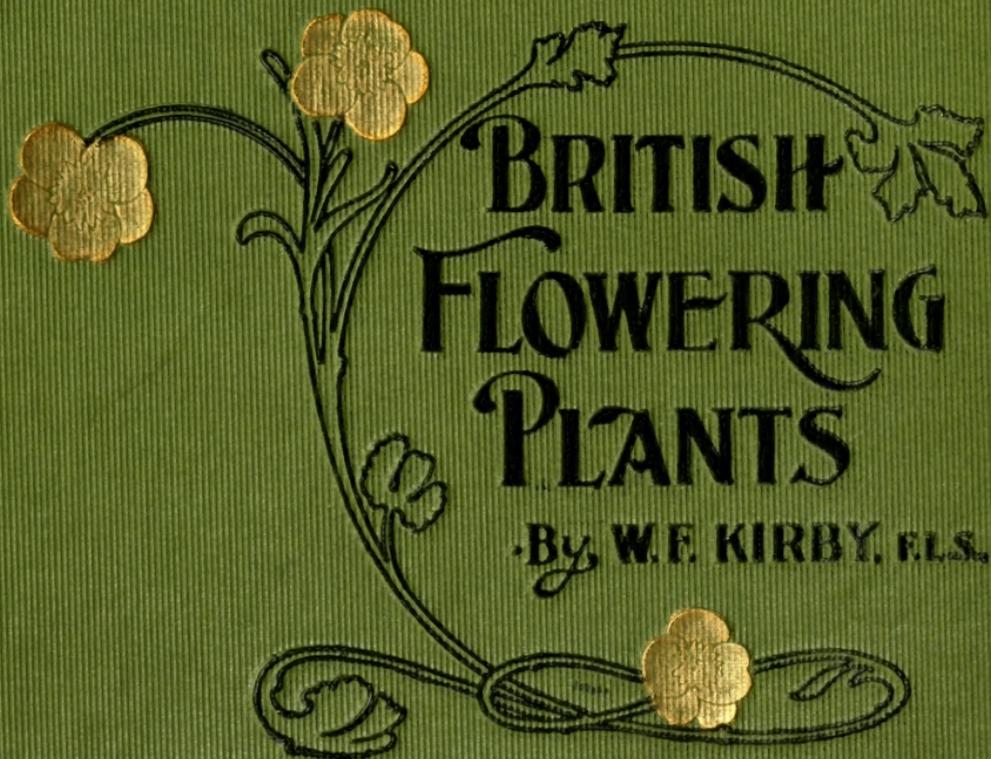
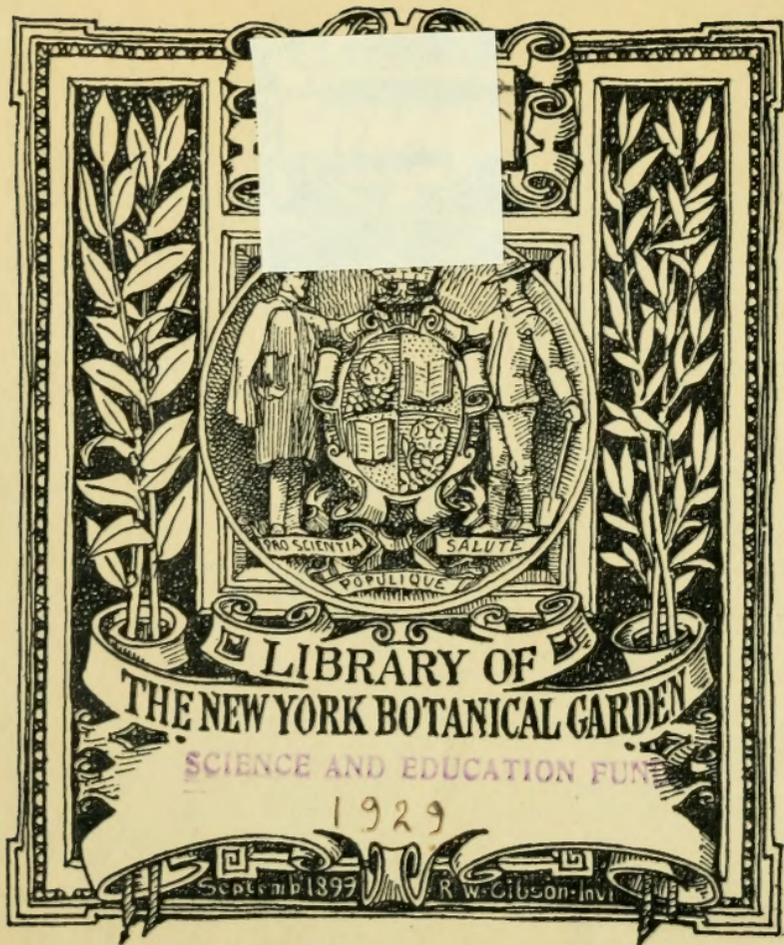


SIDNEY APPLETON'S POPULAR
NATURAL HISTORY BOOKS.



BRITISH
FLOWERING
PLANTS

By W. F. KIRBY, F.L.S., F.E.S.



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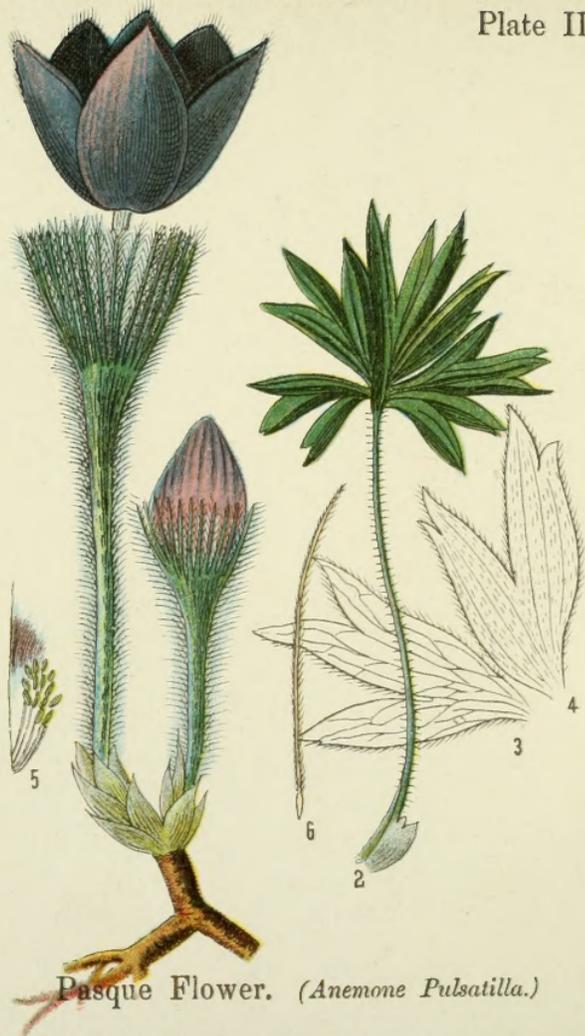
BRITISH FLOWERING PLANTS

Plate I.



Traveller's Joy. (*Clematis vitalba*.)

Plate II.



Pasque Flower. (*Anemone Pulsatilla*.)

BRITISH FLOWERING PLANTS

By *William* *Forsell* F. KIRBY, F.L.S., F.E.S.

AUTHOR OF "BUTTERFLIES AND MOTHS OF EUROPE," ETC.

WITH 120 COLOURED PLATES, SHOWING THE MOST
IMPORTANT CHARACTERS OF EACH PLANT FIGURED;
AND 119 ILLUSTRATIONS IN THE TEXT



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P R E F A C E

THE present little book occupies an intermediate place between the numerous popular works in which the principal feature is the illustration of wild flowers, and more purely technical works (whether illustrated or not) in which most stress is laid on botanical details and descriptions. It is hoped, therefore, that it may serve as a useful companion to the former class, and as an introduction to the latter.

The recognised classification of British Flowering Plants, as adopted in most recent English works on the subject, does not differ very much; and we have decided to follow that adopted in the ninth edition of Babington's "Manual of British Botany," edited by Henry and James Groves (1904), as the latest, though we have not always

used the exact names employed therein for some of the plants.

In this work ninety-two Orders of British flowering plants are recognised; in the fifth edition of Bentham and Hooker's "Handbook to the British Flora" (1887), in which the general arrangement is approximately the same, eighty-nine Orders are described.

A few of our illustrations represent plants not found in the British Islands; but, with a single exception (*Globulariaceæ*) every Order figured is represented in our British Flora.

We have endeavoured to point out the most important botanical characters of every British Order in the following pages, especially as regards the structure of the flower; and most of the more

important Orders are illustrated by one or more plates. We have not, however, been able to notice every species, or even every genus of British plants; but the number of British genera in each Order is noted after its name. Some of the more useful or interesting foreign plants belonging to the various Orders are occasionally mentioned. In order to avoid interrupting the text, a detailed explanation of the plates has been given in a separate Index.

With the view of increasing the interest of the book, some of the most important insects (especially

caterpillars of butterflies and moths) which feed upon or frequent various plants have been briefly described. Casual notes on legends and superstitions in regard to plants have also been occasionally included.

Almost every plant has its medical uses, and various notes on this subject have been contributed by Dr. W. Egmont Kirby.

It will be seen that we have endeavoured to include as varied an assortment of interesting matter as our moderate limits would permit within the compass of the present work.

W. F. KIRBY.

CHISWICK,

June 1906.

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INTRODUCTION

BOTANY is the Science of Plants ; and the series of plants inhabiting any particular country is often called the Flora of that country, after Flora, the Roman Goddess of Flowers.

A considerable number of plants are found growing wild in the British Islands, and many others have been introduced into gardens, and have then run wild, and become naturalised ; while foreign trees have been planted in woods or shrubberies. Many plants, again, especially weeds, are liable to be introduced by accident, as when their seeds are mixed with seed corn. So that it does not follow that every plant found growing apparently wild is truly indigenous.

On the other hand, building, drainage, enclosure, cultivation, clearing, weeding, etc., greatly tend to reduce the number of species of our wild plants. Nor is this the case in Britain only. I was once

walking along a country road in Germany with an artist friend, and we saw a man cutting down the wild flowers that bordered the path. We asked what he was doing this for, and he answered, "to beautify the road." The much greater interest now taken in natural objects likewise contributes towards the extermination of our more conspicuous wild flowers. It is, therefore, by no means superfluous to advise that in gathering wild flowers (especially if only for a temporary purpose, such as decorations or a nosegay), very few of the same kind should be taken unless they are plentiful ; and this applies still more to roots than to flowers. Reasonable care should accompany interest, or we are liable only to destroy what we admire. This is equally true abroad. Even in Switzerland, where wild flowers are far more plentiful and varied than with us, complaints are made that the rarer species are

rapidly being exterminated in many places by reckless gathering and uprooting.

