corolla of 5 petals, funnel-shaped, united into a tube, and separating into 5 blunt rather unequal lobes ; stamens 5, the anthers splitting lengthwise, inserted on the base of the calyx-tube (epi-petalous) ; carpels 2 ; fruit a dry 2-celled capsule, many-seeded, smooth, splitting in two crosswise and opening by the falling off of the short upper lid. Herbs with a powerful odour, often sticky.

Common Henbane. (Hyoseýamus níger. Linn.)—The only British species. As just described. The funnel-shaped flowers are very striking, of a dingy yellow or cream, veined with dark purple, in 1-sided clusters coiled in bud ; the lobes of the calyx are prickly ; the stamens have purple anthers ; the stems are 1–3 feet high, erect, and branched ; and the leaves are large, egg-shaped, and deeply toothed, those of the stem stalkless (sessile) and clasping the stem (amplexicaul), and those of the root stalked. The whole plant is sticky and hairy and has a most unpleasant smell.

This species is extremely poisonous and narcotic and is used in medicine. [Plate 22.]

Local. In waste places, dry sandy ground, near old castles ; generally distributed over England and Ireland, more rare in Scotland and not found in the north. May—August. Annual or biennial.

THE FIGWORT FAMILY

[ORDER LV. SCROPHULARIACEÆ]

CALYX of usually 5 **SEPALS**, sometimes 4, united at the base, remaining with the fruit (persistent), free from and inserted below the seedcase (inferior).

COROLLA of 5 **PETALS**, sometimes 4, united into a tube, and dividing into the same number of unequal lobes which are usually 2-lipped (bilabiate), rarely bell-shaped, or tubular, or flat and spreading (rotate), inserted below the seedcase (hypogynous).

STAMENS usually 4, when they are in unequal pairs (didynamous), or 2, or 5 when the 2 outer ones are longer than the other 3, inserted in the corolla-tube (epi-petalous).

PISTIL of 2 **CARPELS** united into a seedcase, 1 style, and a stigma which is usually 2-lobed.

FRUIT a capsule, 2-celled, usually many-seeded, the seeds attached to a central column (placenta), opening to free the seeds by 2, 3, or 4 valves, or by pores.

FLOWERS usually in long clusters (racemes), sometimes solitary.

LEAVES alternate, opposite, or in circles (whorls), without stipules.

DISTINGUISHED by the 2-lipped corolla, 4 stamens in unequal pairs, and the 2-celled capsule, in the British species, with the exception of the Mullein (*Verbascum*) when there are 5 stamens, the Speedwell (*Veronica*) when the corolla is star-like with 4 lobes and there are only 2 stamens, and the rare Mudwort and Cornish Moneywort.

THIS family is characterised by the usually 2-lipped corolla and the 4 stamens in unequal pairs, combined with the 2-celled many-seeded capsule. The Dead-Nettle Family has the first two named peculiarities, but it has a fruit of 4 little nuts (cocca), and so is distinguished from the Figwort Family. The order is a large one and is spread all over the globe in arctic as well as tropical regions, though it is best represented in temperate countries.

Many beautiful foreign species are cultivated in greenhouses and gardens, such as the *Calceolaria*, *Angelonia*, *Alonsoa*, *Maurandia*, *Lophospermum*, *Collinsia*, *Paulownia*, *Torenia*, *Pentstemon*, *Salpiglossis*, *Schizanthus*, *Browallia*, and *Brunsfelsia*; also various Snapdragons (*Antirrhinums*), Speedwells (*Veronicas*), Toad-flax (*Linarias*), and Mulleins (*Verbascums*). Some species have strong medicinal properties. Extracts from the Foxglove (*Digitalis*) and from certain species of Mullein (*Verbascum thapsiforme* and *Verbascum phlomoides*) are included in the pharmacopœia.

Two large orders found only in warmer and tropical regions and very nearly allied to the Figwort Family are the *Bignoniaceæ* and *Acanthaceæ*. The former are in most instances twining plants with very beautiful flowers, and provide our greenhouses and gardens with *Tecomas*, *Gesneras*, *Gloxinias*, the Trumpet Flowers (*Bignonias*), and the Catalpa-tree. The genus *Acanthus*, belonging to the *Acanthaceæ*, inhabits the region of the Mediterranean,

and inspired the Greek and Roman sculptors with many of their finest conventional designs for enriching the capitals of pillars and other parts of their magnificent buildings. The Ruellias and Justicias grown in greenhouses are also members of the Acanthus Family.

Stamens 5, protruding.

I. MULLEIN (VERBAS'CUM). Corolla circular (rotate), 5-lobed, gaping; stamens hairy; capsule opening by 2 valves.

Stamens 4, usually included.

II. *MONKEY-FLOWER (MIM'ULUS). Calyx 5-angled; corolla tubular, 2-lipped, gaping; capsule opening by 2 valves.

III. SNAPDRAGON (ANTIRRH'NUM). Corolla 2-lipped, gaping, pouched; capsule opening by pores.

IV. FIGWORT (SCROPHUL'ARIA). Corolla nearly globular, usually shortly 2-lipped, gaping; capsule opening by 2 valves.

V. MUDWORT (LIMOSÉ'LA). Corolla minute, bell-shaped, gaping, with 5 nearly equal lobes; flowers and leaves all from the root; capsule opening by 2 valves.

VI. CORNISH MONEY-WORT (SIBTHORP'IA). Flowers minute, circular (rotate), with, in the only British species, 4 sepals, and 5 petals; capsule opening by 2 valves.

VII. FOXGLOVE (DIGIT'ALIS). Calyx unequally divided; corolla bell-shaped, gaping, contracted at the base and inflated above; capsule opening by 2 valves.

VIII. TOADFLAX (LIN'ARIA). Corolla 2-lipped, spurred, the tube usually closed by the palate; capsule opening by teeth or pores.

IX. EYE-BRIGHT (EUPHR'ASIA). Calyx 4-lobed; corolla tubular, gaping, 2-lipped, lower lip with 3 deeply notched lobes; capsule 2-valved.

X. BART'SIA. Calyx 4-lobed; corolla tubular, arched, 2-lipped, upper lip erect, arched, entire or slightly notched; capsule 2-valved.

XI. RED-RATTLE (PEDICULAR'IS). Calyx inflated; corolla tubular, arched, gaping, 2-lipped; capsule 2-valved.

XII. YELLOW-RATTLE (RHINAN'THUS). Calyx inflated, 4-lobed; corolla tubular, arched, gaping, 2-lipped; capsule 2-valved.

XIII. COW-WHEAT (MELAMPY'RUM). Calyx 4-toothed; corolla tubular, arched, 2-lipped; the corolla-tube closed by the palate; capsule 2-valved.

Stamens 2, protruding.

XIV. SPEEDWELL (VERON'ICA). Corolla circular (rotate) with 4 unequal spreading lobes; capsule 2-valved.

I. MULLEIN. (VERBAS'CUM. Linn.)—Flowers yellow, white, or rarely purple, solitary or in little clusters, with small bracts at the base, forming erect showy spikes. Calyx of five sepals united at the base, free from and inserted below the seedcase (inferior); corolla circular (rotate), of 5 petals, united at the base into a very short gaping tube and spreading into a circular limb of 5 broad, slightly unequal lobes, inserted below the seedcase (hypogynous); stamens 5, 2 longer than the other 3, with hairy filaments or with 3 hairy and the other 2 smooth (glabrous), inserted in the corolla-tube (epi-petalous); carpels 2, with 1 style, and a pin-head-like (capitate) stigma; fruit a roundish capsule, 2-celled, with many small seeds attached to a central column, opening

from the apex down the cell-walls (septicidally) by 2 valves. Stately, handsome herbs, often very woolly, with alternate leaves, the root-leaves, in the early stages, spreading on the ground like a rosette.

- (1) Great Mullein. (*Verbas'cum Thap'sus.*)—Flower-spike dense, usually unbranched; leaves continued down the stem (decurrent), woolly on both sides.
- (2) Hoary Mullein. (*Verbas'cum pulverulen'tum.*)—Flower-cluster branched (panicle); stamens scarlet, with white hairs; leaves not continued down the stem, very woolly on both sides.
- (3) White Mullein. (*Verbas'cum Lychnítis.*)—Flower-cluster branched; stamens whitish, with white hairs; leaves smooth above, woolly underneath.
- (4) Dark Mullein. (*Verbas'cum nígrum.*)—Flower-cluster usually unbranched; stamens with purple hairs; leaves smooth above, woolly underneath.
- (5) Primrose-leaved Mullein. (*Verbas'cum virgátum.*)—Flowers very large, in a long dense cluster; stamens with purple hairs; leaves green with a few gland-tipped hairs.
- (6) *Moth Mullein. (*Verbas'cum Blattária.*)—Flowers in an interrupted cluster; stamens with purple hairs; leaves green with a few gland-tipped hairs.

1. Great Mullein. (*Verbas'cum Thap'sus.* Linn.)—As just described. The flowers are about 1 inch across, yellow, almost stalkless, in a dense terminal spike; the 2 longer stamens are smooth; the stem is stout, round and woolly, 2-4 feet high, usually unbranched (simple); and the leaves are large, oblong, pointed, slightly scalloped and wavy, thick and softly woolly on both sides, narrowing to the base and running down the stem on either side (decurrent).

[Plate 23.

Common locally. On road- and hill-sides, and in waste places, often found growing with foxgloves; in England, the south of Scotland, and Ireland. June—September. Biennial.

2. Hoary Mullein. (*Verbas'cum pulverulen'tum.* Vill.)—Flowers $\frac{3}{4}$ inch across, bright yellow, shortly stalked, in small clusters up the main stem and branches (panicle); stamens nearly equal, scarlet, with white hairs. [As described in the genus *Mullein* (*Verbas'cum*).] The stem is 2-3 feet high, round, stout, woolly, and much branched; the leaves are large, broadly oblong, slightly scalloped (crenate), softly woolly on both sides, the lower ones shortly stalked and the upper ones stalkless (sessile) and rounded at the base. The whole plant is densely covered with mealy greyish-white starry hairs, which, however, are easily rubbed off. Rare, local. On roadsides and waste places in Norfolk and Suffolk. July. Biennial.

3. White Mullein. (*Verbas'cum Lychnítis.* Linn.)—A similar species with rather smaller flowers, about $\frac{1}{2}$ inch across, pale yellow to white; whitish stamens with all the filaments having white woolly hairs; stem stout, round, 18 inches to 4 feet high, sprinkled with minute white hairs; and the leaves green above and woolly and powdery underneath. Rare, local. On roadsides and waste places in some of the central and southern counties of England. June—August. Biennial.

4. Dark Mullein. (*Verbas'cum nígrum.* Linn.)—Another similar species with bright yellow flowers about $\frac{1}{2}$ inch across, in small clusters up the stem, which is usually unbranched (simple); equal stamens, all clothed with purple hairs; stem 18 inches to 3 feet high, usually unbranched (simple), angular, slightly woolly; and the leaves scalloped (crenate), nearly smooth above and thickly woolly beneath, somewhat heart-shaped (cordate), the root-leaves very large and stalked, graduating into stalkless, small leaves at the top which pass into the flower-bracts.



GREAT
MILLENNIUM
PERNANETHA
THAPSUS.

YELLOW
MONKEY
FLOWER.

fruit.

pistil

sepals.

corolla
& stamens.



Rather rare. On roadsides, waste places, &c., distributed throughout the southern counties of England, and found in the northern counties and Scotland, but there only where introduced. June—October. Biennial.

5. Primrose-leaved Mullein. (*Verbas'cum virgátum*. Stokes.)—Flowers large, 1-1½ inches across, bright yellow, shortly stalked, generally solitary, crowded together up the stem (raceme) and up the branches when they are present (panicle); the stamens with purple hairs. [As described in the genus *Verbasum*.] The stem stout, 2-5 feet high, slightly angular and usually unbranched (simple), clothed with a few glandular hairs; the leaves oblong, doubly toothed, wavy, the upper ones slightly clasping the stem at the base (semi-amplexicaul) or inclined to run down the stem (slightly decurrent). The whole plant is green, and only sparingly clothed with gland-tipped hairs.

Rare. By roadsides and in waste places; generally considered only native in Cornwall, Devon, and Somerset; introduced into other counties and into Ireland. August. Biennial.

6. *Moth Mullein. (*Verbas'cum Blattária*. Linn.)—A similar species to the last, with smaller, yellow or rarely whitish, usually solitary flowers, in the axils of the bracts, forming a more interrupted cluster (raceme); and with a much more slender stem. Neither this species nor the last has the thick woolly down which is so conspicuous on the other species; they are both smooth save for a few gland-tipped hairs, and they are so much alike in all essentials that they are considered as varieties, not separate species, by some botanists.

Rare. By roadsides and in waste places. Possibly wild in the south of England and Wales, occurring in other counties and in the south of Ireland as an escape. July—August. Biennial.

II. *MONKEY-FLOWER. (*MIM'ULUS*. Linn.)—Flowers showy, stalked, solitary in the axils of the leaves, forming terminal leafy flower-clusters (racemes). Calyx of 5 sepals united into a 5-angled tube and separating into 5 teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a gaping tube and separating into 5 broad teeth which are arranged in 2 lips (bilabiate), the upper lip 2-lobed and erect, and the lower one 3-lobed and spreading, inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), included in and inserted upon the corolla-tube (epi-petalous); carpels 2; fruit a capsule, 2-celled, many-seeded, opening by 2 valves from the top down the middle of the cells (loculicidally). Herbs with opposite leaves.

***Yellow Monkey-flower. (*Mim'ulus Langsdorffii*. Donn.)**—Not a native, but established in many parts of the British Isles. As just described. The flowers are 1½-1¾ inches long, funnel-shaped, bright yellow, the tube usually marked with red or brown; the flowering-stems erect, 6-18 inches high, hollow; the leaves egg-shaped (ovate), strongly toothed and veined; and the root creeping. (*Mimulus luteus*. Linn.) [Plate 23.]

A native of North America. On the banks of streams, &c.; naturalised in many parts of England, Scotland, and Ireland. June—September. Perennial.

III. SNAPDRAGON. (*ANTIRR'HÍNUM*. Linn.)—Flowers showy, solitary in the axils of the leaves or in terminal clusters (racemes). Calyx of 5 sepals, united into a tube and separating at the apex into 5 teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a broad tube which is slightly pouched (saccate) on the lower side, but not spurred, and separating into 2 lips (bilabiate), the upper erect and 2-lobed, the lower spreading, 3-lobed, and with a large projecting palate which closes the tube (personate), inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), included in the corolla-tube, on which they are inserted

(epi-petalous); carpels 2; capsule oblique, 2-celled, opening by 2 or 3 pores to free the numerous minute seeds. Herbs with the upper leaves alternate and the lower often opposite.

- (1) *Great Snapdragon. (*Antirrhinum május.*)—Flowers large; calyx-teeth broad and short.
 (2) Corn Snapdragon. (*Antirrhinum Oron'tium.*)—Flowers small; calyx-teeth narrow, and often long.

1. *Great Snapdragon. (*Antirrhinum május.* Linn.)—Not a native. As just described. The flowers are large, $1\frac{1}{2}$ inches long, purplish-rose or white, each flower with a bract at the base, in dense, terminal, spike-like clusters (racemes), the sepals broad and blunt, much shorter than the corolla-tube; the stems 1-2 feet high, stout, and much branched; and the leaves oblong or strap-shaped, entire, and smooth.

This plant is a very common garden favourite and under cultivation it assumes many brilliant colours. When pressed open sideways the flower bears resemblance to the open jaw of some fabulous monster; hence its popular name.

Rare. An escape from cultivation naturalised on old walls, limestone cliffs, and quarries; in the south of England and in Ireland. July—September. Perennial.

2. Corn Snapdragon. (*Antirrhinum Oron'tium.* Linn.)—A much smaller species with similar characteristics; the flowers are, however, small, $\frac{1}{2}$ – $\frac{3}{4}$ inch long, rose-colour, solitary in the axils of the upper leaves, with the calyx-teeth narrow and strap-shaped, often lengthening in fruit so that they resemble the leaves. The stem is from a few inches to 1 foot or more high, slender, branched from the base; and the leaves are narrow.

[Plate 24.

Not common. Cornfields; chiefly in the south and west of England and southern Ireland. July—September. Annual.

IV. FIGWORT. (SCROPHULÁRIA. Linn.)—Flowers rather small, lurid purple to crimson-red, yellow, or green, in clusters up the stem with bracts at the base, the central flower opening first (cymes), forming a spreading, much branched cluster (panicle). Calyx of 5 sepals which are usually united into a tube and separated into 5 teeth, inserted below the seedcase (inferior); corolla nearly round (globose), of 5 petals, united into a short gaping tube, usually 2-lipped (bilabiate), the upper lip larger, 2-lobed, and erect, and the lower with 3 short lobes, of which the 2 side (lateral) ones are often erect and the middle one turned down, inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), included in and inserted upon the corolla-tube (epi-petalous), usually with a fifth imperfect stamen reduced to a scale at the base of the upper lip; carpels 2; capsule 2-celled, with numerous minute seeds, opening from the top by 2 valves down the juncture of the 2 carpels (septicidally). Stout herbs with angular leaves, the lower ones being opposite.

Corolla 2-lipped, with a fifth scale-like stamen.

Stem 4-winged.

- (1) Water Figwort. (*Scrophulária aquat'ica.*)—Scale-like stamen not notched, roundish; bracts narrow; leaves blunt.
 (2) Shade Figwort. (*Scrophulária aláta.*)—Scale-like stamen notched, kidney-shaped; bracts leafy; leaves pointed.

Stem 4-angled.

- (3) Knotted Figwort. (*Scrophulária nodósa.*)—Scale-like stamen slightly notched; stem sharply 4-angled; leaves pointed, doubly toothed; root with knotty tubers.



COMMON
PURPLE
FOXGLOVE

DIGITALIS
PURPUREA

LIMOSELLA
AQUATICA

CORN
SMALL BACON

MONK'S
NUT-
WORT

ANTIRRHINUM
ORONTIUM

WATER
FIGWORT

CUR-
NISH

MOW-
WORT

PARTHENOCISSIS
AQUATICA

ST. PETER'S
EUCLEAS



- (4) Balm-leaved Figwort. (*Scrophularia Scorodonia*.)—Scale-like stamen roundish, entire bracts leafy; stem bluntly 4-angled, hairy; leaves doubly scalloped, wrinkled, and hairy.

Corolla with 4 equal lobes and only 4 stamens.

Stem 4-angled.

- (5) *Yellow Figwort. (*Scrophularia vernalis*.)—Bracts all leaf-like; leaves roundish, doubly scalloped, and hairy.

1. Water Figwort. (*Scrophularia aquatica*. Linn.)—As just described. The flowers are about $\frac{1}{2}$ inch long, maroon to dull crimson, with the tube green, in opposite clusters up the stem (panicle); the imperfect scale-like stamen is roundish; the upper bracts are small and narrow, while the lower ones are leaf-like; the stem is $1\frac{1}{2}$ –5 feet high, stout, 4-angled, and winged; and the leaves are oblong, smooth, scalloped (crenate), blunt, with winged stalks, the lower ones often heart-shaped (cordate) at the base. [Plate 24.

Common. By the sides of pools, streams, ditches, &c.; in England and Ireland. July—September. Perennial.

2. Shade Figwort. (*Scrophularia alata*. Gilib.)—A very similar species to the last, but having slightly smaller and fewer flowers in a looser cluster; the imperfect scale-like stamen notched; the bracts all leaf-like; the stems more broadly winged; and the leaves broader and pointed. (*Scrophularia umbrosa*. Dumortier; *Scrophularia Ehrharti*. Stevens.)

Uncommon, local. In wet places; in a few counties in England, and in a few parts of Scotland. August—September. Perennial.

3. Knotted Figwort. (*Scrophularia nodosa*. Linn.)—Another similar species to the Water Figwort (*Scrophularia aquatica*), but smaller, the flowers green and brown, the imperfect scale-like stamen slightly notched, the stem 2–3 feet high, sharply 4-angled but not winged, the leaves doubly toothed (serrate) and pointed, and the root thick and fleshy, with small knobs or tubers.

Very common. In moist shady places; generally distributed throughout England, Scotland, and Ireland. June—July. Perennial.

4. Balm-leaved Figwort. (*Scrophularia Scorodonia*. Linn.)—Another similar species to the Water Figwort (*Scrophularia aquatica*), differing chiefly in its leafy bracts, its stem which is bluntly 4-angled and not winged, and in its downy leaves which are strongly and doubly scalloped (crenate) and wrinkled; both stem and leaves are hairy.

Rare. In moist shady places; in Cornwall and Devon, Tralee in Co. Kerry, and the Channel Isles. July—August. Perennial.

5. *Yellow Figwort. (*Scrophularia vernalis*. Linn.)—Not a native. A very different species from the last four. The flowers are about $\frac{3}{8}$ inch long, pale yellow, not lipped but with short equal lobes, and without the fifth imperfect stamen; the bracts are all like leaves; the stem is shorter, rarely more than 2 feet high, 4-angled but not winged; the leaves are much rounder and coarsely and doubly scalloped; the whole plant is of a bright pale green and is covered with gland-tipped hairs.

Rare. In waste places and hedges; an escape from cultivation occasionally found in England. April—June. Perennial.

V. MUDWORT. (*LIMOSELLA*. Linn.)—Flowers very minute, white or pinkish, solitary, on stalks rising from the root (scapes). Calyx of 5 sepals, united into a tube and separating into

5 teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a wide bell-shaped (campanulate) gaping tube and separating into 5 equal spreading lobes, inserted below the seedcase (hypogynous); stamens 4, nearly equal, inserted on the corolla-tube (epi-petalous); carpels 2; capsule 1-celled, opening from the top by 2 valves. Small creeping plants growing in wet mud, with narrow leaves all rising from the root (radical).

Common Mudwort. (*Limosel'la aquat'ica*. Linn.)—The only British species. As just described. The minute flowers are white or pink, on fleshy stalks $\frac{1}{2}$ or 1 inch long, hidden away among the relatively long stalks of the entire oval leaves. [Plate 24.

Rare. In wet mud on the borders of ponds, in places which have been covered with water during the winter; in England, Scotland, and Ireland. July—September. Annual.

VI. SIBTHORPIA. Linn.—Flowers minute, yellow or pinkish, stalked, solitary, in the axils of the leaves. Calyx of 4 to 8 spreading sepals, united at the base, free from and inserted below the seedcase (inferior); corolla of as many petals as there are sepals or 1 more, united into a short tube and spreading into a circular limb (rotate) with as many lobes as there are petals, inserted below the seedcase (hypogynous); stamens 4–8, as many as the sepals, 2-celled, inserted on the corolla-tube (epi-petalous); carpels 2, the stigma 2-lobed; capsule 2-celled, many-seeded, flattened, opening from the top down the middle of the cells by 2 valves (loculicidal). Small trailing herbs with stems often rooting at the nodes and roundish stalked leaves either alternate or in circles round the stem (whorls).

Cornish Money-wort. (*Sibthorp'ia europæa*. Linn.)—The only British species. As just described. The minute yellowish-pink flowers are on short stalks in the axils of the leaves; the sepals are 4 in number; the corolla is composed of 5 unequal petals, with the tips bent inwards, yellowish, the 3 larger being marked with pink, scarcely longer than the sepals; the capsule is roundish, of 2 oval lobes. The stems are very slender and thread-like, and form tangled masses, rooting at the nodes; the leaves are on long stalks, round and heart-shaped at the base, or kidney-shaped (reniform), scalloped (crenate), and hairy. The whole plant is of a tender green and is covered with jointed white hairs. [Plate 24.

Rare. In damp shady places, on the banks of springs and small streams; in Cornwall, Devon, Somerset, and Sussex, in one or two places in Wales, southern Ireland, and the Channel Isles. June—October. Perennial.

VII. FOXGLOVE. (*DIGITALIS*. Linn.)—Flowers large, showy, purple, white, or yellow, in a tall, terminal, spike-like cluster (raceme). Calyx of 5 sepals, united into a long tube and separating into 5 short, unequal lobes, inserted below the seedcase (inferior); corolla of 5 petals, united into a large tubular or bell-shaped (campanulate) gaping tube, which is contracted at the base and then becomes much inflated, and is finally indistinctly 4- or 5-lobed, inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs, included in the corolla-tube, on which they are inserted (epi-petalous); carpels 2; capsule conical, 2-celled, opening from the top down the cell-walls (septicidally) by 2 valves, to free the numerous minute seeds. Stout erect herbs with alternate leaves up the stem and a rosette of root-leaves.

Common Purple Foxglove. (*Digitális purpúrea*. Linn.)—The only British species. As just described. The flowers are $1\frac{3}{4}$ – $2\frac{1}{2}$ inches long, drooping, deep rose-colour, hairy and speckled inside with purple dots, solitary on short stalks up the erect stem, forming long stately clusters. The stems are 2–6 feet high, stout, erect, and usually unbranched (simple); the leaves are large, oval, wrinkled, and downy, those from the root having long stalks.

Our popular name of Foxglove for this beautiful plant is a corruption of an old English name, Folks-glove, meaning Fairies' glove, by which the herb was known. The Foxglove is a poisonous plant; the leaves possess strong medicinal properties and a preparation from them is still used in medicine. [Plate 24.]

Very common. Woods, hedges, hillsides, &c., in England, Scotland, and Ireland. June—September. Perennial.

VIII. TOADFLAX. (LINÁRIA. Hill.)—Flowers small, always spurred at the base, solitary in the axils of the leaves, sometimes crowded together forming spike-like clusters. Calyx of 5 sepals, united at the base only, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube which is spurred at the base, and separating into 2 lips (bilabiate), the uppermost 2-lobed, and the lower 3-lobed and with a broad hairy projecting palate which usually closes the tube (personate), inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), included in and inserted upon the corolla-tube; carpels 2; capsule roundish, 2-celled, many-seeded, opening at the top by several teeth or by pores. Herbs with the upper leaves alternate and the lower sometimes opposite.

Flowers solitary in the axils of the leaves.

Leaves broad.

- (1) *Ivy-leaved Toadflax. (*Linária Cymbalária.*)—Flowers lilac and yellow; capsule opening by two 3-toothed valves; leaves roundish, 5-lobed.
- (2) Sharp-leaved Toadflax. (*Linária Elat'ine.*)—Flowers yellow and purple with a long straight spur; capsule opening by 2 pores; leaves halbert-shaped.
- (3) Round-leaved Toadflax. (*Linária spúria.*)—Flowers yellow and purple, with a curved spur; capsule opening by 2 pores; leaves roundish.

Leaves strap-shaped.

- (4) Least Toadflax. (*Linária m'nor.*)—Flowers pale lilac and yellow, with a blunt straight spur, the corolla-tube not closed by the palate.

Flowers in dense terminal clusters.

Leaves strap-shaped; capsules opening by two 3-toothed valves.

- (5) Decumbent Toadflax. (*Linária sup'na.*)—Flowers yellow, few, with a long slender slightly curved spur.
- (6) Jersey Toadflax. (*Linária Pelisseriána.*)—Flowers purple, few; with a long straight spur.
- (7) *Purple Toadflax. (*Linária purpúrea.*)—Flowers purple, numerous, with a long curved spur.
- (8) Striped Toadflax. (*Linária répens.*)—Flowers whitish striped with purple, numerous, with a short straight spur.
- (9) Common Yellow Toadflax. (*Linária vulgáris.*)—Flowers yellow, numerous, with a long straight spur.

1. *Ivy-leaved Toadflax, Mother-of-thousands. (*Linária Cymbalária. Mill.*)—Not a native. As just described. The little flowers are about $\frac{1}{2}$ inch long, solitary on slender stalks in the axils of the leaves; the calyx is purplish, the lips and spur of the corolla are lilac and the palate is yellow, the spur is short; the capsule opens by 2 valves, each of which has 3 short

broad teeth; the stems are 3 inches to 2 feet long, much branched, trailing, juicy, purplish, and smooth, often rooting at the nodes; and the leaves are shiny, fleshy, stalked, roundish-kidney-shaped (reniform) and 5-lobed. [Plate 25.]

Naturalised on old walls and rocks in England, Scotland, and Ireland. Flowers nearly all the year round. Perennial.

2. Sharp-leaved Toadflax or Fluellen. (*Linária elatíne*. Mill.)—Flowers small, with a long straight spur, pale yellow with a purple upper lip, solitary on long slender stalks in the axils of the leaves; capsule opening by 2 pores. [As described in the genus Toadflax (*Linaria*).] The stems are slender, hairy, prostrate, numerous, spreading around from 6 inches to 2 feet; and the hairy leaves are halbert-shaped (hastate) with entire margins.

Frequent. In cornfields and waste places; frequent in the south of England, and found in many other counties, also in Ireland. July—October. Annual.

3. Round-leaved Toadflax or Fluellen. (*Linária spúria*. Mill.)—A very similar species to the last, differing in the flowers being rather larger, the corolla having a curved spur, the whole plant being stouter and more erect, and the leaves broadly egg-shaped or round.

Not common. In cornfields and waste places, in the south and east of England and Ireland. July—October. Annual.

4. Least Toadflax. (*Linária mínor*. Desf.)—Another species with small flowers, $\frac{1}{4}$ inch long, the spur blunt and straight, pale lilac with the lower lip yellowish, solitary on slender stalks in the axils of the leaves. The only British species in which the corolla-tube is not closed by the palate. Capsule opening at the top by 2 semicircular pores, the margins of which are toothed; the stems are 3–18 inches high, wiry and branched; and the leaves are narrow, strap-shaped, and entire. (*Linaria viscida*. Moench.) [Plate 25.]

Not uncommon. In cornfields especially on chalk or sand, in England, Scotland, and Ireland. May—October. Annual.

5. Decumbent Toadflax. (*Linária supína*. Desf.)—Flowers about 1 inch long, few, yellow, with a long slender spur, in a short dense, erect cluster (raceme) lengthening in fruit; capsule opening at the top by 2 valves, each 3-toothed. [As described in the genus Toadflax (*Linaria*).] Stems 3–9 inches long, decumbent at the base, then erect, smooth or scattered with gland-tipped hairs; leaves narrow (linear), entire, stalkless, the lower ones and those on the barren stems in circles (whorls) of 3–5 together.

Very rare. Naturalised on ballast heaps in Devon and Cornwall, and occurring in similar places in other counties in England. July—September. Annual.

6. Jersey Toadflax. (*Linária pelisseriána*. Mill.)—A species with smaller flowers $\frac{1}{2}$ inch long, with a straight spur, purple, 3–6 in a dense terminal cluster (raceme); the 2 valves of the capsule splitting into 3 teeth; the stems 6–18 inches high, few; and the leaves narrow and distant.

Very rare. Only found in one or two places in Jersey. June. Annual.

7. *Purple Toadflax. (*Linária purpúrea*. Mill.)—A somewhat similar species with very numerous, rather smaller flowers with a curved spur, in a dense long terminal cluster (raceme).

Not native. On old walls; naturalised in many places in England and the south of Scotland. June—September. Perennial.

8. Pale Blue or Striped Toadflax. (*Linária répens*. Mill.)—A similar species to the Purple Toadflax (*Linaria purpurea*), but with whitish flowers striped with blue or purple, which have a short straight spur, and slender wiry stems.





Rare. On roadsides, banks, and waste places; scattered through England and Ireland. July—September. Perennial.

9. Common Yellow Toadflax. (*Linaria vulgaris*. Mill.)—Flowers larger than in any of the preceding species, nearly $1\frac{1}{2}$ inches long, the spur long and straight, lemon-yellow with an orange palate, numerous, in a dense spike-like terminal cluster (raceme); the 2 valves of the capsule each splitting into 3 teeth. [As described in the genus Toadflax (*Linaria*).] The stem 1–2 feet high, erect, woody at the base; and the leaves strap-shaped, entire, and stalkless.

[Plate 25.

A strange form, called *Peloria*, is sometimes found, with the corolla-lobes equal, not divided into lips, and 5 spurs.

Common. On roadsides, banks, and waste places; throughout England, the south of Scotland, and Ireland. June—October. Perennial.

IX. EYE-BRIGHT. (*EUPHRÁSIA*. Linn.)—Flowers stalkless (sessile), solitary in the axils or the leaves terminating the stem and branches, forming dense or loose spikes. Calyx of 4 sepals united into a tube and separating into 4 teeth, inserted below the seedcase (inferior); corolla of 5 petals uniting into a tube and separating into 2 lips, the upper lip erect, broad, 2-lobed, spreading, and the lower with 3 spreading, notched lobes, inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), included in and inserted on the corolla-tube (epi-petalous); carpels 2; capsule oblong, flattened, notched, 2-celled, with numerous minute seeds, opening from the top by 2 valves down the middle of the cells (loculicidal). Small herbs which are semi-parasitic; their seeds germinate in the earth and develop, but the roots send out numerous long branches which, when they come into contact with a suitable root, produce tiny, roundish suckers; these suckers penetrate the neighbouring root and absorb its nutriment; the leaves are opposite.

Common Eye-bright, Euphrasie. (*Euphrásia officinális*. Linn.)—As just described. The only British species. The flowers are small, variable in size, $\frac{1}{6}$ – $\frac{1}{3}$ inch long, white or pale lilac veined with purple and having a yellow spot in the throat; the capsules vary from broadly oblong to very narrow; the stems are 2–18 inches high, wiry, and much or little branched; and the leaves are deeply toothed, stalkless (sessile), varying from almost round and blunt to narrow and very pointed.

This charming and well-known little plant is divided by Mr. Frederick Townsend into 13 and by the London Catalogue (10th edition) into 15 species, which vary according to the size of the flowers, the length of the lower lip of the corolla relatively to the tube, the hairs on the calyx being glandular or otherwise, the height and size of the plant, and the shape of the leaves. In a work of this description these critical differentiations need not be enumerated. Suffice to say that, as is common with most plants which flourish in widely dissimilar situations, on poor soil, such as hill- and mountain-sides or sandy soil near the sea, Euphrasie is small, stunted, and sometimes with fleshy leaves, while in rich soil it luxuriates, is very much branched and even reaches the height of $1\frac{1}{2}$ feet. An infusion of this herb was used by old herbalists as an eye-lotion; hence its name; but nowadays this remedy has been discarded.

[Plate 25.

Common. Meadows, heaths, mountain-sides, &c.; generally distributed throughout England, Scotland, and Ireland. May—September. Annual.

X. BARTSIA. Linn.—A very similar genus to the last, Eye-bright (*Euphrasia*), differing in the upper lip of the corolla being arched and entire or notched, but never with spreading lobes, and in the 3 lobes of the lower lip being less spreading and never notched, also in the capsules being

usually pointed. Flowers stalkless (sessile), solitary in the axils of the leaves terminating the stem and branches and forming dense or loose spikes. Calyx of 4 sepals united into a tube and separating into 4 teeth, inserted below the seedcase (inferior); corolla of 5 petals uniting into a tube and separating into 2 lips, the upper lip erect, arched, entire or notched, and the lower 3-lobed, slightly spreading, inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), included in and inserted on the corolla-tube (epi-petalous); carpels 2; capsule oblong, flattened, pointed, 2-celled, with numerous minute seeds, opening from the top by 2 valves down the middle of the cells (loculicidal). Small herbs which are semi-parasitic: their seeds germinate in the earth and develop, but the roots send out numerous long branches which, when they come into contact with a suitable root, produce tiny roundish suckers; these suckers penetrate the neighbouring root and absorb its nutriment; the leaves are opposite.

- (1) Red Bartsia. (*Bart'sia Odontites*.)—Flowers pink, in 1-sided branched clusters drooping at the tip; leaves very narrow.
- (2) Yellow Viscid *Bart'sia*. (*Bart'sia viscosa*.)—Flowers yellow, in long erect spikes, unbranched; leaves oblong.
- (3) Alpine Bartsia. (*Bart'sia alpina*.)—Flowers dull purple, in short erect spikes, unbranched; leaves egg-shaped.

1. Red Bartsia. (*Bart'sia Odontites*. Hudson.)—As just described. The flowers are $\frac{1}{2}$ inch long, pink, hairy inside, the lower lip deepening to crimson near the tube, in dense drooping 1-sided clusters; the capsules are oblong, blunt with a small abrupt point; the stems are generally 6–12 inches high, erect, wiry, branched, and reddish; and the leaves are stalkless (sessile), narrowly lance-shaped, with a few blunt teeth, and are also often tinged with red. (*Odontites rubra*. Gilib.; *Euphrasia Odontites*. Linn.) [Plate 25.

Common. On roadsides, cultivated fields, and waste places; generally distributed over England, Scotland, and Ireland. June—September. Annual.

2. Yellow Viscid Bartsia. (*Bart'sia viscosa*. Linn.)—A species with yellow flowers, $\frac{3}{4}$ inch long, in a long terminal spike neither 1-sided nor drooping; oblong pointed capsules; wiry stems a foot or more high, sometimes slightly branched; and oblong lance-shaped stalkless leaves, coarsely toothed. The whole plant is clothed with short gland-tipped hairs. (*Euphrasia viscosa*. Benth.)

Rare. Roadsides, moist meadows, and marshes, chiefly near the sea; in the southern and western counties of England, and the south-west of Ireland. June—October. Annual.

3. Alpine Bartsia. (*Bart'sia alpina*. Linn.)—A species with dull purple flowers, $\frac{3}{4}$ inch long, in a short dense leafy spike, the anthers covered with white hairs; the stem 6–8 inches high, unbranched, and the leaves stalkless (sessile), egg-shaped (ovate), and scalloped (crenate).

Rare. In alpine pastures, &c., and by the sides of streams in mountain districts; in the north of England and in Scotland. June—August. Perennial.

XI. RED-RATTLE. (PEDICULARIS. Linn.)—Flowers red, in the British species, in leafy spikes or clusters (racemes). Calyx of 5 sepals, united into a broad tube, which is much inflated after flowering, and is irregularly and sometimes indistinctly 5-toothed, inserted below the seedcase (inferior); corolla of 5 petals united into a gaping tube and separating into 2 lips (bilabiate), the upper lip being arched, flattened laterally, and entire or notched and produced into a short tooth on either side of the notch, the lower lip 3-lobed and spreading, inserted below

the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), inserted on the corolla-tube, and included in the upper lip; carpels 2; capsule flattened, oblique, 2-celled, opening from the top down the middle of the cells by 2 valves (loculicidal), seeds few and rather large. Herbs with leaves which are alternate or rarely in circles (whorls) and are deeply divided or lobed towards the midrib (pinnate or pinnatifid). Semi-parasitic by means of suckers which develop on the fleshy branches of the root, and eventually on the elongated root itself, in this respect differing from the other parasitic genera in this family, which, being annuals, only develop suckers on the branches of the root.

- (1) Marsh Red-Rattle. (*Pedicularis palustris*.) Calyx 2-lobed; corolla with 4 teeth; fruit longer than calyx.
 (2) Dwarf Red-Rattle. (*Pedicularis sylvatica*.) Calyx 5-lobed; corolla with 2 teeth; fruit as long as calyx.

1. Marsh Red-Rattle. (*Pedicularis palustris*. Linn.)—As just described. A very pretty marsh plant with large purplish-pink flowers, about an inch long, solitary in the axils of the upper leaves forming a long leafy cluster; the calyx with 2 toothed lobes; the corolla upper lip with 2 short teeth on the margin just below the apex and another on each side halfway down; the capsule longer than the calyx; the stem from 3 inches to 2 feet high, stout, usually much branched; and the leaves deeply lobed to the midrib (pinnatifid), the lobes being strongly and sometimes twice toothed.

The leaves of this species and of the following one resemble, at a glance, the fronds of some ferns. Not common. In marshes, bogs, and wet ditches; generally distributed over England, Scotland, and Ireland. May—September. Biennial.

2. Dwarf Red-Rattle. (*Pedicularis sylvatica*. Linn.)—A very similar species to the last, differing in the colour of the flower, which is often of a very bright rosy pink; in the calyx being 5-toothed, the teeth becoming cut and leafy in fruit; in the corolla only having 2 short teeth at the apex and none at the sides; in the capsule not being any longer than the calyx; in the stem being shorter, about 6–9 inches long, and only branched at the base; and in the leaves being more deeply divided into narrower segments. [Plate 26.

Common. In marshes, bogs, and wet places; in England, Scotland, and Ireland. April—August. Perennial.

XII. YELLOW-RATTLE. (RHINAN'THUS. Linn.)—Flowers large, yellow, in terminal spikes. Calyx of 5 sepals, united into an inflated tube, which is laterally flattened, and separating into 4 small teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a gaping tube and separating into 2 short lips (bilabiate), the upper lip arched, flattened laterally, with 2 short teeth at the apex, the lower lip 3-lobed, inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), included in the upper lip of the corolla and inserted on the corolla-tube (epi-petalous); carpels 2; capsule round, flattened, 2-celled, opening by 2 valves from the top down the middle of the cells (loculicidal), seeds few and large. Semi-parasitic herbs with opposite leaves; the suckers, as in the Eye-bright (*Euphrasia*), are developed on the root-branches; they are, however, larger than those of that genus.

- (1) Common Yellow-Rattle. (*Rhinantus Crista-galli*.)—Flowers small, flower-bracts green.
 (2) Larger Yellow-Rattle. (*Rhinantus major*.)—Flowers large, flower-bracts yellow ending in a fine point.

1. Common Yellow-Rattle, Cock's-comb. (*Rhinanthus Crista-galli*. Linn.)—As just described. The flowers are $\frac{1}{2}$ -1 inch long, yellow, often with the short teeth of the upper lip of a bright blue or purple and 2 similar spots lower down, solitary in the axils of green leaf-like bracts, forming leafy terminal clusters; the stems are 4-12 inches high, 4-sided, wiry, usually unbranched; and the leaves are oblong lance-shaped and toothed (serrate).

The popular name of Rattle is given to this plant on account of the noise the few large seeds make in the dry bladder-like capsule. (*Rhinanthus minor*. Ehrh.) [Plate 26.]

Very common. In meadows and pastures; throughout England, Scotland, and Ireland. June—July. August.

2. Large Yellow-Rattle. (*Rhinanthus májor*. Ehrh.)—A very similar species with larger flowers, yellow bracts ending in a fine green point, and the stem usually much branched. (*Under Rhinanthus Crista-galli*. Benth. and Hook.)

Rare. In cultivated ground; in various counties in England and Scotland. July—August. Annual.

The last edition of the London Catalogue gives 3 varieties of the Large Yellow-Rattle (*Rhinanthus major*) according to differences in the shape of the seed, and it also gives 6 other species which most botanists include under the Common Yellow-Rattle (*Rhinanthus Crista-galli*).

XIII. COW-WHEAT. (MELAMPÝRUM. Linn.)—Flowers yellow, purple, or variegated, in pairs, or in leafy spikes. Calyx of 4 sepals, united into a tube and separating into 4 teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a long tube and separating into 2 lips (bilabiate), the upper of which is erect, helmet-shaped, and flattened laterally, entire or with a small tooth on either side of the apex; the lower lip is spreading, shortly 3-lobed, and with a projecting palate which usually closes the corolla-tube (personate), inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), concealed in the upper lip of the corolla, inserted on the corolla-tube (epi-petalous); carpels 2; capsule egg-shaped (ovate), oblique, 2-celled, opening from the top by 2 valves down the middle of each cell (loculicidal), and having 1 or 2 large seeds in each cell. Herbs with opposite leaves. Another semi-parasitic genus, giving off round suckers on the root-branches, as in the last genus.

Throat of corolla-tube closed by palate.

- (1) Crested Cow-wheat. (*Melampýrum cristátum*.)—Flowers yellow, variegated with purple, in dense spikes.
- (2) Purple Cow-wheat. (*Melampýrum arven'se*.)—Flowers red with yellow throat, in loose spikes.
- (3) Common Cow-wheat. (*Melampýrum pratens'e*.)—Flowers yellow, in pairs; leaves toothed at the base.

Throat of corolla-tube not closed by palate.

- (4) Alpine Wood Cow-wheat. (*Melampýrum sylvat'icum*.)—Flowers orange-yellow, in pairs; leaves entire.

1. Crested Cow-wheat. (*Melampýrum cristátum*. Linn.)—As just described. The flowers are yellow variegated with purple, in the axils of the upper leaves or bracts, which are densely crowded together and form a spike; these bracts are egg-shaped (ovate), sharply toothed (serrate), pale yellow, heart-shaped (cordate), and stained with rose-colour at the base. The stem





is generally about 1 foot high, erect, wiry, 4-angled, and either simple or with a few opposite branches; and the leaves are long, pointed, lance- or strap-shaped with entire margins.

Rare, very local. In woods and hedges, occasionally in corn- or potato-fields; chiefly in the eastern counties of England. September—October. Annual.

2. Purple Cow-wheat. (*Melampýrum arven'se*. Linn.)—A similar but handsomer species, with a long, loose, leafy spike of rosy-red flowers with a yellow throat and dark red lips; rose-coloured bracts; a taller stem, sometimes 2 feet high; and leaves sometimes toothed at the base.

Very rare, local. In cornfields; near St. Lawrence in the Isle of Wight, in Norfolk, Essex, and Hertfordshire. August—September. Annual.

3. Common Yellow Cow-wheat or Common Wood Cow-wheat. (*Melampýrum pratense*. Linn.)—Flowers yellow, all turning one way and slightly drooping, solitary in the axils of the opposite leaves, forming a very loose terminal cluster (raceme). [As described in the genus Cow-wheat (*Melampýrum*).] Stems 6 inches to 1 foot high, wiry, and slender, with a few almost horizontal opposite branches; leaves lance- or egg-shaped, often toothed at the base, in pairs. [Plate 26.]

Common. In woods; in England, Scotland, and Ireland. June—September. Annual.

4. Alpine Wood Cow-wheat. (*Melampýrum sylvaticum*. Linn.)—A very similar species to the last, but with smaller orange-yellow flowers which are more erect and have a small palate, which does not close the corolla-tube as in the last 3 species, and with entire leaves.

Rare. In woods in mountainous districts; in the north of England, in Scotland, and in the north-east of Ireland. July—August. Annual.

XIV. SPEEDWELL. (VERONICA. Linn.)—Flowers small, usually blue or white, rarely pink, in clusters (racemes), or solitary in the axils of alternate leaf-like bracts, which only differ from the ordinary leaves in being alternate. Calyx of 4, rarely 5 sepals, united at the base, free from and inserted below the seedcase (inferior); corolla of 4 petals, united at the base into a small, very short tube, and spreading into a circular (rotate) unequally 4-lobed limb, the lower lobe being the narrowest, inserted below the seedcase (hypogynous); stamens 2, protruding, inserted in the corolla-tube (epi-petalous); carpels 2, with 1 style and an undivided stigma; capsule compressed, inversely heart-shaped (obcordate) or notched, 2-celled, many-seeded or rarely with only 2 seeds in each cell, opening by 2 valves from the top down the middle of each cell (loculicidal). Herbs or shrubs, usually with opposite leaves, the British species being all small, often inconspicuous herbs.

Flowers solitary in the axils of the alternate leaf-like bracts; sepals 4; corolla-tube shorter than wide; stems prostrate; annuals.

- (1) Ivy-leaved Speedwell. (*Veronica hederæfolia*.)—Flowers $\frac{1}{8}$ inch across; sepals pointed, heart-shaped, fringed with forked hairs; capsule inflated, with 1-2 seeds in each cell; leaves heart-shaped at the base, with 5-7 large lobes.
- (2) Common Field Speedwell. (*Veronica agrestis*.)—Flowers $\frac{1}{8}$ – $\frac{1}{6}$ inch across; sepals blunt, egg-shaped or oval, fringed with gland-tipped hairs; capsule inflated, keeled, with prominent veins, 4-6 seeds in each cell; leaves egg-shaped, regularly toothed.
- (3) Grey Field Speedwell. (*Veronica didyma*.)—Flowers $\frac{1}{4}$ – $\frac{1}{2}$ inch across; sepals pointed, egg-shaped, fringed with incurved hairs; capsule inflated, downy, 8-12 seeds in each cell; leaves egg-shaped, irregularly toothed.

- (4) *Tournefort's Speedwell. (*Veronica Tournefortii*.)—Flowers $\frac{1}{2}$ inch across; sepals pointed, lance-shaped, in divergent pairs, fringed with incurved hairs; capsule inversely kidney-shaped, flattened, with 5-8 seeds in each cell; leaves heart-shaped, coarsely toothed.

Flowers in terminal, more or less leafy clusters (racemes); sepals 4; corolla-tube shorter than wide.

Capsules shorter than sepals, inversely heart-shaped, flattened.

- (5) Finger-leaved Speedwell. (*Veronica triphyllos*.)—Flowers $\frac{1}{4}$ inch across, dark blue; sepals blunt; leaves lobed towards the base into 3-7 lobes.
- (6) Vernal Speedwell. (*Veronica verna*.)—Flowers minute, pale blue; sepals pointed; seeds flattened; leaves lobed to the midrib into 3-7 lobes.
- (7) **Veronica peregrina*.—Flowers minute; leaves inversely heart-shaped; smooth.
- (8) **Veronica repens*.—Flowers with corolla much longer than calyx; leaves roundly oval; calyx and capsules with glandular hairs.
- (9) Wall Speedwell. (*Veronica arvensis*.)—Flowers minute, almost hidden, pale blue; sepals blunt; persistent style very short; leaves egg-shaped, toothed; plant smooth.
- (10) Thyme-leaved Speedwell. (*Veronica serpyllifolia*.)—Flowers $\frac{1}{5}$ inch across, pale blue or white veined with darker blue; sepals blunt; persistent style as long as capsule; leaves oval, slightly scalloped.

Capsules longer than sepals.

- (11) Alpine Speedwell. (*Veronica alpina*.)—Flowers dark blue, in a short head-like cluster, lengthening in fruit; capsules oval with a short style; leaves oval, slightly scalloped.
- (12) Blue Rock Speedwell. (*Veronica fruticans*.)—Flowers $\frac{1}{2}$ inch across, on long erect stalks in a head-like cluster, not lengthening in fruit; capsule egg-shaped; leaves oblong.

Flowers in terminal spikes; sepals 4 or 5; corolla-tube as long as or longer than wide.

- (13) Spiked Speedwell. (*Veronica spicata*.)—Flowers $\frac{1}{4}$ inch across, deep purple-blue, in erect spikes; capsules egg-shaped, persistent style long; leaves narrow, only toothed towards the middle, narrowing into the stalk.
- (14) Tall-spiked Speedwell. (*Veronica hybrida*.)—Like *Veronica spicata*, but with wide leaves, toothed throughout, and abruptly stalked.

Flowers in clusters in the axils of the leaves; sepals 4 or 5; corolla-tube shorter than wide.

- (15) Common Speedwell. (*Veronica officinalis*.)—Flowers about $\frac{1}{3}$ inch across, pale lilac, in spike-like clusters; sepals blunt; capsule inversely heart-shaped, longer than calyx.
- (16) Bird's-eye. (*Veronica Chamædryas*.)—Flowers $\frac{1}{2}$ inch across, deep blue, in loose clusters; sepals pointed; capsule inversely heart-shaped, half as long as calyx; stems smooth save for 2 distinct lines of hairs.
- (17) Mountain Speedwell. (*Veronica montana*.)—Flowers nearly white, in short clusters; sepals broad; capsule inversely heart-shaped, longer than calyx; stems hairy all round.

- (18) Marsh Speedwell. (*Veronica scutellata*.)—Flowers $\frac{1}{4}$ inch across, white or pinkish, in alternate clusters; capsules inversely heart-shaped, half as long again as calyx; marsh plant, usually smooth.
- (19) Water Speedwell. (*Veronica Anagallis-aquatica*.)—Flowers $\frac{1}{5}$ inch across, whitish with darker veins, in opposite clusters; capsules oval, not longer than calyx; marsh plant, erect, shiny.
- (20) Brooklime. (*Veronica Beccabunga*.)—Flowers $\frac{1}{5}$ inch across, bright blue, in opposite clusters; capsules roundish, somewhat swollen, slightly notched, not quite as long as the calyx; marsh plant, prostrate, shiny, without hairs.

Flowers solitary in the axils of the leaf-like bracts, which only differ from the ordinary leaves in being alternate.

1. Ivy-leaved Speedwell. (*Veronica hederifolia*. Linn.)—As just described. The flowers are $\frac{1}{5}$ inch across, pale lilac with purple veins, stalked, solitary in the axils of the leaf-like bracts; the calyx is composed of 4 sepals, which are longer than the corolla, pointed at the tip and broadly heart-shaped at the base, and fringed with long jointed hairs; the capsules are composed of 2 roundish inflated lobes, smooth, without keels or prominent veins, each containing only 1 or 2 seeds; the stem is prostrate, 3–18 inches long, and much branched; and the leaves are all stalked, heart-shaped (cordate) at the base, with 5–7 large tooth-like lobes, and just 2 or 3 oval and entire leaves from the root. The whole plant is of a dull green and is more or less thickly covered with long jointed hairs, but is not so hairy as the following species, the Field Speedwell, from which it is at once distinguished by its heart-shaped sepals and fewer seeds.

[Plate 27.]

Very common. In cultivated and waste ground, hedge-banks, &c.; in England, Scotland, and Ireland. March—August. Annual.

2. Common Field Speedwell. (*Veronica agrestis*. Linn.)—Flowers often less than $\frac{1}{5}$ inch across, of a pale blue, often nearly white with a few dark blue stripes, the lower lobe being always white, on stalks as long as or shorter than the leaf-like bracts, solitary in the axils of the bracts; the calyx of 4 egg-shaped or oblong blunt sepals, fringed with gland-tipped hairs, longer than the corolla; capsule of 2 roundish inflated lobes, rough, with rather prominent veins, keeled, and with a few gland-tipped hairs, each cell containing 4–6 seeds. [As described in the genus Speedwell (*Veronica*).] The stem is 3–10 inches long, weak, and prostrate, much branched from the base; and the leaves are shortly stalked, egg-shaped (ovate), either slightly heart-shaped (cordate) at the base or narrowing into the stalk, regularly toothed. The whole plant is hairy and of a yellowish green.

Very common. In cultivated and waste ground, and hedge-banks; in England, Scotland, and Ireland. April—September. Annual.

3. Grey Field Speedwell. (*Veronica didyma*. Tenore.)—A very similar species to the last, but having larger flowers, about $\frac{1}{4}$ inch across, on stalks longer than the leaf-like bracts; the sepals in unequal pairs, egg-shaped, slightly pointed at the tip and not heart-shaped at the base, fringed with incurved hairs; all the petals of a bright blue, veined; and the capsules not keeled nor with prominent veins, downy, and with 8–12 seeds in each cell. The whole plant is of a greyish green and is smaller, though the flowers are larger, than the Common Field Speedwell, and the leaves are closer together and are irregularly toothed. (*Under Veronica agrestis*. Benth. and Hook.)

A larger-flowered variety—*Veronica polita*, var. *grandiflora*. Bab.—with flowers about $\frac{1}{2}$ inch

across, and the corolla longer than the calyx, is found in Cambridgeshire and the Isle of Wight.

Common. In cultivated and waste ground, hedge-banks, &c. ; in England, Scotland, and Ireland. April—September. Annual.