Plants are divided into two principal sections: Phanerogamia, or those which produce true flowers and seeds; and Cryptogamia, or those which do not. Flowering plants only are included in the present work. The flowerless plants, including Ferns, Mosses, Seaweeds, Lichens, Fungi, Diatoms, Bacteria, and various other low forms of plant life, may perhaps find place in a later volume of this series.

Flowering plants again belong to two main classes—Dicotyledones and Monocotyledones. In Dicotyledones the seed is divided into two halves, each of which throws up a primary leaf when the seed germinates. In Monocotyledones there is often only one primary leaf, and the general formation of the plant is very different. The former class includes by far the larger number of plants. To the latter belong many more or less bulbous plants, such as Orchids, Flags, Lilies, etc.; many water-plants, like Reeds, Rushes, and Sedges; and the great Order of *Gramineæ*, or Grasses.

STRUCTURE OF A PLANT

A plant consists of the following principal parts: the roots, the stem, the leaves, the flowers, and the fruit.

ROOTS

The roots are fixed in the ground, to support the plant, but in climbing plants, like Ivy, for instance, we meet with aerial roots, which cling to the bark of trees or other supports. At the extremity of the rootlets we generally find a "root-cap," which protects the growing extremity of the root, and enables it to penetrate hard ground. As the root grows, the root-cap also continues to grow, the portion behind the tip dying off. Behind the root-cap are the root-hairs. Their function is to absorb water containing nourishing salts which have been dissolved from the surrounding soil, and to convey it to the actual roots.

Roots are divided into primary and adventitious. The primary root is formed by the prolongation of the stem downwards, which, when well developed, is termed a tap-root. In many plants (*Orchidaceæ*,

for example) the primary root dies away annually, and is renewed. The aerial roots of Ivy, and of many tropical plants, and the sucking-roots of the Dodder, are adventitious roots.

The tubers of the Potato and the bulbs of Onions

intermediate space is called an internode. The nodes are marked by a thickening of the stem in Knot-grass, and in grasses generally; and in such plants the nodes are often called knots, and the internodes joints. In grasses, the joints are of

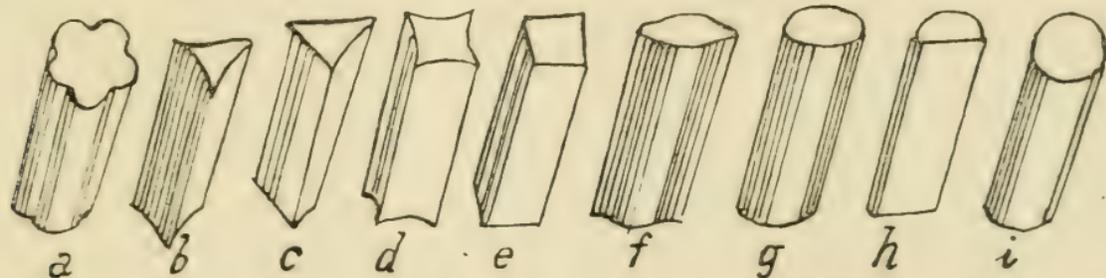


Fig. 1.

are not true roots, but underground portions of the stem.

STEM

The stalk, stem, or trunk of a plant rises upward; it bears the leaves and flowers, and is generally more or less branched. The points of attachment of the leaves are called nodes, and the

considerable length; but in some plants the nodes are so close together that the leaves are crowded into a mass called a "head," as in Lettuce, etc.

The stem may be either simple or branching, woody or herbaceous, and differs much in shape, etc., in different plants (fig. 1, *a—i*). Thus, the stem may be either cylindrical or angulated, rounded or filiform, erect or decumbent, and so on.

The stem is called sinuous when it curves backwards and forwards, jointed when it is interrupted at the nodes, as in Grasses, winding when it supports itself by other objects, as in Hops and Beans, climbing when it supports itself by thorns or aerial roots (Climbing Rose, or Ivy), clasping when it attaches itself by tendrils (Red Bryony, or Vine), erect when it rises straight, like the trunk of a tree, decumbent when it rests on the ground or rises obliquely (Mountain Pine), recumbent when it rests on the ground without rising (as in some species of *Rubus*), and creeping when it clings to the ground by roots (Strawberry).

LEAVES

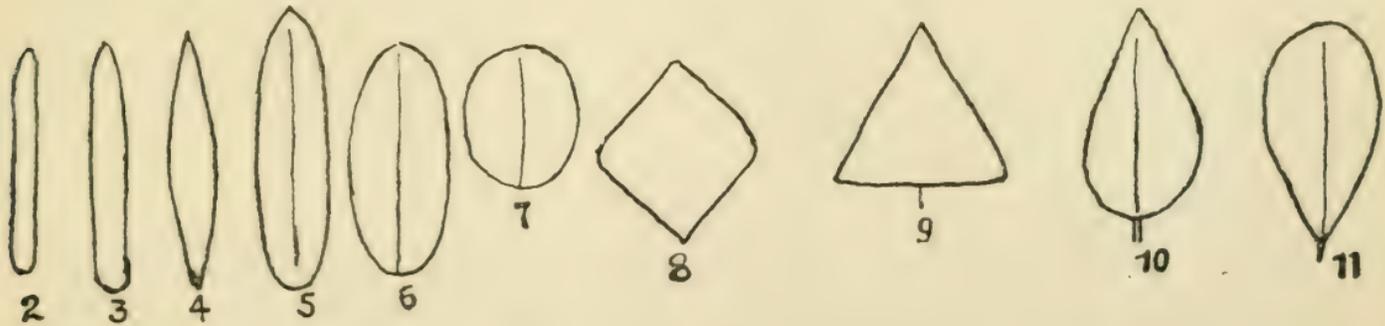
It is not sufficient for the sustenance of plants merely to absorb water and other liquid nutriment through the roots, but it is also necessary for them to breathe air, and this is the principal function of the leaves. The green colour of plants is due to a peculiar substance called chlorophyll, which, under the influence of warmth and sunlight, absorbs from

the surrounding air the gases required for the use of the plant. But plants (except fungi and other low plants, in which chlorophyll is not found) breathe in the opposite way to animals, for animals absorb oxygen to aerate their blood, and exhale carbonic acid, which, in quantity, is poisonous to them; whereas plants require carbon for building up their tissues, and therefore absorb the carbonic acid from the air, and exhale oxygen. Thus, during the day, plants greatly assist in purifying the air which animals breathe; but at night this process is somewhat reversed, for while it is necessary to their life for animals to breathe day and night, in plants the function of chlorophyll ceases at night, and any superfluity of carbonic acid which has been inhaled during the day is then exhaled. Consequently, it is not healthy to allow many plants to remain in a sleeping-room at night. But just as chlorophyll is wanting in some low groups of plants, so is it present in the *Hydra* and in some other low forms of animal life.

Leaves vary much in form, and are usually attached to a branch or stem by a stalk or petiole.

When a leaf stands independently on a single stalk it is called simple. Among the various forms of simple leaves we may mention the following:—

1. Needle-shaped, when they are long and equally thick and broad (fig. 2).



2. Linear, when they are several times as long as broad, with parallel sides (fig. 3).

3. Lanceolate, when they are three or four times as long as broad, and pointed at the end (fig. 4).

4. Elongate, like the last, but with obtuse ends (fig. 5).

5. Elliptical, when they are twice as long as broad (fig. 6).

6. Orbicular, when they are about as long as broad (fig. 7).

7. Rhomboidal, when four-sided (fig. 8).

8. Triangular (fig. 9).

9. Ovate, when the upper end is narrower than the lower, and the leaf is not more than twice as long as broad (fig. 10).

10. Obovate, when the lower part is narrower than the upper (fig. 11).

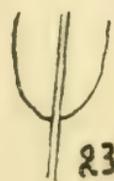
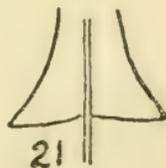
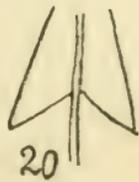
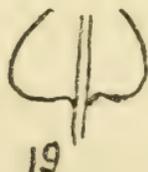
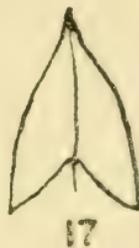
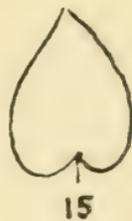
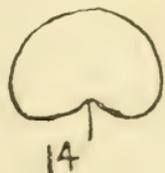
11. Conical, when the upper portion is broader

than the lower, and the borders are not indented (fig. 12).

12. Spatulate, when broader above than below, with the sides sloped inwards (fig. 13).

15. Obcordate, with an indentation above, at the broadest end of the leaf (fig. 16).

16. Sagittate, or arrow-shaped, pointed above and indented below (fig. 17).



13. Reniform, broader than long, with an indentation below (fig. 14).

14. Cordate, longer than broad, and with an indentation below (fig. 15).

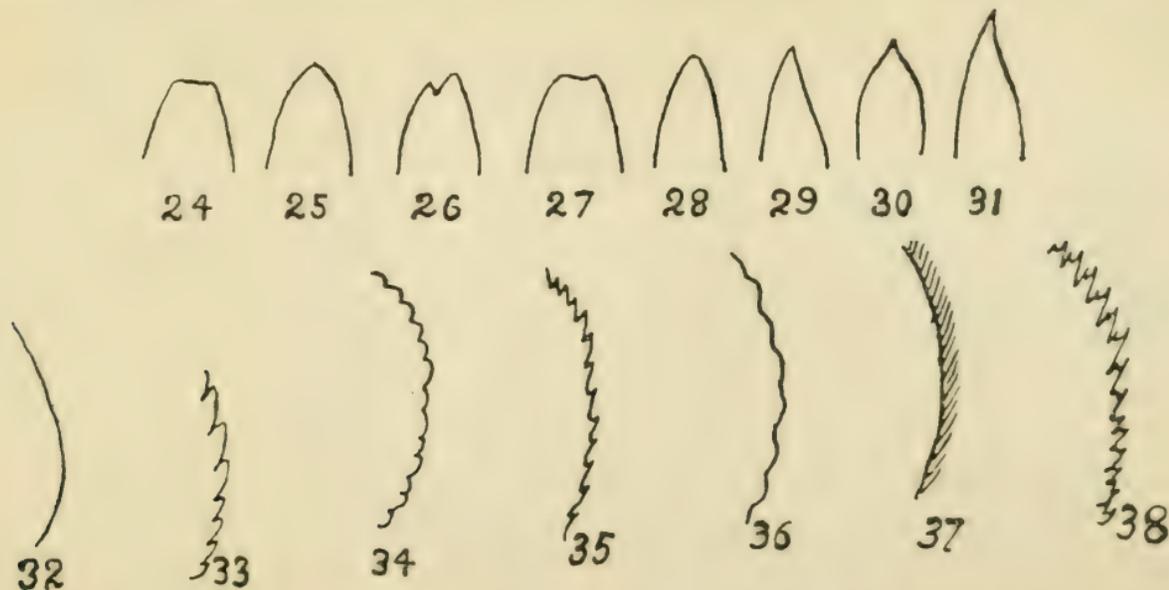
17. Hastate, very similar to the last, except that there is no indentation at the base, which is horizontal (fig. 18).

The general form of the leaf is not the only point

to be observed in examining a plant. The shape of the base, tip, and margins have also to be considered.

The base may be cordate (fig. 19), sagittate

broken off (fig. 24), rounded (fig. 25), incised (fig. 26), emarginate (fig. 27), obtuse (fig. 28), acute (fig. 29), spinose (fig. 30), or pointed (fig. 31).



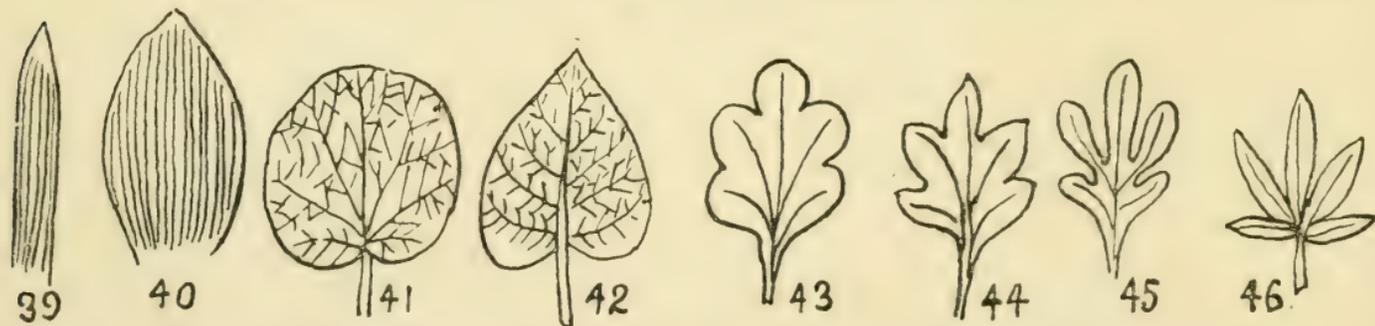
(fig. 20), hastate (fig. 21), attenuated (fig. 22), or rounded (fig. 23).

The apex of the leaf may be truncated, as if

The margin of the leaf is entire when it is not indented (fig. 32), serrated when it has small acute indentations and projections (fig. 33), crenate

when it has small acute indentations and rounded projections (fig. 34), dentated when it has obtuse incisions and pointed projections (fig. 35), sinuated when it has obtuse incisions and rounded projections (fig. 36), ciliated when the margin is set with fine hairs (fig. 37), incised when the margin

When the veins run straight they are called parallel (figs. 39 and 40), but they are frequently curved. Reticulated leaves are called digitate when equally thick veins subdivide towards the ends (fig. 41), and pinnate when there is one midrib forming a continuation of the leaf-stalk,



exhibits alternately larger and smaller indentations and projections (fig. 38).

On examining a leaf we find that the softer surface is traversed by hard lines, which are called veins or nerves, and which may be either simple or branched, and sometimes form a network.

and throwing out slender branching veinlets on the sides (fig. 42).

Hitherto we have been speaking of simple and undivided leaves, but many plants exhibit leaves more or less divided.

When the division is incomplete the leaf is

said to be lobate, but when completely divided into several distinct leaflets it is said to be compound.

A leaf is said to be palmately lobed when the divisions do not extend to the middle (fig. 43),

A leaf is pinnately lobed when the incisions are only slight (fig. 47), and fissured or cleft when they are deeper (figs. 48 and 49).

Leaves may also be entire (fig. 51), lobate (fig. 47), or fissured or cleft (figs. 48, 49).



fissured when they reach nearly to the middle (fig. 44), cleft when they reach beyond the middle (fig. 45). It is simple or entire when undivided (fig. 50).

A palmate leaf is called compound when it divides into several radiating leaflets at the end of the leaf-stalk (fig. 46).

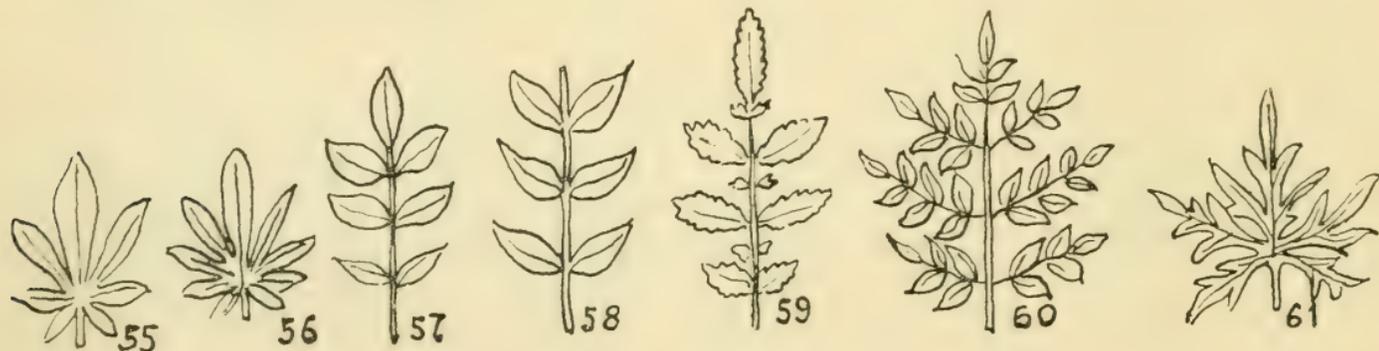
Fig. 52 illustrates a pinnate leaf which has several secondary leaves, called leaflets, on the sides of the leaf-stalk.

When a palmate leaf consists of three leaflets, as in clover, it is called ternate or trifoliate (fig. 53); and a greater number of leaflets, similarly arranged, is shown at figs. 54-6.

When, in a pinnate leaf, the leaflets are arranged on the sides of the leaf-stalk with a terminal leaflet, the leaf is called imparipinnate (fig. 57); when the terminal leaflet is wanting, paripinnate (fig. 58); interruptedly pinnate when the pairs of leaflets are

stalk; and the clasping base, embracing a portion of the stem of the plant (fig. 64).

When the leaf-stalk is absent, the leaf is said to be sessile (fig. 65). When the sessile leaf encloses the stem, it is called amplexicaul (fig. 66);

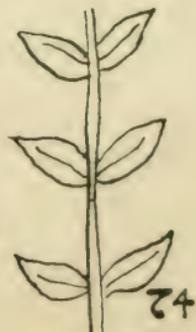
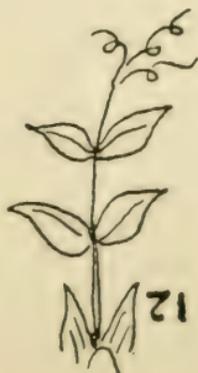
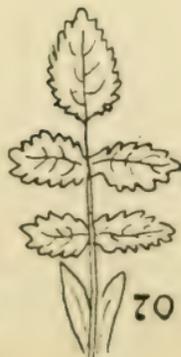
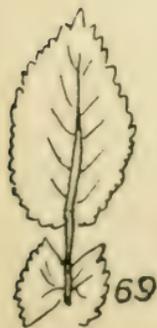
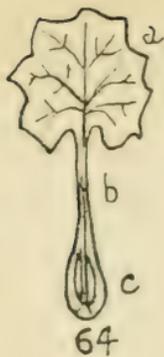
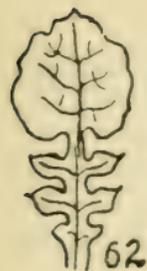


alternately larger and smaller (fig. 59); and bipinnate when the leaflets are themselves compound (fig. 60). Other forms of compound leaves are palmate-partite (fig. 61), lyrate (fig. 62), and pedate (fig. 63).

Many leaves are divided into three principal parts: the lamina, or surface of the leaf; the foot-

and when the stem grows through it, it is said to be perfoliate (fig. 67). Sometimes small leaves are formed near the base of the leaf-stalk. These are called stipules, and the leaf is then said to be stipulate (figs. 68-71).

Occasionally, as in the Plantains, there is a "rosette" of leaves close to the ground (fig. 72);



but they are more usually arranged round the stalk.

When leaves stand at different elevations on opposite sides of the stalk they are called alternate (fig. 73); when they are arranged in pairs, at the same elevation, opposite (fig. 74); and when several are placed at the same height, verticillate or whorled (fig. 75).

Tendrils are regarded as slender branches, or leaf-stalks, which assume a spiral form, and twine round various objects for support (fig. 71). Thorns are either the ends of twigs produced into a sharp point, or similarly modified portions of leaves and leaflets. Prickles are hard, erect portions of the surface of the plant. Thus we find thorns on the Hawthorn and Sloe, but prickles on the Rose, Bramble, and Gooseberry.

Hairs are outgrowths from the superficial cells of the stem, leaf, or root. They are generally tubular. Stiff hairs are called bristles or setæ. When they form a cluster, as in Barley, etc., the cluster is called a beard; when they contain an irritating fluid, as in Nettles, they are called stings;

and when they exude any peculiar secretion, they are called glandular hairs.

FLOWERS

Flowers are structures preparatory to the formation of the seed, and in many cases are the most conspicuous parts of the plant.

A perfectly formed flower consists of the calyx, which is generally green; the corolla, which is often brightly coloured; the stamens; and the pistil. In imperfect flowers the calyx or corolla, or both, may be wanting; or they may be replaced by a single cup, called the perianth.

A perfect flower contains both stamens and pistil. Such flowers are called hermaphrodite. Other flowers are called monœcious, and in these only the stamens are developed, in which case they are male flowers; or only the pistil, when they are female flowers.

In some plants the stamens are united with the pistil; others, as said above, have only stamens (as wild Hop and male Hemp); and others, again, only the pistil (cultivated Hop and female Hemp).