4. *Tournefort's Speedwell. (*Veronica Tournefortii*. C. Gmel.)—Not a native. A beautiful species with large flowers, about $\frac{1}{2}$ inch across, of a brilliant blue veined with darker blue, the small lower petal almost white, solitary in the axils of the leaf-like bracts, on long stalks, 2, 3, or 4 times as long as the leaf-like bracts. The 4 sepals are lance-shaped, pointed, and fringed with incurved hairs, spreading into 2 diverging pairs in fruit ; the capsule is inversely kidney-shaped, of 2 diverging, roundish, much flattened lobes, strongly keeled, with a few gland-tipped hairs, each cell containing 5–8 seeds. [As described in the genus Speedwell (*Veronica*).] The whole plant is somewhat similar to the Common Field Speedwell (*Veronica agrestis*), but is much stouter and larger, and its heart-shaped leaves are larger, coarsely toothed, and almost stalkless. (*Veronica Buxbaumii*. Tenore.) [Plate 27.]

A native of eastern Europe and central Asia. Abundant in England in cultivated fields and waysides, now quite naturalised throughout England, Ireland, and the south of Scotland. April—October. Annual.

Flowers in clusters (racemes) terminating the stem and branches, formed by the crowding together of the solitary flowers in the axils of the alternate leaf-like bracts, which are much smaller than and different from the leaves proper.

5. Finger-leaved Speedwell. (*Veronica triphyllus*. Linn.)—Flowers $\frac{1}{4}$ inch across, dark blue, in terminal clusters ; the upper leaf-like bracts entire and the lower 3- or even 5-lobed ; the sepals blunt, oblong, clothed with gland-tipped hairs, in unequal pairs, rather longer than the corolla ; capsules shorter than the calyx, roundish, flattened, keeled, of 2 lobes, each containing numerous thin concave seeds. [As described in the genus Speedwell (*Veronica*).] The stem is from 2 inches to 1 foot high, prostrate at the base and then erect, branched ; the lowest leaves are egg-shaped, entire or toothed, and stalked, while the others are stalkless (sessile) and deeply lobed from the base (palmatifid) into 3–7 entire lobes ; the whole plant is clothed with gland-tipped hairs.

Very rare. In sandy fields in Norfolk, Suffolk, and Yorkshire. April—June. Annual.

6. Vernal Speedwell. (*Veronica verna*. Linn.)—A very small species, 1–3 inches high, with numerous minute pale blue flowers in the axils of the alternate leaf-like bracts, forming long leafy clusters ; the bracts are lance-shaped and entire ; the sepals are unequal, narrow, and pointed, fringed with hairs, and are longer than the corolla ; the capsule is shorter than the calyx, inversely heart-shaped (obcordate), as broad as long, flattened, each lobe containing numerous flattened seeds. [As described in the genus Speedwell (*Veronica*).] The whole plant is yellowish-green and hairy, and has the lower leaves oval, entire, and shortly stalked, and the others deeply lobed towards the midrib (pinnatifid) into 5–7 lobes.

Very rare. In sandy fields in Norfolk and Suffolk. May—June. Annual.

7. *Veronica peregrina. Linn.—A species with minute bluish-lilac or almost white flowers, solitary in the axils of the alternate strap-shaped bracts forming spike-like clusters (racemes) ; narrow sepals, much longer than the corolla ; slightly notched smooth capsules shorter than the calyx, with a short style, and numerous seeds ; erect stems 3–8 inches high, and inversely heart-shaped leaves, stalkless or nearly so, blunt, and either entire or very remotely toothed.

Not a native. In fields and cultivated ground in Scotland, Ireland, and Jersey. May—July. Annual.



8. **Veronica répens*. DC.—Another rare species, not native to the British Isles, which has short clusters of flowers, the corolla much longer than the sepals, the sepals and capsules with glandular hairs, the capsules shorter than the style, the stems prostrate, and the leaves all roundly oval.

Naturalised near Manchester, York, and Glasgow. April—May. Perennial.

9. **Wall Speedwell.** (*Veronica arvensis*. Linn.)—Flowers minute, pale blue numerous, in a spike-like cluster (raceme), almost concealed by the alternate, lance-shaped, entire leaf-like bracts. The sepals are blunt, oblong or lance-shaped, fringed with hairs, unequal in size, much longer than the corolla; the capsule is shorter than the calyx, inversely heart-shaped (obcordate), flattened, as broad as long, with a very short persistent style not exceeding the notch, each lobe containing numerous flat seeds. [As described in the genus Speedwell (*Veronica*).] The stem is 4–6 inches or rarely 1 foot or more high, very downy, erect, usually branched; and the leaves are egg-shaped, toothed (serrate) but not lobed, the lowest ones stalked and the others stalkless (sessile). The whole plant is of a yellowish green and is thickly covered with soft hairs.

Very small specimens of this species are sometimes mistaken for the preceding, Vernal Speedwell but can easily be distinguished by their toothed but never lobed leaves.

Very common. On walls, banks, and cultivated and waste ground, throughout England, Scotland, and Ireland. April—October. Annual.

10. **Thyme-leaved Speedwell.** (*Veronica serpyllifolia*. Linn.)—Flowers $\frac{1}{5}$ inch across, pale blue or white, veined with darker blue, on short stalks, in a long spike-like cluster (raceme); the alternate leaf-like bracts are narrowly egg-shaped; the sepals are blunt, inversely egg-shaped (obovate) or inversely lance-shaped, fringed with gland-tipped hairs; the capsules are shorter than the sepals, inversely heart-shaped (obcordate), broader than long, flattened, with gland-tipped hairs, and a long persistent style as long as the capsule, and with numerous seeds. [As described in the genus Speedwell (*Veronica*).] The stems are prostrate and very much branched and rooting at the base, then erect, 2–5 inches high; and the leaves are oval, blunt, slightly scalloped, and almost smooth, the lower ones stalked and the others stalkless (sessile). The whole plant is of a dull green and usually without hairs. [Plate 27.

A rare variety—*Veronica serpyllifolia*, var. *humifusa*. Dickson—is occasionally met with on mountains in North Wales, Northumberland, and the Scotch Highlands. It differs in having larger and fewer bright blue flowers in shorter clusters, shorter and broader sepals, the capsule longer than the sepals, and the stems more downy and all prostrate.

Extremely common. In fields, waste places, and pastures, and by waysides. May—July. Perennial.

11. **Alpine Speedwell.** (*Veronica alpina*. Linn.)—A beautiful little species differing from the last in having more crowded, but fewer, darker blue flowers, almost clustered into a head when first opening, but lengthening in fruit; the capsule oval, nearly twice as long as the calyx, with a short persistent style, one-quarter as long as the capsule; the stem more erect; and the leaves larger and fewer.

Rare. On the summits of the higher mountains of Scotland. July—August. Perennial.

12. **Blue Rock Speedwell.** (*Veronica fruticans*. Jacquin.)—Another beautiful species with larger flowers, $\frac{1}{2}$ inch across, bright blue with dark veins, on long erect stalks, 2–6 in a short cluster, not lengthening in fruit; egg-shaped capsules, half as long again as the calyx, with a persistent style as long as the capsule; stems woody, prostrate, much branched at the base, with erect flowering stems 2–4 inches high; and small oblong or inversely egg-shaped (obovate) leaves, rather leathery, with entire or slightly toothed margins. (*Veronica saxatilis*. Linn.)

Very rare. On alpine rocks on a few of the higher Scotch mountains. July—September. Perennial.

Flowers in terminal spike-like clusters with a small bract at the base of each flower; sepals usually 4, rarely 5; corolla-tube longer than broad.

13. Spiked Speedwell. (*Veronica spicata*. Linn.)—Flowers $\frac{1}{4}$ inch across, deep purple-blue, in dense erect spike-like clusters; sepals 4, blunt; corolla-tube longer than in the other species and the lobes narrower; the stamens and style very long and protruding beyond the corolla (exserted); the capsule as long as the sepals, egg-shaped (ovate), with a persistent style twice as long as the capsule. [As described in the genus Speedwell (*Veronica*).] Stems simple or branched from the base, 2–8, generally about 6 inches high; with narrow leaves only toothed towards the middle, in rather distant pairs, insensibly narrowing into their short stalks; the whole plant is of a dull dark green. [Plate 27.]

Very rare. On chalk downs in Cambridgeshire and Suffolk. July—August. Perennial.

14. Tall Spiked Speedwell. (*Veronica hybrida*. Linn.)—A species so similar to the last that most botanists consider it merely a variety. It differs in being altogether larger, 6–18 inches high, with broader leaves, with rounded bases, abruptly stalked, and the margins toothed throughout. (*Veronica spicata*, var. *hybrida*. Syme, and *Benth. and Hook.*)

Rare. On limestone rocks in the west of England and Wales. July—August. Perennial.

Flowers in clusters in the axils of the opposite leaves, each flower having a minute bract at its base; sepals 4 or 5; corolla-tube shorter than wide.

15. Common Speedwell. (*Veronica officinalis*. Linn.)—Flowers $\frac{1}{8}$ – $\frac{1}{4}$ inch across, pale lilac with darker veins, numerous, in spike-like clusters (racemes). Sepals 4, blunt, oval, shorter than the corolla; stamens and style long and protruding beyond the corolla; capsule longer than the calyx, inversely heart-shaped (obcordate), flattened, broader than long, with the persistent style longer than the capsule. [As described in the genus Speedwell (*Veronica*).] The stems are very variable in length, usually about 6 inches long, but sometimes as much as 18 inches, they are prostrate and rooting at the nodes, then ascending; the leaves are oblong or oval or inversely egg-shaped (obovate), toothed, and hairy. The whole plant is usually hairy with jointed and gland-tipped hairs, but it is rarely nearly smooth. [Plate 27.]

A variety—*Veronica officinalis*, var. *hirsuta*. Hopkirk—altogether much smaller and with an inversely egg-shaped (obovate) capsule, not notched at the top, has been found in Ayrshire.

Very common. On dry pastures, heaths, and in woods, throughout England, Scotland, and Ireland. May—August. Perennial.

16. Bird's-eye, Germander Speedwell. (*Veronica Chamædryis*. Linn.)—This species is the best known of all the Speedwells. Its beautiful deep blue flowers, $\frac{1}{2}$ inch across, are on rather long stalks and form elegant loose clusters (racemes); the 4 sepals are pointed and lance-shaped; the capsule is inversely heart-shaped (obovate), flattened, half as long as the calyx, rather broader than long, narrowing at the base, with the persistent style half as long again as the capsule. [As described in the genus Speedwell (*Veronica*).] The stems are 1–18 inches long, weak, rooting only at the base, and then ascending, and are easily distinguished by the two lines of hairs which traverse the entire length of the otherwise smooth stem, passing from side to side as they meet each pair of leaves, apparently for the purpose of directing moisture to the leaves and roots. The leaves are broadly egg-shaped (ovate), slightly heart-shaped (cordate) at the base, deeply toothed, and almost stalkless. [Plate 27.]

Very common. In hedge-banks, pastures, woods, &c. ; generally distributed throughout England, Scotland, and Ireland. April—June. Perennial.

17. Mountain Speedwell. (*Veronica montana*. Linn.)—A very similar species to the last, but having shorter clusters of flowers, the flowers being fewer, smaller, and nearly white ; the sepals broader ; the fruit much larger, flatter, longer than the calyx, and altogether rounder, often toothed at the edge and fringed with hairs ; the stems are hairy all round, more prostrate, and rooting at the nodes ; and the leaves are stalked.

Not uncommon in moist woods in England, rare in Scotland and Ireland. May—September. Perennial.

18. Marsh Speedwell. (*Veronica scutellata*. Linn.)—Flowers about $\frac{1}{4}$ inch across, white or pinkish white, usually with pink veins, in slender alternate clusters (racemes) ; the sepals 4, pointed, and broad ; and the capsules half as long again as the calyx, roundish, broader than long, much flattened, inversely heart-shaped (obcordate), with a short style. [As described in the genus Speedwell (*Veronica*).] The stem very brittle and straggling, from 6 inches to 2 feet high, slender, generally smooth, rooting at the base and then erect, with narrowly lance-shaped smooth leaves, entire or slightly toothed. [Plate 27.]

Not uncommon. In marshes, ditches, and wet places ; distributed throughout England, Scotland, and Ireland. June—August. Perennial.

19. Water Speedwell. (*Veronica Anagallis-aquatica*. Linn.)—Flowers $\frac{1}{8}$ inch across, whitish or pale blue with darker veins, in loose opposite clusters (racemes) ; sepals 4, pointed, lance-shaped ; capsule not longer than the calyx, oval, slightly notched, and only very little flattened. [As described in the genus Speedwell (*Veronica*).] The stems are erect, stout, and fleshy, 1–3 feet high, hollow, and smooth ; the leaves are lance-shaped, stalkless, sometimes clasping the stem, smooth, and with the margins minutely toothed ; and the root is creeping. The whole plant is fleshy, shining, and without hairs.

A form—*Veronica Anagallis-aquatica*, var. *anagalliformis*. Boreau—occurs, with the flower-clusters clothed with gland-tipped hairs.

Not common. In wet ditches, by ponds and slow-running streams ; sparingly distributed throughout England, Scotland, and Ireland. June—August. Perennial.

20. Brooklime. (*Veronica Beccabunga*. Linn.)—A very pretty water plant with numerous bright blue flowers, $\frac{1}{8}$ inch across, in opposite clusters, in the axils of the leaves ; the 4 sepals are pointed and narrowly egg-shaped ; the capsule is nearly as long as the calyx, roundish, slightly notched, and somewhat swollen. [As described in the genus Speedwell (*Veronica*).] The stems are from 9 inches to 3 feet long, prostrate, and rooting at the base, with erect, flowering stems, thick, fleshy, hollow, quite smooth, and much branched ; the leaves are blunt, oval, toothed, and smooth. The whole plant is, like the last, fleshy, shining, and without hairs, but it is much more prostrate and spreading.

Very common. In brooks, wet ditches, and ponds, throughout England, Scotland, and Ireland. May—September. Perennial.

THE BROOM-RAPE FAMILY

[ORDER LVI. OROBANCHACEÆ]

MEMBERS of the Broom-rape Family might at a glance be thought to belong to the Bird's-nest Order (Monotropaceæ). They are similar succulent, brownish, leafless plants, but on examination the flowers will be found to differ from those of the Bird's-nest Family in that the corolla is 2-lipped (bilabiate), and that there are 4 stamens in 2 unequal pairs (didynamous).

The order is small, but has a wide distribution, though it thrives best in temperate regions. All its members are parasites or saprophytes, and, being destitute of chlorophyll, have no green leaves, brownish scales taking their place.

I. BROOM-RAPE (OROBAN'CHE). Calyx deeply divided into 2, 4, or 5 pointed lobes.

II. TOOTHWORT (LATHRÆA). Calyx of 4 sepals, bell-shaped, united halfway into a tube and separating into 4 short, broad teeth.

I. BROOM-RAPE. (OROBAN'CHE. Linn.)—Flowers in a many-sided spike, with 1-3 bracts below each flower. Calyx of 4 sepals, united into 2 cleft or entire lips, which are more or less connected at the base, free from and inserted below the seedcase (inferior); corolla of 4-5 petals, united into a cylindrical or bell-shaped gaping tube, usually curved, 2-lipped, the upper lip 2-lobed and the lower one 3-lobed, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), inserted and included in the corolla-tube; carpels 4, united into a 1-celled seedcase, a single style, and a 2-lobed stigma; capsule 1-celled, with the numerous minute seeds attached to 4 narrow ridges inside the cell-walls (parietal placentæ), opening by 2 more or less distinct valves. Fleshy parasites, never green, with scale-like bracts instead of leaves, often with gland-tipped hairs, and short roots attached to the root of the plant on which it feeds.

One bract below each flower; calyx of 2 portions, entire or lobed; capsule with valves united at the apex and the base.

- (1) Greater Broom-rape. (Oroban'che májor.)—Flowers large, 1 inch long; corolla-tube very gaping; stamens smooth at the base, inserted on the base of the corolla-tube; stigma of 2 diverging yellow lobes. On Broom, Gorse, &c.
- (2) Clove-scented Broom-rape. (Oroban'che caryophylláceæ.)—Flowers large, 1-1½ inches long; corolla-tube narrow; stamens hairy throughout, inserted above the base of the corolla-tube; stigma of 2 widely diverging purple lobes. On Hedge Bedstraw.
- (3) Red Broom-rape. (Oroban'che rúbra.)—Flowers small, ¾ inch long; stamens hairy throughout with gland-tipped hairs at the top, inserted near the base of the corolla-tube; stigma of 2 pale pink lobes touching one another. On Wild Thyme.

THE BROOM-RAPE FAMILY. (ORDER LVI. OROBANCHACEÆ.)

CALYX of 4 SEPALs, rarely 5, which vary in their combination, sometimes being only united at the base, but generally being united into a tube which is 2-lipped (bilabiate), the lips being entire or cleft, remaining with the fruit (persistent), inserted below the seedcase (inferior).

COROLLA of 4 or 5 PETALS, united into a 2-lipped (bilabiate) tube, often bell-shaped (campanulate), usually curved, the upper lip being usually 2-lobed and the lower 3-lobed, inserted below the seedcase (hypogynous).
 STAMENS 4, in unequal pairs (didynamous), inserted in the corolla-tube (epi-petalous)

PISTIL of 2-4 CARPELS, united into a 1-celled seedcase, a single style, and a 2-lobed stigma.

FRUIT a capsule, 1-celled, many-seeded with the seeds attached to 2 or 4 ridges on the cell-walls according to the number of carpels (parietal placenta), opening by 2 valves.

FLOWERS in a terminal spike, with 2 or 3 small scale-like bracts.

STEMS thick and fleshy, usually simple, rarely branched, brownish red or flesh-colour never green.

LEAVES absent, their place being taken by fleshy bracts.

ROOTS deriving their nourishment from other plants (parasitic), or from decaying vegetable matter (saprophytic).

DISTINGUISHED BY the absence of green colouring matter and leaves and by the 1-celled fruit from the Snapdragon Family and by the 2-lobed (bilabiate) corolla from the Birds-Nest Family which it resembles in its saprophytic habit.

TOOTHWORT,

section of fruit

fruit

corolla & stamens

pistil

calyx

TALL BROOM-RAPE,

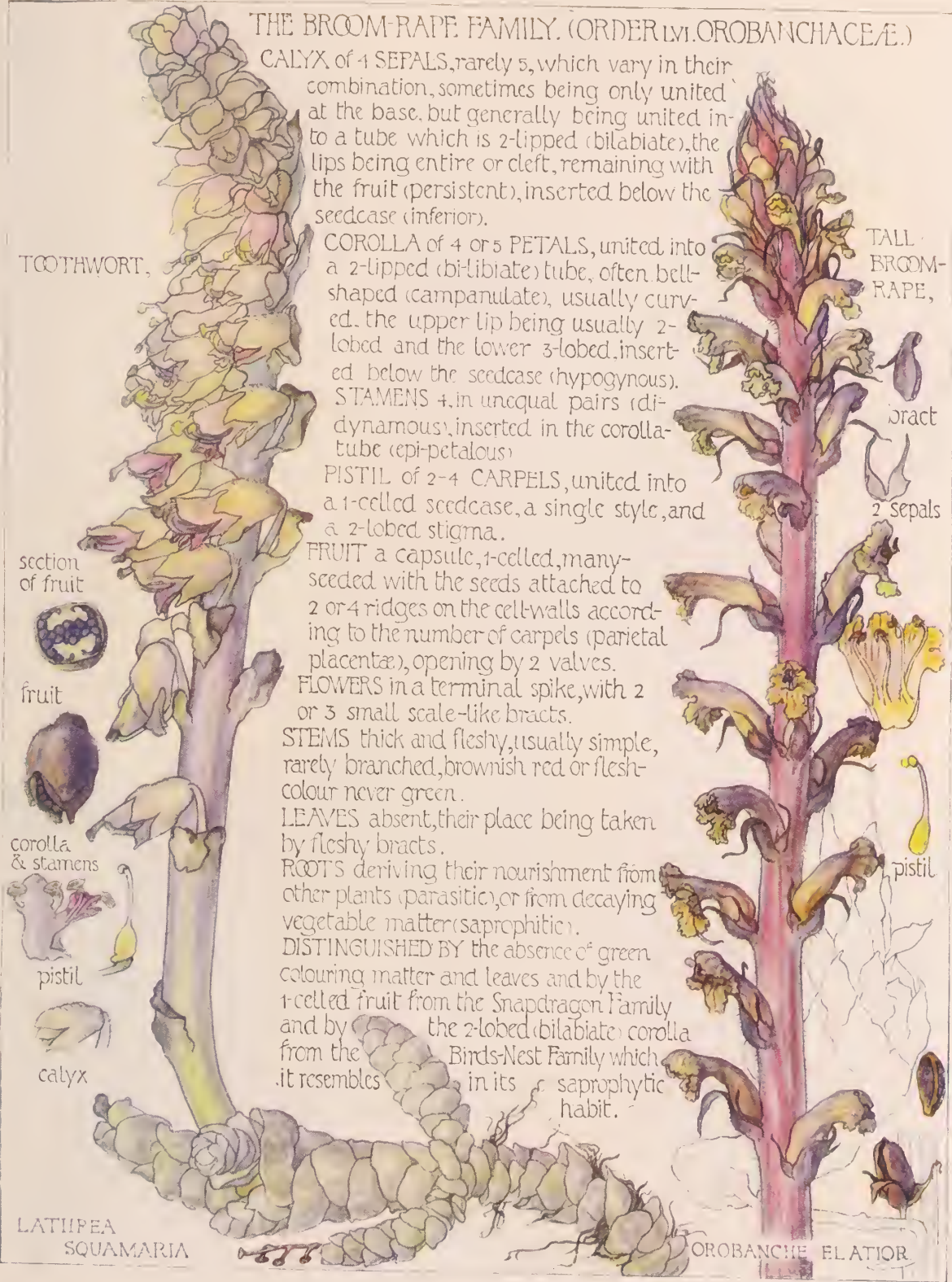
bract

2 sepals

pistil

LATHRAEA SQUAMARIA

OROBANCHE ELATIOR





- (4) Tall Broom-rape. (*Oroban'che elátior.*)—Flowers large, 1 inch long ; corolla very narrow and curved; stamens hairy towards the base, inserted near the base of the corolla-tube ; stigma of 2 yellow lobes touching one another. On Great Knapweed.
- (5) Lesser Broom-rape. (*Oroban'che mínor.*)—Flowers small, $\frac{3}{4}$ inch long ; corolla-tube narrow and curved throughout, the lower lip with 3 equal lobes ; stamens hairy below, inserted just below the middle of corolla-tube ; stigma of 2 slightly diverging purple lobes. On Clover, &c.
- (6) Ox-tongue Broom-rape. (*Oroban'che Pícridis.*)—Differing from the Lesser Broom-rape in the paler colour of the whole plant, and in the lobes of the stigma touching one another. On the Hawkweed Ox-tongue.
- (7) Ivy Broom-rape. (*Oroban'che Hed'erae.*)—Differing from the Lesser Broom-rape in the central lobe of the corolla lower lip being larger than the side ones, and in the stigma having 2 yellow lobes touching one another. On Ivy.
- (8) Purple Broom-rape. (*Oroban'che amethys'tea.*)—Differing from the Lesser Broom-rape in the corolla-tube being curved from the base and then straight, and in the middle lobe of the lower lip being larger.

Three bracts below each flower ; stamens inserted just below the middle of the corolla-tube ; capsule opening at the top by 2 valves.

- (9) Blue Broom-rape. (*Oroban'che purpúrea.*)—Flowers $\frac{3}{4}$ -1 inch long ; calyx of 5 sepals ; corolla 2-lipped but all the lobes pointed and more equal ; stigma white, scarcely lobed. On Common Yarrow.
- (10) *Sand Broom-rape. (*Oroban'che arenária.*)—Flowers 1-1 $\frac{1}{4}$ inches long ; calyx of 5 sepals ; corolla 2-lipped but all the lobes pointed and more equal ; anthers hairy ; stigma yellow (?), scarcely lobed. On Field Wormwood.
- (11) *Branched Broom-rape. (*Oroban'che ramósa.*)—Flowers $\frac{1}{2}$ inch long ; calyx of 4 sepals ; corolla-lobes blunt ; stigma whitish, scarcely lobed ; stem branched. On Hemp, &c.

1. Greater Broom-rape. (*Oroban'che májor.* Linn.)—As just described. The flowers are about 1 inch long, pale yellow tinged with purple, stalkless (sessile), each with 1 bract at the base, crowded together into a dense spike quite half the length of the usually unbranched stem. The bracts are more or less longer than the flowers ; the 4 sepals are united together in twos, often entirely, sometimes separating at the top ; the corolla is widely gaping, bell-shaped, curved, the upper lip scarcely lobed, and the lower 3-lobed, with the central lobe larger than the other two, all being wavy and indistinctly toothed, downy with gland-tipped hairs ; the 4 stamens are inserted on the base of the corolla-tube, the upper part of the filaments and the style are clothed with gland-tipped hairs, and the stigma is of 2 diverging pale yellow lobes ; the valves of the capsules are united at the apex and the base and so only open at the sides ; the stem is 1-2 feet high, stout, fleshy, swollen at the base, clothed with gland-tipped hairs, and lance-shaped bracts, which become much broader at the base ; the whole plant is of a yellowish colour, tinged with purple, and fades to a purplish-brown. (*Orobanche rapum. Thuill.*)

Rather rare. A parasite on the roots of Broom, Gorse, and other shrubby plants belonging to the Pea Family (Leguminosæ) ; generally but sparingly distributed over England, in Dumfriesshire in Scotland, and in the south-east of Ireland. May—August. Perennial.

2. Clove-scented Broom-rape. (*Oroban'che caryophyllácea*. Smith.)—A somewhat similar species to the last, with rather longer and narrower flowers, fewer and not so crowded; shorter bracts; the upper lip of the corolla erect and lobed, and the lower with 3 equal lobes, all wavy and sharply toothed; the stamens are inserted above the base of the corolla-tube, their filaments and the style are clothed throughout with gland-tipped hairs, and the stigma is of 2 widely diverging purple lobes; the stem, though stout and thick and swollen at the base, is not so tall as the Greater Broom-rape, being scarcely a foot high.

Very rare, local. A parasite on the roots of the Hedge Bedstraw (*Galium Mollugo*), but only found in Kent. June—July. Perennial.

3. Red Broom-rape. (*Oroban'che rúbra*. Smith.)—A smaller species, with smaller, dull red sweet-scented flowers, only about $\frac{3}{4}$ inch long; with the corolla-tube, as in the last species, narrower and less open at the top, and the upper lip distinctly cleft, but with the central lobe of the lower lip longer than the side ones, all being sharply toothed and wavy; the stamens inserted near the base of the corolla, hairy, with gland-tipped hairs at the top; the style also with gland-tipped hairs at the top, and the stigma 2-lobed, the lobes touching one another, and of a pale pink colour; the stem 3–9 inches high, stout and fleshy, with numerous scale-like bracts; the whole plant is of a brown- or purple-red.

Rare. A parasite on the roots of Wild Thyme, on magnesian rock in Cornwall, and on basaltic rock in Scotland and Ireland. June—August. Perennial.

4. Tall Broom-rape. (*Oroban'che elátior*. Sutton.)—A species very similar to the first—the Greater Broom-rape (*Orobanche major*)—but differing in having bracts shorter than the flowers; a narrower and more curved corolla, narrower and more curved indeed than in any of the three preceding species, in the upper lip being deeply lobed, and the lower lip with more equal pointed lobes, more distinctly toothed; in the stamens being inserted above the base of the corolla, the filaments hairy towards the base and nearly smooth at the top; and in the style being nearly smooth and the stigma of 2 yellow lobes touching one another. In size this species resembles the Greater Broom-rape, the two being the largest of our species. The stem is from 6 inches to 2 feet high, thick, and fleshy with numerous bracts; the whole plant is of a yellowish hue tinged with purple-brown. [Plate 28.]

Rare. A parasite on the roots of the Great Knapweed (*Centaurea Scabiosa*), distributed throughout the southern and eastern counties of England. June—August. Perennial.

5. Lesser Broom-rape. (*Oroban'che mínor*. Smith.)—A more slender species than any of the preceding ones. The flowers are $\frac{5}{8}$ – $\frac{3}{4}$ inch long, white or yellowish and often tinged with purple, in a loose spike. The bracts are as long as or longer than the flowers; the sepals very pointed; the corolla-tube narrow and slightly curved throughout, the upper lip more or less 2-lobed, and the lower lip with 3 nearly equal lobes, all wavy and sharply toothed; the stamens inserted a little below the middle of the corolla-tube, with the filaments hairy below and smooth above; the style smooth and the stigma of 2 slightly diverging purple lobes; and the capsule with valves united at the top and at the base. [As described in the genus Broom-rape (*Orobanche*.)] The stem is slender, about 1 foot high, covered with scale-like bracts, and the whole plant is yellowish with a little purple.

Not uncommon. A parasite on the roots of Clover and many other plants; not uncommon in the south of England, more rare in west and central England, not found in the north or in Scotland, introduced with Clover seeds into Ireland. June—July. Annual.

6. Ox-tongue or *Picris* Broom-rape. (*Oroban'che Píeridis*. F. Schultz.)—A species very similar to the Lesser Broom-rape (*Orobanche minor*), and by some botanists considered only

a variety, differing in its pale colour, and in the purple stigma-lobes just touching one another. The whole plant is whitish; it is, in fact, the palest of our native Broom-rapes. (*Under Orobanche minor, var. Picridis. Benth. and Hook.*)

Very rare, local. A parasite on the Hawkweed Ox-tongue (*Picris hieracioides*), found in the Isle of Wight, Kent, Cambridgeshire, and Pembrokeshire. July. Perennial.

7. Ivy Broom-rape. (Oroban'che Hed'eræ. Duby.)—Another similar species which chiefly differs from the Lesser Broom-rape in having the central lobe of the lower lip of the corolla larger than the side ones, in the lobes of the stigma being yellow and touching one another, and in the stem and bracts being purple, and the cream-coloured flowers being tinged with purple. (*Under Orobanche minor, var. Hederæ. Benth. and Hook.*)

Rare, local. A parasite on Ivy (*Hedera*), in the south-western counties of England, in the west up to Carnarvon, and in Ireland. June—July. Perennial.

8. Purple Broom-rape. (Oroban'che amethys'tea. Thuill.)—Another species often regarded as a variety of the Lesser Broom-rape, which differs from it in the flowers being more strongly tinged with purple, in the corolla-tube being curved directly from the base and then being straight, and in the central lobe of the lower lip being much larger than the side ones. (*Under Orobanche minor, var. amethystea. Syme, and Benth. and Hook.*)

Very rare. A parasite on the roots of the Seaside Carrot (*Daucus gummifer*), in Cornwall, Devonshire, and Kent, and on Sea-Holly (*Eryngium maritimum*) in Jersey and Guernsey. June. Annual.

9. Blue Broom-rape. (Oroban'che purpúrea. Jacquin.)—Flowers $\frac{3}{4}$ –1 inch long, pale blue with purple veins, in a rather dense spike, with 3 bracts below each flower. Calyx of 5 sepals, narrow and pointed, only united at the base; corolla narrowing and curving at the top, the two lips with pointed lobes, all being more equal than in the preceding species although still divided into 2 lips; the stamens smooth, inserted just below the middle of the corolla-tube; the stigma scarcely lobed, white; and the capsule opening by 2 valves from the top. [As described in the genus Broom-rape (*Orobanche*.)] The stem is unbranched, from 6 inches to 1 foot high, slender, and tough, with narrow lance-shaped scales; the whole plant is downy with gland-tipped hairs. (*Orobanche cærulea. Vill.*)

Rare. A parasite on the roots of the Common Yarrow (*Achillea Millefolium*) in meadows and on grassy walls near the sea, in some of the southern and eastern counties of England, and in the Channel Isles. June—July. Perennial.

10. *Sand Broom-rape. (Oroban'che arenária. Borkh.)—Not a native. A very similar species to the last, with paler blue flowers, 1–1 $\frac{1}{4}$ inches long, the corolla less curved and more gaping, the anthers hairy, the stigma yellow (?), and the whole plant larger, 12–18 inches high, white or tinged with blue. (*Under cærulea. Benth. and Hook.*)

A native of the Continent. A parasite on the roots of the Field Wormwood (*Artemisia campestris*) which has been found in Alderney. June—July. Perennial.

11. *Branched Broom-rape. (Oroban'che ramósa. Linn.)—Not a native. A species somewhat similar to the Blue Broom-rape (*Orobanche purpurea*), but with much smaller, rather more yellowish flowers tinged with blue, the calyx of only 4 broader sepals which are united halfway up into a tube, the corolla-lobes blunt; and the yellowish stem branched, and seldom more than 6 inches high.

A native of southern Europe. A parasite on Hemp, Lucerne, and other plants, which has been found in some of the southern and eastern counties of England. August—September. Annual.

II. TOOTHWORT. (LATHRÆA. Linn.)—A genus differing from the Broom-rape (Orobanche) in the flowers being more regular, less markedly 2-lipped; the calyx of 4 sepals, united into a widely bell-shaped 4-lobed tube; the corolla of 4 petals, with the upper lip concave and entire; and the capsule always opening at the top by 2 valves. Fleshy parasites with underground stems.

Common Toothwort. (Lathræa squamária. Linn.)—The only British species. As just described. The flowers are about $\frac{3}{4}$ inch long, numerous, flesh-colour or stained with purplish-red, drooping, stalked, with a broad egg-shaped (ovate) bract at the base of each stalk, and arranged in 2 rows in a spike-like cluster; the bell-shaped, 4-lobed calyx is hairy; the upper lip of the corolla is entire or slightly notched, and the lower lip is 3-lobed; the anthers are 2-celled, with the cells diverging from one another, and fringed with hairs; the style is smooth, and the 2-lobed stigma is purple; the capsule is egg-shaped (ovate), pointed, and flattened, containing largish seeds; the stem is 3 inches to 1 foot high, thick, fleshy, and brittle, whitish tinged with rose or purple, and with a few broad egg-shaped bracts, which as they near the root pass into short thick scales with which the root is covered. [Plate 28.

Rather rare. A parasite on the roots of the hazel and other trees; distributed through England and Ireland, and the southern and central counties of Scotland. April—May. Perennial.

THE BUTTERWORT FAMILY

[ORDER LVII. LENTIBULARIACEÆ]

CALYX of 2-5 **SEPALS**, partially united together in different ways, more or less 2-lipped (bilabiate), remaining with the fruit (persistent), free from and inserted below the seedcase (inferior).

COROLLA of 2-5 **PETALS**, united into a tube which is spurred at the base, and separating into 2 lips (bilabiate), the upper lip being shorter and 2-lobed and the lower lip 3-lobed or undivided, inserted below the seedcase (hypogynous).

STAMENS 2, included in the corolla-tube, inserted on the base of the corolla (epipetalous).

PISTIL of 2 **CARPELS** united into a 1-celled seedcase, 1 style, and a stigma with 2 unequal lobes.

FRUIT a roundish pointed capsule, 1-celled, many-seeded, with the seeds attached to a central column (free central placenta), opening by 2 valves, or bursting irregularly or transversely.

FLOWERS with the petals irregularly arranged, solitary or several together in a cluster (raceme) on a leafless stalk (scape).

LEAVES in the bog plants entire and all from the root, in a rosette; in the water plants finely divided or absent.

DISTINGUISHED by the 2-lipped spurred corolla, the 2 stamens, and the 1-celled capsule.

ALL the members of this order are bog or water plants. They resemble the Snapdragon Family in their spurred 2-lipped corolla, but differ from it in having only 2 stamens and a 1-celled capsule.

The order is a small one and is spread over most parts of the world

The two genera native to the British Isles are both carnivorous. One captures its prey by means of sticky glands on the surface of the leaves and the other by small bladders borne on the leaves which are all submerged.

I. BLADDERWORT (UTRICULÁRIA). Flowers usually in clusters; calyx of 2 sepals, the lower often notched; corolla-throat closed by a projecting palate; usually water plants without roots and with much divided leaves and with bladders.

II. BUTTERWORT (PINGUIC'ULA). Flowers solitary; calyx of 5 sepals, 2-lipped; corolla gaping; bog plants with the leaves all from the root.

I. BLADDERWORT. (UTRICULÁRIA. Linn.)—Flowers yellow, purple, or blue, solitary or in clusters terminating leafless stalks from the root (scapes). Sepals 2, only just united at the base, the lower often notched, and the upper entire, free from and inserted below the seedcase (inferior); petals united into a tube which is spurred at the base, and dividing into 2 lips, the throat of the tube being closed by the prominent projecting palate of the under lip (personate);

the upper lip is entire or wavy, and the lower, which is usually larger, is entire or 3-lobed, inserted below the seedcase (hypogynous); stamens 2, inserted at the base of the upper lip of the corolla (epi-petalous); carpels 2; capsule roundish, opening at the top by 2 valves in the British species. All the European species of this genus are water plants without roots, floating on the water, with leaves finely divided into thread-like segments, to which are attached small bladders full of air. These plants are carnivorous—the small bladders have tiny openings furnished with stiff hairs which permit the entrance of water fleas and small water insects, but prevent their exit.

- (1) Common Bladderwort. (*Utriculária vulgáris*.)—Flowers deep yellow, upper lip of corolla as long as the large broad palate, margins of the lower lip bent back at right angles; leaves fringed with hairs.
- (2) Overlooked Butterwort. (*Utriculária májor*.)—Flowers pale yellow, upper lip of corolla 2 or 3 times as long as the small palate, margin of lower lip flat and spreading; leaves fringed with hairs.
- (3) Lesser Bladderwort. (*Utriculária mínor*.)—Flowers pale yellow, upper lip of corolla as long as the small inconspicuous palate, margin of lower lip flat and spreading; corolla-spur reduced to a small protuberance; leaves not fringed with hairs.
- (4) *Utriculária Brémii*.—Like the Lesser Butterwort, but with larger flowers and a more definite spur to the corolla.
- (5) Intermediate Butterwort. (*Utriculária intermédia*.)—Flowers pale yellow, upper lip of corolla twice as long as the palate, margin of lower lip flat and spreading; leaves fringed with hairs; bladders on separate stems from the leaves.

1. Common Bladderwort. (*Utriculária vulgáris*. Linn.)—As just described. The flowers are about $\frac{3}{4}$ inch long, bright yellow with a few red streaks, stalked, each flower-stalk with a thin egg-shaped (ovate) bract at its base, 4–8 in a cluster terminating a leafless stalk (scape) 3–9 inches high; the corolla has a short conical spur, a very short upper lip and a large under lip, the upper not exceeding the large broad 2-lobed palate of the under lip, the margins of which are turned back at right angles. The whole plant floats in the water, and has no roots. It gives off from one point numerous leafy stems from 6 inches to over 1 foot long; the leaves are alternate, $\frac{3}{4}$ –2 inches long, and are divided again and again to the midrib (pinnately) into fine hair-like segments, fringed with hairs (ciliate), and bear small bladders about $\frac{1}{8}$ inch long. [Plate 29. Rare. In still water, in deep ponds and ditches; distributed throughout England, Scotland, and Ireland. June—August. Perennial.

2. Overlooked Bladderwort. (*Utriculária májor*. Schmidel.)—A similar species to the last but with the upper lip of the lemon-yellow corolla two or three times as long as the small palate of the under lip, the margin of which is flat and spreading; the flower-stalks longer; the bracts lance-shaped; and the whole plant much more slender, the leaves more finely divided, and the bladders much smaller. (*Utricularia neglecta*. Lehm.) Very rare. In ponds and ditches in the south-eastern counties of England. June—September. Perennial.

3. Lesser Bladderwort. (*Utriculária mínor*. Linn.)—A species differing from the Greater Bladderwort (*Utricularia vulgaris*) in being smaller in all ways; the flowers are only about $\frac{3}{8}$ inch long, of a very pale yellow; the upper lip of the corolla, as in the Greater Bladderwort, is about as long as the palate, but in this instance the palate is small and inconspicuous, and the margin flat and spreading, the corolla-spur is reduced to a short protuberance as broad as long;

ORDER LVII
LENTIBULARIACEÆ
BUTTERWORT
FAMILY.



PINUCULA
MINOR

LESSER
BLADDERWORT

bladder

corolla &
stamens
magnified

pistil
calyx
& pistil
magnified

LARGE
FLOWERED
OR
IRISH
BUTTERWORT

COMMON
BUTTER-
WORT,

COMMON
BLADDER
WORT,

PINUCULA
GRANDI-
FLORA

PALE
BUTTER-
WORT,

section capsule

stamens & pistil

calyx

stamens

corolla

pistil

PINUCULA
LUSITANICA

PINUCULA

MINOR

the stems are seldom more than 6 inches long, and the leaves are very small, about $\frac{1}{2}$ inch long, are not fringed with hairs, and are often destitute of bladders, never having more than one or two to each leaf. [Plate 29.

Rare. In ponds and ditches throughout England, Scotland, and Ireland. June—September. Perennial.

4. Utriculária Brémii. Heer.—This is a species said to grow in one or two places in Scotland; it differs from the Lesser Bladderwort (*Utricularia minor*) in having larger flowers, a more definite spur to the corolla, and a round flat lower lip.

Very rare. In ponds and ditches in one or two places in Scotland. July—August. Perennial.

5. Intermediate Bladderwort. (Utriculária intermédia. Hayne.)—A species intermediate between the Greater and Lesser Bladderwort; the flowers are about $\frac{1}{2}$ inch long, pale yellow; the upper lip of the corolla is twice as long as the projecting palate, and the border of the lower lip has a flat, spreading margin; the leaves are fringed with hairs, without bladders, and are densely crowded at the ends of the branches; and the bladders are borne on leafless branches.

Very rare, local. In ponds and ditches, extending from Dorset to the north of Scotland; also in Ireland. June—September. Perennial.

II. BUTTERWORT. (PINGUIC'ULA. Linn.)—Flowers purple, lilac, blue, yellow, or variegated, drooping, solitary on leafless stalks from the root (scapes). Calyx of 5 sepals, united at the base and separating into 2 lips (bilabiate), the upper lip 3- and the lower 2-lobed, remaining with the fruit (persistent), free from and inserted below the seedcase (inferior); corolla 2-lipped, gaping (ringent), the upper 2- and the lower lip 3-lobed and usually much longer, the tube spurred at the base, inserted below the seedcase (hypogynous); stamens 2, inserted on the base of the corolla (epi-petalous); carpels 2; capsule roundish, pointed, 1-celled, many-seeded, opening by 2 valves. Bog plants with all the leaves from the root in a rosette, entire, fleshy, with the margins rolled in (involute), and the surface greasy with sticky glands which enable the plant to catch any small insects which alight on it.

- (1) Common Butterwort. (*Pinguic'ula vulgáris*.)—Flowers nearly 1 inch long, purplish-blue; spur short, slender, straight; lower lip of corolla unequally lobed and longer than upper lip.
- (2) Large-flowered Butterwort. (*Pinguic'ula grandiflóra*.)—Flowers $1\frac{1}{2}$ inches long, deep violet; spur very long, slender, straight, usually notched; lower lip of corolla unequally lobed, and much longer than upper lip.
- (3) Alpine Butterwort. (*Pinguic'ula alpína*.)—Flowers over $\frac{1}{2}$ inch long, yellowish; spur short, thick, abruptly bent; lower lip of corolla unequally lobed, much longer than upper lip.
- (4) Pale-flowered Butterwort. (*Pinguic'ula lusitan'ica*.)—Flowers barely $\frac{1}{2}$ inch long, mauvish; spur short, thick, curved; lower lip of corolla about the same length as the upper lip and all the lobes nearly equal.

1. Common Butterwort. (Pinguic'ula vulgáris. Linn.)—As just described. The flowers are about 1 inch long, of a purplish-blue, drooping, solitary, on leafless stalks 3–6 inches high; the sepals pointed with gland-tipped hairs; the corolla with a short slender straight spur, the upper lip shorter than the lower, which has unequal lobes; and the capsule roundish and pointed. The leaves are oblong, thick, fleshy, pale shining green, greasy with oily sticky glands, spreading in a rosette on the ground. [Plate 29.

Common in mountainous districts, in bogs by mountain streams ; throughout England, though local in the south, Scotland, and Ireland. May—July. Perennial.

2. Large-flowered Butterwort. (*Pinguic'ula grandifl'ora*. Lam.)—A larger but very similar species with beautiful deep violet flowers over an inch long, with blunt sepals, a long very slender straight spur, broad lobes to the corolla-lips, and much broader leaves. [Plate 29. Very rare, local. On bogs and by mountain streams in the south-west of Ireland, where it is abundant in some parts of Counties Kerry and Cork. May—July. Perennial.

3. Alpine Butterwort. (*Pinguic'ula alpina*. Linn.)—A much smaller plant than the Common Butterwort (*Pinguicula vulgaris*), the flowers $\frac{1}{2}$ inch long, whitish-yellow, the spur short and blunt and abruptly bent down, the upper lip of the corolla shorter than the lower, and the lobes unequal.

Very rare. Bogs in Ross-shire and the Isle of Skye. May—June. Perennial.

4. Pale Butterwort. (*Pinguic'ula lusitan'ica*. Linn.)—The smallest British species ; the flowers are barely $\frac{1}{2}$ inch long, very pale lilac-colour, the throat tinged with yellow and darker lilac stripes, solitary on leafless stalks 2–5 inches high ; the sepals are blunt ; the spur of the corolla is thick, blunt, and curved, and the lobes of the corolla-lips are all about the same size and length. The leaves are very small, $\frac{1}{2}$ –1 inch long, almost transparent, and of a very yellowish green, tinged and often veined with a purplish-red. [Plate 29.

Local. In bogs ; abundant in some parts of England, especially in Devon and Cornwall, in the west of Scotland, and Ireland. June—September. Perennial.

THE VERVAIN FAMILY (VERVAINACEAE)

CALYX of 5 or 6 SLIMLY united into a tube and spreading into 2-5 lobes. The fruit is inserted below the corolla.
 COROLLA or 5 PETALS united into a tube and spreading into a 2-lobed limb which is usually 2-lobed (bilabiate) rarely salver shaped, inserted below the seedcase by POGONIES.

STAMENS 4, in 2 pairs of pairs didynamous, inserted by the corolla tube opposite the upper pair often imperfect.

PISTIL of 1 CARPEL united into an entire seedcase not lobed but 2-celled and tapering into a style and a pinhead like capitulate or sometimes a 2-lobed stigma.

FRUIT a berry like drupe, or a capsule or splitting when ripe into 2 or 4 little nuts or cocci, each of which contains one erect seed.

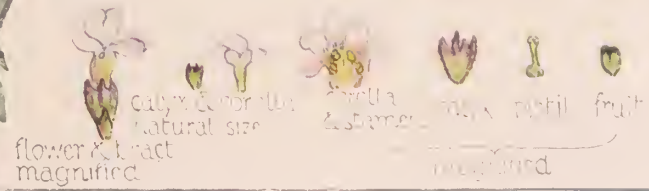
LEAVES usually opposite, without stipules.

FLOWERS in spikes, heads, or various clusters rarely solitary.

DISTINGUISHED from the Dead-Nettle Family (Labiatae) which members of this order resemble, by the pistil which differs in the seedcase being entire with the style rising from its apex, instead of the seedcase being 4-lobed with the style rising from the base and centre of the lobes as in the Dead-Nettle Family.

COMMON
VERVAIN.

VERBENA
OFFICINALIS



flower & fruit magnified

calyx & corolla natural size

corolla & stamens

calyx, pistil, fruit

magnified

THE VERVAIN FAMILY

[ORDER LVIII. VERBENACEÆ]

THIS order closely resembles the Dead-Nettle Family but is distinguished from it by the pistil, the seedcase of which is entire instead of being 4-lobed and is surmounted by the style rising from its apex instead of from its base.

The order is a large one and contains herbs, shrubs, and trees. It belongs chiefly to the tropics and has only one representative in the British Isles.

Many exotic genera are cultivated in greenhouses, such as the Lantana and Vitex. The American Verbenas are deservedly popular in gardens as their vivid colouring can hardly be surpassed, and the sweet-scented Verbena or Lemon-plant (*Aloysia citriodora*) is grown for the fragrance of its rough leaves. The most valuable species is undoubtedly the Teak (*Tectona grandis*), a magnificent tree, a native of East India, which has a particularly firm close wood, which is invaluable in shipbuilding, &c.

I. VERVAIN. (VERBÉNA. Linn.)—Flowers in terminal spikes in the only British species. Calyx of 4 or 5 sepals, united into a tube and separating into 4 or 5 teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and spreading into a slightly 2-lipped or salver-shaped 5-lobed limb, inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), included in and inserted upon the corolla, occasionally with the upper pair imperfect (sterile); carpels 2; fruit dry, 2-celled, splitting into 2 or 4 little nuts (cocca). Herbs or undershrubs with 4-angled stems and opposite leaves.

Common Vervain. (Verbéna officinális. Linn.)—The only British species. As just described. With long slender spikes of small pale mauve flowers, which terminate the stem and branches, each flower stalkless in a small bract; the corolla with a spreading unequally 5-lobed limb; the fruit of 4 little nuts, each containing 1 seed; the stem 1-2 feet high, wiry, 4-angled, with spreading branches, and oblong deeply toothed or lobed leaves.

This plant is one of ancient interest. It was held in high esteem by the Druids, and by the ancient Greeks who attributed to it wonderful purifying properties. [Plate 30.

Not uncommon. On dry banks, roadsides, &c.; common in the south of England but rare in the north, unknown in Scotland, and rare in Ireland. July—September. Perennial.

THE DEAD-NETTLE FAMILY

[ORDER LIX. LABIATÆ]

THE Dead-Nettle Family is one of the most natural orders in the vegetable kingdom, and is easily distinguished by the 2-lipped corolla in conjunction with the fruit of 4 little nuts (cocca). The Foxglove and Borage Families have strong points in common, the former having usually a 2-lipped corolla but a capsular fruit, and the latter a fruit of 4 little nuts (cocca) but a salver-shaped corolla and 5 stamens. Added to those already mentioned the Dead-Nettle Family has other characteristics—the flowers are generally apparently clustered in circles (whorls) round the square stem, the leaves are opposite, each pair at right angles to its neighbour, both stems and leaves are very hairy, and many species are fragrant and aromatic.

The order is a large one and has a wide distribution, though it thrives best in warm or temperate climates. It is abundant in the countries round the Mediterranean.

It has one great attribute—no one of its species possesses any injurious properties, while many are extremely useful.

Many foreign species are cultivated in greenhouses and gardens. Among others are Patchouli and several species of Coleus in houses; while in our gardens we have Lavender (*Lavandula veris*), Sweet Basil (*Ocimum Basilicum*), Rosemary (*Rosmarinus officinalis*), and Balm (*Melissa*), famous for their delicious scents; Phlomis and Leonotis, Salvias, Monardas, Dracocephalums, and Perillas; and, as among some of our most aromatic pot-herbs, Sweet Marjorum (*Origanum vulgare*), Garden Thyme (*Thymus vulgaris*), Sage (*Salvia officinalis*), Mint (*Mentha viridis*), and Summer Savoury (*Satureia hortensis*). Rosemary is largely used in the manufacture of Eau de Cologne, and Lavender is grown in certain districts for making into scent. The essential oil contained in some Mints, Lavenders, &c., is employed as an antiseptic in dentistry.

Corolla 2-lipped, and usually 5-lobed.

Stamens 4, 2 outer longer.

- I. DEAD-NETTLE (*LÁMIUM*). Calyx 5-toothed; upper corolla-lip arched; stamens included, anthers hairy and approaching.
- II. BASTARD BALM (*MELIT'TIS*). Calyx 2-lipped, inflated; upper corolla-lip straight; stamens protruding.
- III. BLACK HOREHOUND (*BALLÓTA*). Calyx with 5 prickly teeth; upper corolla-lip arched; stamens included, anthers approaching.
- IV. GERMANDER (*TEU'CRIMUM*). Upper corolla-lip apparently absent and lower lip apparently 5-lobed; stamens protruding, diverging.

THE DEAD-NETTLE FAMILY. (ORDER LIX. LABIATÆ.)

CALYX of 5 SEPALs united into a tube and separating into 5 teeth occasionally 2-lipped or apparently 2-lobed, remaining with the fruit (persistent), inserted below the seedcase (inferior).

COROLLA of 5 PETALS united into a gaping tube spreading into a limb which is usually 2-lipped (bilabiate), the upper lip entire or 2-lobed, and the lower 3-lobed, inserted below the seedcase (hypogynous).

STAMENS 4, rarely 2, in unequal pairs (didynamous), the anthers conspicuously 2-celled, inserted in the corolla-tube (epipetalous).

PISTIL of 2 CARPELS, each deeply lobed so that the seedcase is 4-lobed and 4-celled, with a single style rising from the centre and base of the 4 lobes, the style is terminated with a 2-cleft stigma.

FRUIT dry, separating into 4 little nut-like fruits (cocca), each containing 1 erect seed.

STEMS 4-sided, hairy.

LEAVES opposite, each pair at right angles to the pair above and below (decussate), hairy, frequently with an aromatic scent secreted in the hair-glands

FLOWERS stalkless (sessile), usually in small clusters (cymes) in the axils of the upper leaves almost forming circles (false whorls or verticillasters), or with the upper leaves bract-like and so close together that the flowers are crowded into a spike-like cluster (raceme), or rarely in pairs, solitary in the axils of the opposite leaves

DISTINGUISHED BY the usually circling clusters of flowers in the leaf axils, by the usually 2-lipped corolla, the 2 unequal pairs of stamens, and by the fruit of 4 little nuts, also by the square stems and the opposite decussate generally fragrant leaves.



calyx

corolla

stamens

pistil

fruit

WHITE
DEAD-
NETTLE.

LAMIAM
ALBUM

- V. BUGLE (AJÚGA). Upper corolla-lip very short ; stamens protruding.
 VI. *MOTHERWORT (LEONÓRUS). Calyx with 5 prickly teeth ; upper corolla-lip straight ; stamens protruding, anthers approaching ; leaves lobed.
 VII. HEMP-NETTLE (GALEOP'SIS). Calyx with 5 pointed teeth ; lower corolla-lip with a small erect tooth on each side near the throat ; anthers fringed.
 VIII. STÁCHYS. Calyx with 5 equal teeth and 5-10 ribs ; anthers smooth.
 IX. WHITE HOREHOUND (MARRÚBIUM). Calyx with 10 teeth curved back ; stamens included in the corolla-tube.

Stamens 4 ; calyx-tube with 10-13 ribs.

- X. MARJORUM (ORÍGANUM). Flower-cluster much branched, with a coloured bract at the base of the flowers ; calyx 5-toothed ; stamens diverging and protruding.
 XI. THYME (THÝMUS). Calyx 2-lipped ; stamens diverging and protruding ; stems prostrate ; leaves small.
 XII. WILD BASIL (CLINOPÓDIUM). Flower-clusters surrounded with involucre of bristly bracts ; calyx 2-lipped ; corolla-tube straight ; stamens converging.
 XIII. CALAMINT (CALAMIN'THA). Calyx 2-lipped ; corolla-tube straight ; stamens converging.
 XIV. *BALM (MELIS'SA). Calyx 2-lipped ; corolla-tube curved ; stamens converging.
 XV. NÉPETA. Calyx with 5 teeth and 15 ribs ; stamens with the inner pair longer than and projecting beyond the outer.

Calyx 2-lipped, closed in fruit ; stamens included in upper corolla-lip.

- XVI. SELF-HEAL (PRUNEL'LA). Flowers in heads or spikes ; upper lip of calyx 3-toothed and lower 2-toothed ; stamens 4.
 XVII. SKULL-CAP (SCUTELLÁRIA). Flowers solitary or in pairs ; calyx-lips entire, with a scale-like protuberance on the upper lip ; stamens 4.
 XVIII. SAGE (SAL'VIA). Calyx 2-lipped ; stamens 2.
 Corolla bell-shaped, with 4 nearly equal lobes ; calyx with 5 equal teeth.
 XIX. GIPSY-WORT (LÝCOPUS). Stamens 2 perfect, sometimes 2 imperfect (abortive), diverging ; little nuts with a corky border.
 XX. MINT (MEN'THA). Stamens 4, diverging.