In some cases flowers bearing stamens or pistil grow on the same plant, but separately. Thus, in Maize, the upper, tassel-like flowers contain only the stamens, and the lower only the style and carpels or seed-vessels.

The leaves of which the calyx is composed are called sepals. These may be coalescent, separate, divided, fissured, lobate, dentated, regular or irregular, bilobate, tubular, pitcher-shaped, bell-shaped or campanulate, etc.

The leaves of which the corolla is composed are called petals. Sometimes these are completely separated (fig. 76); or they may be more or less closely united, sometimes forming only a single piece.

When the corolla is united below, and more or less divided above, it is said to be lobated, dentated, or segmented, according to the depth and character of the incisions, and the undivided portion is called the cup or tube.

Soon after the plant has flowered the corolla falls off. It serves chiefly to attract insects, which in many cases are necessary to fertilisation.

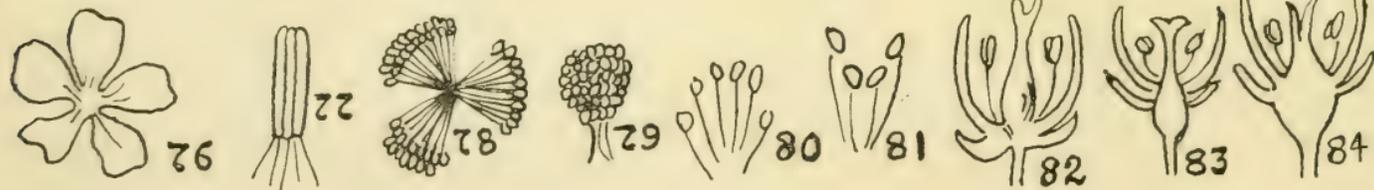
The stamens likewise differ much in form and structure, according to the requirements of the plant. They are sometimes free, and sometimes conglomerated. At the summit of the stamens stand the anthers, which secrete a dust (generally yellow) called pollen.

Sometimes the stamens are fused into a single tube (fig. 77); sometimes they form three clusters (fig. 78); or, again, they may form a single cluster (fig. 79). In other cases we find six stamens, four of about equal length and two shorter (fig. 80); or four, two long ones and two short ones (fig. 81).

The pistil is composed of the ovary or seed-vessel, the style, and the stigma. The ovary is often more or less divided into segments called carpels. It is generally surmounted by the style, at the end of which is the stigma. In order that seed should be matured, it is necessary for the pollen secreted by the anthers to be transferred to the stigma. Sometimes this is effected automatically, especially in perfect flowers; in other cases the pollen is carried from one flower to

another by the wind; and very frequently it is transferred from plant to plant by bees and other insects.

The style is sometimes very short, and placed directly on the ovary; but is often very long. It consists of the stigma, on which the pollen-grains fall, and the tube-like stem. Beneath is the ovary. Sometimes the style is absent, and we find only



a stigma placed directly on the ovary itself. The stigma is then said to be sessile. The ovary may be—

(a) Superior, when it is placed higher than the calyx, corolla, and stamens (fig. 82).

(b) Medium, when the calyx, corolla, and stamens stand in a pitcher-like prolongation of the axis of the flower (fig. 83).

(c) Inferior, when the calyx, corolla, and stamens stand on the ovary itself (fig. 84).

In double flowers, like garden Roses and Dahlias, the stamens, and in part the styles, are metamorphosed into petals; and such flowers are infertile. The outer flowers of the wild Guelderrose, and all the flowers of the garden plant, are likewise infertile.

In many flowers the corolla is irregularly formed.

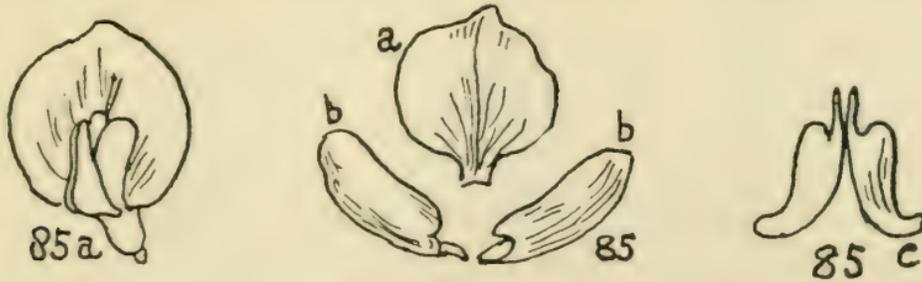
Among these are the *Papilionaceæ*, or butterfly-flowers, such as those of Peas and Beans. They are so called from their resemblance to white butterflies; and the corolla is composed of five petals—one upper (the flag or standard), two lateral (wings), and two lower. The last are generally

fused into one, and are then called the keel (fig. 85, *a, b, c*).

In the *Labiatae* there are five petals fused together into an upper and lower lip, the upper lip being bifid and formed of two petals, and the lower trifold, formed of three. In the Snap-dragon, the

Simple flowers may be either (*a*) terminal, when they rise at the end of a stalk (as in the Snowdrop); or (*b*) lateral, when they are placed in the axil of a leaf.

Compound flowers have received various names according to the manner in which they are arranged.



tube of the corolla is closed by a curve of the lower lip.

At the base of many flowers we find a gland secreting honey, and called the nectary.

ARRANGEMENT OF FLOWERS

Flowers are called simple or compound according to whether one or more rise from a common stalk.

Among the more important of these are the spike, the raceme, the panicle, the umbel, the cyme, and the head.

A Spike has a long axis, and sessile or very shortly stalked flowers (fig. 86). A spike of corn is called an ear.

A Cob (of Maize) is a spike with a thickened axis; a catkin is a spike with unisexual flowers (as

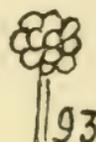
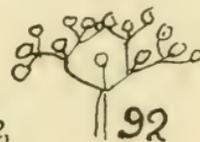
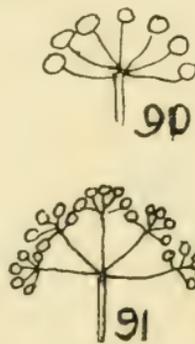
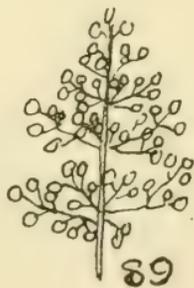
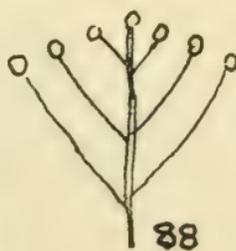
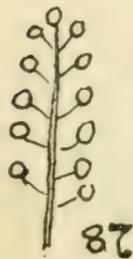
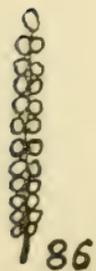
in the Hazel), and a Cone is a spike with ligneous bracts.

A Raceme has a long axis, and long-stalked flowers (fig. 87).

When the lower stalks are longer than the upper,

instead of a flower, this is called a compound umbel (Parsley, fig. 91).

In a cyme the axis terminates in a flower, whereas in an umbel the stalks rise from a point, and consequently the axis bears no flower (Elder, fig. 92).



so that all the flowers stand at a nearly equal level, we have a corymb (fig. 88).

A panicle is a branched raceme (as in Oats, fig. 89).

In an umbel the main axis is short, and numerous stalked flowers stand at the end (*Ceanothe*, fig. 90).

When the branching stalks support small umbels

A flower-head has a very short axis, and very short or sessile flowers (Clover, fig. 93).

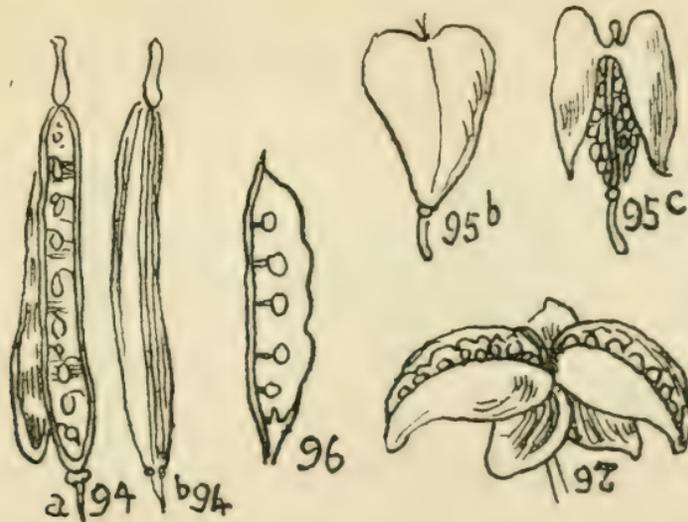
FRUIT

After the flower has faded, the ovary continues to develop, and as many fruits are produced as the flower contains fertilised ovules or germs. The

term fruit is applied to the seed or seeds and their adhesive and protective coverings.

A simple or single fruit is produced by a single

to allow of the escape of the seeds, or else fall off without opening. Dehiscent fruits, which are short and broad, are generally called capsules; and when



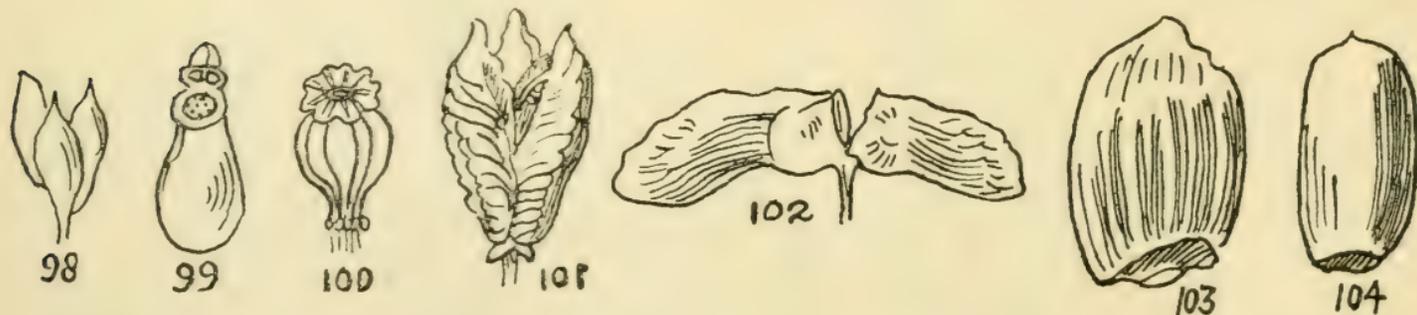
flower (a Nut), and an aggregate fruit is formed by the union of several flowers (a Mulberry). Fruits may be either dry or succulent, dehiscent or indehiscent; that is, they either open when ripe

long, and containing several seeds in a row, they are pods or legumes. Sometimes the pod is longitudinal, divided by a partition through the middle into two seed-chambers (figs. 94-6); in

other cases, as in Peas and Beans (fig. 96) there is no division. The carpels of the Pæony open longitudinally (fig. 97).

A capsule may open in different ways :

(a) At the extremity, by valves or teeth (as in the Pink) (fig. 98).



(b) By a lid, or pyxis, as in the Henbane (fig. 99).

(c) By open pores, as in the Poppy (fig. 100).

(d) By longitudinal clefths, as in the Meadow Saffron (fig. 101).

Among indehiscent seeds some divide longi-

tudinally along the lines of the capsules, and are called schizocarps. Sometimes these split in two, as in the Fennel, or Sycamore ; the latter divides into two winged seeds (fig. 102), called keys (like the single-winged seeds of the Ash-tree) or samaras. In other plants the fruits split longitudinally into

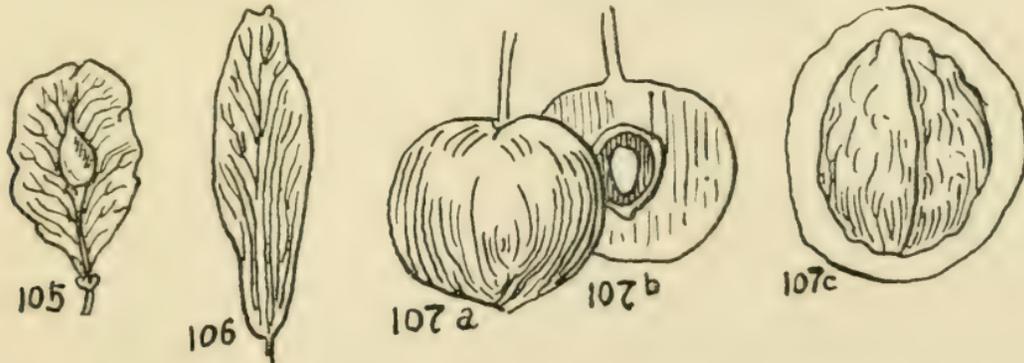
four carpels, five carpels (the Geraniums), or a larger number (the Mallows).

Single indehiscent seeds are generally called nuts, achenes, or grains. The pericarp or outer integument is either woody or leathery, as in the Hazel-nut (fig. 103) and acorn (fig. 104); or the fruit is winged, as in the Elm (fig. 105) and Ash

(fig. 106); or the pericarp is united with the palea, or inner covering of the seed, as in the Grasses; or the ovary is inferior, and partly combined with the nut (or achene as it is sometimes called), as in the Dandelion. Not infrequently a seed or

embedded in pulp. Such are Gooseberries and Currants, and (botanically) even the fruit of such exotic plants as Cucumbers and Melons.

A drupe is a fruit in which the seed (one or more) has a membranous or woody covering



seed-case bears at the extremity a bristle, called an awn; or a feathery appendage, called a pappus.

In succulent fruits the outer covering or pericarp is fleshy or juicy.

A berry is a fruit enclosed in a leathery skin (epicarp) and enclosing one or more seeds

within the pulp. When the covering of the seed is hard and woody, as in the Plum, Cherry, and Walnut, the fruit is called a stone-fruit (figs. 107 *a*, *b*, *c*); but the compound fruits of the Strawberry and Raspberry are also ranked as drupes.

BRITISH FLOWERING PLANTS

IN order to distinguish one plant from another, and that they may easily be spoken of, and identified without any doubt or difficulty, the great Swedish botanist Linné, or Linnæus, who lived in the eighteenth century, improving on the work of his predecessors, established an arrangement by which every animal and plant (for he was a zoologist as well as a botanist) is known by two names—the Genus and the Species. These are thrown into a Latin form, and in most cases the generic name is derived from Greek and the specific name from Latin. These names are known and recognised all over the world; so that, no matter in what country we are, or what language is spoken there, every botanist will immediately know, if we speak of *Quercus robur*, that we mean one particular species of Oak-tree. Many English names of animals and plants have been applied to

very different species in different parts of the country, or at different periods, or in different countries; while, even when this is not the case, popular names are frequently wrongly translated in the best dictionaries. Thus, to take an extreme instance, a robin in England means a small brown bird with a red breast; in America it means a much larger bird, which is really a kind of thrush. But if the Latin names are used, no confusion is possible.

The generic name is placed first (*Quercus*, for instance), and this is applied to all trees which possess a certain number of characters in common. Thus it corresponds to a surname, except in position. The specific name (*robur*) indicates one particular kind of Oak-tree, and corresponds (collectively) to a Christian name.

The genera are grouped together in larger

divisions (Classes, Orders, etc.), according to their characteristics, which are largely taken from the structure of the flowers. The general explanations are given in the Introduction, and we will now proceed to notice the various Orders, etc., which include British plants, with special reference to those figured. It will be good practice for the beginner to compare the plants themselves with our figures and descriptions, and verify the characters which we have given. All botanists do not follow the same arrangement in classifying the Orders of plants. That followed here will be found to correspond nearly with that employed in the latest English scientific compendium :

Babington's "Manual of British Botany," edition 9 (1904).

Plants with flowers in which distinct stamens and pistils are visible are called Phanerogamia, or Flowering Plants, and these alone are discussed in the present work.

Plants without real flowers, and multiplying by spores, are called Cryptogamia. These are Ferns, Mosses, Seaweeds, Lichens, Fungi, Diatoms, Bacteria, etc.; and the lowest organisms merge into the Protozoa—extremely rudimentary forms, which cannot be satisfactorily regarded as either animals or vegetables, but are not yet differentiated into either one or the other.

PHANEROGAMIA, OR FLOWERING PLANTS

The number of British genera is added in brackets after each family

CLASS I

DICOTYLEDONES

Seeds formed of two or more cotyledons. Stems formed of vascular tissue, sometimes enclosing pith, and surrounded by rind or bark. In trees the trunks are formed of concentric layers, one of which is supposed to be added every year. Leaves with branching and reticulating veins. Young plants always furnished with a tap-root. Flowers (when the corolla is present) with 4 or 5 petals (most frequently 5), rarely more.

SUB-CLASS I. *Thalamifloræ*

Petals separate, and rising, as well as the stamens, near the ovary, and not from the calyx.

Order I. *Ranunculaceæ* (15 genera)

These are herbaceous plants, with brightly coloured flowers. The calyx is always present; it has from 3 to 6 sepals, and is often brightly coloured, resembling a corolla. The corolla is sometimes composed of from 4 to 15 petals, in one or several rows, but is frequently rudimentary or absent. The stamens are numerous, and the anthers burst longitudinally. The carpels are usually numerous.

Though the flowers are attractive to insects, by which they are often fertilised, many of the plants belonging to this Order are extremely acrid, and frequently highly poisonous, though the poisonous principle is volatile, and may sometimes be dissipated by heat.

Traveller's Joy—*Clematis Vitalba*

(Plate I)

This is an exceedingly graceful climbing plant with slender stems, which often runs thickly over banks and hedges in the south of England, preferring a chalky soil. The leaves are oval or heart-shaped, and pointed. The flowers grow in small clusters; the corolla is absent; and the calyx, which has 4 or 5 sepals, is yellowish green on the outside, and white within; it is about one-third of an inch in diameter. The seed-vessels are adorned with long feathery awns.

The plant is highly acrid, and in former days it is said that beggars used to bind leaves over scratches, and thus produce ulcers to move the compassion of the charitable.

Upwards of 20 species of insects are recorded as feeding upon this shrub, some being peculiar to it. Among these are several species of *Geometridæ*, or Looper Moths, the caterpillars of which have only 10 legs, 6 situated on the thorax and 4 near the end of the body, and therefore

move by fixing their four hinder-legs, stretching forward and fixing their six front-legs, and then drawing up their hindlegs towards the others, thus arching their bodies into a loop. Often, however, they fix themselves by the hindlegs and stiffen themselves, when they present the appearance of a bare green or brown twig.

One moth, *Phibalapteryx vitalbata*, has been named after the plant. The caterpillar is bluish green, with a yellow line on the sides, and feeds on *Clematis* in autumn. The moth has rather pointed forewings, an inch and a quarter in expanse; it is light brown, with transverse brown lines, and a blackish oblique streak tapering from the inner margin of the forewings to the tip.

The following lines have been written on this plant :

The Traveller's Joy is a darling thing,
 None loveth it more than I;
 I've seen it in courtly gardens cling,
 I've seen it 'mid rocks and ruins spring,
 I know hedgerows where it's wandering,
 And I smile as I pass it by.—TWAMLEY.

Another name by which it is known in England is the Virgin's Bower.

belladonna, one of the principal medicines used by homœopathists.

Pasque Flower—*Anemone Pulsatilla*

(Plate II)

This is a spring flower, met with occasionally in dry pastures, in chalk or limestone districts, in several parts of England, but not commonly. The flowers grow up before the leaves expand, the stalk lengthening till it is 5 or 6 inches high. The leaves, when they expand, are bifid or trifid, and deeply cleft at the extremities of the leaflets. The outside of the calyx (of 6 sepals), the stalks, etc., are very silky; the corolla is absent. In the ripe fruit the carpels are separate, round, and surrounded by long tufts of white hairs or awns.

The fresh juice of the plant has an irritant effect on the skin. Preparations from the plant are sometimes employed in cutaneous diseases, and also in whooping cough. It is, like aconite and

Wood Anemone—*Anemone nemorosa*

This is a much commoner flower in Britain than the last. It is a smaller and much more slender plant, with the leaves less deeply cleft, and a white flower of 6 sepals, often more or less tinged with delicate pink on the outer sides. The carpels are pointed, but destitute of an awn. It is very common on hedge-banks, open places in woods, and similar localities in spring.

On this plant feeds the larva of *Adela Degeerella*, one of the most beautiful of the smaller moths, which appears in June, and sports in the sun. The forewings are of a long oval, three-quarters of an inch in expanse, and are varied with yellow and violet-brown; beyond the middle is a transverse yellow band; the hindwings are brown, and are fringed with long hairs. But what renders this pretty moth and its immediate allies remarkable is the extraordinary length of the slender antennæ,

which are about twice as long as the expanse of the wings. The pale yellowish larva, with a black head, forms a flattened pear-shaped case of fragments of leaves, in which it lives, feeding on chlorophyll, till it reaches its full growth, when it becomes a pupa within the case itself.

Buttercup—*Ranunculus auricomus*

(Plate III)

The genus *Ranunculus*, to which the Buttercups and Crowfoots belong, contains a great number of species, some of which are very abundant in woods and pastures. The flowers of the Buttercups (generally with 5 sepals and petals) are of a paler or deeper yellow, while the Water Crowfoots are white.