I. DEAD-NETTLE. (LÁMIUM. Linn.)—Flowers usually large, red, pink, white, or rarely yellow, stalkless (sessile), in clusters in the axils of the upper leaves almost circling the stem (false whorls or verticillasters). Calyx of 5 sepals united into a bell-shaped tube and separating into 5 pointed, erect or spreading, nearly equal teeth, remaining with the fruit (persistent), inserted below the seedcase (inferior) ; corolla of 5 petals, united into a long tube inflated at the throat, and separating into 2 lips (bilabiate), the upper lip erect, arched, entire or slightly notched, and the lower lip spreading, 3-lobed, the side (lateral) lobes often small and tooth-like, inserted below the seedcase (hypogynous) ; stamens 4, in unequal pairs, included in the upper lip of the corolla, the filaments curving inwards (converging) till each pair of anthers meets, the anthers generally hairy, opening lengthways, inserted on the corolla-tube (epi-petalous) ; carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas ; fruit of 4 little nuts (cocca). Hairy herbs, with square stems, which are decumbent at the base, and broad toothed (serrate) opposite leaves.

Lower corolla-lip with a large central lobe and 2 small side lobes which are more like teeth; anthers hairy.

- (1) Henbit Dead-Nettle. (*Lámium amplexicaúle*.)—Calyx densely hairy, teeth closing in fruit; corolla-tube straight, without an internal ring of hairs; upper leaves stalkless.
- (2) Intermediate Dead-Nettle. (*Lámium molucellifólium*.)—Calyx-teeth slightly hairy, spreading in fruit; corolla-tube straight, short, with an indistinct ring of hairs inside; upper leaves stalkless.
- (3) Cut-leaved Dead-Nettle. (*Lámium híbridum*.)—Calyx-teeth spreading in fruit; corolla-tube straight, without a ring of hairs inside; leaves all stalked.
- (4) Red Dead-Nettle. (*Lámium purpúreum*.)—Corolla-tube curved, with a marked ring of hairs inside; leaves all stalked.
- (5) *Spotted Dead-Nettle. (*Lámium maculátum*.)—Corolla-tube curved, with a marked transverse ring of hairs inside; leaves all stalked.
- (6) White Dead-Nettle. (*Lámium al'bum*.)—Flowers white; corolla-tube curved, with a marked oblique ring of hairs inside; leaves all stalked.

Lower corolla-lip with 3 entire nearly equal pointed lobes; anthers not hairy.

- (7) Yellow Dead-Nettle. (*Lámium Galeob'dolon*.)—Flowers yellow; corolla-tube curved, with a marked oblique ring of hairs inside; leaves all stalked.

1. Henbit Dead-Nettle. (*Lámium amplexicaúle*. Linn.)—As just described. The flowers are about $\frac{3}{4}$ inch long, of a purplish-rose, in distant clusters in the axils of the opposite leaves (false whorls); the calyx is small and densely hairy, the teeth longer than the tube and converging in fruit; the tube of the corolla is long, straight and slender, without an internal ring of hairs, the upper lip is entire and the lower lip has a large central lobe and 2 teeth-like side ones; and the anthers are hairy. The stem is 4-12 inches high and is branched from the base; the leaves are roundish, partly heart-shaped (subcordate) at the base and bluntly scalloped (crenate), the lower ones on long stalks and the upper ones stalkless (sessile).

Common. In cultivated ground and waste places, on sandy and chalky ground; generally distributed throughout England, Scotland, and Ireland. May—August. Annual.

2. Intermediate Dead-Nettle. (*Lámium molucellifólium*. Linn.)—A species intermediate between the Henbit Dead-Nettle (*Lamium amplexicaule*) and the Red Dead-Nettle (*Lamium purpureum*), though with more of the characteristics of the former, from which it differs in the calyx being less hairy, the teeth spreading in fruit, and in the corolla having a shorter tube and an indistinct ring of hairs inside. (*Lamium intermedium*. Fries.)

Local. In cultivated ground on sandy soil; common in Scotland, rare in England and Ireland. June—September. Annual.

3. Cut-leaved Dead-Nettle. (*Lámium híbridum*. Villars.)—Another intermediate species, but more closely resembling the Red Dead-Nettle (*Lamium purpureum*). The flower-clusters are more crowded together at the top of the stem, as in that species, the flowers are red and about $\frac{1}{2}$ inch long, the calyx-teeth are spreading, the corolla-tube is straight and without any internal ring of hairs, and the leaves are all stalked and deeply scalloped (crenate), the upper ones wedge-shaped at the base, only the lower ones being heart-shaped (cordate). (*Lamium incisum*. Willd.)

Rather common. In cultivated ground and waste places; generally distributed throughout England, Scotland, and Ireland. April—October. Annual.



BASTARD
BALM,
MELITTIS
MELISSOPHYLLUM.

YELLOW
ARCHANGEL,
YELLOW
DEAD-
NETTLE.

RED
DEAD-
NETTLE

persistent
calyx cut
open
showing fruit

Parts of Yellow
Dead-Nettle

YELLOW
SNOUT,

MELISSA
OFFICINENSIS



4. Red Dead-Nettle. (*Lámium purpúreum*. Linn.)—The flowers are about $\frac{3}{4}$ inch long, dull rose-colour, crowded together at the top of the stem in clusters (whorls) in the axils of the opposite leaves; the calyx-teeth are spreading; the corolla-tube is slightly curved and has a marked internal ring of hairs; while the lower lip has one large central lobe divided into 3 segments and a tooth-like one on each side; the anthers are hairy; the 4-sided stem is 6–18 inches high, decumbent and branched at the base, often tinged with purple; the leaves are all stalked, the upper ones being shortly stalked, egg-shaped (ovate) or heart-shaped (cordate), and the lower ones on long stalks, small, and roundish.

Very common. In cultivated ground and waste places, throughout England, Scotland, and Ireland. April—October. Annual. [Plate 32.]

5. *Spotted Dead-Nettle. (*Lámium maculátum*. Linn.)—A species very similar to the next—the White Dead-Nettle (*Lamium album*)—but differing from it in its purple-red flowers, which have a transverse ring of hairs inside the corolla-tube and are fewer in number in each cluster, and in the leaves usually having a white stripe down the middle.

Not a native. An escape from cultivation found in various places in England and Scotland. June—September. Perennial.

6. White Dead-Nettle. (*Lámium al'bum*. Linn.)—Flowers large, about 1 inch long, creamy-white, 6–18 in dense clusters (whorls) in the axils of the leaves; the calyx usually stained with purple and the teeth long, fine, and spreading; the corolla-tube with a marked oblique ring of hairs inside and dilated above, the upper lip much arched and densely hairy outside, the lower lip with one large central lobe and 2 teeth-like side lobes; and the anthers black and hairy. [As described in the genus Dead-Nettle (*Lamium*).] The stems about 1 foot high, and the leaves all stalked and coarsely toothed, egg-heart-shaped and pointed.

[Plate 31.]

Very common. By hedges, on waste places, and cultivated ground; very common in England and the south of Scotland, rare in the north of Scotland and in Ireland. May—December. Perennial.

7. Yellow Dead-Nettle, Yellow-Snout, Yellow Archangel. (*Lámium Galeob'dolon*. Crantz.)—Flowers $\frac{3}{4}$ –1 inch long, yellow, 6–10 in clusters in the axils of the leaves (false whorls). The calyx hairy, the teeth pointed; the corolla-tube curved and with a marked oblique ring of hairs inside, the upper lip arched, entire, and densely hairy outside, and the lower lip with 3 nearly equal pointed lobes; the anthers not hairy. [As described in the genus Dead-Nettle (*Lamium*).] The square stems are about 18 inches high, and the leaves are stalked, egg-shaped (ovate), pointed, and coarsely toothed (serrate).

[Plate 32.]

Local. In woods and under hedges; not uncommon in the south of England and Midlands, very rare in Scotland and Ireland. May—June. Perennial.

II. BASTARD BALM. (*MELIT'TIS*. Linn.) A genus consisting of the following species:—

Bastard Balm. (*Melit'tis Melissophyl'lum*. Linn.)—Flowers large, 1–1 $\frac{1}{2}$ inches long, solitary or 2 or 3 in the axils of the leaves. Calyx short and broad, of a thin texture, 2-lipped (bilabiate), the upper lip broad, shortly 3-lobed, and the lower lip 2-lobed, becoming inflated in fruit, inserted below the seedcase (inferior); corolla 2-lipped (bilabiate), upper lip erect, slightly thrown back, and very slightly arched, entire and wavy or with 2 lobes, and the lower lip 3-lobed and spreading, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), diverging, protruding (exserted), inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Stem 1–2 feet high, square, stout; leaves shortly stalked,

opposite, narrowly egg-shaped (ovate) or heart-shaped (cordate) and pointed. The calyx, stem, and leaves are all finely hairy. [Plate 32.]

Rather rare. In woods and shady places, in the south and south-west of England. June. Perennial.

III. BLACK HOREHOUND. (BALLÓTA. Linn.)—Flowers small, in dense clusters in the axils of the leaves (false whorls). Calyx of 5 sepals united into a funnel-shaped tube and separating into 5 equal, prickly, spreading teeth, in foreign species often with 5 or even more smaller alternate teeth, inserted below the seedcase (inferior); corolla of 5 petals united into a tube and separating into 2 lips (bilabiate), the upper erect, arched, notched, and the lower spreading, 3-lobed, the middle lobe being notched, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous) included in the upper lip of the corolla, each pair of anthers approaching one another, inserted on the corolla (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Hairy herbs with square stems and opposite leaves which are often heart-shaped (cordate).

Black Horehound. (Ballóta nígra. Linn.)—The only British species. As just described. The flowers are purplish-rose, in dense, rather 1-sided clusters; the calyx-teeth are broadly egg-shaped and shortly pointed; the stems are 1-3 feet high; and the leaves are stalked, egg-shaped (ovate) or heart-shaped (cordate), and coarsely toothed or scalloped. The whole plant is densely hairy, and has a disagreeable smell. [Plate 33.]

A similar plant is found in Northumberland and Herefordshire with narrower, long, pointed teeth, much softer hairs, and a pleasant scent, and is regarded as var. *ruderalis*. Koch. by Syme, and as a species—*Ballota ruderalis*. Sw.—by Babbington.

Common. Under hedges and in waste places; common throughout England, scarce in Scotland, and rare in Ireland. July—August. Perennial.

IV. GERMANDER. (TEU'CRIMUM. Linn.)—Flowers few in each cluster, usually all turned to one side of the stem. Calyx of 5 sepals united into a tube and separating into 5 teeth which are often arranged in 2 lips (bilabiate), inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and spreading into a 5-lobed under lip, apparently without an upper lip; as a matter of fact the upper lip is very short and is deeply lobed, the lobes following the direction of the lower lip so that the effect is that of no upper and a 5-lobed under lip; stamens 4, in unequal pairs (didynamous), diverging and protruding (exserted), inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs or undershrubs of various habits with square stems and opposite leaves.

Flowers 2-6 in clusters in the leaf-axils; calyx-teeth equal.

- (1) Cut-leaved Germander. (*Teu'crium Bótrys.*)—Flowers in distant clusters; calyx inflated; leaves stalked, lobed to the midrib.
- (2) Water Germander. (*Teu'crium Scor'dium.*)—Flowers in distant clusters; leaves stalkless, oblong.
- (3) Wall Germander. (*Teu'crium Chamédrys.*)—Flowers crowded into a leafy, spike-like cluster; leaves stalked, egg-shaped.

Flowers in pairs in the axil of a small bract, crowded together in spike-like, 1-sided clusters; calyx 2-lipped.

- (4) Wood-sage. (*Teu'crium Scorodónia.*)—Flowers pale yellow.



1. Cut-leaved Germander. (*Teucrium Bótrys*. Linn.)—As just described. The flowers are about $\frac{3}{4}$ inch long, purplish-rose, 4-6 in clusters in the axils of the leaves; the calyx is large, inflated, pouched (gibbous) at the base, and the teeth are nearly equal and pointed; the stem is 4-10 inches high, erect, wiry, branched from the base; and the leaves are stalked, deeply lobed towards the midrib (pinnatifid), the lobes being entire or cut. The whole plant is covered with long hairs and gland-tipped hairs intermixed.

Very rare. In chalky corn-fields in Surrey, and on chalk downs in Kent. August—September. Annual.

2. Water Germander. (*Teucrium Scor'dium*. Linn.)—A species with rose-coloured flowers, $\frac{1}{2}$ inch long, in distant clusters of about 4 flowers together; the calyx is slightly pouched (saccate) at the base, not inflated, and with 5 equal teeth. [As described in the genus Germander (*Teucrium*).] The stems are 4-12 inches high, decumbent at the base, branched and hairy; the leaves are stalkless (sessile), oblong, coarsely toothed (serrate), and hairy; and the root is creeping. Very rare. In wet, marshy places in a few counties in the south and east of England, and in the south and west of Ireland. July—August. Perennial.

3. *Wall Germander. (*Teucrium Chamædrys*. Linn.)—A somewhat similar species with larger rose-coloured flowers, the upper ones forming a leafy, 1-sided cluster (raceme); the stem 3-18 inches long, wiry and hairy; and the leaves stalked, egg-shaped (ovate), deeply scalloped (crenate), and hairy on both sides.

Formerly cultivated as a medicinal herb.

Not a native; rare. On old walls; an escape from cultivation which has established itself in a few localities in England, and has been reported from Scotland and Ireland. July—September. Perennial.

4. Wood-sage, Wood Germander. (*Teucrium Scorodónia*. Linn.)—The only well-known species in this genus. The flowers are pale yellow, in pairs, each pair in the axil of a small bract, crowded together up the stem and branches, forming terminal 1-sided clusters (racemes). The calyx is slightly pouched (saccate), the upper tooth is much larger and broader than the others and is turned back, giving the calyx the appearance of being 2-lipped (bilabiate), while the remaining 4 teeth are small and equal; the tube of the corolla is long and slender, and the protruding anthers are of a golden brown. [As described in the genus Germander (*Teucrium*).] The stem is about a foot high, tough and almost woody at the base; and the leaves are stalked, egg-shaped (ovate), heart-shaped (cordate) at the base, scalloped (crenate), wrinkled, and usually with white marks. [Plate 33.]

This plant is very bitter and was once used as a medicine, and has been employed in the brewing of beer instead of hops.

Very common. On banks, under hedges, in woods, stony places, &c.; distributed all over England, less common in the north of Scotland, and throughout Ireland. June—September. Perennial.

V. BUGLE. (*AJÚGA*. Linn.)—Flowers purplish-blue or yellow, crowded at the top of the stem in clusters in the axils of leafy bracts forming spike-like clusters (racemes). Calyx of 5 sepals, united into a tube, and separating into 5 teeth, remaining with the fruit (persistent), inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and separating into a very short, notched upper lip and a large spreading 3-lobed under lip, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), diverging, protruding, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided

at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs of various habits with square stems and opposite leaves.

- (1) Common Bugle. (*Ajúga rep'tans.*)—Flowers blue; leaves and bracts broad, entire; root with runners; plant smooth.
- (2) Pyramidal Bugle. (*Ajúga pyramidális.*)—Flowers blue; leaves and bracts broad, toothed; root without runners; plant hairy.
- (3) Ground Pine. (*Ajúga Chamæpitys.*)—Flowers yellow; leaves and bracts deeply lobed into narrow segments.

1. Common or Creeping Bugle. (*Ajúga rep'tans.* Linn.)—As just described. A beautiful species with mauvish-blue or rarely white flowers, in clusters (false whorls) of 6-12 in the axils of leafy oval bracts tinged with blue, forming an erect spike-like showy cluster terminating a usually unbranched (simple) stem, which has a few pairs of oval, blunt, shiny, shortly stalked, entire leaves and a few long stalked, scalloped leaves from the root. The whole plant is smooth and has creeping runners. [Plate 33.]

Very common. In woods, by streams, and in moist meadows; throughout England, the south of Scotland, and Ireland. May—July. Perennial.

2. Pyramidal Bugle. (*Ajúga pyramidális.* Linn.)—A very similar species to the last—the Common Bugle (*Ajúga reptans*)—but with the flower-bracts much larger and longer than the flowers, the spike 4-sided, the calyx, and, in fact, the whole plant, densely hairy; the leaves often coarsely toothed, and the root without runners.

Very rare. By mountain streams; in the Scotch Highlands and in Ireland in the Isles of Arran. May—July. Perennial.

3. Ground Pine. (*Ajúga Chamæpitys.* Schreb.)—Flowers yellow, in pairs in the axils of the leaf-like bracts which are either lobed to the midrib (pinnatifid) or to the base (palmatifid) into 3 narrow segments and are always longer than the flowers. The stem is 3-9 inches long, much branched, hairy, sticky, and reddish; and the stem-leaves, like the bracts, are lobed into 3 narrow segments, the root-leaves are narrowly ovate, entire or with a wavy margin.

Local. In cultivated fields, on chalky ground; common in Kent and Surrey and also occurring in other counties in the south-east and east of England. May—August. Annual.

VI. *MOTHERWORT. (*LEONÚRUS.* Linn.)—Flowers rather small, pink or white, in many-flowered clusters in the axils of the leaves (false whorls). Calyx of 5 sepals, united into a bell-shaped (campanulate) tube, and separating into 5 spreading, almost equal teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and spreading into a 2-lipped (bilabiate) limb, the upper lip erect, arched, entire, hairy outside, and the lower lip spreading and 3-lobed with the middle lobe notched, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), included in the upper lip, the anthers approaching one another in pairs, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs with square stems and more or less lobed, opposite leaves.

***Common Motherwort.** (*Leonúrus Cardíaca.* Linn.)—Not a native. As just described. The flowers are about $\frac{1}{2}$ inch long, pale pink, in crowded clusters in the leaf-axils (false whorls); the stem is 2-4 feet high, stiff and hairy, branched below; and the leaves are stalked, the lower ones roundish and lobed to the base (palmatifid), gradually becoming narrower

and less lobed higher up the stem, till those containing the flower-clusters are narrow, 3-lobed or nearly entire.

Rare. In hedges and waste places; naturalised in several parts of England, Scotland, and Ireland. July—September. Perennial.

VII. HEMP-NETTLE. (GALEOP'SIS. Linn.)—Flowers often large and showy, rose, yellow, or white, sometimes strongly marked with another colour, in dense, many-flowered clusters in the axils of the leaves (false whorls). Calyx of 5 sepals, united into a tube and separating into 5 spinous-pointed teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a long tube and spreading into a 2-lipped (bilabiate) limb, the upper lip erect, arched, entire or slightly notched, the lower lip spreading, 3-lobed, with 2 small erect teeth on its upper side, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), included in the upper lip, each pair of anther-cells approaching one another, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Branched herbs with square stems and toothed (serrate) opposite leaves.

- (1) Narrow-leaved Red Hemp-Nettle. (*Galeop'sis angustifolia*.)—Flowers rose; terminal clusters massed into a head; calyx-teeth shorter than tube; corolla-tube much longer than calyx; stem not swollen at joints; leaves narrow.
- (2) Intermediate Red Hemp-Nettle. (*Galeop'sis Lad'anum*.)—Flowers rose; clusters distant; corolla-tube about same length as calyx; stem not swollen at joints; leaves broader.
- (3) Downy Hemp-Nettle. (*Galeop'sis dúbia*.)—Flowers pale yellow; whole plant densely hairy.
- (4) Common Hemp-Nettle. (*Galeop'sis Tet'rahit*.)—Flowers pink, terminal clusters massed in a head; calyx-teeth as long as tube; corolla-tube as long as calyx; stem swollen at the joints; leaves broad; hairy.
- (5) Large-flowered Hemp-Nettle. (*Galeop'sis speciósa*.)—Flowers yellow with purple spot; corolla-tube much longer than calyx; leaves broad.

1. Common Red Hemp-Nettle, Narrow-leaved Red Hemp-Nettle. (*Galeop'sis angustifolia*. Ehrh.)—As just described. The flowers are $\frac{3}{4}$ –1 inch long, rose-coloured, with white blotches and darker rose markings on the lower lip, in dense clusters, the upper clusters crowded together at the top of the stem into a head; calyx-teeth pointed and shorter than the tube; the corolla-tube much longer than the calyx; the stem 6–18 inches high, usually much branched, not thickened at the joints (nodes); and the leaves shortly stalked, narrow, lance-shaped, toothed or entire. Different specimens vary considerably in their hairiness.

Fairly common. In corn-fields and waste places in gravelly and sandy parts; more common in southern England, though fairly generally distributed everywhere, rare in Scotland, local in Ireland. July—October. Annual.

2. Rare Red Hemp-Nettle, Intermediate Red Hemp-Nettle. (*Galeop'sis Lad'anum*. Linn.)—A very similar species to the last, differing in the flower-clusters being not quite so near together, not massed into a head; in the corolla-tube being the same length or very little longer than the calyx; and in the leaves being broader at the base and regularly toothed (serrate). (*Galeopsis intermedia*. Vill.)

Very rare and local. In wheat-fields in Moray in Scotland. July—October. Annual.

3. Downy Hemp-Nettle. (*Galeopsis dúbia*. Leers.)—A very similar species to the last—the Rare Red Hemp-Nettle (*Galeopsis Ladanum*)—but having large pale yellow flowers, $1\frac{1}{4}$ inches long, larger leaves, and the whole plant so densely and softly hairy that the upper part looks whitish. (*Galeopsis ochroleuca*. Lam.)

Rare. In sandy corn-fields and waste places; in the centre and north of England and in Carnarvonshire. July—August. Annual.

4. Common Hemp-Nettle. (*Galeopsis Tet'rahit*. Linn.)—A species with pale pink or whitish flowers, marked with rose, the upper clusters crowded together at the top of the stem; the calyx-teeth fine and pointed, hairy, almost prickly, usually the same length as the strongly ribbed tube, sometimes longer; and the corolla-tube equal in length to the calyx or longer. [As described in the genus Hemp-Nettle (*Galeopsis*).] The stem is 1–2 feet high, swollen at the nodes, branched, the branches spreading and hairy; and the leaves are stalked, egg-shaped (ovate), pointed, toothed (serrate), and hairy. [Plate 34.

Very common. In fields, cultivated land, and waste places; generally distributed throughout England, Scotland, and Ireland. July—September. Annual.

5. Large-flowered Hemp-Nettle. (*Galeopsis speciósa*. Mill.)—A similar species to the last but having larger flowers, $1\frac{1}{4}$ inches long, yellow, with a broad purple spot on the lower lip; and the corolla-tube much longer than the calyx. (*Galeopsis versicolor*. Curt.)

Not uncommon. In fields, cultivated land, and waste places; common in the north of England, rare in the south, common in the south of Scotland and rare in the north, local in Ireland. July—August. Annual.

VIII. STÁCHYS. Linn.—Flowers in clusters in the axils of the upper leaves or bracts (false whorls) forming terminal, or spike-like clusters, or heads. Calyx of 5 sepals, united into a tube with 5 or 10 ribs and separating into as many equal spiny teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube, and separating into a 2-lipped (bilabiate) limb, the upper lip erect and arched, the lower 3-lobed and spreading, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), included in the upper lip, each pair of anthers approaching one another, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs with square stems, and wrinkled (rugose) opposite leaves which are often heart-shaped at the base.

(1) Wood Betony. (*Stáchys officinális*.)—Flowers in a head; leave chiefly from root, stem erect.

Flowers in spike-like clusters.

(2) Downy Woundwort. (*Stáchys germaníca*.)—Plant whitish with silky hairs; stem erect.

(3) Marsh Woundwort. (*Stáchys palus'tris*.)—Corolla-tube no longer than calyx; leaves narrow, oblong, nearly stalkless; stem erect.

(4) Hedge Woundwort. (*Stáchys sylvat'ica*.)—Corolla-tube much longer than calyx; leaves broad, egg-shaped, stalked; stem erect.

(5) Hill Woundwort. (*Stáchys alpína*.)—Corolla-tube longer than calyx.

(6) Corn Woundwort. (*Stáchys arven'sis*.)—Flowers small, corolla-tube shorter than calyx; stem prostrate.

1. Wood Betony. (*Stáchys officinális*. Trev.)—As just described. A very characteristic plant with clusters (false whorls) of magenta-coloured flowers, $\frac{3}{4}$ inch long, all massed together



WHITE HOREHOUND.

WOOD BETONY.

HEDGE WOUNDWORT
STACHYS SYLVATICA.

COMMON HEMP-NETTLE.

GALFODSIS
TETRAHY...

MARLENUM TILPARE

STACHYS ... *OFFICINALIS.*



into a terminal head, except the last circle of flowers, which is usually quite distant from the head ; the leaves of the upper flower-clusters are reduced to small pointed bracts, while the lower clusters (whorls) have each a pair of small stalkless leaves at the base. The square stem is generally 10-12 inches high, sometimes taller, usually unbranched (simple), with a few distant pairs of stem-leaves which are stalkless (sessile) or nearly so, oblong, and scalloped (crenate); the root-leaves, of which there are more, are on long stalks, triangular-oblong, or heart-shaped (cordate) at the base, and deeply scalloped (crenate). (*Stachys Betonica. Benth.*) [Plate 34.]
Very common. Woods and thickets ; throughout England, rare in Scotland and Ireland. June—August. Perennial.

2. Downy Woundwort. (*Stachys germanica. Linn.*)—Flowers pale purplish-rose, $\frac{1}{2}$ inch long, in dense clusters in the axils of the leaves (false whorls), the clusters separated from one another but near enough to form a spike-like cluster ; the calyx covered with silky hairs and the teeth spiny ; the corolla-tube about as long as the calyx ; the stem 1-3 feet high, stout, usually unbranched, and hairy ; the leaves narrowly egg-shaped (ovate) or lance-shaped, heart-shaped (cordate) at the base, pointed, wrinkled (rugose), and softly silky, those from the root on long stalks, and those on the lower stem shortly stalked and graduating into stalkless (sessile) leaves at the top. The whole plant is so densely clothed with long white silky hairs as to present a grey or even whitish appearance.

Very rare. By waysides and in waste places on chalky ground ; reported to have been found in Oxfordshire, Bedfordshire, Norfolk, and Kent, but apparently not persistent in these localities. July—August. Biennial.

3. Marsh Woundwort. (*Stachys palustris. Linn.*)—Flowers about $\frac{1}{2}$ inch long, purplish-rose colour, 6-10 in clusters in the axils of the leaves (false whorls) forming a long interrupted spike-like cluster (raceme) ; the calyx-teeth are slightly spiny ; and the corolla-tube is about the same length as the calyx, the lower lip having white markings. [As described in the genus *Stachys*.] The stem is stout, erect, 1-3 feet high, hollow, square, simple or branched ; the leaves are oblong or lance-shaped, pointed, scalloped (crenate) or toothed (serrate), not wrinkled, almost stalkless (sessile), the lower ones heart-shaped at the base with very short stalks, the upper ones stalkless. The whole plant is slightly hairy and has an unpleasant smell. Very common. By the sides of rivers and ditches and in damp places ; throughout England, Scotland, and Ireland. July—August. Perennial.

4. Hedge Woundwort. (*Stachys sylvatica. Linn.*)—A very similar species to the last but with dull red flowers mottled with white ; the corolla-tube much longer than the calyx ; a more wiry solid stem ; and broader egg-shaped (ovate) leaves, heart-shaped at the base, stalked, the upper ones in the axils of which are the flowers-clusters getting smaller, narrower, not heart-shaped, and graduating into very small bracts at the top of the spike. The whole plant is much more hairy than the Marsh Woundwort (*Stachys palustris*) and has a more powerful and unpleasant smell. [Plate 34.]

Very common. By hedges, in woods and waste places ; in England, Scotland, and Ireland. July—August. Perennial.

5. Hill Woundwort. (*Stachys alpina. Linn.*)—Flowers purple spotted with white in distant clusters of 5-12 in the leaf-axils, forming an interrupted spike ; the corolla longer than the calyx ; the stem erect, 1-2 feet high, little branched, hairy, the upper part with gland-tipped hairs ; and the leaves oblong egg-shaped, heart-shaped at the base, pointed, and scalloped (crenate).

Very rare. Woods in Gloucestershire. July—August. Perennial.

6. Corn Woundwort. (*Stáchys arven'sis*. Linn.)—A very different species from the others with very small flowers, pale pink spotted with white, in clusters of only 2-6 in the axils of the leaves, forming loose leafy spike-like clusters; the corolla-tube shorter than the calyx, the lips scarcely rising above it. [As described in the genus *Stachys*.] The stem weak, prostrate, 4-18 inches long, slender, branched from the base, rather hairy, only the flower-spikes erect; and the leaves small, all stalked except the very smallest at the top of the flower-spike, egg-shaped, blunt, scalloped (crenate), and hairy.

Fairly common. In fields, cultivated ground, and waste places; common in England, rare in Scotland, local in Ireland. April—November. Annual.

7. *Pale Annual Woundwort. (*Stáchys an'nua*. Linn.)—This species, which very probably was introduced with seed from abroad, has been found in several places in Kent. It has yellow flowers and narrow lance-shaped scalloped leaves.

IX. WHITE HOREHOUND. (*MARRÚBIUM*. Linn.)—Flowers small, in dense, many-flowered, sometimes spherical clusters in the axils of the leaves (false whorls). Calyx of 5 sepals, united into a tube with 5 or 10 ribs, and separating into 5 or 10 curved-back spiny teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and separating into 2 lips (bilabiate), the upper lip erect, narrow, and 2-lobed, and the lower spreading and 3-lobed, the middle lobe being broad and notched, inserted below the seedcase; stamens 4, in unequal pairs (didynamous), included in the corolla-tube, on which they are inserted; carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs, often woolly, with square stems and wrinkled (rugose) opposite leaves.

Common White Horehound. (*Marrúbium vulgáre*. Linn.)—The only British species. As just described. The flowers are very unnoticeable, $\frac{1}{2}$ inch long, white, in clusters, which become in fruit round and spiny, in the axils of the leaves; the calyx is 10-toothed and hairy; the stems are 1-1 $\frac{1}{2}$ feet high, branched, covered with a white woolly down; and the leaves are stalked, roundish, deeply scalloped (crenate), and covered with white woolly down, giving the whole plant a greyish-green appearance almost whitish towards the top. [Plate 34. Rare, rather local. On hillsides and waste places; throughout the southern counties of England, very rare in Scotland and Ireland. July—October. Perennial.

X. MARJORUM. (*ORÍGANUM*. Linn.)—Flowers lilac, rose-colour, or white, with a coloured bract at the base of each flower, in compact, dense, branched clusters. Calyx of 5 sepals, united into a tube with 10-13 ribs and separating into 5 equal teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube, rather indistinctly 2-lipped (bilabiate), the upper lip erect and straight, the lower 3-lobed with nearly equal lobes, inserted below the seedcase (hypogynous); stamens 4, in 2 unequal pairs (didynamous), diverging, protruding, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs with square stems and usually entire leaves which are always opposite.

Common Marjorum. (*Origanum vulgáre*. Linn.)—The only British species. As just described. The clusters of rose-coloured or rarely white flowers with their dark red-tinged bracts are crowded into dense heads terminating the main stem and branches, and as the stem is branched from the top a much branched cluster (corymbose cyme) is formed, differing considerably from the almost unbranched flowering stem usual in this order. The stems are usually 1-2 feet high and are erect and rather hairy; and the leaves are stalked, more or less broadly egg-

shaped (ovate), pointed, entire or slightly toothed. The whole plant has a pleasant aromatic scent and flavour, and is still cultivated as a pot-herb. It was formerly considered valuable in medicine, and is still dried by many country-folk who use it to make marjorum tea. [Plate 35.

Common. In hedges, dry bushy places, and waysides, especially in chalk and limestone districts; throughout England and Ireland, but more rare in Scotland. July—September. Perennial.

XI. THYME. (THÝMUS. Linn.)—Flowers lilac, rosy, or white, in clusters, distant, or crowded together into heads, or in looser spikes. Calyx of 5 sepals, united into a tube which has from 10 to 13 ribs, and dividing into 2 lips (bilabiate), the upper of 3 short broad teeth and the lower of 2 narrow pointed teeth, inserted below the seedcase (inferior); corolla of 5 petals united into a tube and separating into 2 lips (bilabiate), the upper lip notched, erect and not arched, and the lower 3-lobed, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), diverging and protruding, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Small, much branched, aromatic herbs or undershrubs, with small entire opposite leaves which in foreign species often have their margins rolled back (revolute).

(1) Mountain Thyme. (*Thýmus Serpyllum*.)—Flowers in dense terminal heads; upper corolla-lip oblong; stems rooting.

(2) Heath Thyme. (*Thýmus Chamædrys*.)—Flowers with several flower whorls below terminal head; upper corolla-lip short and broad; stems not rooting.

1. Mountain Thyme. (*Thýmus Serpyllum*. Linn.)—As just described. The small purplish-rose-coloured flowers are crowded into a head terminating the stem, sometimes having one circle of flowers below; the upper corolla-lip is oblong; the stems are procumbent, rooting, wiry, slender, very much branched, the leaves of the erect flowering stems forming a cushion fringed with the slender trailing barren shoots which the following year produce erect flowering stems; the leaves are oblong or egg-shaped (ovate), usually fringed with long white hairs. The whole plant is sometimes smooth, but generally more or less covered with white woolly hairs, and is fragrant and aromatic. [Plate 35.

Common. On dry heaths, banks, and mountain-sides; generally distributed throughout England, Scotland, and Ireland. June—August. Perennial.

2. Heath Thyme. (*Thýmus Chamædrys*. Fr.)—A very similar species, differing in the flowering stems usually having several separate circles (whorls) of flowers below the terminal head; in the upper lip of the corolla being short and broad; and in the stems being erect, not rooting, and the leaves all broadly oblong.

Not common. On heaths, banks, &c., especially on chalky soils; in England, Scotland, and Ireland. June—September. Perennial.

XII. WILD BASIL. (CLINOPÓDIUM. Linn.)—Flowers in dense, many-flowered, shortly stalked clusters (cymes) in the axils of the leaves, with numerous long bristly bracts forming a kind of involucre. Calyx of 5 sepals, united into a curved tube with 13 ribs, and separating into 2 lips (bilabiate), the upper having 3 and the lower 2 teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into an almost straight tube and separating into 2 lips (bilabiate), the upper erect, scarcely arched, and the lower spreading and 3-lobed, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), included in the upper lip of the corolla, each pair of anthers approaching one another, inserted on the corolla-tube (epi-petalous);

carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs with square stems and opposite leaves.

Wild Basil. (*Clinopodium vulgare*. Linn.)—The only British species. As just described. The flowers are $\frac{3}{4}$ –1 inch long, of a purplish-rose colour, and are densely packed together in circles in the axils of the leaves (false whorls) round the stem and terminating it; the long bristly bracts are covered with white hairs, and so give a very soft grey look to the flower-clusters. The stem is usually 1–2 feet high, branched, and densely hairy; and the leaves are egg-shaped (ovate), slightly toothed, on short stalks, and soft and hairy. The whole plant is aromatic and fragrant. (*Calamintha Clinopodium*. Benth.; *Calamintha vulgare*. Linn.)

[Plate 35.

Common. On banks, waysides, and in dry bushy places; distributed throughout England, more rare in Scotland and Ireland. July—September. Perennial.

XIII. CALAMINT. (**CALAMINTHA.** Linn.)—Flowers in small clusters with or without a common stalk, in the axils of the leaves (false whorls), with a few minute pointed bracts at the base not forming an involucre round the flower-clusters as in the last genus. Calyx of 5 sepals, united into a 13-ribbed tube, and separating into 2 lips (bilabiate), the upper lip 3-toothed and the lower 2-toothed, inserted below the seedcase (inferior); corolla of 5 petals, united into a straight tube and separating into 2 lips (bilabiate), the upper lip erect and hardly arched, and the lower spreading and 3-lobed, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), included in the upper lip of the corolla, each pair of anthers approaching one another, inserted in the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs with square stems and opposite egg-shaped (ovate), toothed (serrate) leaves.

- (1) Basil Thyme. (*Calamintha A'cinus*.)—Flower-clusters not stalked; flowers violet; calyx inflated on the under side.

Flower clusters all stalked.

- (2) Common Calamint. (*Calamintha montána*.)—Calyx-teeth fringed with long hairs; central lobe of lower corolla-lip long; leaves toothed.
- (3) Lesser Calamint. (*Calamintha Népetá*.)—Flower-clusters forked; calyx-teeth fringed with short hairs; leaves indistinctly toothed.
- (4) Wood Calamint. (*Calamintha grandiflóra*.)—Flower-clusters forked; all three lobes of lower corolla-lip about equal; leaves sharply toothed.

1. Basil Thyme. (*Calamintha A'cinus*. Clairv.)—As just described. The flowers are about $\frac{1}{2}$ inch long, of a beautiful violet-purple, the lower lip spotted with white and darker purple, 5–6 together, each on a short stalk, but without a common stalk, in clusters in the leaf-axils (false whorls); the calyx-tube is curved, pouched on the under side and contracted again at the throat; the stem is 6–8 inches high, branched at the base; and the leaves are egg-shaped (ovate), pointed, toothed (serrate), and shortly stalked. The whole plant is more or less hairy. (*Calamintha arvensis*. Lam.)

Not uncommon. In dry places, waysides, banks, and fields; sparingly distributed throughout England, rare in Scotland, and very rare in Ireland. July—August. Annual.

2. Common Calamint. (*Calamintha montána*. Lam.)—Flowers nearly $\frac{2}{3}$ inch long, light purple, the lower corolla-lip with darker markings, the central lobe much longer than the side ones, in few-flowered stalked clusters (cymes) in the axils of the leaves, forming a long 1-sided





cluster (panicle); the calyx-teeth fringed with long hairs, the tube straight. [As described in the genus Calamint (*Calamintha*).] The stem 1-2 feet high, erect, branched, but rather straggling; the leaves on rather long stalks, egg-shaped (ovate), and indistinctly toothed, green on both sides. The whole plant is more or less hairy. (*Calamintha officinalis*. Moench.) [Plate 35. Not uncommon. In dry places, hedges, waysides, and dry banks; throughout England and Ireland. July—August. Perennial.

3. Lesser Calamint. (*Calamintha Népetá*. Savi.)—A very similar species to the last but with more numerous flowers in much looser forked clusters; the calyx-teeth fringed with short hairs; and the stems usually many from the crown of the root, with shortly stalked more distinctly toothed leaves which are pale on the under side. (*Calamintha parviflora*. Lam.) Rare. On dry banks and by waysides, especially on chalky soil; in the southern and south-eastern counties of England. July—August. Perennial.

4. Wood Calamint. (*Calamintha grandiflora*. Moench.)—Another species similar to the Common Calamint (*Calamintha montana*) but with larger and more numerous flowers, $\frac{3}{4}$ -1 inch long, in forked clusters; the middle lobe of the lower lip of the corolla hardly longer than the side ones and all very broad; and the leaves larger, broader, and more sharply toothed. (*Calamintha sylvatica*. Bromf.) Very rare. On dry banks; in the Isle of Wight and in Devonshire. August—October. Perennial.

XIV. *BALM. (MELIS'SA. Linn.)—A genus very similar to the last, the Calamint (*Calamintha*); differing in its corolla-tube, which is curved instead of being straight, and in the anther-cells of each stamen, which are united at the top instead of diverging.

***Common Balm.** (*Melis'sa officinalis*. Linn.)—The only species found in Britain, which is, however, not a native, though it is naturalised in many places. The flowers are $\frac{1}{2}$ - $\frac{3}{4}$ inch long, white, sometimes spotted with rose, in shortly stalked, 1-sided (secund), few-flowered clusters in the axils of the leaves (false whorls); the calyx is rather bell-shaped, the 2 teeth of the lower lip being narrow, pointed, and longer than the 3 broader but pointed teeth of the upper lip. The stems are 1-2 feet high, much branched, stout, erect, and hairy; and the leaves are stalked, egg-shaped (ovate), scalloped (crenate), wrinkled (rugose), and hairy. The whole plant is fragrant. Not a native. By waysides and on banks; naturalised in many counties of England, chiefly in the south and southern Midlands, also in the Isle of Wight. July—August. Perennial.

XV. NÉPETA. Linn.—Flowers often purple-blue, in more or less distant clusters in the axils of the leaves (false whorls) or crowded together into spike-like clusters. Calyx of 5 sepals united into a 15-ribbed tube and separating into 5 teeth, inserted below the seedcase (inferior); corolla of 5 petals united into a tube and separating into 2 lips (bilabiate), the upper erect, notched or 2-lobed, and the lower spreading and 3-lobed, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), the inner pair being longer than the outer and projecting beyond it, instead of being shorter and remaining inside the outer pair as in most genera of this order, included in the upper lip of the corolla, each pair of anthers approaching one another, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs of various habits with square stems and opposite leaves.

- (1) Cat-mint. (*Népetá Catária*.)—Flowers white, in a terminal spike, loose at the base.
- (2) Ground Ivy. (*Népetá hederácea*.)—Flowers purple, in distant clusters.

1. Cat-mint. (*Népetá Catária.* Linn.)—As just described. The flowers are small, hardly $\frac{1}{2}$ inch long, white, with the lower lip spotted with pale red, and with a wavy margin, in many-flowered, dense clusters in the axils of the leaves (false whorls), those at the top of the stem crowded into a spike-like cluster; the stem is 1–3 feet high, grey with hairs, erect and branched; and the leaves are egg-shaped (ovate), heart-shaped (cordate) at the base, toothed (serrate), stalked, and whitish with soft down underneath. The whole plant is of a soft greyish-green, owing to the soft, hoary hairs with which it is covered, and has a strong aromatic odour, supposed to be pleasing to cats. [Plate 36.]

Not common. On hedge banks, waysides, and waste places, especially on chalky soil; distributed throughout England, local in Scotland, and rare in Ireland. July—September. Perennial.

2. Ground Ivy. (*Népetá hederácea.* Trev.)—A very well known early flowering plant, with purplish-blue flowers $\frac{1}{2}$ –1 inch long, in few-flowered clusters which are distant from one another; the lower lip of the corolla is spotted with white and dark purple; the stems are procumbent, hairy, rooting at the base, with the flowering stems ascending, and the leaves are roundish (orbicular), scalloped (crenate), deeply heart-shaped (cordate) at the base, on long stalks.

The plant has an aromatic odour and a bitter taste. It was once used in medicine and for brewing instead of hops. [Plate 36.]

Very common. Under hedges, in woods and shady places; throughout England, Scotland, and Ireland. March—June. Perennial.

XVI. SELF-HEAL. (*PRUNELLA.* Linn.)—Flowers in few-flowered clusters, crowded together in dense, terminal heads. Calyx of 5 sepals, united into a tube and separating into 2 lips (bilabiate), the upper flat, square, with 3 short teeth, and the lower deeply 2-lobed, closing over the fruit, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and separating into 2 lips (bilabiate), the upper erect, arched, entire or slightly notched, the lower spreading and 3-lobed, inserted below the seedcase (hypogynous); stamens 4, in unequal pairs (didynamous), included in the upper lip of the corolla, each pair of anthers approaching one another, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs with square stems and entire or deeply divided opposite leaves, those in the axils of which are the flower-clusters being broad, bract-like, and usually coloured like the flowers (petaloid).

Self-heal. (*Prunella vulgaris.* Linn.)—The only British species. As just described. The violet-blue flowers are $\frac{1}{2}$ – $\frac{5}{8}$ inch long, and are massed together in oval heads and have 2 broad heart-shaped, pointed, bract-like leaves tinged with purple below each small cluster; the 2 calyx-lips ultimately close over the fruit; the stems are 3–18 inches high, the side stems procumbent, rooting at the base; and the leaves are stalked, egg-shaped (ovate), and nearly entire or toothed. In the Continental species the leaves are often deeply divided to the midrib (pinnatifid). [Plate 36.]

Very common. In meadows, fields, hedge banks, and waste ground; throughout England, Scotland, and Ireland. July—September. Perennial.

XVII. SKULL-CAP. (*SCUTELLÁRIA.* Linn.)—Flowers solitary or in pairs in the axil of each leaf. Calyx of 5 sepals, united into a tube and separating into 2 entire teeth (bilabiate), the upper of which bears a fold or scale-like protuberance on its back and closes like a lid over the fruit, inserted below the seedcase (inferior); corolla of 5 petals, united into a long tube and separating into 2 small lips, the upper arched, the lower 3-lobed, inserted below the seedcase





(hypogynous); stamens 4, in unequal pairs (didynamous), each pair of anthers approaching one another, included in the upper lip of the corolla, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs with square stems and opposite leaves.

(1) Common Skull-cap. (*Scutellária galericuláta*.)—Flowers large, blue; stem about 1 foot high.

(2) Lesser Skull-cap. (*Scutellária mínor*.)—Flowers small, pink; stem 4-6 inches high.

1. Common Skull-cap. (*Scutellária galericuláta*. Linn.)—As just described. The flowers are blue, $\frac{3}{4}$ inch or more long, almost stalkless (sessile), solitary in the axils of the opposite leaves and leaning together on one side of the stem (secund) so as to appear in pairs; the corolla-tube is whitish, very slender at the base and enlarged at the throat; the stem is 8-18 inches high, branched or simple, and the leaves are almost stalkless, oblong or narrowly egg-shaped, blunt, slightly heart-shaped (cordate) at the base, and slightly scalloped (crenate). The whole plant is smooth, though the flowers are downy when young. [Plate 37.

Fairly common. On the banks of rivers, lakes, and ditches; throughout England, rare in the north of Scotland, and rather rare in Ireland. July—September. Perennial.

2. Lesser Skull-cap. (*Scutellária mínor*. Huds.)—A similar but much smaller plant than the Common Skull-cap (*Scutellária galericuláta*) with little pink flowers $\frac{3}{8}$ inch long, stems 2-6 inches high, and egg-shaped leaves.

Not common. In boggy places, chiefly in the west of England, south-west of Scotland, and west of Ireland. July—October. Perennial.

XVIII. SAGE. (*SAL'VIA*. Linn.)—Flowers generally showy, in clusters in the axils of bract-like leaves (false whorls) which are often brightly coloured (petaloid). Calyx of 5 sepals, united into a tube and separating into 2 lips (bilabiate), the upper entire or 3-toothed, and the lower 2-toothed, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and separating into 2 lips (bilabiate), the upper erect and arched, and the lower spreading and 3-lobed, inserted below the seedcase (hypogynous); stamens 2, parallel, with short filaments to the top of each of which are attached 2 long thread-like connectives each bearing an anther cell, so that there appear to be 4 stamens, each with a 1-celled anther, instead of only two; the stamens are included in the upper lip of the corolla, and are inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs or undershrubs with square stems and opposite leaves.

(1) Wild Clary or Sage. (*Sal'via Verbenáca*.)—Flowers small, purple; calyx as long as corolla-tube.

(2) Small-flowered Clary. (*Sal'via Marquan'dii*.)—Flowers smaller, purple; corolla-tube twice as long as calyx.

(3) Meadow Clary. (*Sal'via pratén'sis*.)—Flowers large, blue; corolla-tube 3 times as long as calyx.

1. Wild Clary or Sage. (*Sal'via Verbenáca*. Linn.)—As just described. The small purple-blue flowers are about $\frac{3}{8}$ inch long, and are in clusters of about 6, near together at the top of the stem and more distant lower down, with at the base of each circular cluster of flowers 2 heart-shaped (cordate) entire bract-like leaves, tinged with purple; the calyx is purplish, about the same length as the corolla-tube, the upper lip being minutely 3-toothed; the stem is 1-2 feet high, hairy, slightly branched, and leafy; and the leaves are egg-shaped (ovate), much wrinkled

(rugose), coarsely scalloped (crenate) or lobed, and hairy; the root-leaves are on long stalks, those low down on the stem on very short stalks, and the others stalkless (sessile). [Plate 37. Not common. By waysides, in dry pastures, and waste ground; in England, rare in Scotland and Ireland. May—September. Perennial.

2. Small-flowered Clary or Sage. (*Sal'via Marquan'dii*. Druce.)—A very similar species but with smaller flowers, the corolla-tube longer than the calyx, the stems not more than a foot high, and the leaves smaller and more deeply cut.

Very rare. On dry banks in the Channel Isles, and reported from Cornwall. May—September. Perennial.

3. Meadow Clary or Sage. (*Sal'via pratensis*. Linn.)—A very beautiful species (as described in the genus *Salvia*), with large flowers, 1 inch long, bright blue, 4-6 in clusters in the leaf-axils, forming a handsome, spike-like cluster; the upper lip of the calyx is 3-toothed; the corolla-tube is 3 times as long as the calyx; the stem is 1-2 feet high, with usually only 2 pairs of narrow leaves below the flower-clusters, the lower pair being shortly stalked; the root-leaves are on long stalks and grow in a tuft, they are oblong egg-shaped (ovate), heart-shaped (cordate) at the base, toothed (serrate), and scalloped (crenate), and very much wrinkled (rugose),

Very rare. In dry fields, waste places, and by waysides; in Kent and Oxfordshire. June—August. Perennial.

XIX. GIPSY-WORT. (*LÝCOPUS*. Linn.)—Flowers small, white or lilac, stalkless (sessile), crowded in clusters in the axils of the leaves (false whorls). Calyx of 5 sepals, united into a bell-shaped tube and separating into 5 equal teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and separating into 4 lobes, the upper of which is usually notched; stamens 2 with occasionally 2 imperfect upper ones, parallel, diverging at the top and protruding out of the corolla-tube, inserted on the corolla-tube (epi-petalous), carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts surrounded with a corky border. Marsh or water herbs with square stems and opposite leaves.

Common Gipsy-wort. (*Lýcopus europæus*. Linn.)—The only British species. As just described. The small white flowers are densely crowded in distant clusters in the axils of the leaves; the white corolla is sometimes spotted with purple; the little nuts are nearly as long as the calyx; the stem is 1-3 feet high, so sharply 4-sided as almost to appear winged, simple or branched at the base; and the leaves are shortly stalked, lance-shaped, and deeply toothed (serrate) or even lobed towards the midrib (pinnatifid). [Plate 37.

Common. In wet places, on the banks of rivers, pools, and ditches; throughout England and Ireland, but rare in Scotland. July—September. Perennial.

XX. MINT. (*MEN'THA*. Linn.)—Flowers small, lilac or rose, in dense clusters in the axils of the leaves (false whorls), often crowded into terminal spikes. Calyx of 5 sepals, united into a tube and separating into 5 equal teeth, inserted below the seedcase (inferior); corolla of 5 petals, united into a tube and separating into 4 lobes, the upper lobe being broader and generally notched, inserted below the seedcase (hypogynous); stamens 4, equal, diverging from one another, inserted on the corolla-tube (epi-petalous); carpels 2, united into a 4-celled seedcase and a long style divided at the apex into 2 stigmas; fruit of 4 little nuts (cocca). Herbs with a strong aromatic scent, with square stems and opposite leaves.

The members of this genus are extremely difficult to identify, as the same species varies according to situation and conditions, and there are so many varieties and even hybrids.



Flower-clusters in spikes or heads.

- (1) Round-leaved Mint. (*Men'tha rotundifolia*.)—Flowers in slender branched spikes ; corolla hairy ; leaves roundish, stalkless, shaggy underneath, wrinkled.
- (2) Broad-leaved Horse Mint. (*Men'tha alopecuroides*.)—Flowers in slender branched spikes ; corolla hairy ; leaves round, very shortly stalked, hairy underneath.
- (3) Horse Mint. (*Men'tha longifolia*.)—Flowers in slender branched spikes ; corolla hairy ; leaves narrowly egg- or lance-shaped, hairy, stalkless.
- (4) *Spear Mint. (*Men'tha spicata*.)—Flowers in slender branched spikes ; corolla smooth ; leaves smooth, narrowly egg- or lance-shaped, almost stalkless.
- (5) Peppermint. (*Men'tha piperita*.)—Flowers in blunter, more interrupted spikes ; corolla smooth ; leaves smooth, egg-shaped, distinctly stalked.
- (6) Marsh Mint. (*Men'tha aquatica*.)—Flowers in round or oblong heads, often with one or two clusters below.

Flower-clusters distant.

- (7) Marsh Whorled Mint. (*Men'tha gentil'is*.)—Calyx tubular and the teeth narrow ; corolla smooth ; leaves large, egg-shaped, stalked.
- (8) Tall Red Mint. (*Men'tha rubra*.)—Calyx tubular and the teeth narrow ; corolla smooth ; leaves with purple veins, stalked.
- (9) Cardiac Mint. (*Men'tha gracil'is*.)—Calyx tubular and the teeth narrow ; corolla smooth ; leaves narrow, stalked.
- (10) Corn Mint. (*Men'tha arven'sis*.)—Calyx short and bell-shaped and the teeth broad ; corolla hairy ; leaves narrow, stalked.
- (11) Pennyroyal. (*Men'tha Pulégium*.)—Calyx tubular, the throat closed with hairs ; leaves small, stalked.

1. Round-leaved Mint. (*Men'tha rotundifolia*. Huds.)—As just described. The small flowers are about $\frac{1}{8}$ inch long, lilac or white, in dense, slender, cylindrical, sometimes interrupted spikes, usually 2 or 3 together forming a branched cluster (panicle), with lance-shaped bract-like leaves under the clusters ; the corolla is hairy outside ; the stem is 1-3 feet high, much branched, and the leaves are stalkless (sessile), roundish or broadly egg-shaped, toothed (serrate) or scalloped (crenate), much wrinkled (rugose), slightly hairy on the upper and shaggy on the under surface. The whole plant is hairy and has a strong acrid but not agreeable scent.

Rare. In waste places ; in England, Scotland, and Ireland. August—September. Perennial.

2. Broad-leaved Horse Mint. (*Men'tha alopecuroides*. Hull.)—This species is intermediate between the Round-leaved Mint (*Mentha rotundifolia*) and the following species, the Horse Mint (*Mentha longifolia*). It differs from the former in having larger flowers in short, stout spikes, narrower bracts, and rounder, larger leaves which are hairy, not shaggy, underneath and are very shortly stalked.

Rare. In waste and damp places, chiefly in the east of England and the west of Scotland. August—September. Perennial.

3. Horse Mint. (*Men'tha longifolia*. Huds.)—A similar species to the Round-leaved Mint (*Mentha rotundifolia*) but with larger flowers in similar dense, rather slender, cylindrical spikes, usually several together forming a branched cluster (panicle) ; the bract-like leaves are narrower and longer (subulate) ; the stem is 2-3 feet high, less branched and shaggy ; the leaves are narrowly egg-shaped or lance-shaped, almost stalkless, silky white underneath, and not wrinkled ; and the scent is strong and sweet. (*Mentha sylvestris*. Linn.)

Rather rare. In damp pastures, by ditches; distributed throughout the south of England, very rare in the north and in Scotland. August—September. Perennial.

4. *Spear Mint. (*Men'tha spicáta*. Linn.)—This species is very like the last, the Horse Mint (*Mentha longifolia*). It has similar slender spikes of flowers which are rather looser, the corolla is smooth, not hairy, and the whole plant is much greener and smoother and is without the shaggy hairs of all the preceding species. (*Mentha viridis*. Linn.)

This is the species usually grown as a pot-herb, and is only known in countries where it has been cultivated for a long time.

Rare, not a native, though found in England, Scotland, and Ireland. August—September. Perennial.

5. Peppermint. (*Men'tha piperíta*. Linn.)—A somewhat similar species to the last but with shorter, thicker, and blunter spikes, which are often interrupted; the calyx is often red; the stems are shorter and slighter; and the leaves are definitely stalked and broader. The whole plant is smooth and almost free from hairs, as is the last, and has a most powerful aromatic scent. This species is largely cultivated, as it abounds in an essential oil which is useful in medicine and is included in our pharmacopœia, and is also in great demand for confectionery.

Rare. In wet places; in England, Scotland, and Ireland. July—September. Perennial.

6. Marsh Mint. (*Men'tha aquat'ica*. Linn.)—The flowers of this species are larger than those of the preceding ones; they are about $\frac{1}{4}$ inch long, pale lilac, and are massed together in round or oblong terminal heads, with or without one or two more distant clusters (whorls); the corolla is hairy both inside and out. [As described in the genus Mint (*Mentha*.)] The stems are 1–4 feet high, branched, and softly downy; the leaves are stalked, egg-shaped (ovate), pointed, sometimes heart-shaped (cordate) at the base, toothed (serrate), and usually softly hairy on both sides.

This is the commonest Mint in the British Isles, and one of the most variable; under its name the London Catalogue gives three varieties and two hybrids with five varieties. [Plate 37.

Very common. By ditches, streams, marshes, and in damp places; throughout England, Scotland, and Ireland. July—September. Perennial.

7. Marsh Whorled Mint. (*Men'tha gentil'is*. Linn.)—This species is intermediate between the last—the Marsh Mint (*Mentha aquatica*)—and the Corn Mint (*Mentha arvensis*); it is, with the 2 following species, put under the name of *Mentha sativa* by many authorities. The differences between the three are not of importance to the amateur botanist; as a matter of fact they vary much and often slide into one another. The mauve flowers are all in distinct clusters in the leaf-axils (false whorls), and are never collected together into heads or spikes, indeed the uppermost leaves are usually without flowers; the calyx is tubular and the teeth narrower than in the Corn Mint (*Mentha arvensis*); the corolla is without hairs (glabrous); the stem is 1–2 feet high, branched, and more or less hairy; the leaves are spreading, shortly stalked, large, egg-shaped and pointed, toothed, with few veins, and slightly hairy on both sides.

Not common. In wet places; in England and Scotland. July—September. Perennial.

8. Tall Red Mint. (*Men'tha rúbra*. Sm.)—A very similar species to the last, but with larger redder flowers and the veins of the leaves purple.

Not common. In wet places, in England, Scotland, and Ireland. August—September. Perennial.

9. Cardiac Mint. (*Men'tha gracil'is*. Sm.)—Another similar species to the Marsh Whorled Mint (*Mentha gentilis*), differing in being more slender and smoother, and in having narrower and nearly stalkless leaves.

Rare. In wet places in a few stations in England. July—August. Perennial.

10. Corn Mint. (*Men'tha arven'sis*. Linn.)—This, like the Marsh Whorled Mint (*Mentha gentilis*), varies extraordinarily, and the last London Catalogue gives eight varieties of it. It has, however, one feature which is fairly constant and distinguishes it from the 3 preceding species, that is the short bell-shaped (campanulate) calyx with short triangular (deltoid) teeth. [As described in the genus Mint (*Mentha*.)] The flower-clusters are, as in the Marsh Whorled Mint (*Mentha gentilis*), in dense distant clusters in the axils of the leaves, the terminal leaves being empty, without any flowers; the corolla is hairy both outside and in; the stems are usually half prostrate, 6-18 inches long, rarely erect, much branched, spreading, and more or less hairy; and the leaves are stalked, egg-shaped (ovate), toothed (serrate), and hairy. Common. In corn-fields and waste places; in England, Scotland, and Ireland. July—September. Perennial.

11. Pennyroyal. (*Men'tha Pulégium*. Linn.)—This is the smallest species we have and is very different in habit from those already described. The flowers are $\frac{1}{2}$ inch long, purplish-rose, in dense distant clusters in the leaf-axils (false whorls), the clusters and leaves getting smaller at the top of the stem; the calyx is tubular and the teeth rather unequal, the mouth of the tube being closed with hairs; the corolla is hairy outside; the stem is 3 inches to 1 foot long, usually prostrate but with an erect variety; the leaves are smaller than in any other species of this genus and are shortly stalked, egg-shaped (ovate), entire and wavy or slightly scalloped (crenate). The whole plant has a very pleasant scent, and is sometimes nearly smooth (glabrous) and sometimes densely hairy. Not common. By wet ditches, on banks and damp heaths; sparingly spread over England and Ireland, rare in Scotland. July—September. Perennial.

THE KNOT-GRASS FAMILY

[ORDER LXI. ILLECEBRACEÆ OR PARONYCHIACEÆ]

THE Knot-grass Family is a very small order of little prostrate herbs with large membranous stipules which protect the leaves. It is widely distributed, chiefly in warm countries. There has been much discussion concerning the position in the flora of this order, some botanists placing it in or near the Pink Family (Caryophyllaceæ), while others consider that the imperfect petals, which are often reduced to small filaments, may be regarded as imperfect stamens, and therefore place it by the Amaranth Family (Amaranthaceæ).

The Amaranth Family belongs to a group of plants (Monoclamydeæ) in which it is so difficult to distinguish the calyx from the corolla, when they are both present, that it has been thought better to include them both under the name of the perianth. In this tribe the perianth is 3-5-lobed, and is surrounded by 2 bracts, all being brilliantly coloured; there are usually 5 stamens, and the seedcase is 1-celled and 1-seeded, and has 2 or 3 styles. None of the members of this order are natives of the British Isles, but many have long been cultivated in gardens and are great favourites on account of the brilliantly-coloured membranous perianth which often keeps its colour for months. Among those best known are Love-lies-bleeding (*Amaranthus caudatus*), Prince of Wales' Feathers (*Amaranthus hypochondriacus* and *A. speciosus*), Tricolors (*Amaranthus tricolor*), and Cockscombs (*Celosia coccinea*).

Sepals only united at base.

- I. KNOT-GRASS (ILLEC'EBRUM). Flowers white, sepals very pointed, petals like filaments; leaves opposite.
- II. RUPTURE-WORT (HERNIÁRIA). Flowers green, sepals oblong, petals like filaments; leaves opposite.
- III. STRAPWORT (CORRIGIÓLA). Flowers white, sepals oblong, petals oblong, as long as sepals; leaves alternate.

Sepals united into a tube.

- IV. KNAWEL (SCLERAN'THUS). Flowers green, petals like filaments; leaves opposite and united at the base.

I. KNOT-GRASS. (ILLEC'EBRUM. Linn.)—A genus consisting of the one species:—

Whorled Knot-grass. (*Illec'ebrium verticillátum*. Linn.)—Flowers minute, stalkless (sessile), white, in clusters in the axils of the leaves along the whole stem and branches. Calyx of 5 sepals, united at the base, thickish and white, slightly hooded at the apex and terminating in a long, hair-like point; the corolla reduced to 5 filament-like petals, and inserted with the 5 stamens on a ring round the seedcase (perigynous); carpels 2, styles and stigmas 2; fruit a 1-celled, 1-seeded capsule, opening at the base by 5 or 10 valves. The stems are procumbent, 3 inches to

THE KNOT-GRASS FAMILY. (ORDER LXXI. ILLECEBRACEÆ or PARONYCHIACEÆ.)

CALYX of usually 5 SEPALS, rarely 4 or 3, united at the base only or into a tube, and separating into the same number of lobes, remaining with and closing over the fruit, inserted below the seedcase or partially adhering to it.

COROLLA of 5, rarely 4 or 3, minute PETALS, the same number as the sepals, often reduced to small thread-like filaments, or absent, inserted below the seedcase (perigynous).

STAMENS 5, rarely 4 or 3, the same number as the sepals, inserted between the petals round the seedcase (perigynous).

PISTIL of 2 or 3 CARPELS, united into a 1-celled seedcase crowned with 2 or 3 styles & stigmas, or without styles and with the stigmas situated directly on the seedcase.

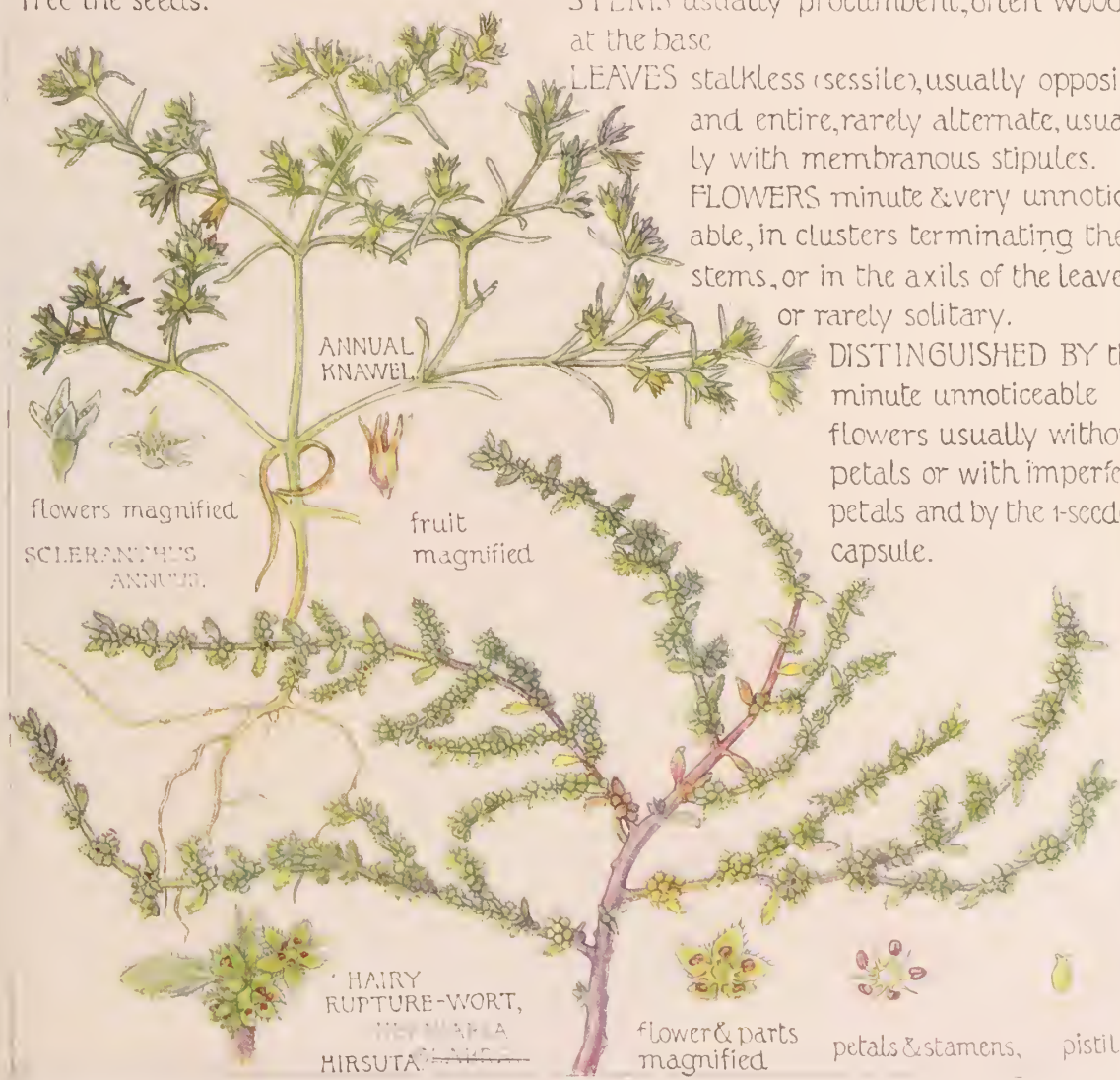
FRUIT a 1-celled, 1-seeded capsule, opening from the top by 3 valves or decaying to free the seeds.

STEMS usually procumbent, often woody at the base.

LEAVES stalkless (sessile), usually opposite and entire, rarely alternate, usually with membranous stipules.

FLOWERS minute & very unnoticeable, in clusters terminating the stems, or in the axils of the leaves, or rarely solitary.

DISTINGUISHED BY the minute unnoticeable flowers usually without petals or with imperfect petals and by the 1-seeded capsule.



ANNUAL
KNAWEL.

flowers magnified
SCLERANTHUS
ANNUUS.

fruit
magnified

HAIRY
RUPTURE-WORT,
HIRSUTA
HIRSUTA.

flower & parts
magnified

petals & stamens,

pistil.



1 foot long, much branched, slender, tangled, and reddish; and the leaves are stalkless (sessile), oval or roundish, and opposite, with large white membranous stipules.

Very rare. In wet sandy or boggy places; in Devon and Cornwall. July—September. Perennial.

II. RUPTURE-WORT. (HERNIÁRIA. Linn.)—Flowers minute, green, crowded in clusters in the axils of the leaves. Calyx of 5 oblong sepals, united at the base, remaining with the fruit (persistent); corolla reduced to 5 filament-like petals alternating with 5 stamens, all inserted on a ring round the seedcase (perigynous); carpels 2, united into a 1-celled seedcase with a minutely short style and 2 stigmas; fruit 1-celled, 1-seeded, decaying to free the seed (indehiscent), and enveloped in the calyx. Small prostrate herbs much branched, with opposite leaves and minute membranous stipules.

- (1) Smooth Rupture-wort. (*Herniária glábra*.)—Stem with minute curved hairs; leaves hairless.
- (2) Fringed Rupture-wort. (*Herniária ciliáta*.)—Stem with curved hairs on upper side only; leaves fringed with hairs.
- (3) *Hairy Rupture-wort. (*Herniária hirsúta*.)—Stem and leaves covered with straight spreading hairs.

1. Smooth Rupture-wort. (*Herniária glábra*. Linn.)—As just described. The little clusters of small green flowers are crowded into leafy spikes; the sepals are obtuse and destitute or almost destitute of hairs; the stems are from the crown of the root and are very numerous, 3–12 inches long, branched, spreading, and woody, with minute curved-back (decurved) hairs; the opposite leaves are oblong, without hairs (glabrous), and all of a pale yellowish-green; and the stipules are triangular and fringed.

Very rare. On sandy commons and field borders; near Cambridge, in Lincolnshire, and Suffolk. July—September. Annual or biennial.

2. Fringed Rupture-wort. (*Herniária ciliáta*. Bab.)—A very similar but stouter, evergreen, shrubby species with the lower flower-clusters more distant from one another, the sepals tipped with a strong bristle, only the upper side of the stem away from the ground hairy, the leaves rounder and fringed with hairs (ciliate), and the stipules whiter and larger.

Very rare. On dry banks and common land; at the Lizard and in Guernsey. July—August. Perennial.

3. *Hairy Rupture-wort. (*Herniária hirsúta*. Linn.)—Another similar species to the Smooth Rupture-wort (*Herniária glabra*) but with the flowers having a very hairy calyx, and the stems and narrow leaves being covered with straight spreading hairs. [Plate 38.

Very rare. On sandy ground; near Christchurch, Hampshire. July—August. Annual.

III. STRAPWORT. (CORRIGIÓLA. Linn.)—Flowers small, white, in small clusters terminating the stem and branches (cymes, spikes, or racemes). Calyx of 5 sepals, united at the base; corolla of 5 oval or oblong petals as long as the sepals; stamens 5; carpels 3, united into a seedcase which is surmounted by 3 stigmas, styles 0; capsule 1-celled and 1-seeded, enveloped in the calyx, decaying to free the seed (indehiscent). Prostrate herbs or undershrubs with hairless (glabrous) alternate leaves, which are narrow and fleshy, and have membranous stipules.

Sand Strapwort. (*Corrigiála littoralis*. Linn.)—The only British species. As just described. The small white flowers are clustered in small heads or clusters (cymes) terminating

the stem and branches; the sepals are green with a broad white membranous margin, so that though the white petals are no longer than the sepals, the flowers look distinctly white; the stems, from the crown of the root, are numerous, 3-9 inches long, prostrate, slender, and hairless (glabrous), and the alternate leaves are oblong or strap-shaped, blunt, fleshy, and hairless (glabrous).

Very rare. On sandy shores; in Devon and Cornwall. July—October. Annual.

IV. KNAWEL. (SCLERAN'THUS. Linn.)—Flowers small, green, in small clusters terminating the stem and branches or solitary in the forks of the branches. Calyx of 5 sepals, united into a tube and separating into 5 teeth with white membranous margins; petals 0, or possibly reduced to 5 filaments which alternate with the 5 perfect stamens and are inserted with them in the throat of the calyx-tube; carpels 2, united into a 1-celled seedcase and separating into 2 distinct styles and stigmas; capsule roundish, 1-celled, 1-seeded, enveloped in the hardened calyx-tube, decaying to free the seed (indehiscent). Small, much-branched herbs, with opposite narrow leaves, united at the base with a narrow membranous edge, and without stipules.

(1) Annual Knawel. (*Scleran'thus an'nuus.*)—Calyx-lobes pointed; flowers solitary.

(2) Perennial Knawel. (*Scleran'thus peren'nis.*)—Calyx-lobes blunt; flowers in clusters.

1. Annual Knawel. (*Scleran'thus an'nuus.* Linn.)—As just described. The small green flowers are solitary in the forks of the stem and branches, the calyx-lobes are pointed and with a narrow white membranous border, the stems are 2-8 inches high and are profusely branched, and the leaves are small, strap-shaped (linear), and pointed. [Plate 38. Common. Sandy fields and waste places; throughout England, Ireland, and the south of Scotland. June—October. Annual or biennial.

2. Perennial Knawel. (*Scleran'thus peren'nis.* Linn.)—A very similar species, but with the flowers crowded into terminal clusters, with, occasionally, a few solitary flowers below; the sepals blunt with a broad membranous margin; and the stems less branched. Very rare. In sandy fields; in Norfolk and Suffolk. June—September. Perennial.

THE GOOSE-FOOT FAMILY

[ORDER LXIII. CHENOPODIACEÆ]

In this and all the following families the calyx and corolla are not distinguishable, or one or other is absent, so they are collectively called the **PERIANTH**.

PERIANTH usually of 5, more or less, united lobes, occasionally only of 2, 3, or 4 lobes, remaining with the fruit (persistent); inserted below the seedcase (inferior).

STAMENS usually 5, as many as the perianth-lobes and opposite them, inserted on a disk round the seedcase (perigynous) or below the seedcase (hypogynous), or absent.

PISTIL of 2-4 **CARPELS** united into a 1-celled seedcase, with the same number of

styles, which are sometimes united, and stigmas, or absent.

FRUIT consisting of a single seed surrounded by a membranous or fleshy coat and enveloped in the perianth, which sometimes enlarges considerably, decaying to free the seed (indehiscent).

LEAVES often fleshy, usually alternate, without stipules.

FLOWERS perfect, or without stamens or pistils (monœcious), in stalkless (sessile) clusters in the axils of the leaves, or in heads or spikes, usually greenish and rather unnoticeable.

DISTINGUISHED by the usually 5-lobed perianth in one row, the 5 stamens, and the solitary seed.

THE plants belonging to this order are rather unnoticeable straggling plants with dense clusters of small greenish flowers, and are made even more unattractive by being very often covered with sand and dust.

The order is a large one and is chiefly composed of salt plants, succulent and often prickly, either growing by the sea-shore, in salt marshes, or in deserts and steppes, and waste and cultivated land.

Many species are cultivated as vegetables, the most important being the Spinach (*Spinacia oleracea*) and Beets. *Beta maritima* is the parent of the Common Red Beet (*Beta vulgaris*) with its variety Mangel Wurzel (*Beta vulgaris*, var. *macrorhiza*), and the Sugar Beet (*Beta altissima*).

- I. **ORACHE** (*AT'RIPLEX*). Perianth enlarging in fruit and 2-lobed; leaves flat.
- II. **BEET** (*BÉTA*). Perianth adhering to fruit, 5-lobed; leaves flat.
- III. **GOOSE-FOOT** (*CHENOPO'DIUM*). Perianth free from and not altering in fruit; leaves flat.
- IV. **MARSH SAMPHIRE** (*SALICOR'NIA*). Flowers sunk in axils of jointed, fleshy, leafless plants.
- V. **SEA BLITE** (*SUÉDA*). Flowers with 5 perianth-lobes and 5 stamens; leaves semi-cylindrical, strap-shaped.
- VI. **SALTWORD** (*SAL'SOLA*). Perianth-lobes developing scarious wing; leaves semi-cylindrical, ending in a spine.

I. ORACHE. (ATRIPLEX. Linn.)—Flowers small, usually male and female, rarely perfect, in clusters often spike-like, in the axils of the leaves or in terminal branched clusters (panicles). The female flowers consist of a perianth of 2 free or more or less united, flat, valve-like lobes, which are sometimes toothed at the edges and have wart-like lumps on the back, enlarging in fruit; and 2 carpels, united into a seedcase with 2 styles and stigmas, developing 1 vertical seed, enclosed in the 2 flat perianth-lobes which close tightly over it. The male flowers consist of a perianth of 3–5 lobes, united at the base and remaining with the fruit; and 5 stamens. While the perfect flowers resemble the male flowers with the addition of a pistil of 2 carpels which may or may not develop one horizontal seed. Herbs or undershrubs, fleshy, usually sprinkled with grey or white meal, with flat fleshy leaves often halbert-shaped or triangular.

The 2 perianth-segments of female flowers united only at the base; fruit free from perianth.

- (1) Grass-leaved Sea Orache. (*At'riplex littoralis*.)—Leaves toothed, not lobed.
- (2) Spreading Orache (*At'riplex pat'ula*.)—Lower leaves triangular with at the base two ascending lobes, upper leaves entire.
- (3) Halbert-leaved Orache. (*At'riplex hastata*.)—Lower leaves halbert-shaped.
- (4) Deltoid-leaved Orache. (*At'riplex deltoidea*.)—All the leaves halbert-shaped.
- (5) Rose-coloured Orache. (*At'riplex Babingtonii*.)—Leaves usually with at the base three ascending lobes.
- (6) Frosted Sea Orache. (*At'riplex laciniata*.)—Leaves toothed and wavy, not lobed.

The 2 perianth-segments of female flowers united halfway or more; fruit adhering to perianth.

- (7) Shrubby Sea Purslane. (*At'riplex portulacoides*.)—Fruit stalkless, leaves entire, shrubby. Perennial.
- (8) Stalked-fruited Purslane. (*At'riplex pedunculata*.)—Fruit stalked, leaves entire. Annual.

1. Grass-leaved Sea Orache. (*At'riplex littoralis*. Linn.)—As just described. The flowers are both perfect and male and female and are all clustered together in long slender terminal spikes; the perianth-segments are egg-shaped (ovate), triangular (deltoid), or 4-sided (rhomboidal), toothed (dentate), warted on the back, united only at the base, and not adhering to the fruit. The stem is erect, 6 inches to 4 feet high, branched, and woody, and has resinous reddish stripes; and the leaves are strap-shaped (linear) or oblong, entire or slightly or deeply toothed (serrate) but not lobed, the upper leaves being very narrow and entire. The whole plant is covered with a bluish bloom (glaucous) and is more or less white with meal. Not common. On salt marshes; throughout England, in Scotland as far north as Fifeshire, and in Ireland. July—September. Annual.

2. Spreading or Narrow-leaved Orache. (*At'riplex pat'ula*. Linn.)—A similar sort of plant with the flowers in long dense terminal spikes; the perianth-segments 4-sided (rhomboidal), toothed or entire, and warted or smooth on the back, united only at the base, and not adhering to the fruit; the stems erect or prostrate, often with the main stem erect and the branches curving downwards to the ground; the upper leaves are alternate, lance-shaped, and entire, and the lower ones are opposite, triangular, and wedge-shaped at the base with 2 ascending lobes. The whole plant is deep green, often tinged with red, and more or less covered with white meal. [Plate 39.

Common. In cultivated ground, waste places, and on sandy sea-shores, in England, Scotland and Ireland. July—October. Annual.



female & male flowers

DELTOID-LEAVED ORACHE

female, male flower

fruit
SPREADING ORACHE,
ATRIPLEX PATULA.

ATRIPLEX DELTOIDES

BETA

SEA BEET,
ATRIPLEX MARITIMA

ATRIPLEX LACINIATA

FROSTED SEA ORACHE

3. Halbert-leaved Orache. (*Atriplex hastata*. Linn.)—A very similar species to the last, differing in the lower leaves being halbert-shaped (hastate), that is, with the lobes at the base spreading horizontally, and in the seeds being of 2 kinds, the larger dark brown and rough, and the smaller black, smooth, and shining.

Common. In cultivated ground, waste places, and on sandy sea-shores, in England, Scotland, and Ireland. July—October. Annual.

4. Deltoid-leaved Orache. (*Atriplex deltoidea*. Bab.)—Another similar species with the flowers in dense branched spikes (panicles), the 2 perianth-lobes of the fruiting flowers warded on the back, and all the leaves halbert-shaped (hastate). [Plate 39.]

Common. In cultivated ground and on sandy sea-shores, in England and Ireland. June—October. Annual.

5. Rose-coloured Orache. (*Atriplex Babingtonii*. Woods.)—Another species similar to the Halbert-leaved Orache (*Atriplex hastata*), but with the flowers in much looser clusters, so that they appear to be more in the leaf-axils (axillary) than in spikes, and the cluster usually unbranched (simple); the perianth-lobes are 4-sided (rhomboidal), pointed, toothed, and warded on the back, and in fruit become large and form a diagonal square with the outside edges a little rounded; the stem is usually striped with red, and the leaves are triangular, usually 3-lobed at the base, but sometimes toothed and with only the 2 ascending lobes as in the Halbert-leaved Orache (*Atriplex hastata*). The colour of the plant is very variable; it is sometimes bright red and at other times green, more or less covered with white meal. (*Atriplex rosea*. Bab.)

Common. On sea-shores, salt marshes, and waste places near the sea; in England, especially abundant in Scotland, and in Ireland. July—September. Annual.

6. Frosted Sea Orache. (*Atriplex laciniata*. Linn.)—A beautiful frosted species with the female fruiting flowers and a few male clustered in the axils of the lower leaves and the perfect flowers only in short blunt dense terminal spikes; the perianth-lobes in fruit are 4-sided (rhomboidal), slightly toothed, swollen and hard at the base, often with two warts on the back, not adhering to the fruit. [As described in the genus Orache (*Atriplex*).] The stems are spreading, 3 inches to 2 feet long, dull red; and the leaves are oval or triangular, sometimes toothed (serrate), and wavy (sinuate). The whole plant is thickly covered with silvery scales and is whiter than any other of the British species. (*Atriplex rosea*. Linn.; *Atriplex arenaria*. Woods.) [Plate 39.]

Not uncommon. On sandy sea-shores, in England, Scotland, and Ireland. July—October. Annual.

7. Shrubby Sea Purslane, Crabweed. (*Atriplex portulacoides*. Linn.)—Flowers stalkless (sessile), in short, rather dense, interrupted, branched clusters (panicles); the two lobes of the fruit-perianth are small and leathery, triangular or nearly round, united nearly to the top where they are toothed (serrate), adhering to the fruit. [As described in the genus Orache (*Atriplex*).] The stem is 1–2 feet long, woody, much branched, and straggling; and the leaves are inversely egg-shaped (obovate) or oblong, tapering at the base and blunt at the apex, and entire. The whole plant is closely covered with grey scales which cannot be rubbed off.

Fairly common. On sea-shores, salt marshes, and waste places near the sea; generally distributed in England, very rare in Scotland and Ireland. August—October. Shrub.

8. Stalked-fruited Orache. (*Atriplex pedunculata*. Linn.)—A somewhat similar species, differing in the fruit having a long stalk and being wedge-shaped and 2-lobed with a small intermediate tooth, and in the stems being usually only 3–4 inches high, though occasionally nearly 1 foot high.

Very rare, local. In muddy salt marshes on the east coast of England. August—October. Annual.

II. BEET. (BÉTA. Linn.)—Flowers perfect, in clusters in the axils of the leaves forming long terminal spikes. Perianth of 5 segments, united at the base and adhering to the seedcase below which it is inserted (inferior), the lower part becoming enlarged and woody in fruit; stamens 5, inserted on a fleshy ring which unites the perianth and seedcase; carpels 2-3, with the same number of styles and stigmas; the 1-seeded fruit embedded in the enlarged fleshy base of the perianth. Herbs with alternate, wavy, almost entire, fleshy leaves. [Plate 39.

Sea Beet. (Béta marítima. Linn.)—The only British species. As just described. The flowers are green, 2 or 3 together in clusters in the axils of the leaves forming long leafy spikes terminating the main stem and branches (panicle); the stems are about 2-3 feet high, stout, decumbent, and spreading; the leaves are small lance-shaped and bract-like at the base of each flower-cluster, the lower stem-leaves shortly stalked, wavy, and egg-shaped (ovate), and those from the root on long stalks, large, and triangular-egg-shaped; and the root is thick and fleshy.

This species is the parent of the red and white Beet and Mangel Wurzel of cultivation.

Fairly common. On sea-shores, throughout England, rare in Scotland, and fairly distributed in Ireland. June—October. Perennial.

III. GOOSE-FOOT. (CHENOPÓDIUM. Linn.)—Flowers small, perfect, green, in small stalkless (sessile) clusters up the stem forming terminal and axillary spikes which are usually much branched (panicle). Perianth of 3-5 lobes, united at the base, free from and inserted below the seedcase, enveloping the fruit but not enlarging with it; stamens 5, inserted below the seedcase (hypogynous); carpels 2-3, with 2 or 3 styles and stigmas; fruit of 1 seed enclosed in a membranous coat and enveloped in the perianth. Herbs with usually alternate leaves, which with the flowers and stems are often covered with white meal.

Flowers with 5-lobed perianth.

- (1) Many-seeded Goose-foot. (*Chenopodium polysper'mum.*)—Perianth not covering fruit; leaves oval, entire; plant green, not mealy.
- (2) Stinking Goose-foot. (*Chenopodium Vulvária.*)—Perianth covering fruit; leaves egg-shaped and entire; plant covered with white greasy, ill-smelling meal.

Leaves toothed or lobed; more or less mealy.

- (3) White Goose-foot. (*Chenopodium álbum.*)—Perianth covering fruit; upper leaves narrow and entire, lower egg-shaped and toothed, all nearly white.
- (4) *Guelder-rose-leaved Goose-foot. (*Chenopodium opulifólium.*)—Perianth covering fruit; all leaves broad, 4-sided, and coarsely toothed.
- (5) Fig-leaved Goose-foot. (*Chenopodium serotínium.*)—Perianth covering fruit; all leaves 3-lobed.
- (6) Nettle-leaved Goose-foot. (*Chenopodium murále.*)—Perianth not quite covering fruit; leaves 4-sided, sharply toothed.
- (7) Maple-leaved Goose-foot. (*Chenopodium híbridum.*)—Perianth not covering fruit; leaves heart-shaped with 2-4 large teeth on each side.
- (8) Upright Goose-foot. (*Chenopodium ur'bicum.*)—Perianth not covering fruit; leaves triangular, deeply toothed or lobed.

Terminal flower only in each cluster with a 5-lobed perianth.

- (9) Red Goose-foot. (*Chenopodium rúbrum.*)—Flower-clusters leafy; leaves triangular, deeply toothed or lobed, shining, dark green tinged with red.



CHENOPODIUM
ALBUM.
WHITE
GOOSE
FOOT.

seed, & fruit
magnified
of
WHITE
GOOSE-FOOT.

fruit

& flower
magnified

PRICKLY
SALTWORT,

MARSH
SAMPHIRE

peri-
anth
lobe in
flower

&
in fruit

RED
GOOSE-FOOT,

CHENOPODIUM
RUBRUM.

ANNUAL
SEA-BLITE

whole
flower

pistil

seed, pistil

SALICORNIA
EUROPEA.

SALSOLA KALI.

fruits
magnified

flower

SARCOCOLLA
MARIANA.

- (10) Many-spiked Goose-foot. (*Chenopodium botryodes*.)—Flower-clusters leafless; leaves triangular, slightly toothed and fleshy.
- (11) Oak-leaved Goose-foot. (*Chenopodium glaucum*.)—Leaves oblong or egg-shaped, wavy and toothed.
- (12) *Good King Henry. (*Chenopodium Bonus-Henricus*.)—Leaves broadly triangular, usually entire, dark green; root thick and fleshy.

1. Many-seeded Goose-foot. (*Chenopodium polysperum*. Linn.)—As just described. The flowers are in small clusters forming short slender branched spikes (panicles) in the axils of the alternate leaves, with the perianth 5-lobed, thin, green, and not covering the dark shining fruit; the stem is 4-18 inches high, erect or decumbent, and much branched, and the leaves are shortly stalked, egg-shaped (ovate) or oval, entire or with one tooth on each side near the base. The whole plant is green or tinged with red and is destitute of white meal. Rather rare. In damp waste places and rich cultivated ground; chiefly in the south of England and in the Channel Isles. August—October. Annual.

2. Stinking Goose-foot. (*Chenopodium Vulvária*. Linn.)—A similar plant to the last but with blunter flower-spikes; the perianth 5-lobed and enveloping the fruit; and the leaves broader and more fleshy. The whole plant, especially when young, is covered with a greasy white mealy powder which has an extremely unpleasant fishy smell. Rather rare. Under walls by waysides and in waste places near houses; in England, Scotland, and Ireland. August—September. Annual.

3. White Goose-foot, Fat Hen. (*Chenopodium album*. Linn.)—The commonest species in the British Isles. The flowers are in dense, sometimes interrupted, branched spikes (panicles) terminating the stem and in the axils of the leaves; the fruit is entirely covered with the perianth, which is 5-lobed. [As described in the genus Goose-foot (*Chenopodium*).] The stem is 1-3 feet high, erect, branched, mealy; and the leaves are egg-shaped (ovate) or somewhat 4-sided (rhomboidal), stalked, irregularly toothed, and wavy (sinuate), the upper ones narrow and entire. The whole plant, particularly the flowers and under side of the leaves, is covered with a thick white mealy powder, giving the plant a whitish aspect. [Plate 40. Very common. In cultivated ground, waysides, and waste places; in England, Scotland, and Ireland. July—September. Annual.

4. *Guelder-rose-leaved Goose-foot. (*Chenopodium opulifolium*. Schrad.)—A species, which is not native but is occasionally found in waste places, with broadly 4-sided leaves, often broader than long, with the angles rounded, coarsely and unevenly toothed, and on long stalks. Not native. In waste places. August—September. Annual.

5. Fig-leaved Goose-foot. (*Chenopodium serotinum*. Linn.)—A similar species to the White Goose-foot (*Chenopodium album*) with the flowers in erect, nearly leafless, branched clusters (cymose racemes) in the axils of the leaves, the perianth 5-lobed and covering the fruit, and the leaves 3-lobed, the basal lobes ascending and the terminal long lobe toothed. (*Chenopodium ficifolium*. Sm.)

Rare. In cultivated and waste ground; in various counties in England, and reported from Ireland. August—September. Annual.

6. Nettle-leaved Goose-foot. (*Chenopodium murale*. Linn.)—A species with branched spikes (cymes) terminating the stem, but chiefly in the axils of the leaves; the slightly mealy perianth is 5-lobed, nearly covering the fruit. [As described in the genus Goose-foot (*Chenopodium*).] The stem about 1 foot high, often divided from the base into several equal decumbent

or erect branches, which are branched above, and all the leaves 4-sidedly egg-shaped (rhomboidal ovate) and sharply and unequally toothed. The whole plant is either green or slightly covered with a white mealy powder.

Rather rare. In waste ground, under walls, near houses; distributed throughout England, and very rarely in Ireland. August—September. Annual.

7. Maple-leaved Goose-foot. (*Chenopodium hybridum*. Linn.)—A plant with the flowers in branched leafless clusters (panicles) terminating the stem and upper branches; the perianth 5-lobed and not covering the fruit. [As described in the genus Goose-foot (*Chenopodium*).] The stem erect, 1–3 feet high, branched, and stout; and the leaves large, egg-shaped (ovate), pointed, broadly heart-shaped (cordate) at the base, and coarsely and distantly toothed with 2–4 large teeth on each side. The whole plant is slightly shining and is destitute or nearly so of meal.

Rare. In cultivated ground and waste places, near houses; chiefly in the south of England, and reported from Ireland. August—September. Annual.

8. Upright Goose-foot. (*Chenopodium ur'becum*. Linn.)—A species with numerous small clusters of flowers forming a terminal, usually leafless spike, and in small branched spikes in the axils of the leaves; the perianth 5-lobed and not covering the fruit. [As described in the genus Goose-foot (*Chenopodium*).] The stem is erect, 6 inches to 3 feet high, simple or branched at the base; and the leaves are triangular or almost 4-sided (rhomboidal) irregularly and deeply toothed or lobed and wavy (sinuate). The whole plant is usually green and is very slightly sprinkled with meal.

Rather rare. In waste places and rich cultivated ground, especially near farm-houses; in England, rare in Scotland and Ireland. August—October. Annual.

9. Red Goose-foot. (*Chenopodium rubrum*. Linn.)—A species very similar to the last, but with larger compact leafy flower-spikes making a cluster (panicle) wider at the base, most of the flowers having a 2–4-lobed perianth and only the terminal flower in each cluster having 5 lobes. The whole plant is shining and green, free from white meal, and usually tinged with red.

[Plate 40.

Not uncommon. In waste and cultivated ground; throughout England, rare in Scotland and Ireland. August—September. Annual.

10. Many-spiked Goose-foot. (*Chenopodium botryodes*. Sm.)—A very similar species to the Red Goose-foot (*Chenopodium rubrum*), but with nearly leafless flower-spikes and triangular leaves which are thick and fleshy and very slightly toothed.

Rare, local. In moist sandy places near the sea; on the south-east coast of England. August—September. Annual.

11. Oak-leaved Goose-foot. (*Chenopodium glaucum*. Linn.)—A species with usually unbranched leafless spikes of flowers in the axils of the leaves; the terminal flower in each spike with a 5-lobed perianth, but all the others having only 2–4 lobes, the perianth nearly closing over the fruit. [As described in the genus Goose-foot (*Chenopodium*).] The stems, 3 inches to 2 feet, usually procumbent but occasionally erect; and the leaves oblong or egg-shaped (ovate), the margin toothed and wavy (sinuate-dentate), and mealy underneath. The whole plant is slightly shining, the only part which is mealy being the under side of the leaves.

Rare. In cultivated ground and waste places, in various parts of England. August—September. Annual.

12. *Good King Henry, All-good. (*Chenopodium Bonus-Henricus*. Linn.)—Not a native. The flowers are in dense leafless spikes, usually unbranched, terminating the stem and

in the axils of the leaves ; only the terminal flower in each cluster has a 5-lobed perianth, the others being 2-4-lobed, and the fruit is longer than the enveloping perianth. [As described in the genus Goose-foot (*Chenopodium*).] The stem is usually about 1 foot high, but sometimes it is taller, and is hardly branched ; and the leaves are triangular halbert-shaped (hastate), entire or wavy or slightly toothed, large, succulent, and of a dark green. The whole plant is of a dark green and has a fleshy root.

Very common. Naturalised in waste places and waysides near villages and farm-houses ; throughout England, the south of Scotland, and Ireland. May—August. Perennial.

IV. MARSH SAMPHIRE. (SALICOR'NIA. Linn.)—Flowers embedded, 3 together, in pits on either side of the nodes of the fleshy stems. The perianth is fleshy, 3-4-toothed, free from the fruit though remaining with it ; stamens 1-2 ; carpels 2, with a short style dividing into 2 stigmas ; fruit seed-like enveloped in the perianth. Strange maritime herbs with green, fleshy, jointed, branched stems, often woody at the base, and no leaves.

The London Catalogue (10th edition) gives 8 species of this well-known and curious plant, but the following two will suffice for the purposes of the present book :—

- (1) Glass-wort. (*Salicor'nia europæa*.)—Flower-clusters with central flower much exceeding side ones.
- (2) Glass-wort. (*Salicor'nia rad'icans*.)—Flower-clusters with central flower hardly exceeding side ones.

1. Jointed Glass-wort, Marsh Samphire. (*Salicor'nia europæa*. Linn.)—As just described, the central flower much exceeding the other two in each cluster ; the stem usually erect, not rooting, 3-12 inches high, branched, the joints compressed and the stem thickening upwards. (*Salicornia herbacea*. Linn.) [Plate 40. Rather common. On muddy sea-shores and by tidal rivers, in England, Scotland, and Ireland. July—September. Annual.

2. Jointed Glass-wort, Marsh Samphire. (*Salicor'nia rad'icans*. Sm.)—A similar species but with the central flower hardly exceeding the other two in each cluster ; the stem shrubby, procumbent, and rooting, sending up numerous erect, woody branches, often tinged with fawn and red, and forming large tufts, the branches scarcely thickening upwards.

These species were formerly used in the manufacture of glass, and are still used for pickling and are often preferred to the Rock Samphire (*Crithmum maritimum*.)

Local. On muddy sea-shores and salt marshes ; only in the south-east of England. July—September. Shrub.

V. SEA BLITE. (SUÆDA. Forsk.)—Flowers small, stalkless, in the axils of the leaves. Perianth 5-lobed, remaining with the fruit, free from and inserted below the seedcase ; stamens 5, inserted below the seedcase (hypogynous) ; carpels 3-5, with the same number, generally 3, of sessile stigmas ; fruit seed-like, the seed coiled. Fleshy maritime herbs and shrubs with small, strap-shaped (linear), fleshy, semi-cylindrical leaves. (*Lerchia*. Hall.)

- (1) Shrubby Sea Blite. (*Suæda fruticosa*.)—Flowers with 3 styles ; and blunt leaves.
- (2) Annual Sea Blite. (*Suæda marit'ima*.)—Flowers with 2 styles ; and pointed leaves.

1. Shrubby Sea Blite. (*Suæda fruticosa*. Forsk.)—As just described. The flowers are small, stalkless (sessile), solitary or 2 or 3 together in the axils of the leaves ; there are 3 styles ;

the stem is 1-2 feet high, much branched, woody, sometimes erect, sometimes low and spreading; and the leaves are strap-shaped (linear), blunt, semi-cylindrical, and fleshy.

Rare. On sandy and shingly sea-shores, on the south and east coasts of England. July—October. Perennial.

2. Annual Sea Blite. (*Suaeda maritima*. Dumort.)—A very similar species differing in the flowers having only 2 styles, and in the leaves being more pointed. The plant often turns red or purple in the autumn. [Plate 40.

Common. On sandy sea-shores and salt marshes; generally distributed along the coasts of England, Scotland, and Ireland. July—October. Annual.

VI. SALTWORT. (*Salsola*. Linn.)—Flowers small, stalkless (sessile), in the axils of the leaves. Perianth 5- rarely 4-lobed, each lobe ultimately having a small appendage on the back which forms a star-like wing round the fruit, free from though remaining with the fruit; stamens 5, inserted on a ring below the seedcase (hypogynous); carpels 2 or 3, with the same number of styles and stigmas; fruit seed-like, enveloped in the perianth. Maritime herbs with semi-cylindrical, fleshy, usually prickly leaves.

Prickly Saltwort. (*Salsola Kali*. Linn.)—The only British species. As just described. The flowers are solitary or 2 or 3 together in the leaf-axils and are clustered in spikes terminating the stem and branches; the stem is 3 inches to 1 foot long, procumbent or ascending, angular and striped; with the leaves fleshy, alternate, semi-cylindrical ending in a spine, and with the margins hairy. The whole plant is fleshy, with a slight bloom (glaucous), and more or less hairy. [Plate 40.

Common. On sandy sea-shores; generally distributed round the coasts of England, Scotland, and Ireland. July—August. Annual.

THE PERSICARIA FAMILY

[ORDER LXIV. POLYGONACEÆ]

PERIANTH 3-6-lobed, the lobes more or less united at the base, or united into a tube, or free, often in 2 rows, remaining and sometimes enlarging with the fruit, inserted below the seedcase (hypogynous).

STAMENS usually 5-8, inserted around (perigynous) or below the seedcase (hypogynous).

CARPELS usually 3, occasionally 2 or 4, united into a seedcase and surmounted with the same number of styles which are sometimes so short that the stigmas seem to be situated directly on the seedcase (sessile).

FRUIT a small nut, 3- or 4-sided according

to whether there are 3 or 4 carpels, flat and 2-sided when there are only 2, enclosed in but not adhering to the perianth, decaying to free the seed (indehiscent).

LEAVES usually alternate, undivided (simple), with membranous stipules forming a sheath or ring round the stem.

FLOWERS small, numerous, in clusters in the axils of the leaves forming spikes, or looser clusters (racemes), or branched clusters (panicles).

DISTINGUISHED by the sheathing stipules which surround the stem even when the sheath is reduced to a mere rim.

MOST members of this order are herbs with hollow stems and simple leaves, and are characterised by the sheathing stipules which surround the stems at the base of each flower-cluster and leaf.

The order is a large one and is distributed over all parts of the world. Those in temperate zones are usually herbs, but in the tropics they are either woody climbers or shrubs.

The stalks of the Rhubarb (various species of *Rheum*) are much used for tarts, and Sorrel (*Rumex Acetosa*) is cultivated as a vegetable in some countries. Buckwheat (*Fagopyrum sagittatum*) is grown as a food for pheasants. Though the stalks of the Rhubarb are pleasant eating, when cooked, the roots are very different; those of *Rheum officinale* and *Rheum palmatum*, however, being valuable in medicine.

A tropical order near akin to the Persicaria Family is the Piperaceæ, of which the Black Pepper (*Piper nigrum*), a native of the East Indies, is a member.

- I. PERSICARIA (POLY'ONUM). Perianth of 5 lobes; stamens 5-8; styles 2-3; nut triangular or flattened, embryo at side of seed, cotyledons flat.
- II. *BUCKWHEAT (FAGOPÝRUM). Perianth of 5 lobes; stamens 8; styles 3, stigma clubbed; nut triangular, embryo in centre of seed, cotyledons large, leaf-like and plaited.
- III. MOUNTAIN SORREL (OXYR'IA). Perianth of 4 lobes, 2 inner larger; stamens 6; styles 2, stigmas feathery; nut flattened and winged.
- IV. DOCK (RÚMEX). Perianth of 6 lobes, 3 inner much larger; stamens 6; styles 3, stigmas feathery; nut triangular.

I. PERSICARIA. (POLY'ONUM. Linn.)—Flowers small, generally pink or white, in clusters in the axils of the leaves forming spikes or branched clusters (panicles). Perianth deeply 5-lobed, in 2 rows, the 3 outer lobes sometimes enlarged in fruit, inserted below and remaining with the seedcase; stamens 5-8; carpels 2 or 3, with the same number of styles and stigmas; fruit a small nut, compressed when there are two carpels, 3-sided (triquetrous) when there are three. Herbs, usually rather straggling, with stems often enlarged and bent at the joints (nodes), alternate leaves which are entire or toothed, and membranous stipules, often fringed at the edge, sheathing the stems.

Flowers in loose clusters (racemes); stamens 8; styles 3; nut 3-sided; stems twining; leaves arrow-shaped; root fibrous.

- (1) Black Bindweed. (*Polyg'onum Convol'vulus.*)—Perianth outer segments keeled.
- (2) Cope Buckwheat. (*Polyg'onum dumetórum.*)—Perianth with broad white wings.

Flowers 1-3 together in leaf-axils; stamens 8; styles 3; nut 3-sided; stipules silvery and torn; root fibrous.

- (3) Common Knot-grass. (*Polyg'onum aviculáre.*)—Nuts rough, about same length as perianth; leaves thin.
- (4) Ray's Knot-grass. (*Polyg'onum Ráii.*)—Nuts shining, much longer than perianth; leaves fleshy.
- (5) Seaside Knot-grass. (*Polyg'onum marit'imum.*)—Nuts shining, much longer than the perianth; leaves fleshy, with margins turned back.

Flowers in spikes; stamens 4-8; styles 2-3; nut compressed or 3-sided; root fibrous.

- (6) Biting Persicaria. (*Polyg'onum Hydrop'iper.*)—Flower-spikes slender, drooping; perianth dotted with conspicuous glands; acrid.
- (7) Creeping Persicaria. (*Polyg'onum mínus.*)—Flower-spikes slender, erect; perianth without glands; flowers and fruit very small.
- (8) Lax-flowered Persicaria. (*Polyg'onum míte.*)—Flower-spikes thicker, erect; perianth without glands.

Flower-spikes erect and oblong.

- (9) Common Persicaria. (*Polyg'onum Persicária.*)—Perianth without glands; leaves with minute warts.
- (10) Pale-flowered Persicaria. (*Polyg'onum lapathifólium.*)—Flowers pale; perianth, flower-stalks, and leaves dotted with conspicuous glands.
- (11) Spotted Persicaria. (*Polyg'onum maculátum.*)—Perianth and flower-stalks dotted with conspicuous glands; leaves white and woolly underneath.
- (12) Amphibious Persicaria. (*Polyg'onum amphib'ium.*)—Spikes usually solitary, handsome; styles 2; stems creeping, usually floating; leaves large oblong.

Stamens 8; styles 3; nut 3-sided; stem erect, unbranched, root a rhizome.

- (13) Bistort. (*Polyg'onum Bistórta.*)—Flower-spike solitary, dense, oblong; leaves egg-shaped.
- (14) Viviparous Bistort. (*Polyg'onum vivip'arum.*)—Flower-spike solitary, loose, slender, bulbiferous; leaves lance-shaped.



BLACK BINDWEED.

POLYGONUM CONVULVULUS

COMMON PERSICARIA.
POLYGONUM PERSICARIA.

BISTORT
POLYGONUM BISTORTA.

COMMON KNOTGRASS

POLYGONUM VULGARE.

POLYGONUM HYDROPIPER

1. Black Bindweed, Climbing Persicaria, or Buckwheat. (*Polygonum Convolvulus*. Linn.)—As just described. A species with greenish-white flowers often tinged with red, in little loose clusters in the axils of the leaves; the perianth enlarged in fruit, the 3 outer lobes being keeled or rarely winged; 8 stamens, 3 styles, and a 3-sided nut-like fruit; the angular stem twining, as in *Convolvulus*, round the neighbouring plants, some two or three feet in length; and the leaves all stalked, shining, heart-shaped (cordate) or arrow-shaped (sagittate), and pointed, with entire semi-cylindrical sheaths. In the autumn the leaves are sometimes a very beautiful red. [Plate 41.

Very common. In fields, cultivated ground, and waste places; throughout England, Scotland, and Ireland. July—September. Annual.

2. Cope Buckwheat. (*Polygonum dumetorum*. Linn.)—A very similar species, more luxuriant, with larger clusters of flowers which have a broad white membranous wing on the back of the 3 outer perianth lobes just continuing down the flower-stem, and a round stem, 3-5 feet in length.

Rare. In hedges and thickets, only in the south of England. July—September. Annual.

3. Common Knot-grass. (*Polygonum aviculare*. Linn.)—A very common little weed with 1-3 pink or greenish-white flowers in clusters in the axils of almost all the leaves, either distant from one another or so near as to form a leafy spike; the 5-lobed perianth is hardly enlarged in fruit; the stamens are 8 in number; the styles 3; and the nut 3-sided, not shining, about as long as the perianth. The stem is from a few inches to 2 feet long, much branched, wiry, prostrate or erect; the leaves are small, shortly stalked or the upper ones stalkless (sessile), oval, oblong, or strap-shaped, and entire; and the stipules are white, membranous, sometimes long, with a few veins, at length torn. [Plate 41.

This species varies very much in its growth according to the soil and situation in which it is found. Many varieties are given; one, *Polygonum litorale*. Link., a seaside variety, it would be well to note, as it is easily mistaken for the Seaside Knot-grass (*Polygonum maritimum*) because of its similar thick, rather fleshy leaves, and larger flowers and nuts than those of the ordinary Knot-grass. It has not, however, the smooth shining nuts of the Seaside Knot-grass.

Very common. In cultivated and waste ground; throughout England, Scotland, and Ireland. May—October. Annual.

4. Ray's Knot-grass. (*Polygonum Ráii*. Bab.)—A very similar species to the last, intermediate between it and the next, but with rather larger flowers, shining nuts which are much longer than the perianth; long, straggling, prostrate stems, and oblong, lance-shaped leaves which bend towards the stem and are often covered with bloom (glaucous).

Not uncommon. Sandy sea-shores; in England, Scotland, and Ireland. August—September. Annual or biennial.

5. Seaside Knot-grass. (*Polygonum maritimum*. Linn.)—A similar species to the Common Knot-grass (*Polygonum aviculare*) and to the last species. Like the last in the long shining nut, but more shrubby, with prostrate, stiff, woody stems often buried in the sand, and fleshy leaves with the margins rolled back (revolute) and the leaves diverging from the stem.

Very rare. On sandy sea-shores in the south of England and in the Channel Isles. July—September. Perennial.

6. Water Pepper, Biting Persicaria. (*Polygonum Hydropiper*. Linn.)—Flowers greenish, $\frac{1}{8}$ inch long in long, slender, drooping spikes terminating the stem and branches; perianth 5-lobed, dotted all over with conspicuous glands, scarcely enlarged in fruit; stamens usually 6, rarely 8; styles usually 2 when the nut-like fruit is compressed, or 3 when the nut is 3-sided.

[As described in the genus *Persicaria* (*Polygonum*).] The stem is 1-2 feet high, with swollen joints (nodes), branched, decumbent, and rooting at the base, then erect; with lance-shaped, entire leaves, the upper ones nearly stalkless and the lower shortly stalked; and the stipules fringed with bristles (ciliate). The whole plant is acrid and green, and usually a large number of plants are found growing together. [Plate 41.

Very common. In wet places, especially by ditches and on the edges of ponds and streams; distributed throughout England, the south of Scotland, and Ireland. August—September. Annual.

7. Creeping *Persicaria*. (*Polygonum minus*. Huds.)—A very similar species to the last, but smaller in every way, the spikes erect, the flowers only half the size, the perianth without conspicuous glands, the nut half the size, and the leaves narrower.

Rare. In wet, gravelly places; in England, Scotland, and Ireland. August—October. Annual.

8. Lax-flowered *Persicaria*. (*Polygonum mite*. Schrank.)—Another species very similar to the last two, but with thicker, erect spikes of flowers, distinguished from the Water Pepper (*Polygonum Hydropiper*) by the absence of glands on the perianth, and from the Creeping *Persicaria* by the larger flowers and fruits which are the same size as those of the Water Pepper.

Rare, local. In wet places by the sides of rivers; chiefly in our south-eastern counties, not recorded from Scotland and Ireland. August—September. Annual.

9. Common *Persicaria*. (*Polygonum Persicaria*. Linn.)—A pretty species with bright rose, rarely white flowers, in compact oblong or cylindrical spikes terminating the stem and branches; the stamens are usually 6; the styles usually 2 when the nut is flattened, or 3 when the nut is 3-sided. [As described in the genus *Persicaria* (*Polygonum*).] The stem is about 1-2 feet high, red or rarely spotted, swollen at the joints (nodes), and branched; the leaves are lance-shaped, shortly stalked, with minute warts, generally with a black blotch in the middle of the leaf, and more or less hairy; and the stipules are strongly fringed with short, weak bristles. The whole plant is often tinged with red. [Plate 41.

Very common. In cultivated ground and damp waste places; throughout England, Scotland, and Ireland. July—October. Annual.