The species which we have figured grows about a foot high, and is common in woods, where it flowers in April and May. The root-leaves are smooth, kidney-shaped, and notched or lobate; while the leaves on the stem are pinnate, sessile, entire or dentated, and the flower-bearing stalks

are erect. The root is fibrous. The stem is upright, cylindrical, smooth, and simple, or branching above. The flower-stalks rise from the axils of the leaves, or from the upper part of the stem. The flowers are large, with a golden-yellow corolla. The petals are round, entire, veined, and provided with a very short base. The sepals are about half as long as the petals, and are yellowish, pubescent, and obtuse. The seeds are gathered into a round cluster, and each seed has a curved beak at the extremity. This species is sometimes called "Goldilocks," a translation of its Latin name.

Among the Buttercups found in meadows, one of the commonest is *Ranunculus bulbosus*, easily distinguished by the upper part of the root forming a small white bulb.

All the Buttercups are very acrid plants, and cattle will not eat them in the fresh state; but when dried among hay they are harmless. It is, therefore, quite a mistake to suppose that the yellow colour of butter is due to cows eating buttercups, though it is almost certain that buttercups derived their name from their being more

Plate III.



Buttercup. (*Ranunculus auricomus*.)

Plate IV.



Monkshood. (*Aconitum Napellus*.)

or less "butter-coloured." In the country a bigger child will often hold a buttercup under the chin of a smaller one to see, by the yellow reflection, whether the little one "is fond of butter."

The white Water Crowfoots, found in shallow pools and slowly running or standing water, are not acrid.

Comparatively few insects feed on Buttercups; but some small beetles, about a quarter of an inch in length, may sometimes be found in the flowers. One of these, *Prasocuris marginella*, is black, with the thorax and wing-cases bordered outside with dull orange; another, *Cryptocephalus sericeus*, is of a bright golden green. Besides these, the larvæ of various small saw-flies and two-winged flies mine in the substance of the leaves.

The Marsh Marigold (*Caltha palustris*) grows commonly in marshy places in large clusters, and has large leaves and bright orange flowers, resembling those of a gigantic buttercup, and composed of 5 sepals, the petals being obsolete. The Globe-flower (*Trollius europæus*) is yellow, with from 10 to 15 broad yellow sepals converging inwards, and

forming a kind of globe nearly concealing the rest of the flower. It is common in mountainous districts both in Britain and on the Continent.

Monkshood—*Aconitum Napellus*

(Plate IV)

This is a tall, erect plant, 2 or 3 feet high, with slender, deeply cut leaves, and large purplish blue flowers, composed of 5 sepals; the petals are rudimentary. It is sometimes called "helmet-flower," from the shape of the upper sepal; and also "wolf's-bane," having formerly been used by hunters to poison wolves. It is one of the most poisonous of all our native plants. With us it is more of a garden than a wild plant; but on the Continent it is very abundant in many mountainous districts, though not found everywhere. It is a dangerous plant in a garden, for after the plant has died down the fleshy roots have sometimes been mistaken for horse-radish, and have been eaten with fatal results.

Nevertheless, several insects feed on this plant,

the most interesting being the green caterpillar of a moth (*Plusia moneta*), allied to our common Gamma Moth (*Plusia Gamma*), which, a few years ago, spread from Central Europe into Holland and England. *P. moneta*, which measures about an inch and a half across the wings, is pale golden-grey, with some silvery markings in the middle of the forewings, and is varied with pale violet towards the borders.

The leaves and root of Monkshood are used in medicine, chiefly to lower the temperature of the body in cases of fever.

In cases of poisoning by aconite an emetic should be given, followed by stimulants (such as brandy), and warmth and friction should be applied to the body. Digitalis and strychnine may be employed as antidotes.

Bane-berry—*Actæa spicata*

(Plate V)

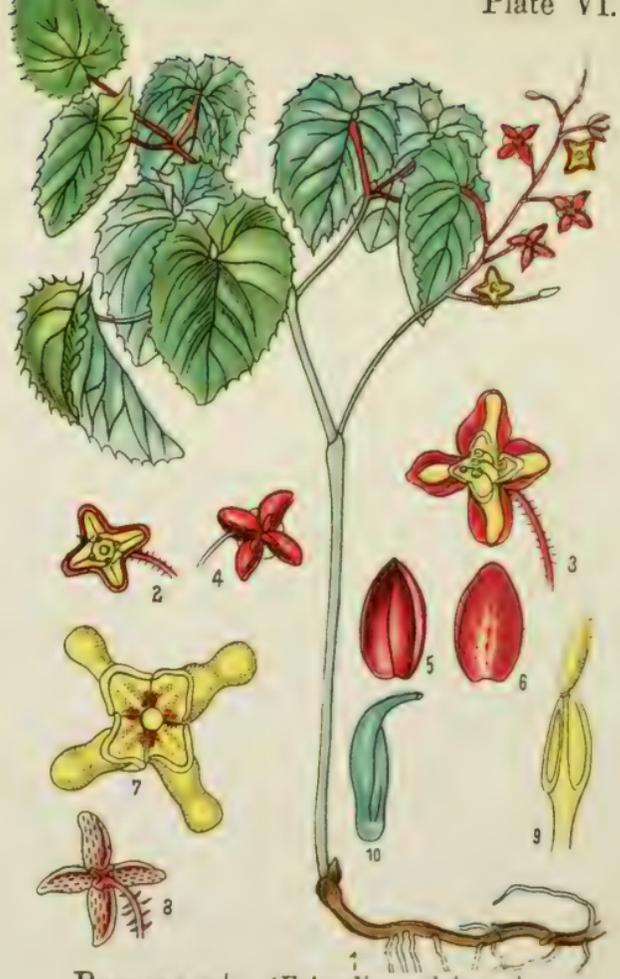
This is a plant growing from 1 to 2 feet high, with large trifid bipinnate leaves. The small

flowers grow in clusters. The calyx and corolla are yellowish white (with 4 sepals and petals), and the berry is black. The plant grows in shady woods and thickets, and flowers in May. It is a local plant in Britain, and is only found in the north of England and Scotland. The leaves, like those of various other *Ranunculaceæ*, will raise blisters on the skin. The berry also is of course poisonous; hence its name. It is an irritant, causing sickness and diarrhoea. No British insect is recorded as feeding on this plant.

Several other plants belonging to the *Ranunculaceæ* are more frequently found in gardens than wild in Britain, and some of these are probably introduced rather than truly native species. Among these we may mention the Pheasant's Eye (*Adonis autumnalis*), which is about 1 ft. in height, and bears a bright scarlet flower, with a black centre; the Hellebores, or Christmas Roses, bearing large green flowers, composed of 5 broad sepals (the petals being rudimentary) incurving towards the extremity, and highly poisonous; the



Baneberry. (*Actaea spicata.*)



Barrenwort. (*Epimedium alpinum.*)

Columbine, a pretty drooping blue flower, not uncommon in woods; the Larkspur, an upright plant with a flower much resembling Monkshood, but of a brighter blue; and the Pæony, which is naturalised on an island in the Severn, but which is really a South European plant.

Order II. *Berberidaceæ* (2 genera)

This is a small family, comprising shrubs the flowers of which have petals and sepals opposite to each other, variable in number, and one 1-celled ovary. There are only two British species, neither of which is perhaps truly indigenous. Of these the best known is the Barberry (*Berberis vulgaris*), which is an ornamental shrub with oval dentated leaves, drooping clusters of yellow flowers (with 6 sepals, petals, and stamens), which emit an unpleasant odour, and smooth, glossy oval or curved fruit, of a bright scarlet, a quarter of an inch in length, and about three times as long as broad. The berries are intensely acid, but when tied in small clusters and boiled in syrup make a very

nice preserve. The tree is set with strong trifid spines. The flowers are remarkable for their peculiar irritability. If one of the stamens is moved or touched with a needle at the base, it suddenly bends over on the pistil, resuming its erect position after a short time, thus ensuring the fertilisation of the seeds. A yellow dye is obtained from the roots and bark of the Barberry. The Corn Mildew (*Puccinia graminis*), which attacks corn and grain, passes through an alternate stage on the leaves of the Barberry, from whence the spores are again transferred to grass or corn. The Barberry is common in hedges in many parts of the British Islands, and is a very favourite plant in shrubberies.

Barrenwort—*Epimedium alpinum*

(Plate VI)

This plant is a native of the Eastern Alps, but is occasionally found half-naturalised in Britain. The root is perennial, creeping, and the stalk is clothed with brown scales towards the base. The

stem divides into a thick leaf-stalk and a slender flower-stalk. The leaves are thin, stiff, drooping, and heart-shaped; they are green above, and whitish green beneath. They are entire, but the borders are set with slender prickles. The flowers are attached to a slightly branching panicle, and at the base of each fork is a small oval leaf-scale. They have 4 sepals, petals, and stamens. The petals are oval, obtuse, concave, and blood-red; the exterior of the flower is yellow. The flowers appear in April and May.

Order III. *Nymphaeaceæ* (2 genera)

In the Water-lilies the calyx is composed of from 4 to 6 sepals. The corolla has numerous petals, gradually passing into the stamens, which, as well as the carpels, are also numerous. The plants are rooted at the bottom of the water; the broad leaves float on the surface, and the buds, when fully developed, also rise and expand on the surface. Three species only, one white and two yellow, are found in Britain, and are not un-

common in ponds and backwaters in most parts of our islands. Many of the tropical species are blue or red, some of them, as the South American *Victoria regia*, attaining a very large size, the leaves being 3 or 4 feet in diameter.

White Water-lily—*Nymphaea alba*

(Plate VII)

The White Water-lily, with its snow-white flowers with a yellow centre, is the largest and most beautiful of our water-flowers, flowering in June and July, and often measuring four inches in diameter, and the leaves twice as much. It varies, however, considerably in size. The leaves float on the surface of the water, and the flowers, which are scentless, expand in the morning and close in the evening. The sepals are white above and green below. The inner petals are smaller than the outer ones. The stigmas are yellow, and the outer ones are broader below than the inner, and are, like the petals and carpels, attached to a disk called the receptacle. The carpels form a



White Water-Lily. (*Nymphaea alba*.)



Corn Poppy. (*Papaver Rhæas*.)

cluster, and the fruit is rounded and obtuse. Each seed is enclosed in a reticulated membrane.

The Yellow Water-lily (*Nuphar lutea*) is also common. The flower is of a deep yellow, not exceeding $2\frac{1}{2}$ inches in expanse, and smells something like brandy. Another much smaller yellow species (*Nuphar pumila*) is very local, and is chiefly found in Scotland.