10. Pale-flowered *Persicaria*. (*Polygonum lapathifolium*. Linn.)—A very similar plant to the last, but differing in the flowers being pale, the flower-stalks (peduncles), perianth, and leaves being dotted with conspicuous glands, and the stipules close to the stem with little or no fringe.

Very common. In cultivated ground and damp waste places; throughout England, Scotland, and Ireland. July—September. Annual.

11. Spotted *Persicaria*. (*Polygonum maculatum*. Trim. and Dyer.)—This is another species very similar to the Common *Persicaria* (*Polygonum Persicaria*), but differing from it in the perianths and flower-stalks being dotted with conspicuous glands, and differing from the Pale-flowered *Persicaria* (*Polygonum lapathifolium*) in the leaves being woolly and white underneath and the stipules loose and shortly fringed.

Not common. In damp, gravelly places; in England, Scotland, and Ireland. July—October. Annual.

12. Amphibious *Persicaria*. (*Polygonum amphibium*. Linn.)—Flowers $\frac{1}{5}$ inch long, rose-coloured, in handsome oblong clusters, solitary or rarely 2 together terminating the stem; perianth without glands; stamens 5; styles 2; nut flattened, roundish, and abruptly pointed. [As described in the genus *Persicaria* (*Polygonum*).] This plant assumes a remarkably different aspect according to where it grows; when, as is usual, it is found in pools or ditches, it

floats in the water and throws up the flower-clusters above the surface of the water on short stalks, the stems float, root at the lower joints, and the leaves are broad, egg- or lance-shaped or oblong, smooth or leathery, on long stalks; when the plant is found growing in dried-up pools or ditches, the stem is creeping and rooting at the base and then erect, about 1 foot high, and the leaves are nearly stalkless, lance-shaped, and slightly hairy.

Very common. In pools and ditches, or on mud or marshy ground; throughout England, Scotland, and Ireland. July—September. Perennial.

13. Bistort, Snakeweed. (*Polygonum Bistorta*. Linn.)—A very distinctive species with a solitary, erect, oblong, handsome spike, 1-2 inches long, of pale rose- or flesh-colour flowers; the 5-cleft perianth without glands, the stamens 8 in number and protruding (exserted), the styles 3, and the nut 3-sided. [As described in the genus *Persicaria* (*Polygonum*).] The stem is 1-2 feet high, erect, unbranched, and with a few almost stalkless, small egg-shaped (ovate) leaves and numerous large egg-shaped root-leaves with long winged stalks. The root is thick and creeping.

[Plate 41.

Not common. In moist meadows, by the side of streams; in England and the south of Scotland, rare in Ireland. June—September. Annual.

14. Viviparous Bistort. (*Polygonum viviparum*. Linn.)—Flowers white or flesh-colour, sometimes very few, in a solitary, erect, slender, loose cluster, with flowers at the top and small red bulbils instead of flowers below; the perianth 5-cleft, without glands, the styles 3, and the nut 3-sided. [As described in the genus *Persicaria* (*Polygonum*).] The stem is 6-18 inches high, erect, and simple; the leaves are narrowly lance-shaped with the margins rolled back (revolute), those of the root on long, wingless stalks, and those of the stem on shorter stalks; the stipules are close to the stem and not fringed; and the root is creeping.

Rare. In mountain pastures, by the side of mountain streams; in Wales, the north of England, and the Scotch Highlands as far as the Shetland and Hebrides Islands, very rare in Ireland. June—July. Perennial.

II. *BUCKWHEAT. (*Fagopyrum*. Hill.)—A genus not native in the British Isles, though one species is occasionally found, and differing from *Persicaria* (*Polygonum*) chiefly in the internal structure of the seed (a point with which this book does not deal), the embryo being in the centre of the seed and the cotyledons being large, leaf-like and plaited, whereas in the *Persicaria* (*Polygonum*) the embryo is at one side of the seed and the cotyledons are flat.

***Common Buckwheat. (*Fagopyrum sagittatum*. Gilib.)**—The flowers are pinkish or cream, in leafless branched clusters (cymose panicles); the perianth 5-lobed, the stamens 8, the styles 3 terminating in clubbed stigmas, the nuts 3-sided, longer than the perianth. The stem is about 1 foot high, branched; the leaves are heart-shaped (cordate) with pointed lobes, the lower stalked and the upper stalkless and clasping the stem (amplexicaul); and the stigmas not fringed. (*Fagopyrum esculentum*. Moench.)

This plant is cultivated in the British Isles for food for game.

Not native. In cultivated ground and waste places; frequent in places where it is cultivated but not remaining; in England, Scotland, and Ireland. July—August. Annual.

III. MOUNTAIN SORREL. (*Oxyria*. Hill.)—A genus containing the one species:—

Common Mountain Sorrel. (*Oxyria digyna*. Hill.)—Flowers green, 2-6 in clusters (whorls) round the stem forming a long simple or branched cluster (panicle) terminating the stem. Perianth of 4 lobes, in 2 rows, the 2 inner ones becoming larger in fruit, inserted below

the seedcase (inferior); stamens 6, 4 in two pairs opposite the 2 outer perianth-lobes, the remaining 2 opposite the 2 inner perianth-lobes, inserted at the base of the perianth (hypogynous); carpels 2, united into the seedcase and separating into 2 short styles, each surmounted with a feathery stigma, which is wind pollinated; fruit nut-like, flattened, with a broad membranous wing, small, dry, decaying to free the solitary seed (achene). The stem is 6-10 inches high, erect, slender, unbranched, and almost leafless; and the leaves are usually all from the root on long stalks, roundish heart-shaped (orbicular-cordate) or kidney-shaped (reniform). The whole plant has an agreeable acid taste. [Plate 42.

Rare. On damp rocky ledges and by the side of mountain streams near the summit of mountains in Wales, the north of England, and Scotland. June—August. Perennial.

IV. DOCK. (**RÚMEX.** Linn.)—Flowers small, numerous, in small circular clusters (whorl-like) up the stem (racemes), usually much branched (panicles). Perianth of 6 lobes, in 2 rows, the 3 inner lobes enlarging and closing over the fruit, inserted below the seedcase (inferior); stamens 6, in pairs, inserted between the perianth-lobes; carpels 3, united into a seedcase and separating into 3 styles, each surmounted with a feathery stigma; fruit nut-like, 3-sided, 1-seeded, decaying to free the seed (indehiscent). Herbs with alternate leaves and yellowish sheathing stipules, never fringed, but soon becoming torn.

Flowers perfect; leaves sometimes heart-shaped but never halbert-shaped.

- (1) Sharp Dock. (*Rúmex conglomerátus*.)—Enlarged perianth-lobes oblong, entire, each with a large wart on the back; leaves lance-shaped, rounded or heart-shaped at the base.
- (2) Shore Dock. (*Rúmex rupes'tris*.)—Enlarged perianth-lobes oblong, entire, each with a large wart on the back; leaves narrow and tapering at the base. Maritime species.
- (3) Bloody-veined Dock. (*Rúmex sanguin'eus*.)—Enlarged perianth-lobes oblong, entire, one with a large wart on the back; leaves lance-shaped or oblong, usually heart-shaped, with red veins.
- (4) Golden Dock. (*Rúmex marit'imus*.)—Enlarged perianth-lobes bright yellow, $\frac{1}{10}$ inch long, 4-sided, with 2 bristly teeth on each side and a narrow oblong wart on the back; leaves narrowly lance- or strap-shaped.
- (5) Yellow Marsh Dock. (*Rúmex limósus*.)—Enlarged perianth-lobes bright yellow, $\frac{1}{8}$ inch long, 4-sided, with 2 or 3 shorter bristly teeth on each side and a narrow oblong wart on the back.
- (6) Fiddle Dock. (*Rúmex pul'cher*.)—Enlarged perianth-lobes oblong-triangular, deeply toothed, warts prickly, unequal; leaves chiefly from the root, fiddle or oblong heart-shaped.
- (7) Broad-leaved Dock. (*Rúmex obtusifólius*.)—Enlarged perianth-lobes triangular, strongly toothed, warts red or brown; lower leaves broadly egg-shaped, heart-shaped at the base.
- (8) Curled Dock. (*Rúmex cris'pus*.)—Enlarged perianth-lobes heart-shaped, not toothed, one only with a wart; leaves all lance-shaped, narrow, very much crisped.
- (9) Long-leaved Water Dock. (*Rúmex domésticus*.)—Enlarged perianth-lobes roundish and heart-shaped, neither toothed nor warted; leaves long, lance-shaped, slightly crisped.





- (10) Great Water Dock. (*Rúmex Hydrolap'athum*.)—Enlarged perianth-lobes egg-shaped, all 3 with a large oblong wart; leaves lance-shaped.
- (11) *Rúmex max'imus*.—Enlarged perianth-lobes heart-shaped, toothed, all 3 with a large oblong wart; leaves heart-shaped.

Flowers imperfect; leaves halbert-shaped or roundish heart-shaped.

- (12) *Monk's Rhubarb. (*Rúmex alpinus*.)—Enlarged perianth-lobes egg-shaped, heart-shaped at the base, without warts; leaves roundish heart-shaped; stipules brown.
- (13) Common Sorrel. (*Rúmex Acetósa*.)—Outer perianth-lobes reflexed, inner but slightly enlarged, heart-shaped, entire, with a minute wart at the base; leaves arrow-shaped.
- (14) *French Sorrel. (*Rúmex scutátus*.)—Inner perianth-lobes without warts; leaves halbert-shaped.
- (15) Sheep's Sorrel. (*Rúmex Acetose'l'la*.)—Outer perianth-lobes erect, inner but slightly enlarged, heart-shaped, entire, without warts; leaves arrow-shaped; stipules silvery white.

1. Sharp Dock. (*Rúmex conglomerátus*. Murr.)—As just described. The flowers are perfect, in small, distant, many-flowered clusters (whorls) up the stem and branches forming a leafy branched cluster (panicle), each small cluster except the uppermost ones having a stalked leaf at the base; the enlarged perianth-lobes are narrowly oblong and entire with a large oval wart on the back of each; the unopened anthers are white; the stem is 1-4 feet high, erect, smooth, slender, furrowed, with a few spreading branches; and the leaves are stalked, wavy, oblong lance-shaped, rounded or slightly heart-shaped (cordate) at the base, pointed at the apex, those at the base of the flowers being small and egg- or lance-shaped.

Common. In wet meadows, by the sides of pools and ditches, in waste places; throughout England, Scotland, and Ireland. June—August. Perennial.

2. Shore Dock. (*Rúmex rupe's'tris*. Le Gall.)—A very similar species to the last, but maritime, differing in having a closer flower-cluster (panicle) almost leafless except that the lower whorls of flowers have a leaf at the base, the inner perianth-lobes larger, and the lower leaves narrower, strap-shaped and tapering, not heart-shaped (cordate) at the base.

Rare. On sandy sea-shores in the southern counties of England. June—August. Perennial.

3. Bloody-veined Dock. (*Rúmex sanguin'eus*. Linn.)—Another very similar species to the Sharp Dock (*Rumex conglomeratus*), but with the flowers in a rather looser cluster which is leafless except at the base; the enlarged perianth-lobes narrowly oblong, one bearing a large globular wart and the other two bearing similar small ones or none at all; the unopened anthers pale yellow; the leaves slightly narrower, usually heart-shaped (cordate), sometimes slightly contracted about the middle, fiddle-shaped, and wavy, and the veins often bright red.

[Plate 42.]

Common. By waysides and hedges; distributed throughout England, more rare in Scotland, and common in Ireland. June—August. Perennial.

4. Golden Dock. (*Rúmex marit'imus*. Linn.)—Flowers perfect, in crowded clusters (whorls) massed together up the stem and branches, with a leaf at the base of each cluster, forming a dense branched leafy cluster (panicle); the enlarged perianth-lobes bright yellow, about $\frac{1}{10}$ inch long, 4-sided (rhomboidal), pointed, with 2 bristle-tipped (setaceous) teeth on either edge, and a narrow oblong wart on the back. [As described in the genus Dock (*Rumex*).]

The stem is 1-2 feet high, branched when large, and the leaves are shortly stalked, narrowly lance-shaped or strap-shaped, slightly wavy. The whole plant is smooth and of a yellowish-green colour.

Rare. In marshes and wet places, chiefly by the sea; distributed throughout England, reported from a few places in Scotland, and found in County Dublin. July—August. Biennial.

5. Yellow Marsh Dock. (*Rúmex limósus*. Thuill.)—A very similar species, only more luxuriant and differing in the small flower-clusters (whorls) being distant from one another instead of being massed together, the enlarged perianth-lobes about $\frac{1}{5}$ inch long, with 2 or 3 shorter teeth, in the nut being much larger, and the whole plant more luxuriant, 2-3 feet high, and always branched. (*Rumex palustris*. Smith.)

Rare. In marshes and wet places, widely distributed in England, and reported from Scotland. July—August. Perennial.

6. Fiddle Dock. (*Rúmex pul'cher*. Linn.)—Flowers perfect, in distant clusters (whorls) up the stem forming a leafy branched cluster (panicle); the inner perianth-lobes oblong-triangular with the lower margins deeply toothed, covered with a network of veins, and an oblong prickly wart on the back, one lobe having a larger, more prominent wart than the other two. [As described in the genus Dock (*Rumex*).] Stem 6 inches to 2 feet, usually only 1 foot long, at first erect and then arching and straggling; the lower leaves fiddle-shaped, or oblong and heart-shaped (cordate) at the base, and the upper leaves lance-shaped and pointed. The whole plant is dull green and usually without hairs.

Not common, local. In dry waste places; chiefly in the south of England, but found in mid-England and North Wales. July—October. Biennial or perennial.

7. Broad-leaved Dock. (*Rúmex obtusifólius*. Linn.)—Flowers perfect, olive green, often tinged with red, in distant clusters (whorls), the upper ones leafless, forming a branched, almost leafless narrow cluster (panicle); the inner perianth-lobes triangular, blunt, usually with several strong teeth at the base, and covered with a network of veins, and one or all three with a red or brown wart on the back. [As described in the genus Dock (*Rumex*).] The stem is stout, 2-3 feet high, and branched; the lower leaves are 8 or 9 inches long, broadly oblong or egg-shaped oblong, heart-shaped (cordate) at the base, blunt, scalloped, and wavy, and the upper leaves are oblong or lance-shaped. The whole plant is deep green, and the stem and vein and in the autumn the whole plant, is often tinged with bright red.

Very common. By waysides, and in fields, pastures, and waste places; throughout England, Scotland, and Ireland. July—September. Perennial.

8. Curled Dock. (*Rúmex cris'pus*. Linn.)—A very similar species to the last but with a denser flower-cluster, only leafy below, often tinged with bright red; with the enlarged perianth-lobes $\frac{1}{8}$ – $\frac{1}{4}$ inch long, heart-shaped (cordate) at the base, not toothed, and usually with only one having an oval wart on the back, the other two having the midrib usually merely thickened but occasionally with a narrower wart too; and with all the leaves lance-shaped, long, and narrow, and the margins very wavy or crisped, the lowest 6-8 inches long.

Very common. By roadsides, in waste places, pastures, fields, &c.; throughout England, Scotland, and Wales. June—October. Perennial.

9. Long-leaved Water Dock. (*Rúmex domes'ticus*. Hartm.)—A very similar species to the last, the Curled Dock (*Rumex crispus*), and easily mistaken for luxuriant plants of that species, but with larger flowers never tinged with red, in even denser clusters; the enlarged perianth-lobes $\frac{1}{4}$ – $\frac{1}{3}$ inch long, rounder and more heart-shaped (cordate), and without any warts,

though the midrib is sometimes thickened; and the leaves rather wavy and but slightly crisped, often 9-10 inches long.

Rather common. By streams and ditches and in wet meadows; in the north of England and in Scotland. July—August. Perennial.

10. Great Water Dock. (*Rumex Hydrolap'athum*. Huds.)—A large handsome species with perfect, green flowers in a long, dense, narrow, branched cluster (panicle), only leafy at the base; the enlarged perianth-lobes egg-shaped (ovate), entire or slightly toothed, netted with prominent veins, all 3 lobes with a large oblong wart on the back. [As described in the genus Dock (*Rumex*).] The stem 3-6 feet high, erect, smooth, and slightly branched; and the leaves lance-shaped and pointed, the margins either flat or minutely wavy or crisped, the root-leaves often more than a foot long and on long flat stalks. The whole plant is smooth and of a dull green colour.

Common. By streams, rivers, and pools; throughout England and Ireland though rather local rare in Scotland. July—August. Perennial.

11. *Rumex maximus*. Schreb.—A species very similar to the last, differing in the enlarged perianth-lobes being heart-shaped (cordate) at the base, with toothed margins; and the root-leaves also heart-shaped at the base and on long flat stalks with raised edges.

Rare. By streams, rivers, and pools; near Lewes, Winchester, Kelvedon in Essex, and in the Scilly Isles. July—August. Perennial.

12. *Monk's Rhubarb. (*Rumex alpinus*. Linn.)—Flowers green, imperfect, some without stamens (female) and some without pistils (male) on the same plant (monœcious), in crowded distant clusters (whorls) up the stem and its numerous erect branches (panicles), leafless except at the base; the enlarged perianth-lobes are egg-shaped (ovate), heart-shaped (cordate) at the base, entire or slightly toothed, and without warts. [As described in the genus Dock (*Rumex*).] The stem is 2-4 feet high; the leaves are roundish, deeply heart-shaped (cordate) at the base, with flat or wavy margins, on long channelled stalks, except the uppermost, which are shortly stalked and lance-shaped; and the root is very thick and was formerly used in medicine. The plant was cultivated for that reason and as a pot-herb.

Not native, rare. An escape from cultivation, near cottages, chiefly found in Scotland. July—August. Perennial.

13. Common Sorrel. (*Rumex Acetosa*. Linn.)—Flowers green tinged with bright crimson, imperfect, without stamens (female) on one plant and without pistils (male) on another (diœcious), in small leafless clusters up the stem and branches of a slightly branched stem (panicle); the outer perianth-lobes reflexed in fruit and the inner perianth-lobes roundish, heart-shaped (cordate) at the base, entire, but slightly enlarged, and with a minute scale-like wart at the base. [As described in the genus Dock (*Rumex*).] The stem is 1-2 feet high, only the flower-cluster (panicle) branched; the leaves are chiefly from the root, oblong, and arrow-shaped (sagittate), the lower on long stalks and the uppermost stalkless (sessile) and clasping the stem; and the sheathing stipules are brown and eventually toothed. The plant is a very well known one: in England it is only children who search for it and eat its pleasantly acid leaves, but abroad it is largely used in salad; its roots yield a strong poison. [Plate 42.]

Very common. In meadows and cultivated and waste ground; throughout England, Scotland, and Ireland. May—August. Perennial.

14. *French Sorrel. (*Rumex scutatus*. Linn.)—Not a native. A species which is naturalised in a few places where it has been grown as a pot-herb. The inner perianth-lobes are white tinged with pink and without warts, the leaves are fleshy halbert-shaped (hastate), somewhat

contracted in the middle and so fiddle-shaped, and the stipules are large and white. The whole plant is covered with a bluish bloom (glaucous) and is very acid.

Very rare. On old walls and in pastures; in Yorkshire, Cumberland, and near Edinburgh. June—July. Perennial.

15. Sheep's Sorrel. (*Rumex Acetosella*. Linn.)—A very similar species to the Common Sorrel (*Rumex Acetosa*) but smaller in all ways, differing in the inner perianth-lobes having no warts at all and in the outer being erect, not reflexed; and in the stipules being silvery-white and torn. The whole plant is only 3-10 inches high and often turns a glorious red in the autumn.

Very common. In dry gravelly places; throughout England, Scotland and Ireland. May—August. Perennial.

THE BIRTHWORT FAMILY
ORDER LXV.
ARISTOLOCHIACEÆ.

PERIANTH of 2 or 3 lobes, or undivided or very irregular, united at the base into a tube which is combined with the seedcase (superior).
STAMENS usually 6 or 12, free or united to the style, inserted on the top of the seedcase (epigynous)

PISTIL usually of 3 or 6 CARPELS united together into a seedcase which is combined with the base of the perianth-tube (inferior), and thinning into a short thick style which is crowned with 3 or 6 stigmas

spreading star like above the stamens
FRUIT a capsule or berry, with as many cells as there are carpels, many-seeded, opening by valves down the middle of each cell (loculicidally), or irregularly, or decaying to free the seeds (indehiscent).

FLOWERS usually solitary or in clusters in the axils of the leaves

STEMS often woody and climbing

LEAVES alternate, stalked, generally entire, and heart-shaped at the base (cordate)

DISTINGUISHED BY the perianth-tube being united with the seedcase, by the short thick style crowned with star-like stigmas & by the 3 or 6 celled fruit.



pistil & stamens magnified

ARISTOLOCHIA CLEMATITIS

flower cut open natural size



COMMON BIRTHWORT.

ASARABACCA.



whole flower seed



stamens & pistil



section

ASARUM EUROPEUM.

THE BIRTHWORT FAMILY

[ORDER LXV. ARISTOLOCHIACEÆ]

THIS is a small order of herbs and twining shrubs with heart- or kidney-shaped leaves. It is poorly represented in the British Isles, only one insignificant plant, *Asarum europæum*, being native. The genus Birthwort (*Aristolochia*), from which the family takes its name, is remarkable for its often gigantic flowers and for the peculiar shape of its tubular perianth and spreading limb.

The order is best studied in the tropics.

Several species are cultivated in gardens and greenhouses—the Wild American Ginger (*Asarum Canadense*), *Aristolochia trilobata*, *Aristolochia Siphon*, and many others.

The tropical Birthworts (*Aristolochias*) with their huge flowers are most extraordinary plants. The flowers of *Aristolochia Goldeana*, a species discovered in recent years in South Africa, are about 26 inches long and 11 inches broad. Those of another species found in Guatemala—*Aristolochia gigas*, variety *Sturtevantii*—are about 22 inches long and 17 inches broad, with a tail over 1 yard long; they are creamy yellow and maroon, but as a rule the flowers are of a dark brown colour, strongly mottled and veined. In South America there are some balloon-like flowers with which the children play, using them instead of hats. Altogether the *Aristolochias* are most curious and interesting plants. Many entrap insects by means of the bladder-like enlarged base of the perianth-tube, in which is enclosed the pistil and stamens; they are not, however, carnivorous plants and let the insects free when the flowers have been fertilised.

The Virginian Snake-root (*Aristolochia serpentaria*) is used as an antidote to snake bites, and several species are said to have properties which stupefy snakes and so enable jugglers to perform their tricks with them.

I. ASARABACCA (*AS'ARUM*). Flower solitary, bell-shaped, 3-lobed; stamens 12.

II. BIRTHWORT (*ARISTOLÓCHIA*). Flowers in clusters, tubular, extended into a limb on one side; stamens 6.

I. ASARABACCA. (*AS'ARUM*. Linn.)—Flowers solitary and terminal, on a short leafless stalk (scape). Perianth bell-shaped (campanulate), the tube entirely or partially united with the seedcase, and spreading into a 3-lobed limb; stamens 12, the filaments more or less united, adhering to the style, inserted on the top of the seedcase (epigynous); carpels 6, style short and thick, stigmas 6; fruit a 6-celled, many-seeded capsule. Stemless herbs with a few long stalked, heart-shaped (cordate) or kidney-shaped (reniform) leaves from the root, a solitary flower, and creeping roots.

Asarabacca. (*As'arum europæum*. Linn.)—The only British species. As just described, and perhaps not a true native. A curious and unmistakable little plant, bearing one

solitary, purplish-green, drooping flower between 2 kidney-shaped or roundly heart-shaped leaves. The flower is $\frac{1}{2}$ inch long, or a shade longer, and the perianth is divided halfway down into 3 broad lobes with turned-back points; the fruit is somewhat fleshy and decays to free the seeds. The leaves of this species are dried and powdered and form part of a snuff preparation useful in colds. [Plate 43.]

Very rare. In woods and on shady banks, near Salisbury in Wiltshire, Halifax and Settle in Yorkshire, in Lancashire, and Westmorland. May—June. Perennial.

II. *BIRTHWORT. (ARISTOLÓCHIA. Linn.)—Flowers in clusters in the axils of the leaves. Perianth tubular, often curved, swollen at the base, extending on one side into a limb which is entire or lobed, united at the base with the seedcase; stamens 6, inserted on the top of the seedcase (epigynous) but with the filaments so adhering to the short thick style as to make the anthers appear sessile on the style; carpels 6, united into a seedcase and one short thick style which is crowned with 6 spreading stigmas; fruit a leathery capsule, 6-celled, many-seeded, opening by 6 valves. Erect or climbing herbs or shrubs with alternate broad leaves, often heart-shaped (cordate) or kidney-shaped (reniform) or spear-shaped (hastate).

***Birthwort. (Aristolóchia Clematítis. Linn.)**—As just described. Not a native, though apparently established in a few stations in England. The flowers are 1 inch or more long, yellow, in clusters of 4–8 together on short stalks all starting from the same point in the axils of the leaves; the tubular perianth is extended on one side into an entire oval-pointed limb; the stem is $1\frac{1}{2}$ –2 feet high, stout, erect, and unbranched; the leaves are large, stalked, broadly heart-shaped, smooth, yellowish-green above and with a bluish bloom underneath; and the root is creeping.

[Plate 43.]

A native of southern Europe. Among ruins in a few stations in the south and east of England. June—September. Perennial.



LAUREL
SPURGE,

DAPHNE LAUREOLA

flower & bract,

corolla & stamens,

pistil,

fruit,

section
of fruit.

THE DAPHNE FAMILY

[ORDER LXVI. THYMELEACEÆ]

PERIANTH of 4 or 5 lobes united into a tube at the base, tubular, funnel-shaped, or salver-shaped, some of the foreign species, as for instance the *Gnidias*, having little scales in the mouth of the tube, inserted below the seedcase (inferior).

STAMENS usually 8 or 10, in 2 rows, rarely 4 or 2, inserted on the perianth-tube.

PISTIL of 1 **CARPEL** consisting of a 1-celled seedcase, 1 style, and an undivided stigma.

FRUIT a berry-like drupe with a 1-seeded stone, or a 1-seeded nut.

FLOWERS generally perfect, in clusters in the axils of the leaves, or in terminal heads or spikes, or rarely solitary, with bracts below each flower.

STEM woody.

LEAVES undivided (simple) and entire, without stipules.

DISTINGUISHED from the Birthwort and Sandalwood Families by the perianth-tube being free from the seedcase, in the stamens often being in 2 rows, and in the berry-like fruit with 1 seed.

THIS family is only represented in the British Isles by two species of the genus *Daphne*.

It is a small order of shrubs or small trees or very rarely herbs, found principally in southern Africa and Australia and tropical countries.

Many foreign species are cultivated in gardens and greenhouses for the delicious perfume of their flowers, such as the trailing *Daphne Cneorum*, *Daphne japonica*, *Daphne indicata*, and other species of *Daphne*, *Gnidias*, *Struthiolas*, and *Pimeleas*.

Most of these plants are acrid and some extremely poisonous. In the British species the berries, though eaten by birds, are fatal to man; and the bark, if applied to the skin, raises a blister. The bark of *Daphne* and most of the members of the order is particularly tough and is much employed in the manufacture of rope, paper, and lace. In Jamaica a wonderful tree is found—the Lace-bark Tree (*Lagétta linteária*)—whose bark yields a natural lace; the thin layers of the inner bark are so fine and white and the fibre so strong that when damped they can be pulled out into all sorts of lozenge patterns. A set of ruffles was cut from it and was sent as a present to Charles II.

Both fruit and bark of *Daphne Mezereum* contain a powerful poison and a decoction is still recognised in the British Pharmacopœia.

DAPHNE. Linn.—Flowers often fragrant, with bracts at the base, in terminal or side (lateral) clusters. Perianth of 4 lobes united into a tube at the base, and spreading salver-shaped into the 4 lobes, inserted below the seedcase (inferior); stamens 8, in 2 rows, included and inserted in the upper part of the perianth-tube; carpel 1, composed of a seedcase containing 1 hanging embryo-seed and a very short style crowned with a somewhat tufted stigma; fruit

a berry (drupe) containing a 1-seeded stone. Small shrubs, or in some exotic species, trees, with undivided (simple), entire leaves, which are usually alternate.

(1) Mezereon. (*Daph'ne Mezereum*.)—Flowers pink, appearing before the leaves; berries red.

(2) Laurel Spurge. (*Daph'ne Laureola*.)—Flowers green; berries black; leaves evergreen.

1. Mezereon. (*Daph'ne Mezereum*. Linn.)—As just described. A shrub with sweet-scented, stalkless (sessile), pink flowers, $\frac{3}{8}$ inch across, in clusters of 2-4 together down the branch, appearing before the leaves; and red berries about the size of a red currant. The shrub is 1-3 feet high, erect, and with few branches; and the entire leaves are inversely egg-shaped (obovate) or lance-shaped.

Rare, local. In woods; chiefly in southern and central England, introduced into southern Scotland, and not known in Ireland. February—April. Shrub.

2. Laurel Spurge. (*Daph'ne Laureola*. Linn.)—A species with drooping, pale yellowish-green, sweet-scented, funnel-shaped flowers, about $\frac{1}{2}$ inch long, with noticeable pale green bracts at the base, in clusters on short stalks in the axils of some of the upper leaves; and black berries. [As described in the genus *Daphne*.] The stem is 1-3 feet high, woody, very little branched, smooth, erect, and naked, except at the top where it is clothed with evergreen lance-shaped or inversely egg-shaped (obovate) leaves, and in due season flowers or fruits.

[Plate 44.

Not common. In woods; throughout England, and introduced into a few parts of Scotland. February—April. Shrub.

THE SANDAL-WOOD FAMILY (ORDER LXIX. SANTALACEÆ.)

PERIANTH of 3-5 lobes, in one row, united into a funnel-shaped tube which adheres to the seedcase (superior) and spreading into 3-5 lobes

STAMENS 3-5, the same number as the lobes of the perianth, on the base of which they are inserted (epi-petalous).

PISTIL of 1 CARPEL, the seedcase 1-celled and adhering to the tube of the perianth (inferior), the style usually short, and the stigma 2-or 3-lobed.

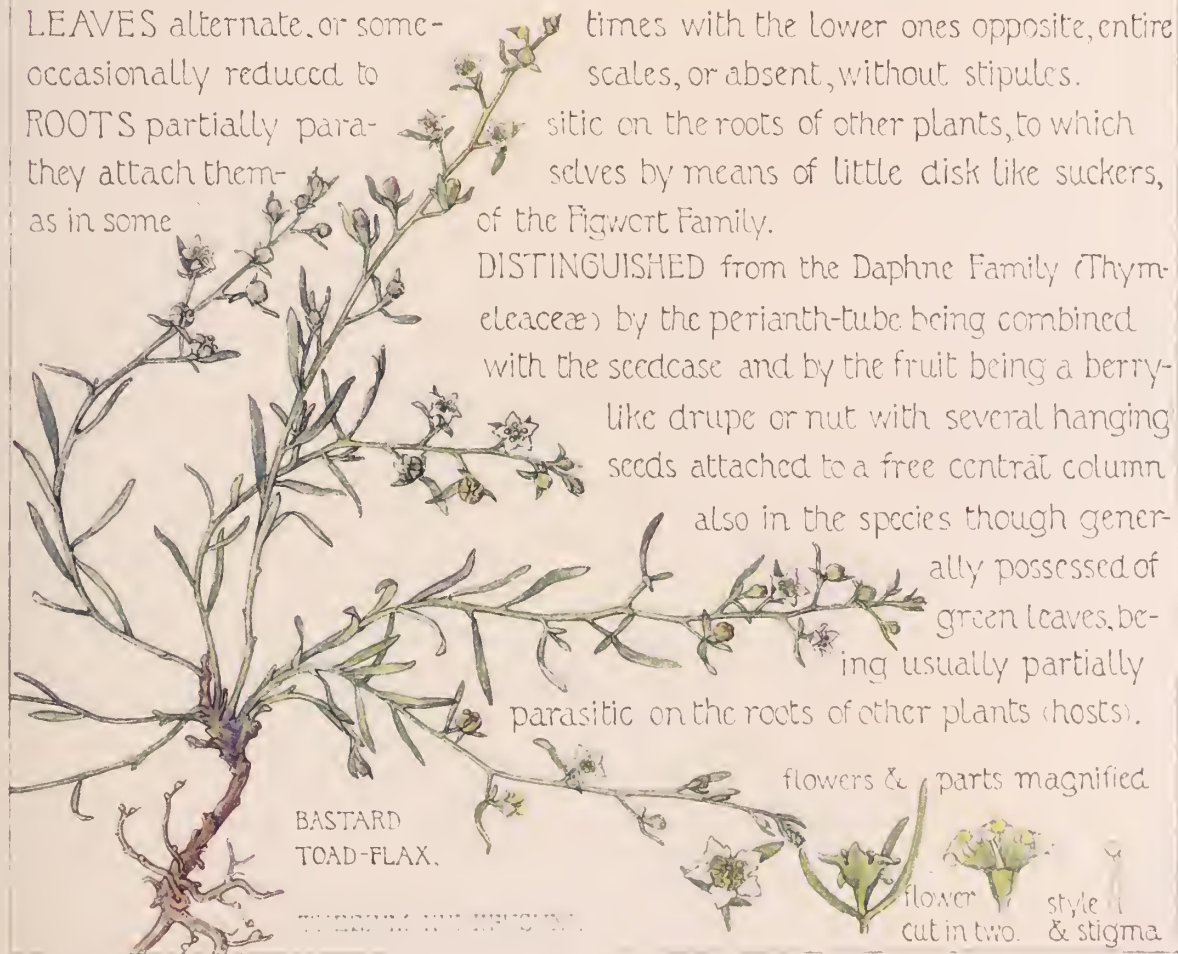
FRUIT a nut or berry-like drupe, with 1-4 seeds hanging from the top of a free central column (placenta) or very rarely erect, decaying to free the seeds (indehiscent), often crowned with the withered perianth.

FLOWERS small, in clusters (racemes, panicles, or spikes), or solitary in the axils of the leaves.

LEAVES alternate, or sometimes with the lower ones opposite, entire occasionally reduced to scales, or absent, without stipules.

ROOTS partially parasitic on the roots of other plants, to which they attach themselves by means of little disk like suckers, as in some of the Figwort Family.

DISTINGUISHED from the Daphne Family (Thymeleaceæ) by the perianth-tube being combined with the seedcase and by the fruit being a berry-like drupe or nut with several hanging seeds attached to a free central column also in the species though generally possessed of green leaves, being usually partially parasitic on the roots of other plants (hosts).



BASTARD TOAD-FLAX.

TILLANDSIA USNEBORACENSIS.

flowers & parts magnified.

flower cut in two. style & stigma.



THE SANDALWOOD FAMILY

[ORDER LXIX. SANTALACEÆ]

A SMALL order represented in the British Isles by one species, the Bastard Toadflax (*Thesium humifusum*), a semi-parasitic herb with green leaves, which, though capable of taking in nourishment itself, yet fastens itself by means of little knob-like suckers on its roots on to other green-leaved plants and absorbs their food.

The family comprises herbs, shrubs, and trees, most of them being semi-parasitic. They are principally found in hot or tropical countries.

Some species are valuable for their bark, one of the best known being the fragrant Sandalwood Tree (*Santalum album*), a parasitic tree growing in East India, from which is obtained the sandalwood of commerce and sandalwood oil

THÉSIUM. Linn.—Flowers small, in clusters in the only British species, as described on Plate 45.

Bastard Toadflax. (*Thesium humifusum*. DC.)—The only British species. The flowers are about $\frac{1}{8}$ inch across, on stalks about the same length, each with 3 narrow strap-like bracts at the base of the perianth, and they form slender or elongated clusters (panicles or racemes); the perianth is funnel-shaped, cleft into 4 or 5 lobes with a minute tooth between each lobe, white inside and green outside; the fruit is a small ovoid ribbed nut, crowned with the perianth-lobes; the stems are 3–18 inches long, prostrate, numerous, usually spreading in a circle; the leaves, $\frac{1}{2}$ –1 inch long, are narrowly strap-shaped (linear), obscurely 1-veined, and somewhat fleshy; and the root is parasitic on various other roots. (*Thesium linophyllum*. Linn.) [Plate 45.]

Local, rare. In chalky or limestone pastures in the southern and south-eastern counties of England. May—July. Perennial.

THE SPURGE FAMILY

[ORDER LXX. EUPHORBIACEÆ]

PERIANTH variously lobed and inserted below the seedcase (inferior), or absent, when its place is taken by an **INVOLUCRE**, often cup-shaped, with a 4- or 5-toothed border, the lobes alternating with the same number of large fleshy glands; this involucre, however, surrounds not one but many flowers, as in the Spurge (Euphorbia).

STAMENS 1 or more, or absent when the pistil is present.

PISTIL of 3, or more, rarely 2, **CARPELS**, united into a 3- or 2-celled seedcase and separating into the same number of styles and stigmas, or absent when the stamens are present.

FRUIT a 3- or 2-celled **CAPSULE** with 1 or 2 hanging seeds in each cell attached to a persistent central column, opening by

2 valves, usually elastically, or more rarely opening down the middle of the cell-walls (loculicidally) to free the seeds.

FLOWERS varying much in their arrangement but always of one sex only, never having both stamens and pistil in the same flower, sometimes with both kinds of flower on the same plant (monœcious), even in the same cluster, and sometimes with staminate (male) flowers on one plant and pistilate (female) on another.

STEMS often with a milky juice.

LEAVES various, sometimes absent when the plant is Cactus-like.

DISTINGUISHED from other unisexual plants with perianths by the fruit with 2 or 3 cells which have 1 or 2 hanging seeds in each cell.

THE one unalterable characteristic of the Spurge Family is the fruit with two or three cells which have one or two hanging seeds in each cell. Otherwise it is a difficult order to identify, as different species vary so much. The flowers are small, but are sometimes very showy through being clustered together and surrounded by brilliant-coloured involucre, which look like petals, and make a whole cluster of flowers look like one flower with a bright-coloured corolla. Most have green leaves, but some foreign species are fleshy and Cactus-like, others have leaf-like stems (phyllocladia or cladodes), and others have scale-like leaves. The majority contain a milky fluid, but some have a watery juice only.

The order is a large one and inhabits temperate and tropical countries. It is represented in the British Isles by three genera which give a very poor idea of the whole family. In the tropics, where the order may best be studied, we find herbs, creepers, shrubs, and trees, the last sometimes forming entire forests.

Many foreign genera are cultivated in greenhouses for the beauty of their flower-clusters, the best known being species of Euphorbia with clusters of flowers enveloped with gorgeous-coloured involucre, Poinsettias and Jatrophas with brilliant red bracts surrounding inconspicuous flowers, and Crotons with their coloured leaves.

Some genera are valuable commercially, the most important being species of the South American Hevea, from the milky juice of which we obtain India-rubber. Box (*Buxus sempervirens*)

still holds its own as the best medium for wood-engraving ; its leaves, however, are poisonous and cause death to animals eating them.

Most of the plants of this order are acrid and poisonous. The Euphorbias are all poisonous ; *Euphorbia resinifera*, a Cactus-like shrub growing in Morocco, contains a gum resin which is a violent poison. The American Manchineel Tree (*Hippomane Mancinella*) has a poisonous milky juice, and though its fruit, which is rather like an apple, looks most deceptively inviting, it has a burning juice which quickly betrays its character. Tapioca and Cassava are, strange to relate, products of a dangerous plant—the Manioc Shrub (*Manihot utilissima*)—a species containing a deadly poisonous juice with which the Indians poison their arrows. The roots, however, lose this evil property if roasted or exposed for some hours to the tropical sun and are nutritious ; they are then made into a pulp, Cassava, which is baked into thin cakes and used instead of bread, or manufactured into Tapioca.

Other foreign species are employed in medicine. The tonic Bark is obtained from *Croton Eleuteria*, a native of the Bahama Islands ; Croton oil from *Croton Tiglium*, an East Indian species ; and Castor oil from the seeds of *Ricinus communis*, an African plant with deeply lobed purple leaves and spike-like clusters of staminate flowers, which is frequently grown in gardens and is often called Palma-Christi.

- I. SPURGE (*EUPHÓRBIA*). Several male flowers, looking like single stamens, clustered round 1 female flower consisting of a pistil, massed inside a cup-shaped involucre with a lobed border ; capsule 3-lobed, 3-seeded.
- II. BOX (*BUX'US*). Male and female flowers intermingled in clusters ; perianth 4-lobed with 1 or 3 bracts underneath ; stamens 4 ; capsule 3-lobed and with 3 horns, 6-seeded.
- III. DOG'S MERCURY (*MERCURIÁLIS*). Male and female flowers usually in separate clusters ; perianth 3-lobed ; stamens 8-16 ; capsule 2-celled, 2-seeded.

I. SPURGE. (*EUPHÓRBIA*. Linn.)—Male and female flowers clustered together (monoecious) into a stalked head, numerous male flowers round one female, all contained in a cup-shaped involucre (looking altogether like one flower) with 2 floral-leaves or bracts, which are sometimes united (connate), at the base : these heads of flowers are rarely solitary in the upper leaf-axils or in the forks of the branches, but usually they are in much branched terminal clusters, 3-10 branches (rays) starting from the same point at the top of the stem (in an umbel), with usually the same number of leaves in a circle (whorl) at the base, and these branches are usually forked several times. The involucre is cup-shaped, the border with 4 or 5 very small teeth alternating with the same number of large thick glands which are often roundish or crescent-shaped ; inside are numerous flowers ; the male flowers, or those without a pistil, consist of 1 stamen with a joint, shewing the juncture of the filament with the stalk (pedicel) and so shewing the right of the single stamen to be considered a flower, and a small bract at the base of the involucre ; the female flower, the central flower without stamens, consists of a 3-celled roundish seedcase (ovary) surmounted with 3 short styles and 3 cleft stigmas, and supported on a long stalk bent downwards by the weight of the seedcase, which seedcase eventually develops into a 3-celled, 3-lobed capsule ; each cell is very round and contains 1 seed and opens down the back (loculicidal). Herbs or shrubs with a white milky bitter juice.

Flower-heads solitary.

- (1) Purple Spurge. (*Euphórbia Pep'lis*.)—Maritime. Glands rounded ; leaves opposite, with stipules.

Flower-heads in clusters (umbels).

Glands of involucre rounded, entire ; leaves alternate, without stipules.

- (2) Sun Spurge. (*Euphórbia Helioscópia.*)—Capsules smooth ; leaves blunt and toothed.
- (3) Broad-leaved Spurge. (*Euphórbia platyphyl'los.*)—Capsule with round warts ; leaves pointed and toothed.
- (4) Upright Spurge. (*Euphórbia stric'ta.*)—1-2 male flowers only in each head ; capsule with long conical warts ; leaves toothed.
- (5) Irish Spurge. (*Euphórbia hiber'na.*)—Glands kidney-shaped ; capsules with cylindrical warts ; leaves entire.
- (6) *Sweet Spurge. (*Euphórbia dul'cis.*)—Capsule with a few prominent warts ; floral-leaves triangular.
- (7) *Coral Spurge. (*Euphórbia corallóides.*)—Capsule woolly without warts ; leaves toothed.
- (8) Hairy Spurge. (*Euphórbia pilósa.*)—Flower-cluster loose ; capsules with a few small purple warts with white silky hairs ; leaves toothed.

Glands of involucre crescent-shaped ; leaves alternate without stipules.

- (9) Wood Spurge. (*Euphórbia amygdalóides.*)—Floral-leaves united into a cup ; capsule smooth, with minute white warts.
- (10) *Leafy-branched Spurge. (*Euphórbia Ésula.*)—Flower-cluster with 8-20 branches ; capsules rough.
- (11) *Cyprus Spurge. (*Euphórbia Cyparis'sias.*)—Flower-cluster so dense as to look like a head ; leaves strap-shaped.
- (12) Sea Spurge. (*Euphórbia Parálias.*)—Maritime. Involucral glands with short horns ; capsule smooth ; leaves thick.
- (13) Portland Spurge. (*Euphórbia portlándica.*)—Maritime. Involucral glands with long pointed horns ; capsule with 3 ridges of dots ; leaves thin.
- (14) Petty Spurge. (*Euphórbia Pep'lus.*)—Umbel of 3 rays ; stem about 9 inches high ; leaves broad, stalked.
- (15) Dwarf Spurge. (*Euphórbia exig'ua.*)—Umbel of usually 3 rays ; stem about 6 inches high ; leaves strap-shaped.

Glands of involucre crescent-shaped ; leaves opposite, without stipules.

- (16) Caper Spurge. (*Euphórbia Lath'yrus.*)—Capsule $\frac{1}{2}$ inch long ; each pair of leaves at right angles to its neighbour.

1. Purple or Red Spurge. (*Euphórbia Pep'lis.* Linn.)—As just described. A very easily recognised maritime species, being the only one in the British Isles which has solitary heads of flowers. These flower-heads are shortly stalked, solitary in the axils of the upper leaves and in the forks of the branches ; the glands of the involucre are rounded ; the capsules are smooth ; the stems are numerous from the crown of the root, branched, and prostrate on the sand, forming patches of 6-12 inches in diameter ; the leaves are opposite, shortly stalked, oblong, blunt, slightly heart-shaped at the base, nearly entire, fleshy, and with minute stipules. The whole plant has a bluish bloom (glaucous) and is stained with purple-red.

Very rare. On sandy sea-shores ; in the south-west of England and Wales, in County Waterford in Ireland, and in the Channel Isles. July—September. Annual.



DOGS
MER-
CURY.

male
flower

DWARF
SPURGE

male

female

female
flower

section of
flower-cluster

stamens

female
flower

WOOL
SPURGE.

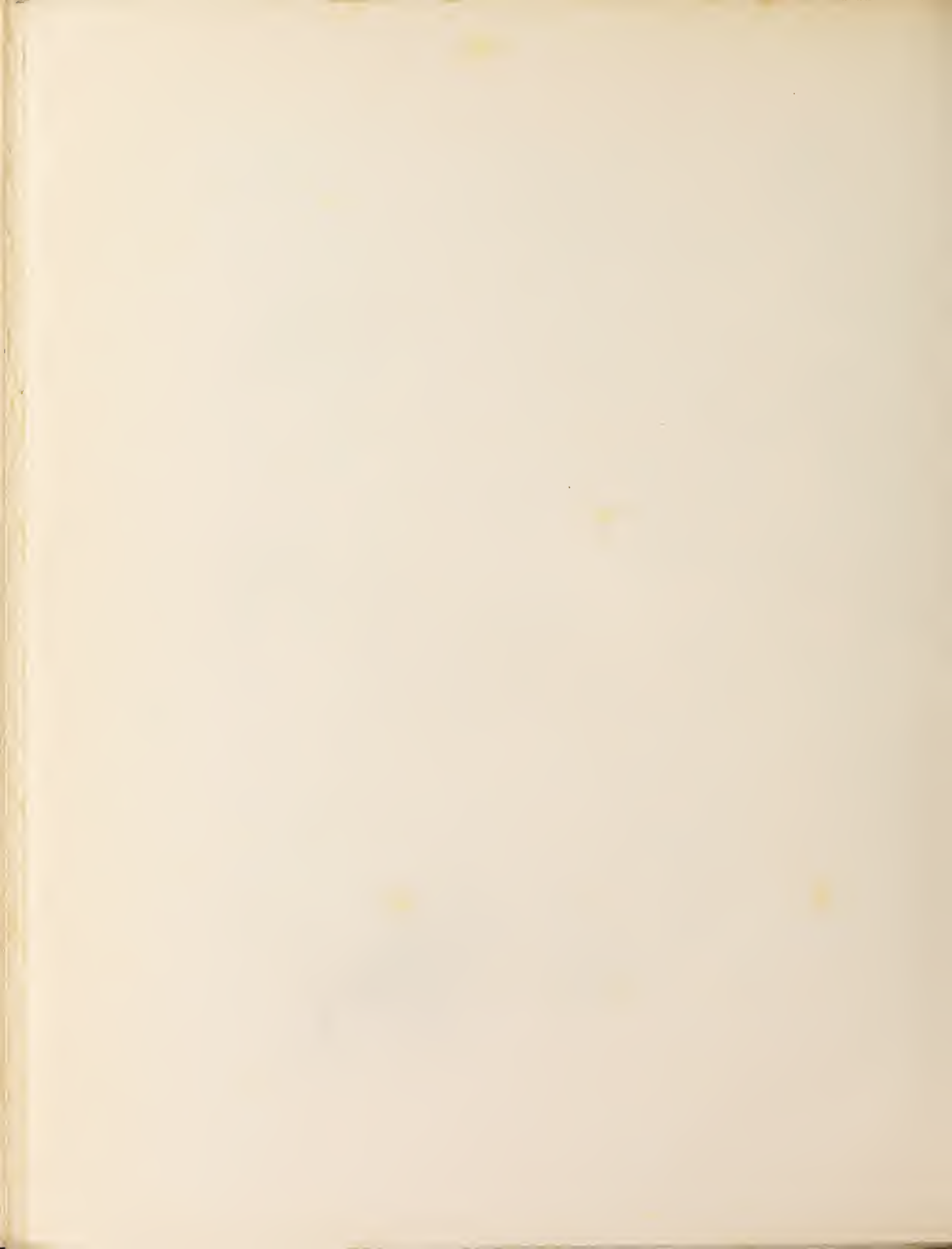
fruit

COMMON BOX
PINK'S SEMPER VENS.

EUPHORBIA
EXIGUA.

EUPHORBIA
ALYSSA LOIDES

EUPHORBIA
MERCURIALIS LE. TAMM.



2. Sun Spurge. (*Euphórbia Helioscópia*. Linn.)—A species with a compact, much branched golden-green flower-cluster (umbel) at the top of an unbranched stem; the cluster (umbel) has 5 short branches (rays) and each branch is shortly forked at the top either once or twice, giving the effect of a broad dense leafy flower-head surmounting a rather bare stem. The glands of the involucre are rounded, entire, and bright yellow; the floral-leaves are broad, inversely egg-shaped (obovate) or nearly round (orbicular), blunt, and minutely toothed (serrate); the capsule is roundish, 3-sided, and smooth. [As described in the genus Spurge (*Euphorbia*).] The stem is solitary or there are several stems rising from the crown of the root, 6–18 inches high, erect, stout, and fleshy; and the leaves are alternate, inversely egg-shaped (obovate), rounded at the tip, and the upper half finely toothed (serrate).

Very common. In cultivated and waste ground; throughout England, Scotland, and Ireland, June—October. Annual.

3. Broad-leaved Spurge. (*Euphórbia platyphyllos*. Linn.)—A somewhat similar species to the last, differing in the flower-clusters often having only 3 branches instead of 5, all more slender; in the capsules being covered with rounded warts; in the floral-leaves being pointed at the tips and heart-shaped (cordate) at the base; in the stem usually having a few short branches in the axils of the upper leaves; and in the leaves being oblong, pointed, and heart-shaped (cordate) at the base, the upper ones partially clasping the stem (semi-amplexicaul) and the lower indistinctly stalked.

Rare. In cultivated and waste ground; in the south of England, reaching Worcester, and found in Yorkshire. July—October. Annual.

4. Upright Spurge. (*Euphórbia stric'ta*. Linn.)—This species is very similar to the last, the Broad-leaved Spurge (*Euphorbia platyphyllos*), but has usually only 1 or 2 staminate flowers in each head; the capsules are smaller and have longer conical warts; and the stem is more slender and has more numerous flower-branches below the main cluster.

Very rare. In limestone woods; in Gloucestershire and Monmouthshire. June—August. Annual.

5. Irish Spurge. (*Euphórbia hiber'na*. Linn.)—A most beautiful species, with a compact flower-cluster usually of 5 flower-branches (rays) from the top of the main stem, which are once or twice shortly forked; the glands of the involucre are kidney-shaped (reniform) and entire; the capsule large, roundish, smooth (glabrous), with cylindrical warts; and the floral-leaves are egg-shaped or oblong, usually yellowish. [As described in the genus Spurge (*Euphorbia*).] The stems are 1–2 feet high, stout, usually unbranched, though there are several stems from the crown of the root; the leaves are alternate, stalkless (sessile), oblong, blunt, and entire, often 2–4 inches long. The whole plant is light green with yellowish flower-clusters.

In Ireland this species is sometimes put into the streams, as it possesses properties which stupefy the fish and so enable them to be obtained without trouble.

Very rare and local. In woods; in Devonshire, and in Ireland in County Kerry. May—June. Perennial.

6. *Sweet Spurge. (*Euphórbia dul'cis*. Linn.)—A species not native but found in one or two places, with a flower-cluster of 5 long branches (rays) which are forked at the apex; the glands of the involucre rounded; the capsules with a few prominent warts; the floral-leaves triangular; the stem erect and about 1 foot high; and the leaves inversely egg-shaped (obovate) and blunt.

Not a native. An escape from cultivation; in Essex and Llansilin. June. Perennial.

7. *Coral Spurge. (*Euphórbia coralloídes*. Linn.)—Another species not native in

the British Isles, which is very similar to the following—the Hairy Spurge (*Euphorbia pilosa*)—but differing from it in the flower-cluster being more regular and terminal, the stems having very few branches below the main cluster, the capsules being woolly and without warts; and the whole plant woolly, and the stem and leaves often tinged with red.

Not native. An escape from cultivation; in Sussex. May—June. Biennial.

8. Hairy Spurge. (*Euphórbia pilósa*. Linn.)—The flower-cluster is irregular; the terminal cluster (umbel) has about 5 unequal branches (rays), which are 3-forked, and these in their turn are 2-forked, while the main stem has many flowering branches just below. The glands of the involucre are oblong and entire; the capsule roundish, with a few small purple warts which have usually some white silky hairs; and the floral-leaves are oblong, smooth, and yellow. [As described in the genus Spurge (*Euphorbia*).] The stems are $1\frac{1}{2}$ –3 feet high, stout, and so branched above that the flowers form an irregularly branched cluster (panicle); and the leaves are stalkless (sessile), alternate, lance-shaped or oblong, finely toothed (serrate), and hairy when young.

Very rare. In woods; near Bath. May—June. Perennial.

9. Wood Spurge. (*Euphórbia amygdalóides*. Linn.)—Terminal flower-cluster (umbel) of 5–10 equal branches (rays), not much divided, and with a few flower-heads below in the axils of the upper leaves; the floral-leaves yellowish, united into a 2-lobed cup (connate) generally enclosing 3 flower-heads; the glands of the involucre bright yellow, crescent-shaped, with rather long horns; the capsules round and smooth (glabrous), with minute white warts. [As described in the genus Spurge (*Euphorbia*).] The stems are of two kinds, one with flower-clusters and one without. Those without flowers grow about 1 foot high the first year, are woody, and have many leaves which increase in size up the stem till towards the top they are sometimes 3 or 4 inches long. They last the whole winter and in the following spring the stems elongate and a fresh green shoot rises, leaving the dark green leaves at its base, and grows 1–2 feet high, and is unbranched below the terminal cluster, except for a few short flower-branches. The leaves are lance-shaped or oblong and entire. The plant varies in colour; the first year leaves at the base of the flowering shoot are dark green, the flowering shoot is pale green, yellowish at the top, and in the autumn the whole plant is often tinged with deep crimson. [*Plate 46.* Fairly common. In woods and thickets; common in the south and rare in the north of England, unknown in Scotland, and very rare in Ireland, where it is found in one habitat in County Cork. March—April. Perennial.