Insects which live on water-plants are less particular about their food than others; and those which feed on Water-lilies will also feed, as a rule, on other plants. Among these are several small brilliant metallic-green, coppery, or blue beetles belonging to the genus *Donacia*, and the dingy white caterpillars of the China Marks (*Hydrocampa Nyphæata* and *Potamogata*), elegantly-marked moths about an inch in expanse, with long slender bodies and legs, and oblong wings varied with clear white and brown, and slightly interlined with yellow.

A fluid extract obtained from the white and yellow Water-lilies has been used as an astringent in diarrhœa, and also for sore throat.

Order IV. *Papaveraceæ* (5 genera)

In the Poppies the calyx has two sepals, and the corolla four petals (rarely three), all falling off after a short time; the seeds are enclosed in a large capsule. The stem is generally set with stiff hairs, and the plants contain a milky secretion of a white or yellow colour. From that yielded by some species opium is prepared. Most of the British Poppies are red or yellow.

Opium is a powerful narcotic, and is used to cause sleep and to ease pain. A poisonous dose causes insensibility, and contraction of the pupil of the eye, and the breathing becomes slow and stertorous. In cases of poisoning by opium an emetic should first be given, and then strong coffee. The patient should also be roused, if possible, and kept walking about to counteract the tendency to sleeping.

Corn Poppy—*Papaver Rhœas* (Plate VIII)

This bright-coloured flower is a very common weed among corn, or on waste land. The stem is

upright and forking, and the stem, leaves, and outer side of the calyx are set with stiff hairs. The root-leaves are entire, oval and serrated, but those of the stem are pinnate and deeply fissured. The bright scarlet petals of the corolla are darker at the base, and fan-shaped. The sepals are oval and concave. The seed-capsules are oval, with 10 or 15 ridges on the outer side. The whole plant has a very disagreeable odour.

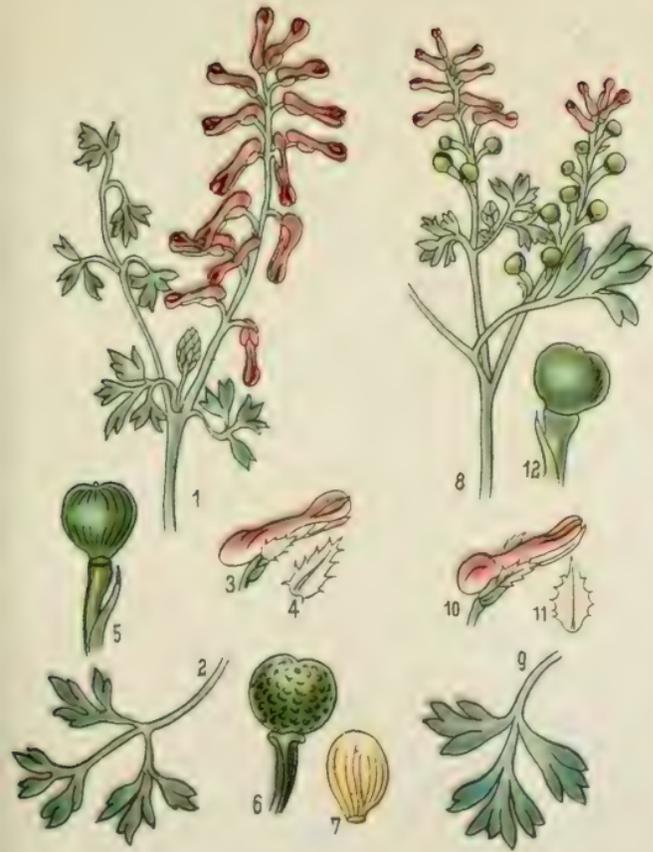
The Garden Poppy (*Papaver somniferum*) is a larger and less hairy plant, with a bluish-white flower. When the capsules and stem are scored, a white bitter juice exudes from them, which soon hardens into brown opium.

The White or Garden Poppy is widely spread in Europe and Asia, and is naturalised in some parts of Britain; and although most of the opium used here comes from Turkey or Asia Minor, the plant is occasionally cultivated in Britain for the sake of the poppy-heads, which are used in medicine, and the seeds, which are employed in confectionery, or to prepare oil. Much opium is grown in India, chiefly for export to China. The stamens

in Garden Poppies often become changed into petals, rendering the flower double, more handsome, but sterile.

One of the most interesting of the wild poppies is the beautiful Yellow Horned Poppy (*Glaucium luteum*), which grows all round our coasts on the shingle of the seashore, a little above high-water mark.

The flowers are of a bright yellow, and the leaves glaucous green. In place of a capsule, we find a long double pod, 6 or 8 inches in length, containing the seeds. There is a somewhat similar arrangement in the seed-pod of the Columbine, a plant with large compound deeply lobate leaves and small yellow flowers, which exudes a highly acrid and foetid yellow juice, and which is included in the present Order. It is not uncommon in waste places in Britain and on the Continent. In California there is a genus allied to the Poppies named *Eschscholtzia*, after the famous traveller and naturalist Eschscholtz. They are low-growing plants, with handsome yellow or white flowers nearly 2 inches in expanse, and the seeds are



Fumitory. (*Fumaria officinalis*.)



White Mustard. (*Sinapis alba*.)

formed in a long double pod. They grow well in Britain, and if not interfered with, they scatter their seeds so abundantly as to overrun a garden like weeds.

Order V. *Fumariaceæ* (2 genera)

A small Order, including plants bearing flowers with 2 small sepals (or none) and 4 petals, forming 2 lips, the upper ones spurred. There are 6 stamens, and 1 ovary. The fruit is either a nut with a single seed, or a pod containing several seeds. By some authors this Order is included in the *Papaveraceæ*.

Fumitory—*Fumaria officinalis*

(Plate IX)

This is an annual plant, with a slender, fibrous root, and a branching, ridged stem, covered, like the whole plant, with a glaucous bloom. The leaves are bipinnate, with deeply cleft leaflets, and clusters of red or white flowers. The sepals are small, white, and soon shed. Our figures represent the

large and small varieties of the plant. It is a common plant in Britain, chiefly in fields, but has perhaps been introduced with cultivation.

Order VI. *Cruciferæ* (31 genera)

This is an extensive Order, including a large number of useful plants, such as Mustard, Cress, Cabbage, Radish, etc., besides other plants grown for the sake of their flowers, such as Wallflower, Rocket, and Candytuft.

The *Cruciferæ* have 4 petals (rarely absent) arranged in a cross (whence their name), and 6 stamens. The calyx has also 4 sepals, but is soon shed. The flowers are generally small, and form clusters at the ends of the branches, and develop successively, so that the lower part has often ripened its seeds while the upper part is still flowering. Many are provided with nectaries to attract insects, but others are self-fertilised. The fruit is a pod (siliqua), long and broad, or short and broad, or constricted, as in the Radish. It is divided by a septiment into two compartments,

containing the seeds. Several species yield a strong essential oil. We have only space to notice one or two plants belonging to this extensive Order in detail.

White Mustard—*Sinapis alba*

(Plate X)

Mustard is a troublesome weed in arable land, and all the more so because it harbours various insects which are very injurious to cultivated crops, especially the dreaded "Turnip Fly." This is a collective name for several small species of shining metallic greenish or bronzy beetles, with or without yellow markings, which have thickened hindlegs and skip about like fleas. They belong to the genus *Haltica* and its allies.

The flowers of the White Mustard are yellow, and the flower-stalks are angular, and stand erect when they bear the pods. The pods are very pilose, and are furnished with a long sword-shaped beak. The seeds are white or brown, and number from 3 to 5 in a pod. This plant is some-

times cultivated, and mustard is prepared from the ground seeds. It is in daily use as a condiment; and is of great value as a household medicine, either mixed with water as an emetic, or as a poultice for chest complaints.

Woad—*Isatis tinctoria*

(Plate XI)

This plant is largely cultivated in many parts of the Continent, especially in Eastern Germany and Austria, for the preparation of indigo from the root. It is so scarce and local in England that botanists have doubted whether it is truly indigenous, although it is with the juice of this plant that the Britons are said to have stained their bodies blue in the time of Cæsar.

The root is turnip-like and biennial, and the plant flowers in the second year. The root-leaves are oval, smooth, narrower at the base, and notched on the borders. The stem grows to the height of 2 or 3 feet, and is enclosed by the leaves. The stem divides into several branches, which

Plate XI.



Woad (*Isatis tinctoria*)

Plate XII.



Sweet Violet (*Viola odorata*)

bear thick clusters of yellow flowers. The pods are smooth, hang downwards, and only contain one seed, which is very rich in oil.

Nasturtium officinale (Watercress), is a common plant in ditches and in shallow water generally, and also at the borders of streams. The stem is rather stout, fleshy, branching, and sometimes creeping; the flowers are small and white. The pods are about three-quarters of an inch in length, and are arranged in a double row. It is generally only a few inches long, but sometimes grows to a length exceeding 2 feet. It has, however, been introduced into Australia and New Zealand, where it has suddenly begun to grow with such luxuriance that it often reaches a length of 5 or 6 feet, and threatens to block up the rivers.

The name *Nasturtium* is often incorrectly applied to a handsome garden flower, also called with equal impropriety "Indian Cress" (*Tropæolum majus*). It really belongs to an exotic Order allied to the Geraniums, called *Tropæolaceæ*. It is grown either low or as a creeper; the leaves are large, very thick, and the whole plant has a strong

odour resembling that of mustard and cress. It bears large showy red or yellowish flowers (only one on a stalk), yielding large green carpels, which are sometimes pickled.

Many cruciferous plants are cultivated, but they suffer much from the attacks of various insects, for numerous wild plants belong to this Order, and as the insects which attack them are usually not very particular in their choice of food, they spread and multiply on cultivated plants, to which they often cause serious injury. We have already mentioned the small beetles which are so destructive to Turnips; but there are many other insects which are almost equally destructive to Cabbages, Turnips, etc. Among these are the caterpillars (mostly green) of no less than five white butterflies: the Large White (*Pieris brassicæ*), the Small White (*P. rapæ*), the Green-veined White (*P. napi*), the Bath White (*P. daphnidice*), and the Orange Tip (*Euchloë cardamines*). The caterpillars of all these butterflies are green, though sometimes inclining to yellowish or bluish. The Large and Small White are almost always common in gardens;

they are white, with the tips of the forewings dark, and some dark spots on the forewings above in the females; the former generally exceeds 2 inches in expanse, and the latter rarely reaches this size.