10. *Leafy-branched Spurge. (*Euphórbia Ésula*. Linn.)—Not a native species, but one easily recognised by its flower-cluster with 8–20 long, slender, forked branches (rays) all starting from the same point at the top of the stem (in an umbel); the glands of the involucre are crescent-shaped with short horns; the capsules are round, rough with minute scale-like warts; and the floral-leaves are heart-shaped (cordate), abruptly pointed (mucronate), and not united. [As described in the genus Spurge (*Euphorbia*).] The stem is 1–2 feet high, unbranched at the base, but with many flowerless branches towards the middle and a few flowering branches below the main terminal cluster (umbel); the leaves are alternate, oblong, or narrowly lance-shaped, entire or indistinctly toothed (serrate).

Not a native, rare. In woods and borders of fields; in Northumberland and near Edinburgh. June—August. Perennial.

11. *Cypress Spurge. (*Euphórbia Cyperis'sias*. Linn.)—Another alien very nearly resembling the last, but with the terminal flower-cluster (umbel) so close and round as to resemble a head; the floral-leaves blunt and less heart-shaped; the horns of the glands shorter; the stems

shorter ; the leaves smaller, strap-shaped (linear), and more numerous ; and the root with underground runners.

Not a native. In woods ; in Westmorland. June—July. Perennial.

12. Sea Spurge. (*Euphórbia Parálias*. Linn.)—Flower-cluster (umbel) compact, usually of 5 short, thick, once or twice forked branches (rays), occasionally with a few short flowering branches just below. Glands of the involucre crescent-shaped with short horns ; capsules round and smooth ; floral-leaves egg-shaped (ovate), heart-shaped (cordate) at the base, not united. [As described in the genus Spurge (*Euphorbia*).] The stems are erect or ascending, 6 inches to 1 foot high, some short and barren, others taller and flowering, densely crowded with short leathery (coriaceous) leaves, which are oblong, blunt, entire, and stalkless (sessile). The whole plant is of a pale green, covered with a bluish bloom (glaucous), and the lower part is often tinged with red.

Not uncommon. On sandy sea-shores ; fairly common in the south and west of England up to Cumberland, rare on the east coast, not north of Suffolk, and local in Ireland. July—October. Perennial.

13. Portland Spurge. (*Euphórbia portlandíca*. Linn.)—Another maritime species with a flower-cluster (umbel) of 5 branches (rays), which are repeatedly forked, sometimes 4 times, with or without flower-branches in the leaf-axils below the terminal cluster. The glands of the involucre are 4 in number, crescent-shaped, and have long slender horns ; the capsule is round, with a ridge of small raised dots down the back of each lobe. [As described in the genus Spurge (*Euphorbia*).] The stems are erect or ascending, slender, very numerous, and form a small bush 6–18 inches high, unbranched or with a few flowering branches underneath the main umbel ; the leaves are thin, inversely egg-shaped (obovate), abruptly pointed (mucronate), entire, and covered with a bluish bloom (glaucous). This species, in common with many of this genus, is frequently tinged with bright red in the autumn. (*Euphorbia segetalis*. Linn. in *Benth. and Hook.*)

Rather rare. On the sea-shore, or on stony banks or cliffs by the sea ; in the south-west of England from the Isle of Wight to the Mull of Galloway in Scotland, and in Ireland. April—September. Perennial.

14. Petty Spurge. (*Euphórbia Pep'lus*. Linn.)—A species with a large flower-cluster (umbel) of 3 branches (rays) which are repeatedly forked ; the involucre glands are crescent-shaped with long slender pointed horns ; the capsules smooth with a rough keel down the back of each lobe ; the floral-leaves are egg-shaped (ovate) or heart-shaped (cordate). The stems are 6 inches to 1 foot high, slender, solitary or branched from the base ; and the leaves are inversely egg-shaped (obovate), entire, and shortly stalked.

Very common. In gardens, cultivated ground, and waste places, a very common garden weed ; throughout England, Scotland, and Ireland. July—November. Annual.

15. Dwarf Spurge. (*Euphórbia exig'ua*. Linn.)—An unmistakable species, often only a few inches high, with clusters of 3, rarely 4 or 5, forked flowering branches (rays), usually occupying half the stem. The involucre glands are crescent-shaped with very fine pointed horns ; the capsules are smooth or with warted ridges ; and the floral-leaves are lance-shaped. The whole plant is frequently only 2 or 3 inches high, though it is occasionally 6–8 inches, and is branched from the base ; and the leaves are alternate, strap-shaped (linear), and entire. [Plate 46.

Common. In cultivated ground and waste places ; throughout England, the south of Scotland, and Ireland. June—October. Annual.

16. Caper Spurge. (*Euphórbia Lath'yris*. Linn.)—A very distinctive species, unlike all the preceding. The flower-cluster (umbel) has 3 or 4 long branches (rays) which are forked

once or twice; the involucre glands are crescent-shaped with blunt horns; the capsules are very large, about $\frac{1}{2}$ inch long, round, and smooth; and the floral-leaves are oblong-egg-shaped (ovate) and acute. The stem is solitary, 2-3 feet high, stout and erect, purplish and covered with a bluish bloom (glaucous); and the leaves are opposite, each pair at right angles to the one above and below (decussate), stalkless (sessile), narrowly oblong, pointed, and entire.

Very rare. In stony, rocky woods; near Bath and in Sussex, found as an escape from cultivation in some other districts. June—July. Biennial.

II. BOX. (BUX'US. Linn.)—Flowers clustered together in the axils of the leaves, some without pistils (male) and some without stamens (female) in the same cluster (monœcious). The perianth, which has bracts at the base, is 4-lobed, inserted below the seedcase (inferior); stamens 4 in the male flowers, absent in the female; carpels 3 in the female flowers, united into a seedcase, and separating into 3 styles and stigmas, absent in the male flowers; fruit a 3-celled capsule with 3 horns, each cell containing 2 seeds. Evergreen shrubs or small trees with opposite, entire leaves.

Common Box. (Buxus sempervirens. Linn.)—As just described. The only British species, with clusters of minute greenish-yellow, unpleasant-smelling flowers, the male with 1 small bract under the perianth and with long stamens with large yellow protruding anthers, and the female with 3 bracts just under the perianth, and the capsules oblong, with 3 horns, hard and almost woody. The shrub is 4-10 feet high and is much branched; the leaves are evergreen, small, opposite, thick, oblong-oval, and entire. [Plate 46.

This is a very well known shrub; it is largely used in gardens for borders for flower-beds, for hedges, and when allowed to grow into trees is often clipped into fantastic shapes as best pleases the copyist of Dutch gardens. The close-grained wood is invaluable for engraving.

Very rare. On dry chalky hills; in Surrey and Kent. April—May. Perennial.

III. DOG'S MERCURY. (MERCURIALIS. Linn.)—Flowers small, green, with stamenless (female) and pistilless (male) flowers on the same plant (monœcious) or with all stamenless on one and all pistilless on another plant (diœcious); the male flowers being arranged in small clusters forming a spike-like cluster, and the female usually solitary or in small clusters, all in the axils of the leaves and terminating the stem. Perianth of 3 lobes, inserted below the seedcase (hypogynous); stamens 8-16 in the male flowers, in the female 2 or 3 antherless filaments; carpels usually 2 in the female flowers, united into a 2-celled seedcase, with 2 styles and stigmas, absent in the male flowers; fruit a 2-lobed capsule, each lobe bursting down the back to free the single seed. Herbs with opposite leaves with stipules at the base.

(1) Common Dog's Mercury. (*Mercurialis perennis*.)—Capsules large, minutely warted; stem unbranched; root creeping.

(2) Annual Dog's Mercury. (*Mercurialis annua*.)—Capsule small with large pointed warts; stem branched; root fibrous.

1. Common Dog's Mercury. (Mercurialis perennis. Linn.)—As just described. The flowers with stamens are clustered up a slender spike-like flower-stem in the axils of the leaves in one plant, and those with pistils are solitary or 2 together, stalked, in the leaf-axils of another (diœcious). The female flowers have large capsules, rough with minute warts and soft prickles. The stems are about 1 foot high, unbranched, and erect; the leaves are opposite, shortly stalked or nearly stalkless, oblong or lance-shaped, and coarsely toothed; and the root is creeping.

[Plate 46.

Very common. In woods, by hedges, and in shady places; distributed throughout England and Scotland, rare in Ireland. March—May. Perennial.

2. Annual Dog's Mercury. (*Mercurialis an'ua*. Linn.)—A similar species, with the male flowers in long spikes as in the Common Dog's Mercury (*Mercurialis peren'nis*), but with the female flowers nearly stalkless, in small clusters, rarely with a few male flowers intermingled, in the axils of the leaves; the capsules small and covered with large pointed warts on which are bristly hairs; the stem is branched; the leaves are very shortly stalked; and the root is fibrous.

Not common. In cultivated and waste places; in the south and west of England, and the south and east of Ireland. July—October. Annual

THE NETTLE FAMILY

[ORDER LXXI. URTICACEÆ]

PERIANTH of 3, 4, or 6 lobes, sometimes reduced to scales in the female flowers, inserted below the seedcase (inferior).

STAMENS usually the same number as and opposite to the perianth-lobes, rarely more or fewer, inserted at the base of the perianth, absent in the flowers that have pistils (female). The filaments are an interesting feature; in several genera they are coiled in bud and open elastically with a jerk when the pollen is ripe and so disperse the grains of pollen in a cloud.

PISTIL of 1 or 2 **CARPELS** forming a 1- or 2-celled seedcase with the same

number of styles and stigmas, or absent in the flowers that have stamens (male).

FRUIT dry, 1-seeded, decaying to free the seed (indehiscent).

FLOWERS small, green, usually imperfect, those without pistils (male) on one plant and those without stamens (female) on another (dicæcious), or both on the same plant (monocæcious).

LEAVES usually rough or hairy, the hairs sometimes stinging, and with stipules.

DISTINGUISHED from the Spurge tribe by the 1-celled, 1-seeded fruit, and from the Persicaria and Goose-foot tribes by the often imperfect flowers.

THIS order has, as a rule, inconspicuous flowers which are massed together in clusters. The staminate flowers have a large amount of dry pollen which is often dispersed either elastically or by the wind, and is caught on large, brush-like stigmas. There are always stipules at the base of the leaves.

The Nettle Family is a large one, and inhabits temperate and tropical countries. In the British Isles it is poorly represented by the Wych and Common Elm, the Hop, Nettles, and Wall Pellitory. It thrives best in the tropics, where it includes herbs, shrubs, and forest trees of considerable value and beauty. Some species have a milky juice, useful in various ways, and others have delicious fruits.

Among those cultivated in the British Isles are the Mulberry and Fig. The Mulberry (*Morus nigra*), which is a native of Asia, is a very interesting tree on account of its curious fruit. The female flowers are collected into heads, and each flower is enclosed in an unnoticeable 4-lobed perianth, which becomes swollen and fleshy as the true fruit ripens inside, and it is this fleshy perianth which forms the juicy fruit once such a favourite in our gardens. The Fig (*Ficus*) has another unusual fruit. The so-called fruit of the Fig is, in reality, a fleshy receptacle inside which are the flowers and eventually the seed-like fruits: this fleshy receptacle is urn- or pear-shaped, with a very small aperture at the apex which is protected by scales; on the inside is placed a whole collection of small male and female, or only female, flowers, which almost fill the cavity, and which, whether fertilised or not, develop with the receptacle into a sweet juicy fruit. The Fig furnishes a most interesting example of wasp fertilisation; about 50 species of small wasps lay their eggs in

the seedcases (ovaries) of different Fig flowers ; when the eggs are hatched the wasps creep out through the aperture of the receptacle, collecting pollen as they push their way through ; they then crawl into other flower receptacles to lay their eggs, and in so doing leave the pollen on the stigmas of the flowers and fertilise them.

The Bread-fruit Tree (*Artocarpus incisa*) also has a curious fruit which is an invaluable article of food in hot climates. Its male flowers are collected into sausage-like catkins, while the female flowers are clustered together into round heads covering the outside of a conical fleshy receptacle, which becomes very much enlarged and merging with the fleshy flowers forms a nutritious fruit very like bread. The Cow-tree of Venezuela (*Galactodendron utile*) gives off, when pierced, a quantity of delicious milk. The Wild Hop (*Humulus Lupulus*) is largely cultivated in England, as a bitter substance (lupulin) which is produced in the fruit is used in the manufacture of beer. The Elm is valuable as a timber-bearing tree.

Several species of Indian Fig (*Ficus*), notably *Ficus elastica*, are very valuable on account of the India-rubber they yield. The milky juice in the trees wells up and forcing its way through any rift in the bark hangs down in masses, forming ropes and cords which hang all round the trunks. The Fig (*Ficus*) is either a climber or a tree, and often has an extraordinary root formation. Some climbing species send out root-girdles which circle round and round the tree to which the stem is clinging. Others throw out roots from the main stem some distance above the ground which take root in the soil and form a lattice-work of "supporting roots." The Banyan-trees (*Ficus Indica*), one of whose species is the Sacred Fig-tree (*Ficus religiosa*) of the Hindoos, under the branches of which Buddha is said to have meditated on the mystery of life, produce "columnar roots." These roots originate from horizontal branches and grow down vertically into the soil beneath and so form column-like pillars supporting the branches ; they increase till they look like trunks and send out leafy branches. Some trees have hundreds of these trunk-like roots, and cover a large area of ground. In Ceylon a native village of about 100 huts has been erected under one Banyan-tree.

Other foreign species yield fibre, useful in the manufacture of textile materials. Hemp (*Cannabis sativa*) is extensively cultivated in many countries, and we receive a large supply from Russia and Poland for making into cord, rope, canvas, and other materials. The Paper Mulberry (*Broussonetia papyrifera*) of Japan, the Rhea or Glass-cloth (*Boehmeria rivea*) of India, and our own Nettles (*Urticas*) all yield useful fibre.

- I. HOP (*HÚMULUS*). Female flowers in a head, hidden behind bracts ; style short with 2 long stigmas ; leaves lobed.
- II. NETTLE (*UR'TICA*). Flowers in clusters without bracts ; style absent, stigma tufted ; leaves with stinging hairs.
- III. PELLITORY (*PARIETÁRIA*). Flowers stalkless, several in the axils of the leaves, with bracts ; style hair-like, stigma tufted.

I. HOP. (*HÚMULUS*. Linn.)—Male and female flowers on separate plants (diœcious). Male flowers in loose branched clusters (panicles) in the axils of the upper leaves, with a perianth of 5 lobes, inserted below the seedcase (inferior) ; 5 stamens, inserted on the base of the perianth ; carpels 0. Female flowers in pairs in the axil of a bract which enlarges in fruit, clustered in shortly stalked round or cone-shaped spikes or heads, with an entire scale-like perianth which encloses the seedcase ; carpels 2, united into a 1-celled seedcase with a short style and 2 long stigmas ; fruit small, dry, 1-seeded. Twining herbs with opposite stalked leaves, deeply lobed towards the base (palmatifid), and with united stipules.

Common Hop. (*Húmulus Lúpulus*. Linn.)—As just described. A very well known plant climbing over hedges. The staminate (male) flowers are green with bright yellow erect stamens, and though common in hedges are not grown in the hop-fields; the pistilate (female) flowers are in roundish heads in the axils of the leaves and terminating the branches, the flowers being hidden behind the overlapping large green bracts, and the fruit being hidden behind the scale-like perianth which by the time the fruit has matured is enlarged considerably. The stems are tough, twisted, angular, and with anvil-shaped climbing hooks which enable them to climb to a considerable length over hedges and bushes; the leaves are broadly heart-shaped (cordate), with 3-5 lobes, sharply toothed, and very rough with small warts which sometimes terminate in bristles. The scale-like perianths of the female flowers are sprinkled with protective resinous glands, as is the underside of the leaves, the whole plant being dark green and rough with bristles and glands.

[Plate 47.]

Common. In hedges; throughout England, especially in the south, and introduced into Scotland and Ireland. July—August. Perennial.

II. NETTLE. (*UR'TICA*. Linn.)—Flowers stalkless (sessile) in clusters in the axils of the leaves or in spikes, with pistilless (male) flowers on one plant and stamenless (female) on another (diœcious), or with both on the same plant (monœcious). The male flowers have a perianth of usually 4, more rarely 5, lobes, with the same number of stamens, and are arranged in loose clusters (racemes). While the female flowers have a perianth of 4 lobes, the 2 outer ones very small, a seedcase crowned with a brush-like tufted stigma, and eventually a small flattened seed-like fruit enclosed in the perianth; they are arranged in tighter clusters. Herbs with opposite leaves, and small stipules, both stem and leaves usually covered with stinging hairs.

- (1) Great Nettle. (*Ur'tica dioíca*.)—Flowers in branched spikes; male on one and female on another plant.
- (2) *Roman Nettle. (*Ur'tica pilulífera*.)—Flowers in round clusters, female in a round head; male on one and female on another plant.
- (3) Small Nettle. (*Ur'tica úrens*.)—Flowers in unbranched spikes, in pairs; male and female intermixed.

1. Great Nettle. (*Ur'tica dioíca*. Linn.)—As just described. A very well known species with small green flowers, with a very unpleasant scent, the male on one plant in small clusters forming slender branched spreading spikes (panicles) 1-3 inches long, and the female on another in denser, somewhat drooping branched spikes (panicles); in the male flowers the stamens are a very interesting feature, as they are coiled in bud and open with a jerk sending up a cloud of pollen dust. The stem is erect, 2-3 feet high, and usually unbranched (simple); and the leaves are opposite, egg- or lance-shaped, pointed, heart-shaped (cordate) at the base, and coarsely toothed. The whole plant is of a dull green and is more or less downy and covered with stinging hairs.

[Plate 47.]

Very common. By waysides, under hedges, everywhere; throughout England, Scotland, and Ireland. June—September. Perennial.

2. *Roman Nettle. (*Ur'tica pilulífera*. Linn.)—A species differing from the last in the flower-clusters being round (globose), the male in distinct little round clusters up the flower-stem, and the female in a distinct round head terminating a flower-stem of about an inch long; in the leaves being sometimes entire instead of toothed, when it is called variety *Dodartii*, and having longer stalks; and in there being no downy hairs, only the stinging ones which are particularly virulent.





Not a native, local. In waste places, chiefly by the sea, about towns and villages in the east of England. June—August. Annual.

3. Small Nettle. (*Urtica úrens*. Linn.)—A smaller species than the preceding with the male and female flowers intermixed on the same plant (monœcious), in short unbranched spikes, in pairs in the axils of the leaves; with the stems only about 1 foot high, often less, and branched; and the leaves egg-shaped (ovate) or oblong and pointed; the whole plant, like the Roman Nettle, with stinging but without downy hairs, and unlike both the Great and Roman Nettles in being of a brighter green and of a softer texture.

Very common. In cultivated and waste ground; throughout England, Scotland, and Ireland. June—October. Annual.

III. PELLITORY. (PARIETÁRIA. Linn.)—Flowers perfect and imperfect on the same plant (polygamous), surrounded by an involucre, in clusters in the axils of the leaves. The perfect flower with a perianth of 4 lobes inserted below the seedcase (inferior); 4 stamens, opposite to and inserted at the base of the perianth-lobes; a 1-celled carpel with a hair-like style, surmounted with a feathery stigma; and a small seed-like fruit enclosed in the perianth-tube. The male and female flowers are similarly constructed, but in the former the pistils are imperfect and in the latter the stamens are imperfect; the stamens are again, as in the Nettle (*Urtica*) genus, very curious, they are coiled up like a watch spring and opening with a jerk fling out the pollen in a cloud. Herbs with alternate leaves, destitute of stinging hairs.

Common Pellitory of the Wall. (*Parietária ramiflóra*. Moench.)—As just described. The flowers are minute and pinkish, with an involucre of 2 or 3 deeply lobed bracts, in stalkless (sessile) clusters in the axils of the alternate leaves. The stems are ascending, 6 inches to 1 foot high, branched, brittle, hairy, and red; and the leaves are alternate, oval, entire, slightly pointed, tapering at the base into a short stalk. (*Parietaria officinalis*. Linn.; *Parietaria diffusa*. Koch.) [Plate 47.

This plant was grown in all herbal gardens; an infusion of it was a favourite medicine.

Fairly common. By hedges, on walls, and stony banks; throughout England, rare in the south of Scotland and unknown in the north, and frequent throughout Ireland. June—October. Perennial.

THE CROWBERRY FAMILY

[ORDER LXXV. EMPETRACEÆ]

THIS family consists of some half dozen or so evergreen heath-like shrubs, whose branches are thickly covered with stiff rolled-back leaves, one species only being found in the British Isles. The affinities of the order are obscure; some botanists place it near the Heath Family (Ericaceæ) and others by the Spurge Family (Euphorbiaceæ).

It inhabits arctic, antarctic, and northern temperate regions.

Its members are not of much use. The rather insipid berry of one native species—the Black Crowberry (*Empetrum nigrum*)—is eaten in arctic regions in lieu of better fruit as a preventive of scurvy.

CROWBERRY. (EMPE'TRUM. Linn.)—Flowers minute, in the axils of the leaves, with the male flowers—those with stamens—on one plant and the female—those without stamens and with perfect pistils—on another. Perianth in 2 rows of 3 lobes, the outer leathery and the inner petal-like (petaloid), with 6 smaller scale-like bracts at the base, free from and inserted below the seedcase; stamens 3, inserted below the seedcase (hypogynous), or 0, or imperfect; carpels 6–9, united into a seedcase with the same number of cells, 1 short style, and a stigma with the same number of spreading lobes, or imperfect in the male flowers; fruit a round fleshy berry, with 6–9 minute stones, each containing 1 seed. Small heath-like shrubby plants with crowded evergreen leaves, narrow, and with entire rolled-back (revolute) margins.

Black Crowberry, Crakeberry. (Empe'trum nigrum. Linn.)—The only British species. As just described. The minute flowers are red and stalkless (sessile) in the axils of the leaves; the inner petals reflexed and of a crimson red, the outer erect, yellowish-green marked with red; the stamens protruding in the male flowers; the stigmas 9 in number; the berry round, intensely black when ripe, and containing 9 minute 1-seeded nuts; the stems are 3–18 inches long, prostrate, much branched, and densely covered, except at the base, with small narrow leaves, whose margins are so much rolled back that they almost meet, just leaving visible a white line of the under surface of the leaf. [Plate 48.]

Common on mountain heaths in western and northern England, in Scotland, and in Ireland. April—June. Perennial.

THE CROWBERRY FAMILY (ORDER LXXV. EMPETRACEÆ)

PERIANTH in 2 rows, with 3, or rarely 2, segments in each row, free from & inserted below the seedcase (inferior)

STAMENS 3, or rarely 2, inserted below the seedcase (hypogynous) in the male flowers, absent or imperfect in the female flowers

PISTIL of 2-9 CARPELS, united into a 2-9-celled seedcase, 1 style, and a stigma spreading star-like with as many lobes as there are carpels, imperfect in the staminate (male) flowers.

FRUIT a roundish berry-like drupe containing 2-9 small 1-seeded stones, decaying to free the seeds (indehiscent).

FLOWERS small, solitary or in clusters in the axils of the leaves, rarely in terminal clusters, the flowers with stamens (male) on one plant & without stamens & with perfect pistils (female) on another plant (dioecious).

STEMS woody.

LEAVES crowded, alternate, or so crowded as to appear in circles (whorls), narrow & entire.

DISTINGUISHED from the Heath Family, which the members of this order closely resemble in their growth, leaves, and habit, by the flowers having a perianth instead of a calyx & corolla, 3 stamens, & a berry-like fruit, & in having the staminate (male) flowers on one & the pistilate (female) flowers on another plant.



BLACK CROWBERRY.
CRAKEBERRY.

EMPETRUM NIGRUM.



THE ORCHID FAMILY

[ORDER LXXIX. ORCHIDACEÆ]

In this order we have to deal with flowers which consist of 2 parts only, the **PERIANTH** and the **COLUMN**, the Column being the combination of the stamens and pistil.

PERIANTH in 2 rows, united together into a tube which is combined with the seedcase, and separating into an outer and an inner limb, all usually petal-like (petaloid); the outer limb is divided into 3 lobes, all much the same size; the inner limb is also divided into 3 lobes, which are irregular; the 2 side ones are similar to those of the outer limb, but the uppermost—which in the British species is usually the lowermost owing to the twisting of the seedcase or of the flower-stalk—is very different from the other two, being larger, often 3-lobed, and usually spurred at the base, and is called the **LABELLUM** or Lip.

The **COLUMN** is composed of 3 **STAMENS** and the **PISTIL**, which are combined together. The 2 side stamens do not produce pollen (abortive) except in the genus *Cypripedium* when the 2 side stamens bear pollen and the central one does not. The anthers are 2-celled and are situated on the style itself above the stigma; the pollen is powdery, or more often waxy, and coheres into 2 club-shaped masses called **POLLINIA**, which are often

supported by a stalk which is called the **CAUDICLE**. **PISTIL** of 3 **CARPELS**, united into a long 1-celled seedcase, 1 style and a stigma. The seedcase is combined with the perianth-tube, and is often so twisted as to invert the flower and so long as to be mistaken for a stalk; it is surmounted with the style and stamens cohering together and so forming the column, and is sometimes extended below the anther into a process called the **ROSTELLUM**, below which is the stigma, a sticky surface in front of the column.

FRUIT a dry capsule, opening by 3 valves from the top down the sides (rarely a berry), 1-celled, many-seeded, the seeds being minute, dust-like, and attached to 3 cushions on the inner surface of the cell-wall (parietal placentæ), which are alternate with 3 ribs which bear no seeds.

FLOWERS, in the British species, red, pink, purple, white, yellow, or greenish, in a spike or simple cluster (raceme), with a bract at the base of each flower.

LEAVES sheathing at the base, entire, with parallel veins, often all from the root (radical).

ROOTS usually tuberous.

DISTINGUISHED by the combining of the stamens and stigma into a central column.

THE Orchid Tribe is the most wonderful order we have. It is easily distinguished from all others by the structure of the flowers, by the combination of the stamens and pistil into a central column, and by the lip or labellum of the 6-lobed perianth. In the British Isles most of the species grow in the usual way in the soil, and throw up stem and leaves, which derive their nutriment from the soil through the root and stem; the flowers are usually small, and are rendered noticeable from their being massed together in spike-like clusters. They have, of course, the wonderful construction peculiar to all orchids, and are so unlike the ordinary flower

in appearance that they are frequently likened to animals, reptiles, and insects, as we may see by their names, the Monkey-, Frog-, Lizard-, Bee-, Fly-, Spider-, and Butterfly-Orchids.

But it is in the hot, moist climate of the tropics that these strange plants are seen at their best. There they do not root in the earth—their thick, contorted, grey, snake-like roots twine and twist in the branches of trees and huge ferns; they are nearly leafless, and bear on slender stalks gorgeous and fantastical flowers, coloured and marked in marvellous fashion, and often filling the air with their sweet perfume. Though growing on trees they are not parasites; they derive their food from the hot, damp air and from any decaying vegetable matter that may have collected round their roots—they are epiphytes.

Not only are the flowers of such strange and exceeding beauty of form and construction, but they are marvellously planned with a view to fertilisation—usually with a definite intention of insect pollination, that is to say with the idea of insects carrying the pollen from one flower to another. The perianth always protects the column so as to allow the entrance of insects in such a way only as to remove the pollen. The pollen-masses, or pollinia as they are called, are attached to the column by a sticky gland, against which the insect brushes on entering the flower. This action ruptures a delicate membrane covering the sticky gland, and the gland with its pollen-bag adheres to the insect and separates from the column. While the insect is obtaining his store of honey the sticky matter sets as hard as cement, so that there is no chance of the pollen-bag being moved on the insect. This is not all, however, for if the pollen-bag remains in the same position it is clear that when the insect enters another flower the pollen will touch the stamen of that flower and not the stigma which is lower down on the column. This would be of no use, the end in view being the fertilisation of the stigma of the next flower entered. A wonderful mechanism is provided. The sticky gland, though now set as hard as a rock, has the power of contraction when exposed to the air, and from being upright on the insect the contraction of the gland bends the stalk of the pollen-mass downwards, into a position where, as the insect enters the next flower, the pollen strikes the stigmatic surface. Only a part of the pollen is torn off and one pollen-mass is able to fertilise many flowers. The nectar is not always free and easily obtained; sometimes it answers the purpose of fertilisation better to delay the exit of the insect, and in these instances Darwin discovered that the honey was secreted between the layers of tissue which compose the tube, so that the outer tissue has to be pierced in several places before the nectar can be obtained, giving ample time for the sticky disk to set as hard as a rock. It is due primarily to Darwin's researches that the exact mechanism of the orchid with regard to fertilisation has been made clear. In his "Fertilization of Orchids" the process is lucidly explained.

Apart from the beauty of the flowers and wonder of construction, the orchid order is of little known use. The Vanilla (*Vanilla planifolia*), a native of Mexico, but now cultivated in all tropical countries, a species which climbs over walls and trees like our Ivy, produces capsules which are useful, when dried, as a flavouring in cookery. From another genus a gluey matter is extracted which is used in Brazil; the roots of *Eutophia vera* and *Eutophia campestris*, natives of India, furnish Salep, as do two of our own orchids, *Orchis mascula* and *Orchis Morio*. Otherwise the attraction of the order lies in the weird beauty of the flowers.

Some interesting tropical families—the Musaceæ, Marantaceæ, Cannaceæ, and Zingiberaceæ—frequently have only one fertile stamen, the others being like petals, and sometimes being united into a lip (labellum). Members of the first two mentioned orders are cultivated in tropical countries, such as the Banana (*Musa sapientum*), the Plantain (*Musa paradisiaca*), and

Maranta Arundinacea from which is obtained Arrowroot. The Cannaceæ and Zingiberaceæ are cultivated in hot-houses for the sake of their beautiful flowers and foliage.

Tribe I. CYPRIPEDEÆ.—Two side anthers perfect, central anther sterile; pollen-masses not stalked; pollen pulpy and granular.

I. LADY'S SLIPPER ORCHID (CYPRIPÉDIUM). Flowers with an inflated slipper-shaped lip; outer perianth-row of apparently only 2 lobes; stamens 2.

Tribe II. MALAXIDEÆ.—Anther terminal, free, lid-like; pollen-masses stalkless; pollen waxy, and coherent.

II. BOG ORCHID (MALAX'IS). Flowers greenish; lip uppermost, entire, not spurred; column short.

III. FEN ORCHID (LIPÁRIS). Flowers greenish; lip erect, entire, not spurred; column long; leaves 2.

IV. CORAL-ROOT (CORALLORRHÍZA). Flowers yellowish-brown; lip lowermost, 3-lobed, minutely spurred; column short; brown saprophytes with coral-like roots.

Tribe III. NEOTTIDEÆ.—Anther terminal, attached to the column by its base; pollen-masses stalkless; pollen mealy, slightly coherent.

Column prolonged into a rostellum.

V. BIRD'S-NEST ORCHID (NEOT'IA). Flowers stalked, largish, brown, hooded; lip lowermost 2-lobed, not spurred but slightly pouched; column long; seedcase twisted; brown, leafless saprophytes with a nest-like mass of fleshy root fibres.

VI. TWAY-BLADE (LIS'TERA). Flowers stalked, small, spreading, green; lip lowermost, 2- or 4-lobed, not spurred; column short; seedcase twisted.

VII. LADY'S-TRESSES (SPIRAN'THES). Flowers stalkless, white, in a spirally twisted spike; lip lowermost, not lobed, toothed, not spurred; column short; seedcase twisted; plants leafy.

VIII. GOODYÉRA. Flowers stalkless, spiral; lip lowermost, constricted in the middle, pouched at the base but not spurred; column short; seedcase twisted; plants leafy.

IX. HELLEBORINE (HELLEBORÍNE). Flowers drooping, stalked; lip lowermost, constricted in the middle, with 2 prominent bosses, not spurred; column short; seedcase straight, on a twisted stalk.

Anther shortly stalked; column without a rostellum.

X. HELLEBORINE (CEPHALAN'THERA). Flowers erect, stalkless; lip lowermost, constricted in the middle, pouched at the base; column long; anther shortly stalked; seedcase twisted; plant leafy.

Tribe IV. ARETHUSEÆ.—Anther terminal, ultimately free; pollen-masses stalked; pollen pulpy or powdery, more or less coherent.

XI. EPIPÓGUM. Flowers stalked, yellowish; lip uppermost, 3-lobed, spurred; seedcase and flower-stalk straight; yellowish saprophyte without any green leaves.

Tribe V. OPHRYDINEÆ.—Anther wholly attached to the column; pollen-masses, stalked; pollen waxy and coherent.

XII. **MAN-ORCHID (AC'ERAS).** Flowers stalkless, hooded; lip lowermost, 4-lobed, not spurred; plants leafy.

XIII. **INSECT ORCHID (ÓPHRYS).** Flowers stalkless, spreading; lip lowermost, variously lobed, usually convex, not spurred; rostellum 2-lobed; plants leafy.

XIV. **ORCHID (OR'CHIS).** Flowers stalkless, hooded; lip lowermost, 3-4-lobed, spurred; column with a rostellum; leafy plants.

XV. **MUSK ORCHID (HERMIN'IUM).** Flowers stalkless, bell-shaped; lip lowermost, 3-lobed, not spurred; pollen-masses each on a large naked gland.

XVI. **HABENÁRIA.** Flowers stalkless, hooded; lip lowermost, spurred; pollen-masses stalked, each attached to a naked gland.

Tribe I. CYPRIPEDEÆ.—Two side anthers perfect, central anther sterile; pollen-masses not stalked; pollen pulpy and granular.

LADY'S SLIPPER ORCHID. (CYPRIPEDIUM. Linn.)—Flowers few, stalkless, large, with the lip large and inflated, and supposed to resemble a Turkish slipper or a French sabot, solitary, or 2 or 3 in a loose spike terminating the stem; the lip lowermost (inverted), owing to the twisting of the stalk. The outer perianth-row has the 2 lower lobes combined, so there are apparently only 4 similar perianth-lobes, which are all spreading; the lip is very large, inflated, and curved upwards and inwards. The column is short, curved inwards, and 3-lobed, the central lobe is petal-like and bears a sterile anther, and the side lobes each bear one perfect anther; the anthers are stalkless, and the pollen is pulpy and granular. Herbs with large parallel-veined stem-leaves and fibrous roots.

Common Lady's Slipper Orchid. (Cypripedium Calcéolus. Linn.)—The only British species. As just described. A most beautiful, very large (for a British orchid), and usually solitary flower, with the 2 outer perianth-lobes lance-shaped, the 2 upper lobes of the inner row strap-shaped, all 4 maroon-coloured; the lip large, inflated, and curved upwards and inwards, pale yellow; the leafy stem 1-1½ feet high, usually without any root-leaves, but with several broad pointed stem-leaves with sheathing bases. [Plate 49.]

Very rare. In dense woods on limestone in Yorkshire and Durham. May—June. Perennial.

Tribe II. MALAXIDEÆ.—Anther terminal, free, like a lid; pollen-masses not stalked, pollen waxy and coherent.

II. BOG ORCHID. (MALAXIS. Soland.)—A genus consisting of the following species:—

Bog Orchid. (Malaxis paludosa. Swartz.)—Flowers minute, numerous, stalked, yellowish-green, in a spike-like cluster (raceme), remarkable from the fact that the lip (labellum) of the perianth is uppermost, not through remaining in its natural position, but owing to the long seedcase being so much twisted that the flower is turned right round and back into its original position, instead of being twisted halfway till the lip is lowermost (inverted) as are most of the other orchids. Outer perianth-row of 3 lobes, broadly lance-shaped, reflexed, larger than the inner; inner perianth of 3 lobes, narrower and shorter than the outer, the lip (labellum) uppermost, entire, concave, and not spurred at the base, but embracing the column and making the entrance to the flower tubular. Column very short and straight, terminated by a lid-like, 2-celled anther, which has the pollen disposed in 2 pairs of stalkless, club-shaped masses, all attached to a



Parts of Lady's Slipper Orchid.

The two anthers.

front view of upper part of column,

side view of upper part of column

Lip of Lady's Slipper Orchid

BOG ORCHID, MALAXIS PALUDOSA

LADY'S SLIPPER ORCHID,

FEN ORCHID.

LIPARIS LOESELII

CYPRIPEDIUM CALCEOLUS

single gland; the pollen is granular and waxy; the rostellum is an entire pointed projection on the column below the anther; and immediately below is a deep fold or pocket which is the stigma. Fruit a capsule. This is one of our smallest orchids; its stem is 1-4 inches high, slender, and angular, with towards the base 3-5 oblong or egg-shaped (ovate) leaves. [Plate 49.

Very rare. Growing on bog-moss (*Sphagnum*), and deriving its nutriment from the moisture in the air (an epiphyte); distributed throughout England and Scotland, local in Ireland, but so unnoticeable and sunk in the moss as to be extremely difficult to find. July—September. Perennial.

III. FEN ORCHID. (LIPÁRIS. Rich.)—Flowers small, stalked, greenish-yellow or purplish, in a short spike-like cluster (raceme), the lip (labellum) erect. Outer perianth-row of 3 spreading lobes; inner perianth-row of 3 lobes, the 2 side ones similar to the outer row, and the lip (labellum) broader, entire, and not spurred at the base. The column long, slender, and sometimes curved, terminated by a lid-like, stalkless anther, with the 4 pollen-masses waxy and cohering, and attached in pairs to 2 glands; the rostellum absent; and the stigma roundish; the seedcase twisted. Herbs with the base of the stem enveloped in sheaths and usually bearing only 2 leaves.

Fen Orchid, Two-leaved Liparis. (Lipáris Loesel'ii. Rich.)—The only British species. As just described. A delicate little plant with 6-12 flowers terminating a stem 2-6 inches high; the root is enveloped in soft sheaths, and bears 2 oblong or lance-shaped, smooth, bright green leaves, and by the side of the root a small bulb is formed from which the next year's plant is produced. [Plate 49.

Very rare. Epiphyte on bog-moss (*Sphagnum*), in the eastern counties, though now nearly extinct owing to the drainage of the fen country. June—July. Perennial.

IV. CORAL-ROOT. (CORALLORRHÍZA. Chatelain.)—Flowers small, stalked, brown, in a loose terminal spike-like cluster (raceme), the lip (labellum) lowermost (inverted), owing to the twisting of the seedcase. Outer row of the perianth of 3 equal lobes; inner perianth-row of 3 lobes, the 2 upper similar to those of the outer row, and the lower or lip (labellum) larger, with 2 prominent ridges, 3-lobed, the side lobes being minute, and the middle lobe slightly notched (emarginate) and with a short spur at the base. Column erect, rather short, terminated by the lid-like anther; the pollen waxy and disposed in roundish, stalkless masses in 2 pairs; rostellum absent; stigma triangular; seedcase twisted. Herbs without green leaves, but having membranous sheaths, and fleshy underground roots, branched and interlacing like coral.

Common Coral-root. (Corallorrhíza trifida. Chatelain.)—The only British species. As just described. The flowers are small, yellowish, 4-10 in a loose cluster, each with a very small bract at the base; the lip is white and is marked with raised purplish dots, the lobes of the outer row of the perianth are narrowly lance-shaped and are longer than the inner row. The whole plant is 6-10 inches high and is of a pale brown or yellowish colour, with a few sheathing bracts instead of leaves, and pale yellow coral-like roots. (*Corallorrhiza Neottia. Scopoli*; *Corallorrhiza innata. R. Brown.*)

Very rare. Boggy woods in a few localities in Scotland. July—August. Perennial.

Tribe III. NEOTTIÆ.—Anther terminal, attached to the column by its base; pollen-masses 2, stalkless; pollen mealy, only cohering slightly.

V. BIRD'S-NEST ORCHID. (NEOTTIA. Adans.)—Flowers rather large, hooded, stalked, brown, in a dense terminal spike-like cluster (raceme), with the lip (labellum) lowermost owing to the

twisting of the seedcase. The outer row of the perianth is of 3 lobes and forms a hood with the upper 2 lobes of the inner perianth-row, the remaining lobe, the lip (labellum) being much larger, deflexed, 2-lobed, and not spurred but slightly pouched at the base. The column is long and is prolonged into a flat, broad, entire, beak-like rostellum, on which is situated the free anther; there are 2 stalkless pollen-masses, united, roundly club-shaped, and attached to a single gland, and the pollen is mealy, very slightly cohering; the stigma is transverse; the seedcase twisted. Brown herbs deriving their food from decaying vegetation (saprophytes), without green leaves, their place being taken by sheathing brown bracts, and with a dense mass of thick fleshy root-fibres, which give rise to its name.

Bird's-nest Orchid. (*Neot'ia Níduš-ávis*. Rich.)—The only British species. As just described. The flowers are of a pale brown, in a dense spike-like cluster (raceme), with a few distant flowers below, terminating a stem about a foot high. The whole plant is of varying shades of brown. [Plate 50.]

Not uncommon. Growing among dead leaves, especially among Beech leaves, in shady woods, throughout England, more rare in Scotland, and very rare in Ireland. June—July. Perennial.

VI. TWAY-BLADE. (*LISTERA*. R. Brown.)—Flowers small, gaping, stalked, greenish, turning in all directions, in a loose terminal spike-like cluster (raceme), with the lip (labellum) lowermost (inverted) owing to the twisting of the seedcase. The outer row of the perianth of 3 lobes, broader than the inner, spreading; the inner row of 3 lobes, the two side ones similar to the outer row, and the lip (labellum) much larger though narrow, pendulous, 2-lobed, and sometimes with a smaller lobe on each side at the base, not spurred. The column is short, and extends in front into a large entire leafy rostellum which projects above the stigma, at the back the column is prolonged above the rostellum and protects the anther, which is situated behind and above the rostellum; the anther has 2 stalkless pollen-masses, united, club-shaped, attached to a single minute gland; the pollen is mealy; the stigma is situated on the column underneath the rostellum; the seedcase is twisted. Herbs with 2 opposite or nearly opposite leaves a little distance above the base of the stem, with sheathing bracts below, and with a root of thin fleshy root-fibres.

- (1) Common Tway-blade. (*Lis'tera ováta*.)—Flowers in a long spike; lip 2-lobed; leaves large, egg-shaped.
- (2) Lesser Tway-blade. (*Lis'tera cordáta*.)—Flowers in a short spike; lip 4-lobed; column with a crest; leaves small, heart-shaped at the base.

1. Common Tway-blade. (*Lis'tera ováta*. R. Brown.)—As just described. The flowers stalked, small, yellowish-green, in a long, slender, loose, spike-like cluster (raceme); the bracts at the base of each flower-stalk not quite half as long as the stalk; the lip (labellum) more than twice as long as the other perianth-lobes, and divided halfway up into 2 strap-shaped segments, but without lobes on either side at the base; and the column without a crest. The stem is 1–2 feet high, downy, with 2 sheaths at the base, and with, halfway up the stem, a pair of large egg-shaped (ovate) leaves, 2–5 inches long, which are strongly ribbed. [Plate 50.] Common. In woods and moist pastures, distributed throughout England, Scotland, and Ireland. May—July. Perennial.

2. Lesser Tway-blade. (*Lis'tera cordáta*. R. Brown.)—A much smaller, slighter species than the last, with a shorter spike of very small greenish flowers, which have the lip (labellum) twice as long as the other perianth-lobes, and divided, as in the last species, halfway up



HURD'S
NEST
ORCHID.

PRINCE
HELLEBORINE

CEPHALAN
THERA
RUBRA

AUTUMN
LADY'S TRESSES

NEOTTIA
NIDUS-AVIS

LEAFY
HELLEBORINE

SPIRANTHES
SPIRALIS

CEPHALAN
THERA
LONGIFOLIA

GREENING
GOODYERA

GOODYERA
REPENS

columns
COMMON
TWAY-BLADE
LISTERA
OVATA



into 2 strap-shaped lobes, but having also a very small lobe on either side at the base ; the column is crested ; the stem is 3-8, usually about 6, inches high, slender, smooth (glabrous), and with 2, or even 3 or 4 small, opposite, stalkless, egg-shaped leaves, $\frac{1}{2}$ -1 inch long, which are heart-shaped (cordate) at the base.

Rare. On mountain moors and open woods, generally distributed throughout the British Isles ; very scarce in the south of England, more common in the north and in Scotland, and local in Ireland. June—September. Perennial.

VII. LADY'S-TRESSES. (SPIRANTHES. Rich.)—Flowers small, stalkless (sessile), gaping, white or pink, in a spirally-twisted spike ; the lip (labellum) lowermost (inverted) owing to the twisting of the seedcase. The outer row of the perianth of 3 lobes, the upper one cohering with the inner row, all 3 lobes similar to the two side lobes of the inner row, the remaining lobe of the inner row, the lip (labellum), broader, not lobed but more or less distinctly toothed, and embracing the column at the base, without a spur, but with 2 roundish receptacles which secrete honey. The column is short and is extended into a 2-lobed rostellum, on which is situated the anther ; there are two partially united, stalkless, club-shaped pollen-masses which are attached to a single gland ; the roundish stigma is situated on the column below the rostellum. Herbs with leaves on the flowering stem, or with a little tuft of leaves from the root by the side of the stem, and with thick fleshy root-fibres or a few oblong tubers.

Flowers small, in 1 row, twisted.

(1) Common Lady's-Tresses. (*Spiranthes spiralis*.)—Stem leafless, bearing bracts only, leaves in a tuft from the root ; root of 2 or 3 tubers.

(2) Summer Lady's-Tresses. (*Spiranthes æstivalis*.)—Stem with a few leaves at the base ; root of a few thick fleshy fibres.

Flowers large, in 3 rows, twisted.

(3) Drooping Lady's-Tresses. (*Spiranthes Romanzoffiana*.)—Stem very leafy ; root of thick fleshy fibres.

1. Common or Autumn Lady's-Tresses. (*Spiranthes spiralis*. Koch.)—As just described. An insignificant plant with small greenish-white, sweet scented flowers, growing in a single row, in a dense twisted spike, on a downy stem 3-9 inches high ; each flower has at its base a downy, pointed, egg-shaped bract, which is longer than and encloses the seedcase, and the stem has a few pointed, sheathing green bracts ; the leaves are oblong or egg-shaped (ovate), and appear in the autumn in a little tuft from the root, from the centre of which the next year's flowering stem is produced ; the root consists of 2 or 3 oblong tubers. (*Spiranthes autumnalis*. Rich.) [Plate 50.

Not uncommon. On dry downs and hilly pastures, especially on chalk and limestone ; generally distributed throughout England but not found further north than Westmorland and Yorkshire, and very rare and local in Ireland, where it is only found in the south and centre. August—October. Perennial.

2. Summer Lady's-Tresses. (*Spiranthes æstivalis*. Rich.)—A similar species with rather larger flowers in a looser spike, terminating a stem 6-18 inches high, on which are a few leaves sheathing the base ; the root is of a few thick fleshy fibres 2 or 3 inches long.

Very rare. In bogs between Lyndhurst and Christchurch, in Wyre Forest, and in Jersey and Guernsey. July—August. Perennial

3. Drooping Lady's-Tresses. (*Spiranthes Romanzoffiana*. Chamisso.)—A very rare species with much larger, whiter flowers, in 3 rows, in a dense spike 1-4 inches long, terminating a leafy stem 5-15 inches high; the leaves round the base of the stem are oval or strap-shaped and spreading, but gradually narrow up the stem till near the flower-spike they resemble sheathing green bracts; the root is of a few long thick fleshy fibres. (*Spiranthes gemmipara*. Lindley.) Very rare. Pastures in the south-west of County Cork. August—September. Perennial.

VIII. GOODYÉRA. Brown.—A very similar genus to Lady's-Tresses (*Spiranthes*), but differing in that the perianth-lip does not embrace the column and is constricted in the middle, as in Helleborine, into a cup-shaped portion containing nectar, and a terminal entire lip which is pouched at the base, on which the insects alight; and also in the root being creeping.

Creeping Goodyera. (*Goodyera répens*. R. Brown.)—The only British species. As just described. The flowers are small, gaping, creamy-white, in a 1-sided slightly twisted spike 1½-5 inches long, terminating a stem 6-15 inches high; each flower with a bract at the base which embraces and is longer than the seedcase; the stem with glandular hairs, narrow sheathing bracts, and a few egg shaped, pointed leaves at the base which have very marked netted veins; the root creeping. (*Peranium repens*. Salisb.) [Plate 50. Rare and local. In fir-woods, in Cumberland and Scotland, particularly in the northern counties of Scotland. July—August. Perennial.

IX. HELLEBORINE. (**HELLEBORÍNE.** Hill.)—Flowers drooping, stalked, usually greenish or reddish, in loose spike-like clusters (racemes), the lip (labellum) is lowermost (inverted) owing to the flower-stalk being twisted. The outer row of the perianth is of 3 lobes, spreading, and similar to, though longer than, the 2 side lobes of the inner row, the remaining lobe, the lip (labellum), is not spurred and is very much constricted and hinged in the middle; the lower half is cup-shaped and contains the nectar, and the terminal part is broad and often toothed, and is a good landing place for insects; it has 2 prominent folds or bosses above, near the hinge. The column is short and is prolonged into a short rostellum with a roundish cap; the anther is terminal, stalkless, of 2 oval, united pollen-masses, attached to a single gland on the rostellum; the stigma is directly beneath the rostellum and is 2-lobed and projects in front of the column; and the seedcase is straight. Leafy herbs with the oval stalkless (sessile) leaves, clasping the stem, the lowest ones generally reduced to sheaths. (*Epipactis*. Adans.)

- (1) Broad-leaved Helleborine. (*Helleboríne latifolia*.)—Perianth-lip with terminal lobe roundish heart-shaped with small central recurved point; stem solitary; leaves egg-shaped.
- (2) Purple Helleborine. (*Helleboríne violácea*.)—Terminal lobe of perianth-lip triangular egg-shaped and pointed; stems numerous; leaves narrower.
- (3) Dark-green Helleborine. (*Helleboríne atróviridis*.)—Intermediate between numbers 1 and 4 with reddish flowers and broad leaves.
- (4) Dark-red Helleborine. (*Helleboríne atrorúbens*.)—Terminal lobe of perianth-lip broader than long, roundish, with short abrupt point; stem solitary; leaves small and egg-shaped.
- (5) Marsh Helleborine. (*Helleboríne longifolia*.)—Terminal lobe of perianth-lip roundish and scalloped; stem solitary; leaves narrow.

1. Broad-leaved Helleborine. (*Helleboríne latifolia*. Druce.)—As just described. The flowers are drooping, shortly stalked, purple, or green with a purple lip, in a long 1-sided

spike (raceme); the bracts on the lower flowers are usually longer than the flower, and gradually become smaller towards the top of the cluster, but are always longer than the seedcase; the lip (labellum) is shorter than the other perianth-lobes, which are broadly egg-shaped (ovate), and the terminal lobe of the lip is roundish heart-shaped (cordate) with a small point, finally recurved, in the centre. The stem is 1-3 feet high, stout, downy, and very leafy; the leaves are broadly egg-shaped (ovate) and clasp the stem (amplexicaul) towards the base, and become narrower as they ascend the stem, until they pass insensibly into the bracts. (*Epipactis latifolia*. All; *Epipactis Helleborine*. Crantz.) [Plate 51.]

A variety, the **Narrow-leaved Helleborine** (*Helleborine média*. E. S. Marshall), considered by most botanists as a distinct species, is a similar plant with green flowers tinged with purple; the lip (labellum) equal in length to the other lobes of the perianth, and with the terminal lobe triangular heart-shaped and pointed; and the leaves longer and narrower. (*Epipactis media*. Fries.)

Not uncommon. In woods and shady places, distributed throughout England, more rare in Scotland, distributed throughout Ireland but local. August. Perennial.

2. Purple Helleborine. (*Helleborine violácea*. Druce.)—A species very similar to the Broad-leaved Helleborine (*Helleborine latifolia*), with yellow-green flowers tinged with red; the terminal lobe of the lip triangular-egg-shaped and pointed; the stems numerous and clustered together; the leaves narrower; and the whole plant more or less tinged with purple. (*Epipactis violacea*. Boreau; *Epipactis purpurata*. Sm.)

Very rare. Woods in the south of England; reported from Scotland and Ireland. August. Perennial.

3. Dark-green Helleborine. (*Helleborine atróviridis*. W. R. Linton.)—A species in some respects intermediate between the Broad-leaved Helleborine (*Helleborine latifolia*) and the Dark-flowered Helleborine (*Helleborine atrorubens*). The flowers are not so rose-coloured as in the latter species, and the leaves are broad and rounded as in the Broad-leaved Helleborine, but with more numerous lance-shaped leaves on the stem.

Rare. In woods and copses mostly on coal measures. August. Perennial.

4. Dark-red or Oval-leaved Helleborine. (*Helleborine atrorúbens*. Druce.)—A species with small flowers, varying from dark yellow to dingy red, in a loose 1-sided cluster; the lip is about the same length as the other perianth-lobes, with the terminal lobe broader than long, rounded, and with a short abrupt point in the middle. [As described in the genus *Helleborine*.] The stem is solitary, slender, and rather wiry, about 1 foot high, and the leaves are smaller than in the other species, egg-shaped (ovate), pointed, only lance-shaped high up the stem. (*Epipactis atrorubens*. Schultz; *Epipactis ovalis*. Bab.)

Rare. On limestone ledges at Settle, Yorks; Little Doward Hill, Hertfordshire; Orme's Head, Carnarvon; Durness, Sutherland; and County Clare, Ireland. July. Perennial.

5. Marsh Helleborine. (*Helleborine longifólia*. Allione.)—The flowers are few but larger than in the Broad-leaved Helleborine (*Helleborine latifolia*) and not 1-sided; the bracts are all shorter than the flowers; the outer perianth-lobes are of a purplish-green, and lance-shaped, and the inner are white veined with purplish-red, the lip (labellum) being as long as the outer perianth-lobes, roundish and scalloped. [As described in the genus *Helleborine*.] The stem is 6-18 inches high, and the leaves are narrower than in the Broad-leaved Helleborine, lance-shaped and pointed; the root is creeping. (*Epipactis palustris*. Crantz.)

Not uncommon. In marshes and moist places, generally distributed throughout England, rare in Scotland, and rare and local in Ireland. July—August. Perennial.

X. HELLEBORINE. (CEPHALAN'THERA. Rich.)—Flowers large, erect, stalkless (sessile), white or pink, in loose spikes; the lip (labellum) being lowermost (inverted) owing to the twisting of the seedcase. The outer row of the perianth of 3 lobes, spreading, egg-shaped or lance-shaped, and more or less pointed, similar to the 2 side lobes of the inner row; the lip (labellum) pouched or very shortly spurred at the base, constricted and jointed in the middle, with the terminal portion egg-shaped, more or less pointed, sometimes curved back, and without any prominent bosses as in the last genus (Helleborine). The column is long and without a rostellum, and is terminated by the anther, which is shortly and thickly stalked, and movable; the stigma is transverse; and the pollen mealy, in 2 club-shaped masses; the seedcase is twisted. Leafy herbs with oval or lance-shaped, stalkless leaves, clasping the stem, the lowest ones generally reduced to sheaths.

- (1) Red Helleborine. (*Cephalan'thera rúbra.*)—Flowers red; bracts longer than the downy seedcase; leaves oblong and lance-shaped.
- (2) Long-leaved Helleborine. (*Cephalan'thera longifólia.*)—Flowers pure white; bracts shorter than the seedcase; leaves long and narrow.
- (3) Broad-leaved Helleborine. (*Cephalan'thera grandifóra.*)—Flowers yellowish-white; bracts longer than the seedcase; leaves broad and shorter.

1. Red Helleborine. (Cephalan'thera rúbra. Rich.)—As just described. The flowers are of a purplish-rose colour, with a narrow white lip about as long as the other perianth-lobes, the terminal portion is streaked and bordered with purplish-rose; the bracts are longer than the downy seedcase, about the same length as the flowers; the stem is about 1 foot high, slender, with numerous leaves, the lowest being oblong and the middle and upper ones narrowly lance-shaped, pointed, and long; the root is creeping and has numerous thick fleshy root-fibres.

[Plate 50.

Very rare. Woods on limestone in Gloucestershire. June—July. Perennial.

2. Long-leaved Helleborine. (Cephalan'thera longifólia. Fritsch.)—A very similar species to the last, with pure white flowers; the outer perianth-lobes pointed, the lip marked with orange-yellow; the bracts very short, shorter than the smooth seedcases; the stem taller, sometimes even 2 feet high, and the leaves longer. (*Cephalanthera ensifolia. Rich.*) [Plate 50. Rare, local. In woods; distributed throughout England, and in Scotland as far north as Perth and Argyle; very rare in Ireland. May—June. Perennial.

3. Broad-leaved Helleborine. (Cephalan'thera grandifóra. Gray.)—A similar species to the Long-leaved Helleborine (*Cephalanthera longifolia*), but stouter; the flowers are rather larger and cream-coloured or yellowish; the outer perianth-lobes are blunt; the bracts are longer than the seedcase, the lower ones being very leaf-like and longer than the flowers; there are often several stems from the one root, and the leaves are broader and much shorter, the lower ones being broadly egg-shaped and the upper broadly lance-shaped. (*Cephalanthera pallens. Rich.*)

Rare. In woods, especially on chalk, in many counties throughout England, more frequent in the south. June. Perennial.

Tribe IV. ARETHUSEÆ.—Anther terminal, ultimately free; pollen-masses stalked; pollen pulpy or powdery, more or less coherent.

XI. EPIPÓGUM. S. G. Gmel.—A genus consisting of the one species:—

Leafless Epipógum. (Epipógum aphyllum. Swartz.)—Flowers large, drooping, stalked, yellow, with a white lip dotted with purple, 1-7 in a loose cluster (raceme); the lip of the

perianth uppermost, as neither the seedcase nor the stalk is twisted. The outer perianth-row of 3 lobes, which are narrowly lance-shaped, pointed, and of a pale yellow colour, similar to the 2 lower lobes of the inner row; these 5 lobes are all turned downwards, in the opposite direction to the lip; the lip (labellum) is large and 3-lobed, the side lobes are small, and the terminal lobe large, slightly concave, white with 4 rows of raised purple spots, and with a thick erect spur at the base. The column is short and is terminated by a lid-like anther which contains 2 club-shaped pollen-masses, which are stalked; the pollen is pulpy or powdery, more or less coherent; there is no rostellum; and the seedcase is straight. The stem is 3-10 inches high, usually about 6 inches, yellowish, and has no green leaves, only a few distant scale-like bracts, and much branched, interlacing, thick fleshy roots which resemble coral, very similar to those of the Coral-root (*Corallorrhiza trifida*).

Very rare. In damp woods, in rotten leaves; only found once or twice in Herefordshire. August. Perennial.

Tribe V. OPHRYDINEÆ.—Anther wholly attached to the column; pollen-masses stalked; pollen waxy and coherent.

XII. MAN ORCHID. (*Ac'ERAS*. R. Brown.)—A genus of few species, like the *Orchis* genus except that the lip has no spur.

Man Orchid. (*Ac'eras anthropophóra*. R. Brown.)—The only British species. A plant with a slender spike of strange, small, yellowish flowers; each with a bract at the base shorter than the seedcase; the 5 similar perianth-lobes form a large hood over the column; the lip is long, narrow, hanging, and is divided into 2 short side lobes, likened to arms, and a long central lobe which is divided halfway up into 2 narrow segments and has been compared with the body and legs of a man. The whole plant is usually 9 inches to 1 foot high; the spike occupies most of the upper half, and the oblong or egg-shaped leaves are chiefly from the root, with intermediate leaf-like sheaths; the tubers are entire. [Plate 51.

Rare. In dry places, on chalky soil, in the south-eastern counties. June—July. Perennial.

XIII. INSECT ORCHID. (*ÓPHRYS*. Linn.)—Flowers few, large, stalkless, in a loose spike, the lip, which resembles the body of an insect, being turned downwards (inverted), owing to the twisting of the seedcase. The bract at the base of each flower is often leafy; the 3 outer perianth-lobes are spreading and are much larger than the 2 inner side ones; the lip is variously lobed, usually very convex and velvety, and not spurred. The column is long; the rostellum is 2-lobed, and projects over the stigma, but not beyond the anther; the anther, which is wholly attached to the face of the top part of the column, is 2-celled, each cell containing a stalked pollen-mass attached to a separate gland, each gland being contained in a distinct pouch, one in each lobe of the rostellum; the pollen is waxy and coherent; the stigma is situated immediately below the anther; and the seedcase is twisted. Leafy herbs with roundish tubers.

Lip of the perianth as broad as long, and about the same length as the other perianth-lobes, velvety and convex, not spurred.

- (1) Bee Orchid. (*Óphrys apif'era*.)—Lip 5-lobed, central lobe very small, narrow, pointed, reflexed; column beaked over anther.
- (2) Late Spider Orchid. (*Óphrys fuciflóra*.)—Lip 5-lobed, central small lobe heart-shaped, flat, bent inwards, green; column erect, or slightly beaked.

- (3) Spider Orchid. (*Ophrys sphegodes*.)—Lip obscurely 3-lobed, central lobe broad, entire or notched, with or without a central point; column erect, or slightly beaked.

Lip much longer than broad, much longer than the outer perianth-lobes, flat, not spurred,

- (4) Fly Orchid. (*Ophrys muscifera*.)—Lip 3-lobed, central lobe long, hanging, and notched; 2 inner and upper perianth-lobes erect, thread-like, hairy; column not beaked.

1. Bee Orchid. (*Ophrys apifera*. Hudson.)—As just described. A very singular and beautiful plant, which is especially interesting, as it is usually said to be the only British orchid which fertilises itself, though I have observed the Fly Orchid to do the same. This self-fertilisation is brought about by the weight of the mature pollen-bags being sufficient to bend their remarkably long slender stalks (caudicles) into such a position that they can touch the stigmatic surface. Darwin's experiments proved that wind was necessary to procure fertilisation, as certain specimens placed in a still room, though with the pollen suspended in front of the stigmas, never matured fruits. The flowers are large, generally about 3-6 in a loose cluster; the bracts are leafy, usually longer than the seedcase and sometimes longer than the flowers; the 3 outer perianth-lobes are egg-shaped (ovate) and pointed, pink, mauve, flesh-colour, or nearly white inside, and greenish outside; the 2 side inner perianth-lobes are strap-shaped, much smaller and narrower than the outer ones, and the lip is broad, velvety, very convex, 5-lobed; the side lobes are very hairy, and the 3 middle ones are turned back under the convex lip, the central one being very small, narrow, pointed and reflexed; the whole lip is of a dark maroon-purple, marked with pale yellow, and bears a remarkable similarity to the insect from which it receives its name; the column is erect and is beaked over the anther; the stem is generally about 1 foot high, and the leaves are oblong and mostly from the root (radical). [Plate 51.]

Rather rare. In dry pastures and open places on chalk and limestone; generally distributed in the south and east of England, in the south and middle of Ireland, but not found in Scotland. June—July. Perennial.

2. Late Spider Orchid. (*Ophrys fuciflora*. Reichb.)—A very similar species to the last, differing in the lip (labellum) being browner and longer, with the central minute lobe flat, bent inwards, rather heart-shaped, and green, and in the column being straight or beaked over the anther. (*Ophrys arachnites*. Lamarck; under *Ophrys apifera*. Benth. and Hook.)

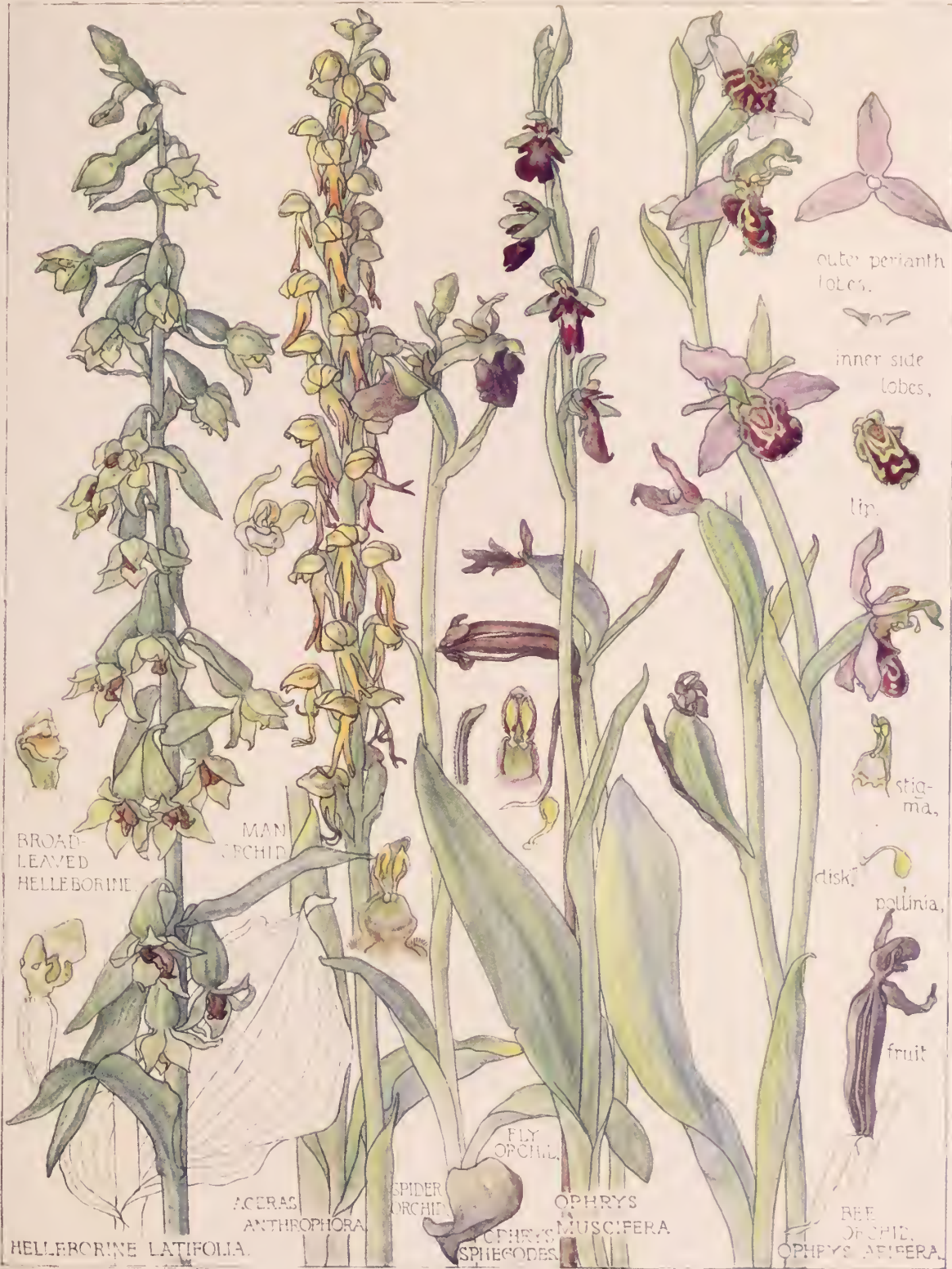
Very rare, local. On chalk downs at Folkestone in Kent and Sittingbourne in Surrey. April—June. Perennial.

3. Spider Orchid. (*Ophrys sphegodes*. Mill.)—A similar species to the Bee Orchid (*Ophrys apifera*), but usually smaller, the flowers generally fewer, the outer perianth-lobes of a pale yellowish-green, the lip (labellum) longer, obscurely 3-lobed, the central lobe being broad, entire or notched, with or without a central point, and all the lobes only slightly turned under, the beak of the column erect and not beaked over the anther. (*Ophrys aranifera*. Hudson.)

[Plate 51.]

Rare. On downs and open places, in chalk and limestone soils, in the south and east of England. April—June. Perennial.

4. Fly Orchid. (*Ophrys muscifera*. Hudson.)—A much more slender species than the preceding with smaller flowers, generally only 3 or 4 in a slender spike; the bracts are leafy the lower ones usually very much longer than the seedcase; the 3 outer perianth-lobes are oblong or narrowly egg-shaped (ovate), spreading, and of a fresh pale green; the 2 side inner lobes are





much smaller and narrower, thread-like, owing to the rolling in of the edges (involute), erect, hairy, purple, and somewhat resemble the antennæ of a fly; the lip (labellum) is much longer than the outer perianth-lobes, oblong, 3-lobed, the long middle lobe notched more or less deeply and hanging down, of a brownish-purple with a pale blue or whitish mark in the middle; the column is not beaked. The slender stem is 6 inches to 1 foot high; the leaves are narrow, oblong, larger at the base and graduating into bracts high up the stem; the tubers are undivided and roundish. [Plate 51.

Uncommon. On downs and dry pastures, on chalk and limestone; generally distributed in the east and south-east of England, and found in various other counties, as far north as Westmorland and Durham; not found in Scotland; and rare in Ireland. May—June. Perennial.

XIV. ORCHID. (OR'CHIS. Linn.)—Flowers handsome, stalkless (sessile), hooded, spurred, in a terminal spike; the lip (labellum) lowermost (inverted), owing to the twisting of the seedcase. The outer perianth row of 3 lobes, similar to the 2 side lobes of the inner perianth, and forming with them a hood over the column; the lip (labellum) 3-lobed, spurred at the base, with the honey secreted between the layers of tissue. Column long; extended into a rostellum on which is placed the anther, which is wholly attached to the face of the column; the rostellum projects beyond the bases of the anther-cells; the anther is 2-celled, each cell containing a stalked pollen-mass, usually attached to a separate gland, but rarely to one common gland which is concealed in the pouch of the rostellum; pollen waxy and coherent; stigma immediately below the rostellum, sometimes 2-lobed; seedcase twisted. Herbs with the leaves mostly from the root, stalkless (sessile), and sheathing, and with tuberous roots, which are sometimes lobed.

Lip 3-lobed; pollen-masses attached to one gland; tubers undivided

- (1) Lizard Orchid. (*Or'chis hircina*.)—Lip strap-shaped, very long, central lobe ribbon-like, very long and twisted; spur very short and blunt.
- (2) Pyramidal Orchid. (*Or'chis pyramidális*.)—Lip with almost equal blunt oblong lobes and 2 short blunt teeth at the base; spur very long and slender, longer than seedcase.

Lip 4-lobed, with a minute tooth between the middle lobes; other 5 perianth-lobes hooded; spur short; each stalked pollen-mass attached to a separate gland; tubers undivided.

- (3) Dwarf Dark-winged Orchid. (*Or'chis ustuláta*.)—Flowers dark purple before open, becoming white; hood dark purple, lip white; spur very short, one-quarter as long as seedcase.
- (4) Great Dark-winged Orchid. (*Or'chis purpúrea*.)—Hood dark purple; lip white with raised red dots; middle lobe broad; spur short, half as long as the seedcase.
- (5) Military Orchid. (*Or'chis militáris*.)—Hood pale pink; lip white with raised red dots; middle lobe broadish; spur short, half as long as the seedcase.
- (6) Monkey Orchid. (*Or'chis sim'ia*.)—Hood dark red; lip white, lobes narrow, strap-shaped, and red; spur short, half as long as seedcase.

Lip 3-lobed, lobes broad and short; spur long, as long as the seedcase; each stalked pollen-mass attached to a separate gland.

- (7) Green-winged Meadow Orchid. (*Or'chis mório*.)—Flowers few, hooded; 2 outer lobes veined, greenish; lip broader than long; tubers undivided.
- (8) Early Purple Orchid. (*Or'chis mas'cula*.)—Flowers not hooded, 3 upper lobes arched; lip as broad as long; bracts narrow, 1-veined; leaves often spotted; tubers undivided.

- (9) Lax-flowered Orchid. (*Or'chis laxiflóra.*)—Like last but with rich red flowers; leaves not spotted; bracts broad 3-5-veined.
- (10) Crimson Marsh-Orchid. (*Or'chis incarnáta.*)—Flowers not hooded, 3 upper lobes arched; lip slightly lobed; leaves hooded at apex; tubers lobed.
- (11) Spotted Orchid. (*Or'chis maculáta.*)—Flowers not hooded, 3 upper lobes arched; lip with central lobe longer and narrower than side ones; spur shorter than seedcase; tubers lobed.
- (12) *Or'chis ericetórum.*—Like species 11, but with the central lobe of the lip shorter and narrower than the side ones.
- (13) Broad-leaved Marsh-Orchid. (*Or'chis latifólia.*)—Like species 11, but with purple-rose flowers with thick blunt spurs.

1. Lizard Orchid. (*Or'chis hircína.* Crantz.)—As just described. The flowers are large and numerous, in a rather loose spike, and have a very disagreeable odour; the bract at the base of each flower is longer than the seedcase; the 5 similar perianth-lobes are green tinged with purplish-red; the lip (labellum) is strap-shaped, and has 3 ribbon-like lobes which are spirally coiled in bud, with the middle lobe very long and twisted; the whole lip is $1\frac{1}{2}$ inches or more long, and has a very short blunt spur at the base; it is of a greenish-white colour spotted with purplish-red; the 2 stalked pollen-masses are attached to a common gland in the pouch of the rostellum; the stem is tall and stout, 1-3 feet high, and leafy, with broadly oblong leaves; and the tubers are undivided and roundish. [Plate 52.]

Very rare. In bushy places on chalk hills in Kent, Surrey, and Suffolk. May—July. Perennial.

2. Pyramidal Orchid. (*Or'chis pyramidális.* Linn.)—This species has flowers of a deep rich rose-colour in a dense pyramidal spike, 1-3 inches long; the bracts are coloured, 3-veined, and about the same length as the seedcase; the 5 similar perianth-lobes are lance-shaped, and the lip (labellum) is lobed into 3 oblong, nearly equal segments, with 2 short blunt teeth at the base, protecting the opening to the spur; the spur is very long and slender, longer than the seedcase; the 2 stalked pollen-masses are attached to a common gland in the pouch of the rostellum. [As described in the genus *Orchis.*] The stem is 1-2 feet high, slender, and with narrow, lance-shaped, pointed leaves arising chiefly from the root, which is a roundish undivided tuber. [Plate 52.]

Not uncommon. On downs, banks, and pastures, on chalk or limestone; common in England in such districts; very rare in Scotland, and then only in southern Scotland, where it occurs in two or three localities; not uncommon in Ireland. July—August. Perennial.

3. Dwarf Dark-winged Orchid. (*Or'chis ustuláta.* Linn.)—A small plant with numerous small flowers, of a red-purple and white, in a dense oblong spike; the bracts are half as long as the seedcases; the 5 similar perianth-lobes form a hood over the column and are of a dark red-purple at first, but become paler as the flower opens and are white before they fade, so, as the lowermost flowers open first, the spike is nearly white below and of a dark red-purple above, giving the cluster a strange appearance, which has been likened to that of a burnt stick, and accounts for its scientific name; the lip is white dotted with purple, deeply 3-lobed with the central lobe larger and 2-lobed and with a small tooth between the 2 lobes, and the base is prolonged into a very short spur, about $\frac{1}{4}$ as long as the seedcase; the 2 pollen-masses are stalked and each attached to a separate gland, both glands being contained in the pouch of the rostellum. [As described in the genus *Orchis.*] The stem is seldom more than 6-8 inches high, and has few leaves, which are oblong and pointed; the roots are undivided. [Plate 52.]



LIZARD ORCHID.

ORCHIS HIRCINA.

MONKEY ORCHID

ORCHIS SIMIA.

PYRAMIDAL ORCHID

ORCHIS PYRAMIDALIS.

DWARF DARK-WINGED ORCHID

ORCHIS USTULATA

GREAT DARK-WINGED ORCHID.

ORCHIS PURPUREA.

Rare, local. Upland pastures on chalk and limestone; distributed throughout England, but not found in Scotland or Ireland. May—June. Perennial.

4. Great Dark-winged Orchid. (*Or'chis purpúrea*. Huds.)—Flowers numerous, in a dense oblong spike; bracts about one-quarter as long as the seedcase, the 5 similar perianth-lobes forming a dark purple hood; the lip whitish, with raised red dots, 3-lobed, the terminal lobe broad, divided, and with a small tooth between the segments, the spur blunt, about half as long as the seedcase; the 2 stalked pollen-masses each attached to a separate gland contained in the rostellum pouch. This species resembles the Dwarf Dark-winged Orchid (*Orchis ustulata*) in its colouring, as the upper part of the spike is very dark when in bud, only shewing the dark purple perianth-lobes, and is lighter below where the flowers are out, though never so light as the Dwarf Dark-winged Orchid. The stem is stout and tall, 1–3 feet high, and the leaves are rather narrow. (*Under Orchis militaris. Benth. and Hook.; Orchis fusca. Jacq.*) [Plate 52.]
Very rare. On chalky, bushy hills in Kent. June. Perennial.

5. Military Orchid. (*Or'chis militáris*. Linn.)—Flowers numerous, in a dense oblong spike; the bracts short, about one-quarter as long as the seedcase; the 5 similar perianth-lobes egg-shaped, pointed, forming a hood over the column, of a pale purplish-pink, the lip (labellum) whitish, tinged with purple and dotted with raised rough red points, 3-lobed, the terminal lobe divided and with a conspicuous tooth between the 2 lobes, prolonged into a short blunt spur, about half as long as the seedcase; the 2 stalked pollen-masses each attached to a separate gland, both glands being contained in the pouch of the rostellum. [As described in the genus *Orchis*.] The stem is 1–2 feet high; the leaves, which are chiefly in the lower part of the plant, are broadly oval or oblong; and the tubers are undivided.

Very rare, local. In hilly pastures and on the edges of woods, on chalk, in Berkshire, Oxfordshire, Buckinghamshire, and Hertfordshire. May. Perennial.

6. Monkey Orchid. (*Or'chis sim'ia*. Lamarck.)—A similar species to the Military Orchid (*Orchis militaris*), but with the flowers having a dark red hood, and a spotted white lip (labellum) with narrow strap-shaped red lobes, the side lobes being as long as the middle ones. (*Under Orchis militaris. Benth. and Hook.*) [Plate 52.]
Very rare. On the edges of woods and fields on chalk hills, in Berkshire, Oxfordshire, and Kent. May. Perennial.

7. Green-winged Orchid. (*Or'chis mório*. Linn.)—Flowers few, rich purple, rarely pink or white, in a rather loose spike; the bracts pinkish and about as long as the seedcase; the 5 similar perianth-lobes blunt, with green veins, forming a hood over the column; the lip paler in the middle, spotted with purple, broader than long, 3-lobed, and the spur long, straight, and very blunt, nearly as long as the seedcase; the 2 stalked pollen-masses each attached to a separate gland, both glands being contained in the pouch of the rostellum. [As described in the genus *Orchis*.] The stems 6–12 inches high, with a few narrow leaves low down, and sheathing bracts above; the tubers roundish and undivided. [Plate 53.]
Common in meadows in the south of England, more rare towards the north, not found in Scotland, and rare in Ireland. May—June. Perennial.

8. Early Purple Orchid. (*Or'chis mas'cula*. Linn.)—This is the commonest orchid found in our meadows. The flowers vary in colour from a purplish-red to pink and white, spotted with red; they are arranged in a loose cluster; the bract at the base of each flower is about as long as the seedcase and is 1-nerved; the 2 side perianth-lobes are spreading, the upper ones somewhat hooded, about the same length as the lip (labellum) which is as broad as long, 3-lobed, and prolonged at the base into a long blunt spur about as long as the ovary; the 2 stalked pollen-

masses are each attached to a separate gland, both glands being contained in the pouch of the rostellum. [As described in the genus *Orchis*.] The stem is 8 inches to 2 feet high, and the leaves are lance-shaped, blunt, and usually with purple-black spots; the tubers are undivided.

[Plate 53.]

Common. In pastures, woods, and shady places; universally distributed throughout the British Isles. April—June. Perennial.

9. Lax-flowered Orchid. (*Orchis laxiflora*. Lamarck.)—A very similar species to the Early Purple Orchid (*Orchis mascula*), but with larger rich red flowers, in a looser cluster; much broader 3-5-veined bracts; all the perianth-lobes spreading away from the column; and the leaves narrow and not spotted.

Very rare. In wet meadows and marshy places. Only found in the Channel Isles and on ballast heaps at Hartlepool. May—June. Perennial.

10. Crimson Marsh-Orchid. (*Orchis incarnata*. Linn.)—Flowers numerous, dark rose-colour or pale purple, spotted and streaked with a darker shade, in a dense oblong tapering spike, $2\frac{1}{2}$ –9 inches long; the bracts 3-veined, usually longer than all the flowers, but sometimes shorter than the upper ones; the 3 upper perianth-lobes not hooded but arching over the column, the 2 side ones erect, and the lip 3-lobed, the middle lobe small and a little longer than the side lobes, with a broad thick spur nearly as long as the seedcase; the 2 stalked pollen-masses attached each to a separate gland, both contained in the pouch of the rostellum. [As described in the genus *Orchis*.] The stem 9 inches or more high, hollow, and leafy; the leaves erect, narrow, lance-shaped, hooded at the top, and with a broad base, usually not spotted; tubers divided into 2 or 3 finger-like lobes. (*Under Orchis latifolia*. Benth. and Hook.)

[Plate 53.]

Common. In marshes and wet meadows, generally distributed, especially in the south of England. June. Perennial.

11. Spotted Orchid. (*Orchis maculata*. Linn.)—Flowers pale lilac or white, spotted and lined with darker purple, in a dense oblong tapering spike; the bracts 3-veined, usually a little shorter than the flowers or the same length; the 2 side perianth-lobes turned back, the 3 upper not hooded but arching over the column, and the lip deeply 3-lobed, the central lobe longer and narrower than the side ones, and the spur shorter than the seedcase; the 2 stalked pollen-masses each attached to a separate gland, both glands being contained in the pouch of the rostellum. [As described in the genus *Orchis*.] The stem is usually about a foot high, solid, and slender; the leaves are spreading, usually spotted with purplish-black; the lower ones are oval and larger and gradually taper up the stem into smaller, pointed, lance-shaped ones; the tubers are divided into finger-like lobes.

[Plate 53.]

Common. Meadows, pastures, and moist commons; generally distributed throughout England, Scotland, and Ireland. May—June. Perennial.

12. *Orchis ericetorum*. Linton.—A plant by some regarded merely as a variety of the preceding species, from which it differs in having a shorter and more pyramidal spike of flowers, 1–2 inches long, and in the corolla-lip being much more unequally lobed, the central lobe being much smaller and usually shorter than the broad side ones and in the whole plant being more slender, the leaves narrower, and all pointed, and with the margins more or less curved back.

Not uncommon. In meadows and pastures; in England, Scotland, and Ireland. Very probably often passed over as the Spotted Orchid (*O. maculata*). June—July. Perennial.

13. Broad-leaved Marsh-Orchid. (*Orchis latifolia*. Linn.)—A very similar species to the Spotted Orchid (*Orchis maculata*), but having purplish-rose flowers with a thick blunt spur,



SPOTTED ORCHID,

GREEN-WINGED ORCHID,

BROAD-LEAVED MARSH ORCHID,

ORCHIS MORIO.

EARLY PURPLE ORCHID,

pollenia

CRIMSON MARSH ORCHID,

ORCHIS MACULATA

ORCHIS MASCULA.

ORCHIS INCARNATA.

ORCHIS LATIFOLIA.



and the leaves spotted with ring-shaped spots, broadest near the middle and tapering to the base and spreading. [Plate 53.]

Not uncommon. In marshes; generally distributed throughout England, Scotland, and Ireland. May—June. Perennial.

XV. MUSK ORCHID. (HERMINIUM. R. Brown.)—Flowers small, numerous, stalkless (sessile), bell-shaped, in a terminal spike; the position of the lip (labellum) varies slightly, as in some instances the seedcase is more twisted than in others. The 3 outer perianth-lobes are erect and slightly curved inwards, as are the 2 side lobes of the inner perianth-row; the lip (labellum) is 3-lobed, and not spurred at the base, only slightly pouched. The column has the anther attached wholly to the upper part of the face, and the rostellum is not extended beyond the anther; the anther is 2-celled; each cell contains a very shortly stalked pollen-mass, and each stalk is attached to a large naked gland, nearly as large as the pollen-mass. Leafy herbs with roundish tubers.

Musk Orchid. (Herminium Monorchis. R. B.)—The only British species. As just described. A small plant with numerous, small, pale yellowish-green, bell-shaped flowers clustered in a rather dense slender spike; the bracts are about the same length as the seedcase; the 3 outer perianth-lobes are narrow and rather shorter than the inner row, contrary to that which is usual in orchids, and the 3 inner lobes are remarkable for their similarity, all being 3-lobed, the lip (labellum) differing very slightly from the 2 side lobes. The whole plant is small, usually about 6 inches high, with 2, rarely 3, oblong pointed root-leaves, and now and then 1, or even 2, smaller stem-leaves. [Plate 54.]

Rare, local. Downs and dry pastures on chalk and limestone; in some of the south-eastern counties of England; not found in Scotland or Ireland. June—July. Perennial.

XVI. HABENARIA. Willd.—A similar genus to the Orchis, but with the glands attached to the anther-cells naked, instead of being hidden in a pouch.

Flowers stalkless (sessile), hooded, spurred, in a terminal spike; the lip (labellum) lowermost (inverted), owing to the twisting of the seedcase. The outer perianth-row of 3 lobes, similar to the 2 side lobes of the inner perianth, spreading, or sometimes forming with them a hood over the column; lip (labellum) spurred. Column extended into a rostellum, on which is placed the anther and which sometimes projects between the bases of the anther-cells or forms a plate in front of them; anther, which is wholly attached to the face of the upper part of the column, 2-celled, each cell containing a stalked pollen-mass, each attached to a separate gland which is naked instead of being concealed in a pouch; the pollen is waxy and coherent; the stigma is situated immediately below the rostellum; the seedcase is twisted. Leafy herbs with the tubers entire or lobed.

Rostellum prolonged beyond the bases of the anther-cells.

- (1) Sweet-scented Orchid. (*Habenaria conopsea*.)—Flowers lilac; lip with 3 equal lobes; spur long and slender, twice as long as the seedcase.
- (2) Small White Orchid. (*Habenaria alba*.)—Flowers white; lip with 3 unequal lobes; spur short and thick, not half as long as the seedcase.

Rostellum extended into a plate in front of the anther with 2 crescent-shaped lobes.

- (3) Dense-flowered Orchid. (*Habenaria intacta*.)—Flowers pink; with 3 unequal lobes; spur short.

Rostellum not prolonged beyond the anther.

- (4) Frog Orchid. (*Habenaria viridis*.)—Flowers green ; lip hanging, 3-lobed with the middle lobe the shortest ; spur very short and blunt, about one-fourth as long as the seedcase.
- (5) Lesser Butterfly Orchid. (*Habenaria bifolia*.)—Flowers white ; lip hanging, entire ; spur very long, twice as long as the seedcase ; pollen-cells parallel.
- (6) Greater Butterfly Orchid. (*Habenaria virescens*.)—Flowers white ; lip hanging, entire, spur very long, twice as long as the seedcase ; pollen-cells twice as near at apex as base.

1. Sweet-scented Orchid. (*Habenaria conopsea*. Benth.)—As just described. A plant with sweet scented reddish or deep lilac flowers in a long tapering spike, very like those of the Pyramidal Orchid (*Orchis pyramidalis*) but smaller, more lilac, and with a still longer spur. The bract at the base of each flower is leafy, 3-veined, and as long as or longer than the flower ; the lip (labellum) is about as long as broad, with 3 equal lobes, and the spur is very slender, long, and pointed, about twice as long as the seedcase ; the rostellum is prolonged between the glands of the anther-cells ; the stem is 1-2 feet high ; the leaves are narrowly lance-shaped ; and the tubers are lobed. (*Gymnadenia conopsea*. R. Brown.) [Plate 54.]
Common. Upland pastures and heaths ; generally distributed throughout England, Scotland, and Ireland. June—July. Perennial.

2. Small White Orchid. (*Habenaria albida*. R. Brown.)—Flowers small, fragrant, yellowish-white, in a dense 1-sided spike ; the bracts rather leafy, 3-veined, as long as or a little longer than the seedcase ; the 5 similar perianth-lobes hooded, the lip with 3 unequal lobes and a thick short spur not half the length of the seedcase ; the rostellum prolonged between the bases of the pollen-cells. [As described in the genus *Habenaria*.] The stem 6-12 inches high, rarely much more than 6 inches ; the lower leaves oblong and blunt, and the upper lance-shaped and pointed ; the root of several fleshy fibres. (*Gymnadenia albina*. L. C. Richard.)
Uncommon, rather local. Hilly pastures in Wales and the northern counties of England ; common in Scotland and Ireland. June—August. Annual.

3. Dense-flowered Orchid. (*Habenaria intacta*. Benth.)—A small and extremely rare species with delicate pink flowers ; the lip unequally lobed and shortly spurred ; the rostellum rolled inwards and looking like a pouch protecting the bases of the anther-cells ; and a remarkable stigma which is extended into a plate in front with two crescent-shaped lobes ; the stem is 6-12 inches high, the leaves are broadly oblong and usually spotted ; and the tuber is 2-lobed. (*Neotinea intacta*. Reichenbach.)
Very rare. Open limestone pastures in Counties Clare, Galway, and Mayo. April—June. Perennial.

4. Frog Orchid. (*Habenaria viridis*. R. Br.)—A species with rather larger pale green flowers in a loose spike ; the bracts leafy, as long as the flower or longer ; the 3 outer perianth-lobes broadly egg-shaped, and the 2 inner narrower, in a roundish hood, the lip hanging, long, strap-shaped, with 3, rarely 2, short pointed lobes at the tip, pale green tinged with brown, the spur very short and blunt, only one-fourth or one-third as long as the seedcase ; the rostellum not extended beyond the base of the anther. [As described in the genus *Habenaria*.] The stem is 4-8 inches high ; the leaves are oblong, blunt at the base, and narrower and more pointed higher up ; and the tubers are lobed. [Plate 54.]
Rather local. Hilly meadows and pastures ; generally distributed but more common in the north of England, Scotland, and Ireland. June—August. Perennial.

5. Lesser Butterfly Orchid. (*Habenaria bifolia*. R. Br.)—A beautiful species, though not in the least resembling a butterfly, as its name would imply. The flowers are large, pure white tinged with green, sweet scented, in a long loose spike; the 2 side lobes of the outer perianth-row are spreading, but the upper lobe, together with the 2 side lobes of the inner row, form a hood over the column; the lip (labellum) is strap-shaped, long, hanging, and undivided, and the spur is very long and slender, about twice as long as the seedcase; the 2 anther-cells are parallel and have short stalks; the rostellum is not extended beyond the base of the anther. [As described in the genus *Habenaria*.] The stem is 1-1½ feet high and has 2 broadly oblong blunt leaves at the base, and a few small narrow pointed ones, resembling the bracts, up the stem; the tubers are entire.

Common. Moist heaths, meadows, and pastures; generally distributed throughout England, Scotland, and Ireland. June—July. Perennial.

6. Greater Butterfly Orchid. (*Habenaria virescens*. Druce.)—A very similar species, but larger and stouter in all ways; the flowers are larger, the spur thicker, and the anther-cells twice as distant at the base as at the apex and with long stalks. (*Habenaria chloroleuca*. Ridley; *Habenaria chlorautha*. Bab.; *Habenaria montana*. Durand and Schinz.; under *Habenaria bifolia*. Benth. and Hook.) [Plate 54.

Common. Moist meadows and pastures; generally distributed throughout the British Isles. July—August. Perennial.

THE IRIS FAMILY

[ORDER LXXX. IRIDACEÆ]

PERIANTH of 6 lobes, united at the base into a tube, the 6 lobes in 2 rows which are often unequal, the tube partially adhering to the seedcase (superior).

STAMENS 3, the anthers turned away from the stigma and opening towards the perianth-lobes (extrorse), inserted on the base of the outer lobes of the perianth, or on the top of the seedcase (epigynous).

PISTIL of 3 **CARPELS**, uniting into a 3-celled seedcase which adheres to the perianth-tube, and 1 style which is terminated with 3 stigmas, dilated and often petal-like or fringed.

FRUIT a capsule, 3-celled, many-seeded, opening down the middle of the cells (loculicidally) by 3 valves.

FLOWERS showy, brightly coloured, enclosed when in bud in a sheath (spathe) which remains round the stalks and is often membranous, in various clusters or solitary.

LEAVES long, narrow, parallel-veined, and often sword-shaped, either all from the root (radical) or closely packed on opposite sides of the stem with the edges overlapping (equitant).

ROOTS fleshy, bulbs, or tubers, or thick and shortly creeping.

DISTINGUISHED from the Amaryllis and Lily tribes, which both have a 6-lobed, petal-like perianth, by only having 3 stamens with their anthers turned towards the perianth, and by the dilated stigmas.

THE Iris Tribe is easily recognised from other British families of Monocotyledons which have a 6-lobed perianth by the presence of 3 stamens only, instead of 6, and by the anthers which are turned away from the stigmas and burst outward, so that the insects visiting the honey-glands, which are situated outside the circle of stamens, shall get dusted with pollen to carry to the stigmas of another flower. The structure of the stigmas, too, is peculiar, as in most genera they are large and petal-like; even in the Crocus they are really widened, though they are so rolled up that it is not evident unless you unroll them.

It is a large order, widely distributed over the world, more abundant in dry warm countries, such as Cape Colony. There are found innumerable species of *Ixia*, *Gladiolus*, *Tigridia*, *Ferraria*, *Watsonia*, *Babiana*, &c., which, as soon as the rains begin, help to cover the bare ground with green foliage and gaily coloured flowers. Many of these are cultivated in England. The Iris has been the subject of many experiments and wonderful hybrids are produced.

Many Continental species of Iris are cultivated in gardens, as are those of the Crocus and *Gladiolus*.

One species of Crocus, the Saffron Crocus (*Crocus sativus*), has wide rolled-up stigmas which are so heavy that the style cannot hold them erect, and they hang like a tassel outside the flower. These stigmas, dried and powdered, are the Saffron used in cooking and dying. Orris-root powder, used in dentistry, is obtained from the roots of several species of Iris native to the countries bordering the Mediterranean.



- I. IRIS. Perianth of 3 large and 3 small lobes ; stigmas petal-like, arching over stamens.
 II. CRÓCUS. Perianth of 6 nearly equal lobes with a very long tube ; stigmas dilated, cut or fringed.
 III. ROMULÉA. Perianth of 6 nearly equal lobes ; stigmas slender, 2-lobed.
 IV. BLUE-EYED GRASS (SISYRIN'CHIUM.)—Perianth of 6 nearly equal lobes, with a very short tube ; stigmas slender, entire.
 V. GLADÍOLUS. Perianth almost 2-lipped ; stigmas dilated, entire.

I. IRIS, FLAG. (IRIS. Linn.)—Flowers large, brightly coloured, few, in branched clusters. Perianth 6-lobed, the 3 outer ones large, spreading or turned back, the tube adhering to the seedcase ; stamens 3, with the anthers turned away from the stigmas and opening towards the perianth-lobes (extrorse), inserted on the base of the outer perianth-lobes ; carpels 3, uniting into a seedcase and a short thick style which is branched into 3 broad petal-like stigmas which arch over the stamens ; fruit a leathery or parchment-like capsule, 3-celled, and opening from the top by 3 valves to free the seeds, which are usually enclosed in a fleshy substance and look like little berries. Herbs with sword-shaped (ensiform) parallel-veined leaves, either all from the root (radical) or closely packed on opposite sides of the stem with the edges overlapping (ensiform) ; and a thick creeping root.

- (1) Stinking Iris. (Iris fœtidis'sima.)—Flowers purplish-blue or yellowish-white, in clusters, stigmas yellowish ; seeds red.
 (2) Iris spúria.—Outer perianth-lobes roundish, stigmas violet.
 (3) Yellow Iris. (Iris Pseudac'orus.)—Flowers bright yellow, in clusters ; seeds brown.
 (4) *Tuberous Iris. (Iris tuberósa.)—Flowers purple, solitary.

1. Stinking Iris, Gladden, Roast-beef Plant. (Iris fœtidis'sima. Linn.)—As just described. The flowers are about 3 inches across, pale purplish-blue or rarely yellowish-white, 2 or 3 together in the terminal clusters, but usually only 1 in the side branches ; the stigmas are yellowish ; the berry-like seeds are bright scarlet and remain in the open capsule all the winter. The stem is 1-2 feet high, compressed ; and the leaves are sword-shaped, deep green, and rather shining. The whole plant has a most disagreeable smell when bruised. [Plate 55.
 Not uncommon. In woods and thickets ; generally distributed throughout the south of England, especially on chalky soil, rare in the north, naturalised in a few places in Scotland, and rare in Ireland. May—August. Perennial.

2. Iris spúria. Linn.—A species with the outer perianth-lobes roundish, the inner lobes and the stigmas violet, the capsules terminating in a short point (apiculate), and the leaves narrow. Very rare. In marshes at Huttoft, Lincolnshire.

3. Yellow Iris. (Iris Pseudac'orus. Linn.)—A similar plant to the Stinking Iris (Iris fœtidissima), only altogether stouter and with bright yellow flowers, 3-4 inches across, in clusters of twos or threes ; green capsules with numerous pale brown berry-like seeds, the outer covering of which soon dries ; stems 2-5 feet high, rounder than in the Stinking Iris ; and pale green leaves broadly lance-shaped and covered with a bluish bloom (glaucous). Common. By the sides of rivers and streams, by pools and ditches, and in marshes ; throughout England, Scotland, and Ireland. May—August. Perennial.

4. *Tuberous Iris. (Iris tuberósa. Linn.)—A species with solitary purple flowers, 4-angled leaves, and tuberous roots. Not native, very rare. In orchards and by hedges ; naturalised at Penzance and Cork. May—June. Perennial.

II. CRÓCUS. Linn.—Flowers large and showy, purple, yellow, or white, funnel-shaped with a remarkably long perianth-tube, 4–5 inches long, which looks like a stalk, the seedcase remaining underground till after flowering, solitary, almost stalkless on the root and rolled in a membranous sheath (spathe). Perianth of 6 equal lobes which are bell-shaped (campanulate) and are united at the base into a very long straight tube, looking like a stalk; stamens 3, inserted on the base of the outer perianth-lobes; carpels 3, united into a seedcase which adheres to the perianth-tube and remains underground till after flowering, a remarkably long slender style, and 3 dilated stigmas which are cut or fringed or rolled in; fruit a capsule buried in the leaves, opening by 3 valves to free the round seeds. Herbs with a bulbous root enveloped in a fibrous covering, and all the leaves from the root, narrow, strap-shaped (linear), and often rolled back (revolute), parallel-veined, grass-like.

(1) *Spring Crocus. (*Crócus officinális.*)—Flowers in the spring with the leaves; stigmas jagged.

(2) *Autumn Crocus. (*Crócus nudiflorus.*)—Flowers in the autumn after the leaves; stigmas fringed.

1. *Spring Crocus. (*Crócus officinális.* Huds.)—As just described. The flowers are purple or white, the perianth-tube is 3–6 inches long, the anthers are bright yellow, and the stigmas orange, dilated at the top and jagged but not fringed; all the leaves are from the root, narrow, with rolled-back margins, and white under sides, and are enclosed at the base in a tubular sheath of 2 or 3 thin membranous parts. (*Crocus vernus. All.*) [Plate 55.
Not a native, very rare. Naturalised in meadows at Nottingham, Mendham in Suffolk, and Hornsey in Middlesex. March. Perennial.

2. *Autumn Crocus. (*Crócus nudiflorus.* Sm.)—A similar species with rather larger flowers opening in the autumn after the leaves are faded, rather paler and mauver than those of the Spring Crocus, and with the orange stigmas deeply cut into a fringe.
Not a native, very rare. Naturalised in meadows at Nottingham, Derby, and Warrington September. Perennial.

III. ROMULÉA. Maratti.—A genus very similar to the last, the principal difference being in the short perianth-tube. The flowers are often lilac or purple and are wrapt in a 2-lobed sheath (spathe). The perianth is of 6 lobes, united at the base into a tube which does not extend beyond the seedcase; stamens 3, erect, inserted in the throat of the perianth-tube; carpels 3, united into a short oval seedcase which adheres to the perianth-tube, a long thread-like style, and 3 narrow inrolled stigmas which are deeply lobed; capsule oval, opening by 3 valves. Small herbs with a bulbous root, which is enveloped in a smooth shining brown covering, and narrow grass-like parallel-veined leaves chiefly from the root.

Romuléa Colum'næ. Seb. and Maur.—The only British species. As just described. A very small plant with pale bluish-lilac flowers striped with darker purple, yellowish in the centre, and greenish outside, the perianth-lobes only $\frac{3}{8}$ inch long, 1, rarely 2 or 3 flowers on a short stalk 1–2 inches high, with long narrow grass-like leaves considerably overtopping the flowers. (*Trichonema Columnæ. Reich.*)

Very rare. Sandy links and pastures, chiefly near the sea; at the Warren at Dawlish and in the Channel Isles. March—May. Perennial.

IV. SISYRIN'CHIUM. Linn.—Flowers rather small, brightly coloured, in terminal clusters enclosed in 2-lobed sheaths (spathes). Perianth of 6 equal lobes, united into a short tube at the

base ; stamens 3, with the filaments either united into a tube round the style or only into a ring at the base, inserted on the perianth-tube ; carpels 3, united into a seedcase which adheres to the perianth-tube, a short style, and 3 narrow, rolled-in (involute), entire stigmas ; capsule roundish. Herbs with stems often 2-edged, sword-shaped (ensiform) parallel-veined leaves, and fibrous roots.

- (1) Blue-eyed Grass. (*Sisyrinchium angustifolium*.)—Flowers blue, perianth-lobes pointed.
 (2) *Sisyrinchium californicum*.—Flowers yellow, perianth-lobes blunt.

1. Blue-eyed Grass. (*Sisyrinchium angustifolium*. Mill.)—As just described. A pretty little plant which has delicate blue flowers with pointed perianth-lobes, 1-6 on slender stalks (pedicels) in a cluster terminating a long slender 2-edged stalk, 6 inches to 1 foot high, which is occasionally branched and is usually destitute of leaves, when they are all from the root, and are narrow, short, and sword-shaped, and looking very like the leaves of the Bog Asphodel (*Narthecium ossifragum*). (*Sisyrinchium Bermudiana*. Linn.)

The variety ***Sisyrinchium anceps***. Cav., which is the species drawn on Plate 55, is very similar, but it has broader leaves, more broadly winged stems, and one lobe of the spathe longer than the flowers. [Plate 55.

Very rare. In boggy places ; in Counties Kerry, Cork, Clare, and Galway. July—August. Perennial.

2. *Sisyrinchium californicum*. Ait.—A similar species, having clusters of 3-5 yellow flowers with dark veins and blunt perianth-lobes.

Very rare. In marshy ground ; in Rosslare, Wexford. June. Perennial.

V. GLADIOLUS. Linn.—Flowers showy, in long terminal 1-sided spikes, the base of each flower enclosed in a 2- or 3-lobed sheath (spathe). Perianth of 6 unequal lobes which are almost 2-lipped, united into a short tube at the base to which the seedcase adheres ; stamens 3, inserted on the perianth-tube ; carpels 3, united into a seedcase, a long thread-like style, and 3 dilated, entire stigmas ; capsule oval, 3-valved. Herbs with bulbous roots with a fibrous covering more or less netted, and leafy stems with sword-shaped (ensiform), parallel-veined leaves.

Gladíolus illyricus. Koch.—As just described. The only British species. The flowers are large, $1\frac{1}{4}$ - $1\frac{1}{2}$ inches long, of a rich crimson, the 3 lower lobes with a pale spot, 3-10 in a 1-sided spike ; the capsule is short, oblong, with 3 prominent angles ; the stems are $1\frac{1}{2}$ -2 feet high, with short, narrow, very pointed leaves, and small bulbs with numerous bulbils about the size of a hemp seed.

Very rare. Among bracken ; in the New Forest and the Isle of Wight. June—July. Perennial.

THE AMARYLLIS OR NARCISSUS FAMILY

[ORDER LXXXI. AMARYLLIDACEÆ]

THE Narcissus Family has many characteristics of both the Iris and Lily tribes, but is easily recognised from the former by having 6 stamens and from the latter by the perianth-tube being united with the seedcase. Only three genera are represented in the British Isles.

It is a large and beautiful order of bulbous plants, widely distributed over the world, but it thrives best in hot sunny dry countries, and produces wonderful flowers in Cape Colony, Brazil, and the East and West Indies.

Many species are cultivated in greenhouses and gardens. The Scarlet Amaryllis grown in greenhouses is a common favourite, also the Belladonna Lily (*Amaryllis Belladonna*) of Cape Colony, the golden Sternbergia, the deep red Nerines with among them the Guernsey Lily (*Nerine sarniensis*), the white and crimson Crinums, and the sharp-leaved *Alstromeria* from Chili. Various species of *Narcissus*, which we know as Daffodils, *Narcissus*, and Jonquils, are cultivated in gardens. The parent species of *Narcissi* from which varieties are obtained are natives of southern Europe and Asia. Snowdrops are common in every garden.

The Century plant (*Agave americana*) of Mexico, often but erroneously called Aloe, produces one of the largest clusters of flowers known in the vegetable world. It is a strange plant with a rosette of stiff spiny leaves and a short stumpy stem. For 20 or 30 years, or as some say 100, the plant remains in much the same condition. Then a long thick stem, 10-20 feet high, arises from the centre of the rosette of leaves, which terminates in a huge flower-cluster bearing thousands of greenish flowers, which secrete so much honey that it drips on to the ground below. As soon as the fruits have ripened and the seeds dispersed the stem and leaves die away. In Mexico this plant is largely cultivated for the sake of the juice secreted in the flowering stem, which is converted into a sparkling fermented drink called pulque, and also for its leaves which yield a fibre useful for making paper and cord. Other species of the same genus—*Agave vivipara* and *Agave sisalana*—also yield valuable fibres.

- I. DAFFODIL (*NARCIS'SUS*). Perianth of 6 nearly equal lobes, and a long tube, which is prolonged into a trumpet- or cup-shaped crown.
- II. SNOWDROP (*GALAN'THUS*). Perianth of 6 lobes, 3 outer twice as long and more spreading than the 3 inner; anthers opening by pores at the tip.
- III. SNOWFLAKE (*LEUCÓJUM*). Perianth of 6 nearly equal lobes; anthers opening by slits.

THE AMARYLLIS & NARCISSUS FAMILY (ORDER LXXXI) AMARYLLIDACEAE.



PERIANTH of 6 lobes, united at the base into a tube, which adheres to the seedcase (superior), and separating into 5 lobes, sometimes with a tubular crown at the mouth of the tube.

STAMENS 6, the anthers bursting inwards or transverse, inserted in the perianth-tube, and opposite the lobes, on a disk above the seedcase (epigynous).

PISTIL of 3 CARPALS united into a 3-celled seedcase adhering to the perianth-tube (inferior), 1 style, and 1 or 3 stigmas.

FRUIT a capsule, 3-celled, many seeded, opening by 3 valves down the middle of the cell-walls (loculicidally) or rarely a 1-3-seeded berry.

FLOWERS showy, solitary, or in a cluster all the stalks of which rise from the same point on a leafless stalk from the root, or more rarely in a long or branched cluster (raceme or panicle).

ROOTS generally bulbous.

LEAVES narrow, strap- or sword-shaped (linear or ensiform), with parallel veins, all from the root (radical).

DISTINGUISHED from the Iris Tribe, which in other respects it resembles,

by the 6 stamens & the anthers bursting inwardly

VERNUM & from the Lily Tribe by the seedcase adhering to the perianth-tube.

COMMON DAFFODIL
NARCISSUS PSEUDO-NARCISSUS

SPRING SNOWFLAKE
LEUCON

SNOW-DROP

pistil

stamens

perianth lobes

fruit

SNOW-DROP

I. DAFFODIL. (NARCIS'SUS. Linn.)—Flowers showy, white or yellow, enclosed in bud in a membranous sheath (spathe), solitary on a leafless stalk from the root (scape), or several together in a cluster, all the stalks rising from the same point at the top of the main stalk (in an umbel). Perianth of 6 nearly equal lobes, in 2 rows, united at the base into a long tube, the mouth of which is prolonged into a tubular or cup- or saucer-shaped crown usually scalloped at the edge; stamens 6, included in the perianth-tube, on which they are inserted in 2 rows; carpels 3, united into a seedcase which adheres to a small portion of the perianth-tube, a long style and an undivided stigma; fruit a capsule. Herbs with bulbous roots, and narrow strap-shaped (linear) leaves with parallel veins.

- (1) Common Daffodil. (*Narcis'sus Pseudo-narcis'sus.*)—Flowers pale yellow; crown long, trumpet-shaped, yellow.
- (2) *Short-crowned Daffodil. (*Narcis'sus incomparabilis.*)—Flowers pale yellow; crown short, cup-shaped, yellow.
- (3) *Two-flowered Narcissus. (*Narcis'sus biflorus.*)—Flowers whitish, usually 2 together; crown saucer-shaped, yellow.
- (4) *Poet's Narcissus. (*Narcis'sus poet'icus.*)—Flowers pure white; crown saucer-shaped, yellow with red edge.

1. Common Daffodil, Lent Lily, Daffy-Down-Dilly. (*Narcis'sus Pseudo-narcissus.* Linn.)—As just described. A well known and beautiful flower and the only true native belonging to this genus in the British Isles, with pale yellow perianth-lobes, and a large golden somewhat trumpet-shaped crown which is scalloped and wavy at the edge; each flower drooping and terminating a hollow stalk about 1 foot high and surrounded with narrow leaves about the same height. [Plate 56.]

Not uncommon. In pastures and woods; throughout England, though in the north doubtfully native, introduced into Scotland and Ireland. March—April. Perennial.

2. *Short-crowned Daffodil. (*Narcis'sus incomparabilis.* Mill.)—A species with a much shorter, more cup-shaped crown, otherwise resembling the Common Daffodil (*Narcissus Pseudo-narcissus*).

Not native. In meadows; naturalised near Thirsk in Yorkshire, and near Swansea. May. Perennial.

3. *Two-flowered Narcissus. (*Narcis'sus biflorus.* Curt.)—A species with whitish sweet scented flowers with a very short, saucer-shaped yellow crown with a jagged wavy margin, 1-3 together.

Not native. In meadows and orchards; naturalised in many places in the south and west of England, and in Ireland. April—May. Perennial.

4. *Poet's Narcissus. (*Narcis'sus poet'icus.* Linn.)—A species having solitary flowers with pure white perianth-lobes and a very short saucer-shaped yellow crown with a bright red margin.

Not native. In meadows and orchards; naturalised in Warwickshire, Norfolk, and Kent. May—June. Perennial.

II. SNOWDROP. (GALAN'THUS. Linn.)—A genus consisting of the one species:—

Common Snowdrop. (*Galan'thus nivális.* Linn.)—Flowers white, solitary, drooping, on a short stalk enclosed in a membranous sheath (spathe), terminating a slender stem from the root (scape) 6 inches or more high. Perianth of 6 lobes, in 2 rows, with a very short tube at the

base entirely united with the seedcase, the outer row of lobes oblong, entire, much longer and more spreading than the inner row, which are notched, erect, and sheathed with green at the tip; stamens 6, the pointed anthers opening at the tip by 2 pores, inserted on the seedcase (epigynous); carpels 3, united into a 3-celled seedcase, 1 style, and 1 stigma; fruit a capsule, opening down the middle of the cells by 3 valves (loculicidal). The root is bulbous and bears one flower and two narrow strap-shaped (linear), bluish-green leaves. [Plate 56.

Rare. In woods and thickets; naturalised in many parts, and possibly native in some places in the west of England; not naturalised in Scotland and Ireland. January—March. Perennial.

III. SNOWFLAKE. (LEUCÓJUM. Linn.)—A genus only differing from the Snowdrop (*Galanthus*) in the flowers being usually several together in a cluster (umbel), in all 6 perianth-lobes being nearly equal, and in the anthers opening by slits, not pores.

Flowers large, drooping, white, or tinged with pink, often with a green stain on the tip of the perianth-lobes, solitary or several together on short stalks enclosed in a membranous sheath, in a cluster all starting from the same point (umbel), terminating a stem from the root (scape). Perianth of 6 nearly equal lobes with greenish tips, united at the base into a short green tube entirely adhering to the seedcase (superior); stamens 6, the anthers opening lengthways by slits, inserted on the ovary (epigynous); carpels 3, united into a seedcase, 1 style, and 1 stigma; fruit a capsule, opening down the middle of the cells (loculicidally) by 3 valves. Herbs with bulbous roots and long narrow strap-shaped (linear) leaves with parallel veins.

(1) Summer Snowflake. (*Leucójum æstívum.*)—Flowers 2-6 together, in an entire sheath.

(2) Spring Snowflake. (*Leucójum ver'num.*)—Flowers 1-2 together, in a sheath 2-lobed at the tip.

1. Summer Snowflake. (*Leucójum æstívum. Linn.*)—As just described. The flowers are large and white in clusters (umbels) of 2-6 together, in an entire sheath, terminating a hollow 2-edged stalk, 9-18 inches high, with large blunt strap-shaped (linear) leaves about the same height.

Very rare. Wet meadows; in the south and east of England. May. Perennial.

2. Spring Snowflake. (*Leucójum ver'num. Linn.*)—A very similar species with 1 or only 2 flowers together in a sheath (spathe) which is 2-lobed at the tip, the whole plant being only 8-10 inches high. [Plate 56.

Very rare. On banks by hedges; near Bridport and Bicester. February—April. Perennial.



BLACK
BRYONY,

TAMUS COMMUNIS

male flowers
&
female
flower
magnified

sections
of fruit

202

2

THE YAM FAMILY

[ORDER LXXXII. DIOSCOREACEÆ]

PERIANTH of 6 lobes, in the male flowers united at the base into a ring, and in the female united into a tube which is combined with the seedcase (superior), and then separating into 6 lobes.

STAMENS 6 in the male flowers, inserted on the base of the perianth-lobes; absent or imperfect in the female flowers.

PISTIL of 3 **CARPELS** in the female flowers, united into a 3-celled seedcase which is combined with the perianth-tube (inferior), and separating into 3 styles terminating in 3 entire or rarely 2-lobed stigmas; imperfect in the male flowers.

FRUIT a berry, 3-celled, with 1 or 2 seeds in each cell, decaying to free the seeds (indehiscent), or a capsule 3-celled and 3- or 6-seeded, opening down the middle of the cells to free the seeds (loculicidal).

FLOWERS small, clustered together in spikes or long clusters (racemes) in the axils of the leaves, with stamens and imperfect pistils (male) on one plant, and without stamens and with perfect pistils (female) on another (dicocious).

STEMS twining.

LEAVES stalked, usually alternate, net-veined, often heart- or arrow-shaped (cordate or sagittate) at the base.

ROOTS often with large tubers, or woody and massive.

DISTINGUISHED from the other orders which have the male flowers on a different plant from the female by the 6-lobed perianth, 6 stamens, and the seedcase combined with the perianth-tube.

THE Yam is a small family of twining herbs and shrubs, and is represented in the British Isles by one species only. It is to be found at its best in tropical lands.

Some curious species with large, woody roots and slender stems from Mexico and South Africa are grown in hot-houses.

The Yam (*Dioscorea*), from which genus the family derives its name, is a native of India and China, and is cultivated for the sake of its large tubers, which in those countries take the place of the Potato. These tubers are often very large, and weigh 30 or 40 pounds apiece.

BLACK BRYONY. (*TÁMUS.* Linn.)—A genus of the one species:—

Black Bryony. (*Támus communis.* Linn.)—As just described in the Yam Family. Slender twining plants with the male flowers on one plant, greenish and with a rudimentary pistil, in erect slender clusters; and with the female flower on another plant, greenish and with 6 imperfect stamens, in much shorter curved clusters. The stems twine to a considerable height over hedges and shrubs; the leaves are alternate, bright, glossy, and heart-shaped, and become a beautiful yellow in the autumn and then fade and shrivel, forming a wonderful contrast to the bunches of rose-scarlet berries with which the plant is loaded. The root is a large black tuber.

[Plate 57.]

Common. In hedges and bushy places; throughout England, and not found in Scotland or Ireland. May—June. Perennial.

THE LILY FAMILY

[ORDER LXXXIII. LILIACEÆ]

PERIANTH usually of 6, rarely of 4 or 8, lobes, in 2 rows, almost free from one another or united at the base into a tube, inserted below the seedcase (inferior).

STAMENS usually 6, as many as the perianth-lobes and opposite them or very rarely 3 as in *Ruscus*, inserted on the tube of the perianth or on the receptacle by the perianth (hypogynous).

PISTIL of 3 **CARPELS**, united into a 3- or rarely 1-celled seedcase and 1-3 styles and stigmas.

FRUIT a capsule, 3-celled, many-seeded, opening by 3 valves either down the middle of the cells (loculicidally) or down the cell-walls (septicidally); or a berry, 3-celled, and few- or many-seeded,

decaying to free the seeds (indehiscent).

FLOWERS often showy, usually perfect, arranged in numerous different ways.

LEAVES undivided (simple), usually entire and parallel-veined, sometimes net-veined as in *Herb Paris*, and sometimes reduced to mere scales as in the *Butcher's Broom* (*Ruscus*) when the branches are flattened out and look like leaves (cladodia).

ROOTS usually bulbous or thick and creeping, rarely fibrous.

DISTINGUISHED from the *Daffodil Family* (*Amaryllidaceæ*) by the seedcase being free from the perianth, and from the *Iris Family* (*Iridaceæ*) by the presence of 6 stamens.

THE Lily Family is a large and beautiful order and has many representatives in the British Isles. Its 6 stamens and its perianth-tube being free from the seedcase distinguish it from the *Iris* and *Amaryllis* families.

Its members are found widely spread over the world, but they are perhaps best developed in the dry warm parts of the temperate zone. Most of them are succulent herbs with bulbs or rhizomes and sword-shaped leaves, but there are some shrubs and small trees. They almost all bear specially beautiful flowers, some very large, brilliantly coloured, and sweet scented. Many lovely species are to be found in the fields and meadows of the countries bordering on the Mediterranean, including *Asphodels*, supposed to carpet the fields of *Elysium*; while in South Africa members of the Lily Family, together with those of the *Orchid*, *Iris*, and *Amaryllis* families, make, in the spring, one of the most gorgeous scenes imaginable. They cover the ground with blossoms of every hue, but directly the hot season arrives they disappear from the face of the land.

The *Australian Grass-trees* (*Xanthorrhæa hastilis*), the *Dragon-tree* (*Dracæna Draco*) of the *Canary Isles*, together with the *Aloes* and *Yuccas* are the principal trees and shrubs in the order.

Many lovely flowers are cultivated in greenhouses and gardens. Some of the best known are various species of the *Lily*, *Tulip*, *Hyacinth*, *Star of Bethlehem*, *Lily of the Valley*, *Tuberose*, *Trillium*, *Aloe*, *Yucca*, *Dog-tooth Violet* (*Erythronium*), *Red-hot Poker* (*Knipholia*), the *Day Lily* (*Hemerocallis*), *Smilax*, and *Aspidestra*.

Other species provide us with vegetables, such as Asparagus (*Asparagus officinalis*), Onion (*Allium Cepa*), Garlic (*Allium sativum*), Chives (*Allium Schoenoprasum*), Shallot (*Allium ascalonicum*), and Leek (*Allium Porrum*). Some species are useful in medicine. A bitter juice, obtained from the South African Aloes, an extract from the Mediterranean Squill (*Urginea maritima*), and a preparation from the roots of the Autumn Colchicum are of the most value.

The Bromeliaceæ, an order inhabiting tropical America, is very near akin to the Lily Family, from which it differs in possessing a distinct calyx and corolla. Several species are cultivated in greenhouses, such as the epiphyte *Tillandsia*, the *Pouretia*, and the Pineapple (*Ananassa sativa*), the fruit of the last named being an interesting example, similar to the Mulberry and Breadfruit, of what is called a "collective fruit," and which really is a collection of small fleshy fruits all merged together on a fleshy receptacle.

Fruit a berry ; root never bulbous.

- I. BUTCHER'S BROOM (*RUS'CUS*). Shrub. Flowers spreading, on the middle of false leaves ; stamens 3 ; leaves scale-like ; branches like leaves.
- II. ASPAR'AGUS. Flowers tubular on jointed stalks ; leaves scale-like, with numerous bristly branches.
- III. SOLOMON'S SEAL (*POLYGONÁTUM*). Flowers tubular, in the axils of the leaves.
- IV. MAY LILY (*MAIAN'THEMUM*). Flowers spreading, in a spike-like cluster terminating a leafy stem ; perianth-lobes and stamens 4.
- V. LILY OF THE VALLEY (*CONVALLÁRIA*). Flowers bell-shaped in a terminal cluster on a leafless stalk.

Fruit a capsule ; leaves all radical ; roots mostly bulbous.

- VI. GARLIC (*AL'LIUM*). Flowers spreading, in a terminal umbel with a 1- or 2-lobed sheath at the base.
- VII. GRAPE HYACINTH (*MUS'CARI*). Flowers roundish, in a spike-like cluster.
- VIII. HYACINTH (*SCIL'LA*). Flowers bell-shaped or spreading, in a terminal cluster.
- IX. SIMÉTHIS. Flowers spreading, in a terminal branched cluster ; filaments bearded ; root of thick fleshy fibres.
- X. STAR OF BETHLEHEM (*ORNITHOGÁLUM*). Flowers spreading, in a terminal cluster ; filaments broad and flattened.

Perianth-lobes free or just united at the base ; fruit a capsule ; stems usually leafy ; roots bulbous.

- XI. TULIP (*TULIP'A*). Flowers large, bell-shaped, solitary on a leafy stem ; stigmas 3, spreading on the seedcase.
- XII. LLOYD'IA. Flowers spreading, usually solitary, on a leafy stem.
- XIII. LILY (*LIL'IUM*). Flowers large, spreading or reflexed, in a terminal cluster on a leafy stem.
- XIV. FRITILLARY (*FRITILLÁRIA*). Flowers bell-shaped, usually solitary on a leafy stem ; stigmas 3.
- XV. GÁGEA. Flowers spreading, in a flat cluster with 2 large leafy bracts at the base.

Fruit a capsule ; leaves mostly from the root ; roots rarely bulbous.

- XVI. MEADOW SAFFRON (*COL'CHICUM*). Flowers solitary, nearly stalkless on the bulb ; perianth-tube long and stalk-like ; styles and stigmas 3.

XVII. **BOG ASPHODEL** (*NARTHÉCIUM*). Flowers spreading, in a spike-like cluster, filaments woolly; root creeping.

XVIII. **SCOTTISH ASPHODEL** (*TOFIELD'IA*). Flowers spreading, in a spike-like cluster; styles and stigmas 3.

Fruit a berry; roots creeping.

XIX. **HERB PARIS**. Flowers solitary, of usually 8 perianth-lobes, 8 stamens, and 4 stigmas; leaves net-veined, 4 in a circle at the base of the flower.

I. BUTCHER'S BROOM. (*RUS'CUS*. Linn.)—Flowers imperfect, with stamens and without pistils (male) on one plant and with pistils and without stamens (female) on another (diœcious), apparently stalkless in the middle of the leaf. Perianth of 6 free lobes, the 3 inner smaller than the outer, inserted below the seedcase (inferior); stamens 3, the filaments completely united into a tube, on the top of which are the anthers in the male flowers and which are absent in the female, inserted on the base of the perianth-lobes; carpels 3, united into a 1-celled seedcase which is contained in the tube of the filaments, a short thick style, and pin-head-like (capitate) stigma; fruit a 1-celled, 1- or 2-seeded berry. Shrubs with hard green branching stems bearing minute scale-like leaves in the axils of which spread flattened, evergreen leaf-like branches (cladodia), in the middle of each of which is placed the flower.

Common Butcher's Broom, Knee-holly. (*Rus'cus aculeátus*. Linn.)—The only British species. As just described. An erect branched shrub, with its dark evergreen false leaves (cladodia) egg-shaped (ovate) and ending in a sharp spine, in the middle of many of which are 1 or 2 very small yellowish-green stalkless flowers with a purple pistil, or later on in the year a stalkless bright red round berry. [Plate 58.

Uncommon. In woods and thickets; not uncommon in the south of England, but rare and perhaps not native elsewhere in the British Isles. March—May, and often again in the autumn in cultivated species. Shrub.

II. ASPAR'AGUS. Linn.—Flowers small, green or brownish, drooping, on very slender 1-flowered stalks which are jointed (articulated) near the middle, 1 or more in the axils of the scale-like leaves. Perianth of 6 almost free nearly equal lobes, bell-shaped, inserted below the seedcase (inferior); stamens 6, inserted on the base of the perianth-lobes; pistil of 3 carpels, united into a 3-celled seedcase, 1 thread-like style, and 3 stigmas, sometimes with imperfect pistils; fruit a 3-celled, 3–6-seeded berry. Herbs or shrubs with branched stems, minute scale-like membranous leaves in the axils of which are numerous short green bristle-like branches (cladodia), which perform the functions of leaves, and stout creeping roots.

Common Asparagus. (*Aspar'agus marit'imus*. Mill.)—The only British species. As just described. The flowers are pale yellowish-green, drooping, on slender stalks, 1 or 2 together in the axils of the branches and some of the scale-like leaves; the berries are round and scarlet; the stem is round, prostrate at the base, and producing ascending branches about 1 foot high; and the bristle-like false leaves (cladodia) are short and flexible. (*Asparagus officinalis*. Linn.) [Plate 58.

The cultivated Asparagus (*Asparagus officinalis*), which is occasionally found as an escape, differs very slightly from the wild species, except that it is altogether larger and erect. The true leaves are very easily seen on the young shoots, which are such a favourite vegetable; they are triangular, and often tinged with purple, and look like scales. Asparagus was cultivated by the Romans.



MAIANTHEMUM BIFOLIUM.

BUTCHER'S BROOM

TWO-LEAVED MAY-LILY.

ASPARAGUS.

ASPARAGUS OFFICINARIS

COMMON DOG-MEN'S SEAL.

CONVALLARIA MAJALIS.

LILY OF THE VALLEY

CONVALLARIA MAJALIS.



Very rare. On sandy sea-coasts; Kynance Cove, Anglesey, Glamorganshire, and Pembrokeshire, and in Ireland in Waterford. July—August. Perennial.

III. SOLOMON'S SEAL. (POLYGONÁTUM. Hill.)—Flowers greenish-white in the British species, drooping, on short stalks, solitary or several together in the axils of the leaves. Perianth of 6 lobes, united into a long tube and separating into 6 short lobes, inserted below the seedcase (inferior); stamens 6, included in the perianth-tube, on the middle of which they are inserted; carpels 3, united into a 3-celled seedcase, a long slender style, and a pin-head-like, faintly 3-lobed stigma; fruit a 3-celled berry with 1 or 2 seeds in each cell. Herbs with an unbranched erect or arching stem, stalkless entire leaves with parallel veins, and thick creeping roots.

- (1) Whorled-leaved Solomon's Seal. (*Polygonátum verticillátum*.)—Stem erect, leaves 3-7 in whorls; berries red.
- (2) Common Solomon's Seal. (*Polygonátum multiflórum*.)—Flowers 2-5 together, filaments hairy; leaves alternate; berries black.
- (3) Angular-stemmed Solomon's Seal. (*Polygonátum officinále*.)—Flowers usually solitary, filaments smooth; leaves alternate; berries black.

1. Whorled-leaved Solomon's Seal. (*Polygonátum verticillátum*. All.)—As just described. The flowers are about $\frac{3}{8}$ inch long, greenish-white, 1-3 drooping on a stalk in the axils of the leaves; the berries are red; the stem is erect, 2-3 feet high; the leaves are stalkless (sessile), narrowly lance-shaped, 3-7 in circles (whorls) round the stem; and the root is thick and creeping.

Very rare. In woods; in Northumberland and Perthshire. June—July. Perennial.

2. Common Solomon's Seal. (*Polygonátum multiflórum*. All.)—A similar plant with 2-5 greenish-white drooping flowers, with hairy filaments, in clusters in the axils of the alternate, broadly oblong, half-clasping, stalkless (sessile) leaves, on a drooping round stem 1-2 feet high. The berries are blue-black.

Rare. In woods; widely but sparingly distributed in England, not a native in Scotland or Ireland. May—June. Perennial.

3. Angular-stemmed Solomon's Seal. (*Polygonátum officinále*. All.)—A very similar plant to the last, the Common Solomon's Seal (*Polygonatum multiflorum*), with usually solitary rather larger flowers, about 1 inch long, with smooth filaments, in the axils of the alternate broadly oblong half-clasping leaves, on an angular drooping stem seldom more than 1 foot high.

[Plate 58.]

Rare. In woods; in various parts of England. May—June. Perennial.

IV. MAY-LILY. (MAIAN'THEMUM. Weber.)—Flowers small, white, sweet scented, in a terminal cluster. Perianth of 4 lobes in the only British species, generally of 6 lobes, free or only united at the base, inserted below the seedcase (inferior); stamens 4 in the British species, as many as the perianth-lobes, and inserted on their base; carpels 3 or 2, united into a 3- or 2-celled seedcase, 1 short thick style, and a faintly 3- or 2-lobed stigma; fruit a 1- or 2-seeded berry. Herbs with alternate parallel-veined leaves and creeping roots.

Two-leaved May-Lily. (*Maian'themum bifólium*. Schmidt.)—As just described. The flowers are small, white, and fragrant, in a spike-like cluster terminating the stem, which is unbranched and is 3-8 inches high, bearing 2 alternate heart-shaped (cordate) pointed leaves. (*Maianthemum Convallaria*. Web.; *Smilacina bifolia*. Desf.)

[Plate 58.]

Very rare. In woods and bushy places ; plentiful near Scarborough, Middlesex, Preston, Blackburn, and Durham. May—June. Perennial.

V. LILY OF THE VALLEY. (CONVALLÁRIA. Linn.)—A genus consisting of the one species :—

Lily of the Valley. (Convallária majális. Linn.)—Flowers drooping, sweet scented, on short stalks terminating a stem from the root (scape) 6–9 inches high. Perianth cup-bell-shaped, of 6 lobes, united into a cup-shaped tube and separating into 5 short turned-back (recurved) lobes, inserted below the seedcase (inferior) ; stamens 6, included in the perianth-tube, on the base of which they are inserted ; carpels 3, united into a 3-celled seedcase, 1 thick style, and a faintly 3-lobed stigma ; fruit a round 3-celled berry, 2–6-seeded. The leaves, as the flowers, are all from the root, 2, rarely 3, leaves to each root, the leaves being egg-lance-shaped, and the root creeping. [Plate 58.

Rare. In woods ; widely distributed throughout England, naturalised in Scotland and Ireland. May—June. Perennial.

VI. GARLIC. (AL'LIIUM. Linn.)—Flowers stalked, in a cluster all starting from the same point at the top of the stem (umbel), the flower-cluster being enclosed when in bud in a 1- or 2-lobed membranous sheath (spathe), and the whole cluster terminating a leafless stalk from the root (scape). Perianth of 6 free lobes, spreading or bell-shaped, inserted below the seedcase (inferior) ; stamens 6, inserted on the base of the perianth ; carpels 3, united into a seedcase, 1 style, and a minute stigma very rarely 3-lobed ; fruit a dry capsule 3-celled, with 1 or 2 seeds in each cell, opening down the middle of the cells (loculicidal). Strong smelling herbs with parallel-veined leaves all from the bulbous roots.

Alternate stamens with broad filaments, 3-toothed at apex, central tooth bearing anther ; umbels round.

- (1) *Wild Leek. (Al'lium Ampelóprasum.)—Flower-clusters rarely with bulbs ; stamens protruding ; leaves flat.
- (2) Al'lium Babingtónii.—Flower-clusters always with bulbs ; stamens protruding ; leaves flat.
- (3) Sand Leek. (Al'lium Scorodóprasum.)—Flower-clusters always with bulbs ; stamens not protruding ; leaves flat.
- (4) Small Round-headed Garlic. (Al'lium sphæroceph'alum.)—Flower-clusters without bulbs ; stamens much projecting ; leaves round, faded before flowering.
- (5) Crow Garlic. (Al'lium vineále.)—Flower-clusters with bulbs ; stamens just protruding ; leaves round, faded before flowering.

Stamens with entire, not 3-toothed filaments.

- (6) Field Garlic. (Al'lium oleráceum.)—Flowers in a loose cluster, with bulbs ; stamens included ; sheath-lobes with very long green points.
- (7) *Keeled Garlic. (Al'lium carinátum.)—Flowers in a loose cluster, with bulbs ; stamens protruding.
- (8) Chives. (Al'lium Schoëno'prasum.)—Flowers in a dense round cluster, without bulbs ; stamens included ; leaves erect and quill-like.
- (9) Greater Chives. (Al'lium sibir'icum.)—Like the last only twice as big and with quill-like leaves recurved.

(10) *Triangular-stalked Garlic. (*Allium triquetrum*.)—Flowers large, white, in a loose 1-sided cluster, without bulbs.

(11) Ramsons. (*Allium ursinum*.)—Flowers starry, white, in a flat-topped cluster, without bulbs.

1. *Wild Leek. (*Allium Ampeloprasum*. Linn.)—As just described. The largest British species, with large round compact clusters (umbels) of bell-shaped whitish flowers tinged with pale purplish-rose and with a green midrib; the stalks vary in length so as to form the round cluster which is enclosed in a roundish sheath ending abruptly in a beak as long as the rest of the sheath; the filaments of the alternate stamens are flattened, broad, and split at the top into 3 teeth, the central tooth bearing the anther, all the anthers protruding. The flower-stems are 2-4 feet high, and very thick; the leaves are broadly strap-shaped, flat, from a few inches to 1½ feet long, and their sheaths enclose the lower part of the flower-stem so that the stem looks leafy although in reality all the leaves spring from the bulb.

The garden leek (*Allium Porrum*. Linn.) is a cultivated variety of this species.

A variety—var. *bulbiferum*—is found in Guernsey, in which there are little bulbs, about the size of a pea, taking the place of some of the flowers in the flower-cluster.

Not a native, very rare. Naturalised in an island in the Severn. July—August. Perennial.

2. *Allium Babingtonii*. Borr.—A species, often regarded as a mere variety of the last, with more rose-coloured flowers and with numerous bulbs about the size of hazel-nuts taking the place of some of the flowers in the flower-cluster.

Very rare. In the South Isles of Arran, County Galway, and as an escape in Roundstone and in Cornwall. August. Perennial.

3. Sand Leek. (*Allium Scorodoprasum*. Linn.)—A similar specimen to the Wild Leek, but smaller in all ways. The flowers in a looser, usually smaller cluster, always having red bulbs instead of some of the flowers and sometimes being reduced to a head of bulbs with hardly any flowers; the sheath (spathe) with a shorter beak; the flowers of a dark purplish-rose and the anthers not projecting; the stems not so thick, 2-3 feet high, and the leaves shorter and narrower.

Rare, local. In sandy woods, and fields; in the north of England, south of Scotland, and in Counties Kerry and Cork in Ireland. May—July. Perennial.

4. Small Round-headed Garlic. (*Allium sphærocephalum*. Linn.)—A species similar to but smaller than the last, with a round cluster of purplish-red flowers without any bulbs; the stamens projecting, being twice as long as the perianth; the sheath (spathe) entire and tapering into a long slender point; the stem slender, 1-2 feet high; and the leaves few, short, very narrow, curved so that they appear hollow, and usually fading before the flowers open.

Very rare. On ledges of St. Vincent's Rocks, Bristol, and on sands in Jersey. June—August. Perennial.

5. Crow Garlic. (*Allium vineale*. Linn.)—A very similar plant to the Small Round-headed Garlic (*Allium sphærocephalum*), only with the flowers paler, pale rose-colour with a green streak down the back, always with some greenish or red bulbs and sometimes with the whole cluster composed of bulbs; the enveloping sheaths 2-valved and with a very short beak; the stem about 1 foot high, and the leaves faded at the time of flowering.

Not uncommon. In waste and cultivated sandy ground; distributed over England, rare in Scotland, and local in Ireland. July. Perennial.

6. Field Garlic. (*Allium oleraceum*. Linn.)—Flowers usually few, green or brownish-pink, bell-shaped, in a very loose cluster (umbel) with numerous bulbs at their bases; enveloped in

an unequally 2-lobed sheath (spathe), each lobe ending in a very long slender green point, the longer one often 2 or 3 inches long and rather resembling the leaves; the stamens included in the perianth, the filaments being entire and not 3-cleft. [As described in the genus Garlic (*Allium*).] The flowering-stem is 1-2 feet high; and the leaves are narrowly strap-shaped (linear), semi-cylindrical, grooved above and ribbed beneath, or broader, nearly flat, and thick, sheathing the flowering-stem about halfway up.

Rare. On the borders of fields, in waste and cultivated ground; in England and Scotland, but not found in Ireland. July—August. Perennial.

7. *Keel'd Garlic. (*Allium carinátum*. Linn.)—A very similar species, but having rose-coloured flowers with protruding stamens twice as long as the perianth, very few bulbs, and leaves flat at the tip.

Not a native, very rare. Naturalised in a few places in England and Scotland. August. Perennial.

8. Chives. (*Allium Schœno'prasum*. Linn.)—Flowers numerous, purplish-pink, on short stalks, without bulbs, in a dense round cluster (umbel), looking like a head of flowers as the 2 short, broad, abruptly-pointed lobes of the sheath (spathe) hide the stalks; the stamens are included in the perianth and the filaments are entire. [As described in the genus Garlic (*Allium*).] The flowering-stem is only 6-12 inches high, slender, and hollow; and the leaves are few, erect, very narrow and rounded, quill-like, one sheathing the stem. [Plate 59.

Very rare. In rocky mountainous pastures; in a few places in England and Scotland. June—July. Perennial.

9. Greater Chives. (*Allium sibir'icum*. Linn.)—A very similar species to the last, but larger in all respects, the perianth much larger and deeper rose, and the narrow, rounded, quill-like leaves often strongly recurved.

Very rare, local. On rocks in Cornwall. June—July. Perennial.

10. *Triangular-stalked Garlic. (*Allium triquétrum*. Linn.)—A very distinct species with large pure white flowers nearly $\frac{3}{4}$ inch long with green midribs, 3-12 hanging in a 1-sided cluster (umbel), without bulbs; the 2-lobed sheath (spathe) short and pointed; the stamens included in the perianth and not more than half its length; the flower-stem about 1 foot high, and with 3 sharp angles; and the leaves narrow, strap-shaped (linear), flat and not sheathing the stem.

Not a native. In meadows and hedges; naturalised in Cornwall and the Channel Isles. April—June. Perennial.

11. Ramsons, Broad-leaved Garlic. (*Allium ursinum*. Linn.)—The only well-known species in this genus. The flowers are numerous, star-like, pure white, about $\frac{3}{4}$ inch across, in a flat-topped bulbless cluster (umbel); the 2 lobes of the sheath are egg-shaped (ovate) and pointed; the stamens are shorter than the perianth-lobes, and the filaments are entire. The flower-stem is 3-angled, not quite 1 foot high; and the leaves are broad, flat, egg-lance-shaped, and all from the root, not sheathing the stem, extremely like the leaves of the Lily of the Valley, but easily known by the powerful smell of Garlic they give out when bruised. [Plate 59.

Common. In woods and thickets; generally distributed in England, the south of Scotland, and Ireland. May—June. Perennial.

VII. GRAPE HYACINTH. (*MUS'CARI*. Mill.)—Flowers roundish or oblong, blue or greenish, in erect terminal clusters (racemes) terminating a leafless stem from the root (scape). Perianth roundish with 6 small short teeth at the apex, inserted below the seedcase (inferior); stamens $\bar{6}$,



GRAPE HYACINTH.
MUSCARI
RACEMOSUM.

RANSOMS
BROAD-
LEAVED
GARLIC.

ALLIUM AFRICANUM.

SPRING
SQUILL.

SCILLA
HYVERNA.

CHIVES.

ALLIUM
SCOPULORUM.

COMMON
BLUEBELL.

WILD
HYACINTH.

NONI SCILLA.

included in and inserted on the perianth-tube; pistil of 3 carpels united into a seedcase, 1 style, and a small stigma; fruit a capsule, 3-celled, and opening by 3 valves down the middle of the cells (loculicidally). Herbs with strap-shaped (linear), rounded, parallel-veined leaves, all from the root, and bulbous roots.

Grape or Starch Hyacinth. (*Muscari racemosum*. Lam. and DC.)—As just described. The only British species. The flowers are small, oblong, nodding, darkish blue or occasionally white, with a minute bract at the base of each, in a cluster (raceme) $\frac{3}{4}$ –1½ inches long terminating a stem 4 inches to 1 foot high; the upper flowers are often imperfect; and the leaves are very narrowly strap-shaped (linear) and semi-cylindrical. [Plate 59.

Very rare. In sandy fields; near Cavenham and Pakenham in Surrey and about the Gogmagog Hills, Cambridgeshire. April—May. Perennial.

VIII. HYACINTH. (SCILLA. Linn.)—Flowers bell-shaped, tubular, or spreading, blue, purple, or white, rarely pink, in erect or drooping clusters (racemes), with or without a bract at the base of each flower, terminating a leafless stalk from the root (scape). Perianth of 6 free lobes, inserted below the seedcase (inferior); stamens 6, inserted below the middle or on the base of the perianth-lobes; carpels 3, united into a 3-celled seedcase, a long style, and a minute stigma, 3-lobed or entire; fruit a capsule, 3-celled, with few black roundish seeds in each cell, opening by 3 valves down the middle of the cells (loculicidally). Herbs with strap-shaped (linear), parallel-veined leaves, all from the bulbous root.

Perianth-lobes spreading; flowers erect, in erect cluster.

(1) Autumnal Squill. (*Scilla autumnalis*.)—Flowers without bracts.

(2) Spring Squill. (*Scilla ver'na*.)—Flowers with 1 bract at the base of each flower.

Perianth-lobes bell-shaped; flowers drooping in drooping cluster.

(3) Bluebell. (*Scilla non-scripta*.)—Two bracts at the base of each flower.

1. Autumnal Squill. (*Scilla autumnalis*. Linn.)—As just described. A little plant with an erect cluster of pale violet-blue flowers with a darker line down the back of each spreading perianth-lobe, without a bract at the base of each flower; the flower-stem 6–9 inches high; and the strap-shaped dark-green leaves appearing after the flowers.

Rare, local. On sandy or dry pastures, especially near the sea; in the south and west of England. July—October. Perennial.

2. Spring or Vernal Squill. (*Scilla ver'na*. Huds.)—A charming little plant with an erect cluster of delicate, pale-lilac, star-like flowers, with dark purple stamens, terminating a stem usually about 6 inches high; the perianth-lobes are spreading; there is a lance-shaped bract below each flower; and the leaves, which are recurved, are often longer than the flower-stem and are out at the same time as the flowers. [Plate 59.

Local. On sandy pastures and ledges of rock near the sea; abundant in parts of Cornwall, along the western, northern, and rarely eastern coasts of England, the east of Scotland, and abundant on the east coast of Ireland. April—May. Perennial.

3. Bluebell, Wild Hyacinth. (*Scilla non-scripta*. Hoffmgg. and Link.)—One of our best known and favourite wild flowers, with long clusters, drooping at the top, of bell-shaped, purple-blue, or rarely white, sweet scented, drooping flowers, with 2 purplish bracts at the base of each flower. The flower-stem 6–18 inches high, very fleshy and juicy, and the leaves dark green and strap-shaped. (*Hyacinthus non-scriptus*. Linn.; *Endymion nutans*. Dumort.; *Scilla nutans*. Sm.) [Plate 59.

Very common. In woods and shady places; throughout England, Scotland, and Ireland. May—June. Perennial.

IX. SIMÉTHIS. Kunth.—A genus containing the one following species:—

Variegated Simethis, Bournemouth Lily. (*Siméthis planifolia*. Gren. and Godr.)—Flowers white, tinged on the back with dull purple, in a very loose branched cluster (panicle) terminating a leafless stem from the root (scape). Perianth of 6 spreading free lobes, inserted below the seedcase (inferior); stamens 6, with bearded filaments, inserted on the base of the perianth; carpels 3, united into a seedcase, 1 thread-like style, and a minute stigma; fruit a capsule, 3-celled, with 2 seeds in each cell, opening by 3 valves down the middle of the cells (loculicidally). The flowering stem 6–18 inches high; and the leaves strap-shaped (linear), pointed, flat, and slightly keeled at the tip, all from the root; with a root which differs from all the other species with capsular fruits in this order, except the Bog and Scottish Asphodels, in not being bulbous but having a root of numerous fleshy thick fibres. (*Simethis bicolor*. Kunth.; *Pubilaria bicolor*. Raf.) [Plate 60.

Very rare. On sandy heaths, in fir woods; formerly at Bournemouth, and in County Kerry. May—June. Perennial.

X. STAR OF BETHLEHEM. (*ORNITHOGALUM*. Linn.)—Flowers rather large, stalked, white or yellow, with a small bract at the base of each flower, in a terminal cluster on a stalk from the root (scape). Perianth of 6 free lobes, more or less spreading, inserted below the seedcase (inferior); stamens 6, with wide flattened filaments, adhering to the base of the perianth; carpels 3, united into a seedcase, 1 style, and a minute stigma; fruit a capsule, 3-celled, few-seeded, opening by 3 valves down the middle of the cells (loculicidally). Herbs with strap-shaped leaves all from the bulbous root and not sheathing the stem.

- (1) *Drooping Star of Bethlehem. (*Ornithogálum nútans*.)—Flower-cluster short and drooping.
- (2) *Common Star of Bethlehem. (*Ornithogálum umbellátum*.)—Flower-cluster flat on the top.
- (3) Spiked Star of Bethlehem. (*Ornithogálum pyrenáicum*.)—Flower-cluster long and spike-like.

1. *Drooping Star of Bethlehem. (*Ornithogálum nútans*. Linn.)—As just described. The flowers are few, large, each perianth-lobe 1–1½ inches long, white, greenish outside, with long bracts at the base of each flower, in a loose, short, drooping cluster (raceme) terminating a leafless stalk (scape) 9–18 inches high; and the leaves are strap-shaped and pointed.

Not a native, rare. Naturalised in fields and orchards; in various counties in England. April—May. Biennial.

2. *Common Star of Bethlehem. (*Ornithogálum umbellátum*. Linn.)—Flowers few, erect, the perianth-lobes ¾ inch long, white with a broad green stripe down the back, with a small bract at the base of each flower, in a flattened cluster (corymbose raceme) terminating a leafless stem 6 inches to 1 foot high; with long narrow flaccid leaves from the bulb.

Not a native. In meadows and pastures; well established in many counties in England and a few in Scotland. April—May. Perennial.



SPIKED STAR-OF-BETHLEHEM,

QUINQUEFOIDIA LYRENACUM

BOURNE-MOUTH LILY,

AMETHELLA FLAMMEOLA

WILD TULIP,

TULIPA BY VESTRIS

MOUNTAIN SPIDER-WORT

LEUCODIA CENTAURA

3. Spiked Star of Bethlehem. (*Ornithogálum pyrenáicum*. Linn.)—The only native species. A beautiful plant with a long spike-like cluster of greenish flowers, the perianth-lobes $\frac{1}{2}$ inch long, the bracts short and pointed, the flowering stem $1\frac{1}{2}$ –2 feet high, thick and fleshy, and the leaves long and strap-shaped (linear), usually dead before the flowers come out.

The young shoots are sold in the market at Bath as asparagus.

[Plate 60.

Very rare. In woods; abundant near Bath, also found in Sussex and Bedfordshire. June. Perennial.

XI. TULIP. (*TULIP'A*. Linn.)—Flowers large, bell-shaped, erect in flower, usually solitary on a leafy stem. Perianth of 6 free lobes, inserted below the seedcase (inferior); stamens 6, inserted by the perianth; carpels 3, united into a seedcase, without a style, and 3 stigmas often wavy, situated immediately on the seedcase; fruit a capsule, 3-celled, with several seeds in each cell, opening down the middle of the cells by 3 valves (loculicidally). Herbs with leafy stems and bulbous roots, the leaves being long and often broad, entire, and parallel-veined.

Wild Tulip. (*Tulip'a sylves'tris*. Linn.)—The only British species. As just described. The flower is $1\frac{1}{2}$ –2 inches long, bright yellow, fragrant, with the stamens hairy at the base, the flower solitary, terminating a leafy stem about 1 foot high, the lower half of which bears 1, 2, or 3 narrow, lance-shaped leaves.

[Plate 60.

Very rare. In chalk pits; in the eastern counties. April—May. Perennial.

XII. LLOYD'IA. Salisb.—A genus containing the one species:—

Mountain Spiderwort, Alpine Lloydia. (*Lloyd'ia serotína*. Reichb.)—A delicate little plant with white flowers veined with red and with a small yellow spot at the base, usually solitary, terminating a leafy stem. Perianth of 6 free spreading lobes, inserted below the seedcase (inferior); stamens 6, adhering to the base of the perianth; carpels 3, united into a seedcase and separating into a slender style and a 3-lobed stigma; fruit a 3-celled capsule with numerous seeds in 2 rows in each cell, opening by 3 valves down the cells (loculicidally). The stem is 2–8 inches high, very slender, and with 2–4 rather short leaves, while those from the root are 3–9 inches high, longer than the flower-stalk, and very narrow and semi-cylindrical. (*Lloydia alpina*. Salisb.; *Lloydia montana*. Salisb.)

[Plate 60.

Very rare. On rocky ledges on mountains; mountains in Carnarvonshire. June—July. Perennial.

XIII. LILY. (*LIL'IUM*. Linn.)—Flowers large, showy, all shades of red and yellow, or white, solitary or in clusters on a leafy stem. Perianth of 6 free lobes, spreading or reflexed, inserted below the seedcase (inferior); stamens 6, inserted by the perianth-lobes; carpels 3, united into a seedcase, a thick style, and an indistinctly 3-lobed stigma; fruit a 3-celled capsule with numerous seeds in 2 rows in each cell, opening by 3 valves down the middle of the cells (loculicidally). Herbs with leafy stems and scaly bulbs.

(1) *Pyrenean Lily. (*Lil'ium pyrenáicum*.)—Flowers yellow, reflexed; leaves alternate.

(2) Turk's-cap Lily. (*Lilium Mar'tagon*.)—Flowers purplish-pink, reflexed; leaves in circular clusters.

1. *Pyrenean Lily. (*Lil'ium pyrenáicum*. Gouan.)—As just described. The flowers are $1\frac{1}{2}$ inches across, drooping, 2 or 3 rising from the same point and terminating the stem, with a

few solitary ones below in the axils of the upper leaves; the perianth-lobes yellow with raised purplish-black dots much reflexed; the stem is $1\frac{1}{2}$ –4 feet high, stout, and leafy to the top; and the leaves are alternate, crowded, and narrowly lance-shaped.

Not a native, very rare. Naturalised in one place in North Devon. July. Perennial.

2. Turk's-cap Lily. (*Lilium Mar'tagon*. Linn.)—A species with the perianth-lobes reflexed, dull purplish-pink or flesh-coloured with purplish-black raised dots, the flowers drooping, solitary in the axils of the very small upper leaves, forming a cluster (raceme), terminating a leafy stem 2–3 feet high; the leaves are lance-shaped, 5–8 together in circles (whorls) up the stem. Very rare. In woods; naturalised in Surrey and occurring as an escape in some other places. July—September. Perennial.

XIV. FRITILLARY. (*FRITILLÁRIA*. Linn.)—Flowers large, showy, bell-shaped, solitary or several on very long drooping stalks terminating a leafy stem. Perianth of 6 free lobes, bell-shaped, inserted below the seedcase (inferior); stamens 6, inserted at the base of the perianth; carpels 3, united into a seedcase, 1 long style, and separating into 3 narrow long stigmas; fruit a 3-celled capsule, with numerous flat winged seeds in 2 rows in each cell, opening by 3 valves down the middle of the cells (loculicidally). Herbs with leafy stems, narrow leaves, and bulbous roots.

Common Fritillary or Snake's Head. (*Fritillária Meleágris*. Linn.)—As just described. The only British species. A fascinating flower usually of a dull maroon-purple, rarely white, with regular paler markings resembling those on the body of a snake, bell-shaped, an inch or more long, solitary or rarely 2 or 3 in a very loose cluster terminating a stem 9 inches to 1 foot high, with a few alternate very narrow strap-shaped leaves. [Plate 61.

Rare, local. In moist meadows and pastures; very abundant in Wiltshire and various southern and eastern counties. May. Perennial.

XV. GAGEA. Salisb.—Flowers yellow, in a terminal rather flat-topped cluster on a stalk from the root, usually leafless, sometimes with 1 sheathing leaf. Perianth of 6 free lobes, inserted below the seedcase (inferior); stamens 6, adhering to the base of the perianth; carpels 3, united into a seedcase, 1 style, and a small 3-lobed stigma; fruit a capsule, 3-celled, and opening by 3 valves down the middle of the cells (loculicidally). Herbs with a few narrow strap-shaped (linear) leaves usually all from the root.

Yellow Star of Bethlehem. (*Gágea lútea*. Gawler.)—The only British species. As just described. The flowers are about $\frac{3}{4}$ inch across, of a pale lemon-yellow, greenish outside, spreading, on rather long stalks, in a flat-topped cluster, all the stalks crowded close together at the top of the stem, with at their base 2 unequal leaf-like bracts. The stems are about 6 inches high, usually naked, sometimes with one sheathing leaf and several long strap-shaped leaves from the root. (*Gagea fascicularis*. Salisb.) [Plate 61.

Rare. In woods, especially near streams; widely distributed in England and the south of Scotland. March—April. Perennial.

XVI. MEADOW SAFFRON. (*COL'CHICUM*. Linn.)—Flowers remarkably like those of the Crocus, but easily distinguished from them by the 6 stamens, lilac, pink, or whitish, solitary, with a very long perianth-tube which looks like a stalk, almost stalkless on the bulb. Perianth with a very long slender tube, many inches long, with 6 lobes, cup-shaped and finally spreading, inserted below the seedcase (inferior); stamens 6, inserted on the perianth-tube; carpels 3, united into a



SCOTTISH ASPHODEL.

AUTUMN COLCHICUM.

TONFIELDIA PALUSTRIS.

HEFF PARIS.

BOG ASPHODEL.

MARTHECIUM OSSIFRAGUM.

COLCHICUM AUTUMNALE.

PARIS QUADRIFOLIA.

COMMON FRITILLARY.

YELLOW STAR-OF-BETHLEHEM.

ACEA LUTEA.

FRITILLARIA MELEAGRIS.

PLUM.

seedcase, and separating into 3 long slender styles and stigmas; fruit a 3-celled capsule, many-seeded, opening by 3 valves down the cell-walls (septicidally); this capsule is situated under ground at the base of the perianth-tube and rises above ground with the leaves the following spring. Herbs with parallel-veined leaves all from the bulbous roots.

Meadow Saffron, Autumn Colchicum. (*Colchicum autumnale*. Linn.)—The only British species. As just described. The flowers are bright mauve or rarely white, the cup-shaped lobes are $1\frac{1}{2}$ – $1\frac{3}{4}$ inches long, and the stalk-like perianth-tube rises some 4 or 5 inches above the ground; the flowers appear in the autumn when the leaves are faded, and the fruit appears the following spring with the flat erect lance-shaped leaves.

The bulbs and seeds of this species are employed in medicine. They contain an active poison, which when properly diluted is beneficial in cases of gout. The leaves kill cattle that feed on them. [Plate 61.

Local, rather rare. In meadows; abundant in Oxfordshire and Gloucestershire, and found in many parts of England; not native in Scotland, and rare in Ireland. September—October. Perennial.

XVII. BOG ASPHODEL. (*NARTHÉCIUM*. Huds.)—A genus consisting of one known species:—

Bog Asphodel. (*Narthécium ossifragum*. Huds.)—The flowers are $\frac{1}{2}$ – $\frac{3}{4}$ inch across, bright yellow with orange anthers, in a spike-like cluster terminating a stem from the root 6–12 inches high, on which are a few scale-like bracts. Perianth of 6 free, spreading lobes, inserted below the seedcase (inferior); stamens 6, the filaments woolly, inserted by the perianth; carpels 3, united into a seedcase, 1 style, and an undivided stigma; fruit a capsule, becoming vivid red, 3-celled, many-seeded, opening down the middle of the cells by 3 valves. The leaves are in tufts from the root and are short and sword-shaped; and the root is creeping and sends off tufts of fibres. [Plate 61.

Common. In bogs on mountains and wet moors; throughout England, Scotland, and Ireland. June—August. Perennial.

XVIII. SCOTTISH ASPHODEL. (*TOFIELD'IA*. Huds.)—Flowers small, white or greenish, in a spike-like cluster terminating a nearly leafless stalk from the root. Perianth of 6 free lobes, inserted below the seedcase (inferior); stamens 6, inserted on the base of the perianth; carpels 3, united into a seedcase and separating into 3 short styles each crowned with a pin-head-like stigma; fruit a capsule, 3-lobed, many-seeded, opening by 3 valves down the cell-walls (septicidally). Herbs with short sword-shaped leaves, parallel-veined, and all from the root, which is slender, creeping, and throwing off many fibres.

Scottish Asphodel. (*Tofield'ia palus'tris*. Huds.)—The only British species. As just described. The flowers are very small, yellowish-white, in a short spike-like cluster terminating a stem about 6 inches high, which is leafless or has one or two leaves at the base or rarely one near the middle; the leaves from the root are 1–2 inches high, flat, sword-shaped (ensiform), and resembling those of the Common Bog Asphodel (*Narthecium ossifragum*).

[Plate 61.

Rare, local. In mountain bogs; in England in Teesdale, not uncommon in the Scotch Highlands, not found in Ireland. July—August. Perennial.

XIX. HERB PARIS. (*PARIS*. Linn.)—Flower rather large, erect, stalked, solitary, with 4–10 leaves in a circle (whorl) at its base, terminating a naked stem from the root. Perianth of

usually 8 free spreading lobes, in 2 rows, the inner much smaller and narrower than the outer, inserted below the seedcase (inferior); stamens usually 8, as many as the perianth-lobes and inserted on their base; carpels usually 4, rarely 5, united into a 4-, rarely 5-celled seedcase, and dividing into the same number of styles or stigmas; fruit a roundish berry, 4- or rarely 5-celled, with numerous seeds. Herbs with creeping roots and a solitary naked stalk without root-leaves and with one whorl of leaves at the top surrounding an erect solitary flower.

Herb Paris, True-love Knot. (*Paris quadrifolia*. Linn.)—The only British species. As just described. The flower is green, on an erect stem $\frac{3}{4}$ –1 inch high, the perianth-lobes about $\frac{3}{4}$ –1 inch long, the anthers bright yellow, and the seedcase and stigmas purplish-black; the stem is 9–12 inches high, and is terminated by this strange flower and usually 4 almost stalkless egg-shaped (ovate) leaves surrounding it; as the berry, which is purplish-black, ripens, the stem which bears it lengthens and rises 1 or 2 inches above the circle of leaves.

[*Plate 61.*

Rather local, not uncommon. In woods and shady places; in England and Scotland. May. Perennial.

THE ARUM FAMILY

[ORDER LXXXVI. ARACEÆ OR AROÏDEÆ]

FLOWERS small, usually imperfect, rarely perfect, densely clustered together in a spike called a **SPADIX**, and often surrounded with a coloured sheathing bract called a **SPATHE**.

THE IMPERFECT FLOWERS are in clusters, free or more or less united together, the male usually above and the female lower down on the spadix.

THE MALE FLOWERS consist of 1 stamen, often without a filament.

THE FEMALE FLOWERS consist of 1 carpel, with a seedcase, with or without a style, and with an entire or lobed stigma.

THE PERFECT FLOWERS consist of:

PERIANTH reduced to 4-8 scale-like lobes, inserted below the seedcase (inferior).

STAMENS 4-8 or more.

PISTIL of 1, 2, or 3 **CARPELS**, united into a seedcase with the same number of cells, with or without a style, and with an entire or lobed stigma.

FRUIT usually a berry, rarely dry, with 1 or more seeds, decaying to free the seeds.

LEAVES alternate or all from the root, with the stem sheathed at the base.

DISTINGUISHED as a rule by the spadix and surrounding spathe.

THIS family has only three representatives in the British Isles. It is characterised by its small flowers massed together on a spadix and by the enveloping spathe, which is usually showy.

It is in the tropics that the order is best studied, where it forms an important element in the dense growth of the forests. It includes erect herbs and climbers usually bearing very large leaves. The roots are either tubers or rhizomes and may be underground or aerial; some of the aerial ones take strange forms. They may be coiled in thick twists on the boughs of the trees or hang in long cords from the branches.

The most remarkable member of the family is the *Amorphophallus titanum*, a native of Sumatra, an extraordinary plant with a huge tuber, umbrella-like leaves on stalks 9-14 feet high, and an enormous flower-cluster consisting of a spadix 9 feet high with a beautiful mottled green and purple sheath. This plant has flowered at Kew.

Many species are cultivated in greenhouses, as for instance various *Anthuriums*, some of which have a brilliant scarlet spathe and a vivid yellow spadix and are popularly called the Flamingo-flower, many *Caladiums* with their variegated leaves, the Calla-Lily or Pig-Lily as it is called in South Africa (*Richardia æthiopica*), and many others.

Most of the members of the Arum tribe are poisonous. They are not of much value in medicine.

A very valuable tropical order near akin to the Arum Family is the Palmæ, an order composed chiefly of various species of Palm-trees which form a very characteristic feature of tropical vegetation. The Date Palm (*Phoenix dactylifera*) is cultivated in the oases of the Sahara;

and the Coco-nut Palm (*Cocos nucifera*) grows in almost all tropical countries near the coast.

- I. CUCKOO-PINT (*ÁRUM*). Spathe broad and petal-like ; leaves broad, heart-, arrow-, or halbert-shaped.
- II. *SWEET SEDGE (*AC'ORUS*). Spathe narrow and leaf-like ; leaves narrow and sword-shaped.

I. CUCKOO-PINT (*ÁRUM*. Linn.)—Flowers imperfect, clustered round the lower half of a club-shaped coloured spadix, the female at the base, usually with a ring of sterile female flowers above, then the male, and finally another cluster of sterile female flowers at the top which are rather bristly and pointed slightly downwards ; the flowerless club-shaped spadix is exposed in the large leaf-like spathe which is contracted and folded over where the flowers begin and so conceals them. The reason for this contraction is very interesting and has to do with the fertilisation of the flowers. Insects are attracted by the unpleasant odour of the flowers ; they crawl down and feed on the juice secreted in the thick lower part of the fleshy spathe, but, on attempting to creep out, they are met with the upper cluster of bristly sterile flowers, which, with the contracted spathe, form a trap and prevent their egress. There is, however, plenty of food, and they wander about till the anthers are ripe and they get well dusted with the pollen ; then the uppermost flowers become limp, the spathe expands, and the insects are free to take the pollen to other flowers.

The male flowers consist of 1 stamen, the filament being so short that the 2-celled anther appears stalkless (sessile) on the spadix ; they are free or united in pairs ; the female flowers consist of 1 carpel with a 1-celled seedcase, a short style or none, and a stigma. The fruit is a 1-celled fleshy berry with 1 or more seeds. Herbs with large halbert-shaped (hastate) leaves, with netted veins, on long stalks which are all from the short fleshy root and are sheathed at the base.

- (1) Common Cuckoo-pint. (*Árum maculátum*.)—Spadix brownish-purple.
- (2) Italian Cuckoo-pint. (*Árum ital'icum*.)—Spadix yellow.

1. Cuckoo-pint, Wild Arum, Lords and Ladies, Wake Robin. (*Árum maculátum*. Linn.)—As just described. The spathe, which is 6–9 inches long, is of a delicate translucent yellow-green and surrounds a dull brownish-purple or yellowish club-shaped spadix ; the female flowers are yellowish and the male purple ; the berries are of a brilliant scarlet and are poisonous ; the spathe is on a stalk some 6 inches high ; the leaves are large, heart-arrow-shaped (cordate-sagittate), and often spotted with dark purple ; and the root is an oblong tuber.

[Plate 62.

Common. On hedge-banks and in woods ; throughout England, rare in Scotland, common in Ireland. April—May. Perennial.

2. Italian Arum. (*Árum ital'icum*. Mill.)—A very similar species, but larger in all ways ; the spathe is 8–15 inches long, of a greenish-white, fragile, and quickly falling over the spadix, which is always yellow ; the berries are larger ; and the leaves appear in the winter instead of in the spring as in *Arum maculatum*.

Local, rare. In shady places ; in the Isle of Wight, Cornwall, Devon, and Dorsetshire, and in the Channel Isles. June. Perennial.



WILD
CUCKOO-
PINT.

LORDS
AND
LADIES.
fruit section



ARUM
MACULATUM

female
flower
2
male
flowers



fruit.



spathe and
spadix.



whole
flower

SWEET
SEDGE,
ACORUS
CALAMUS.

II. ***SWEET SEDGE.** (**AC'ORUS.** Linn.)—Flowers minute, perfect, densely clustered round the stalkless spadix, which has at its base a leaf-like green spathe ascending in the same line as the stalk from the root (scape) which bears it; the spadix ascends at an angle from it and appears to be in the axil of a leaf. Perianth of 6 membranous oblong lobes, inserted below the seedcase (inferior); stamens 6, inserted at the base of the perianth-lobes; carpels 2 or 3, united into a seedcase with the same number of cells, and 2 or 3 stigmas situated on the seedcase (ovary) without styles; fruit 1-3-seeded, dry, decaying to free the seeds (indehiscent). Water or marsh plants, with a creeping root and narrow sword-shaped (ensiform) leaves.

***Sweet Sedge, Sweet Flag, Sweet Rush.** (**Ac'orus Cal'amus.** Linn.)—As just described. The only British species. A reed-like plant, growing in water, with the spadix 2-4 inches long, cylindrical, yellowish-green, densely covered with flowers; the leaves are dark green, sword-shaped, and very fragrant. The whole plant is aromatic and when bruised has an extremely pleasant fragrant smell, and was used for strewing floors before the universal use of carpets. [Plate 62.

Local, rare. In water; throughout the south of England, near the site of monasteries in other parts, a doubtful native in Scotland, and rare in Ireland. June—July. Perennial.

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