The Green-veined White Butterfly resembles the Small White; but the underside of the hindwings is distinctly streaked with yellowish green. It frequents woods and lanes oftener than gardens. The Bath White is a very rare butterfly in Britain. The forewings have a black, white-spotted border on the apical half, and a large dark spot on the front edge; the hindwings beneath are tessellated with dull green and white. It is generally found in stubble-fields. It is said to have derived its name from a young lady having worked a picture of a specimen taken near Bath on a sampler. The caterpillar feeds on Wild Mignonette, as well as on various species of *Cruciferae*. The Orange-tip is a very pretty spring butterfly found in meadows and lanes. The hindwings are chequered beneath with bright green mixed with yellow scales, and the male has a bright orange patch at the tip of the forewings. The female has no orange patch,

and has sometimes been mistaken for the Bath White, but the forewings are only narrowly edged with black at the tip, and there is only a small dark spot in the centre.

Many moths are very destructive to Cabbages, etc. The Cabbage Moth (*Mamestra brassicae*) is brown, with a white mark in the middle of the forewings. It measures about an inch and a half across the wings, and its green or brown caterpillar eats into the heart of the cabbage. Other caterpillars, generally pale grey in colour, are called in America "cut-worms," because they eat through the roots of plants below the surface of the ground. The moths are generally about an inch and a half in expanse; most of them are brown, but one of the commonest in Britain is the Yellow Underwing (*Triphana pronuba*), which has light brown forewings and bright yellow hindwings with a black border. It is often flushed in the daytime, when it flies wildly, and looks very conspicuous on the wing, but soon drops down among the herbage, folds its dull-coloured forewings over the hindwings, and becomes practically invisible.

The Diamond-backed Moth (*Plutella cruciferarum*) belongs to another group, and is much smaller, measuring scarcely three-quarters of an inch across the wings, which are brown, narrow, and fringed; the forewings are bordered behind with a white undulating stripe. The green caterpillar is extremely destructive to Cabbages, Turnips, etc., wherever it is found, and it has now been carried nearly all over the world.

Order VII. *Resedaceæ* (1 genus)

This is a small family, most numerous represented in the Mediterranean Region, but one or two species are common, chiefly on chalk or limestone, in the British Islands, and other parts of Northern Europe. These are the Wild Mignonette (*Reseda lutea*) and the Weld (*R. luteola*). They have pale yellowish green flowers, much resembling those of the Garden Mignonette (*R. odorata*, originally an Egyptian species), but scentless. Another species, the White Mignonette (*R. suffruticulosa*), with nearly white flowers, found

in sandy places, chiefly in the south, is believed to be introduced.

The Wild Mignonette has 6 sepals and petals, divided leaves, and most of the petals also divided. The White Mignonette has 5 or 6 sepals and petals, the petals and leaves mostly divided; and the Weld has 4 sepals and petals, the latter partly divided, but the leaves lanceolate and undivided. The peculiar ridged seed-capsule, open at the upper end, is very characteristic of these plants. This capsule is much longer in the Wild Mignonette than in the other species. A yellow dye is obtained from the Weld.

One of the most interesting insects associated with the *Resedaceæ* is the scarce Bath White Butterfly, already noticed under *Cruciferæ*.

Order VIII. *Cistaceæ* (1 genus)

This family, like the last, is chiefly Mediterranean. Many are shrubs; but the few species found in Northern Europe are low-growing plants, belonging to the genus *Helianthemum*. The best-

known species, the Rock-Rose (*Helianthemum vulgare*) has branching recumbent or ascending stems, about a foot long, with oval leaves placed in pairs opposite each other on the stem, which are green above and whitish below, and slightly curved downwards at the edges. The flowers are yellow, with 5 sepals, the two outermost small; 5 widely expanding petals, and numerous stamens; in size and colour the flower is not unlike that of a Buttercup. There is 1 style and stigma, and the capsule has 1 or several valves. The plant is common on dry sunny slopes in England and Scotland.

Order IX. *Violaceæ* (1 genus)

The Violets have 5 sepals and petals, generally irregular, 5 stamens, and a single style, with an oblique stigma. There is 1 ovary, and the capsule has 3 valves.

All the North European species belong to the single genus *Viola*. The large-flowered species of *Viola*, which are favourites in our gardens, are

generally called Pansies. Some of these are cultivated varieties of the Wild Pansy, and others are derived from various European species, not found wild in Britain.

Sweet Violet—*Viola odorata* (Plate XII)

This plant grows wild in woods and hedges, generally in shady places, but is largely cultivated in gardens for the delicious perfume of the flowers, which are usually of a deep purplish blue colour, but occasionally white. The leaves are heart-shaped, only slightly tapering, with the edges denticulated, and the surface smooth and reticulated with nervures. They rise on long or short stalks from a branching root. At the base of the leaf-stalks are small oval pointed root-leaves. Between the leaf-stalks the flower-stalks rise immediately from the root; and above the middle they are provided with two leaf-like appendages called "bracts." The flower has 5 stamens, and the lowest petal forms a hollow spur behind.

Plate XIII.



Heartsease or Wild Pansy. (*Viola tricolor*.)

Plate XIV.



Waterwort. (*Elatine triandra*.)

The Dog Violet (*Viola canina*) is generally of a paler blue, and scentless. It is as common as the Sweet Violet, if not more so, and grows freely in open places. An infusion of the leaves has lately been tried as a cure for cancer, both as a drink and locally. But the experiment does not seem to have led to any improvement.

The Yellow Violet (*Viola lutea*) is found on some of the English, Welsh and Scotch mountains.

Heartsease or Wild Pansy—*Viola tricolor* (Plate XIII)

This plant is very common on waste ground, and also grows as a weed in gardens and corn-fields. The stem is decumbent, branching and spreading. The leaves are placed alternately, and are oval and denticulated. The leaflets are clustered, pinnate, the pinnæ long, with smooth edges; and the terminal pinna is the longest. The flower-stalks rise singly in the axils of the leaves; they are long, quadrangular, and furrowed at the back. The calyx is smooth, and the corolla is twice as large

as the calyx. The lower petal is rather larger than the rest, and marked towards the tube with 7 lines; it passes into an obtuse spur at the base. The flower is very variable both in size and colour. It seeds and spreads much faster than most species of *Viola*. A fluid extract of the leaves has been used as an expectorant in cough.

Most of the insects recorded as feeding on different species of *Viola* are the caterpillars of butterflies and moths. Among the most noticeable are some of those beautiful butterflies called Fritillaries. There are different species, measuring from an inch and a half to three inches and upwards across the wings; but all of a rich tawny, with black spots, on the upper surface, and with silvery white spots or streaks on the under-surface of the hindwings. Their caterpillars are dark-coloured and spiny; but the hairy caterpillars of the White and Buff Ermine Moths (*Spilosoma menthastris* and *S. lubricipeda*) will also feed on Violets as well as on other low plants. These caterpillars are also brown, with a yellow stripe or yellow spots. The moths are white or dull yellow, with numerous

black spots, and thick yellow bodies, with rows of longitudinal black spots.

Order X. *Droseraceæ* (1 genus)

This is another small Order, represented in Britain by only one genus. Three species are not uncommon in swampy places. They are low-growing plants; the flowers have 5 sepals, petals and stamens, and the leaves are set with long hairs which exude a viscid substance. When an insect settles on the leaf, the leaf bends over and captures it, and does not again unfold till the juices of the prey have been absorbed. But the plant does not catch more insects than it requires, ceasing to do so when it has obtained sufficient for its needs. An American species, Venus's Fly-trap (*Dionæa muscipula*), often to be seen in botanic gardens, is particularly celebrated for its fly-catching propensities; but our British Sundews have the same habit, though their leaves do not close so completely in the rat-trap fashion of *Dionæa*, which has the edges of the leaves set round with long spine-like hairs.

In the Common Sundew (*Drosera rotundifolia*) the leaves are nearly circular, the stem is erect, and the capsule is not furrowed. The Oblong Sundew (*D. longifolia*) has erect stems, a furrowed capsule, and erect leaves, much longer than broad. The English Sundew (*D. anglica*) which, notwithstanding its name, is less common in England than in other parts of the British Islands, has erect leaves, much longer and narrower than in the other species.

The flowers are white, at the end of a stalk from 2 to 8 inches high, and expand in the sunshine. Hybrids between the different species are not uncommon.

A preparation of *Drosera rotundifolia* has been employed as a sedative in asthma and whooping cough.

Order XI. *Frankeniaceæ* (1 genus)

The only British representative of this Order, the Sea Heath (*Frankenia lævis*) is a low decumbent spreading plant with shoots 6 inches long or more, with small opposite leaves, small pink flowers,

with 1 sepal cleft into 5 divisions, placed at the ends of the shoots, and a 1-celled capsule, with numerous seeds. The plant is found near the seashore in the south-east of England.

Order XII. *Polygalaceæ* (1 genus)

Many of the foreign species of this Order are shrubs, but the only European genus is *Polygala*, comprising the Milkworts, which are perennials, the root-stem throwing up shoots several inches long. The leaves are entire, alternate, and the flowers are terminal, and form clusters. The flowers are of the type called "Papilionaceous," or butterfly-like; but it is here the calyx, and not the corolla, which assumes this form. It is composed of five sepals, the two inner ones, or "wings," being considerably larger than the others. The latter are green. The three petals are small. The capsule is compressed, and contains two seeds; the lowest forms a keel. The root-leaves are clustered together into a rosette. There are 8 stamens, divided above into two clusters.

The common Milk-wort (*Polygala vulgaris*) is found in dry places; the flowers are blue or pink, and occasionally white. Some of the Continental species have yellow flowers.

Order XIII. *Elatinaceæ* (1 genus)

This family only includes a few small water-plants, with from 3 to 5 sepals, and the same number of petals, styles, and stamens; or the stamens may be more numerous. The capsule has from 3 to 5 divisions, and contains numerous seeds.

Waterwort—*Elatine triandra* (Plate XIV)

The plants creep on the ground in swampy places, close to, or even under the water.

The species figured has sessile pink flowers, with 3 petals and 3 stamens. It is a Continental species, but there are two British species, both rather scarce, with pink and white flowers respectively. The Water-Pepper (*Elatine hexandra*) has

stalked flowers with 3 petals and 6 stamens ; and the Eight-stamened Elatine (*Elatine hydropiper*) has sessile flowers with 4 petals and 8 stamens.

Order XIV. *Caryophyllaceæ* (19 genera)

This is a large family, including the Pinks and Carnations and many other handsome flowers, both wild and cultivated. There are generally 4 or 5 sepals and petals, the sepals often connected, and forming a tube, the outer rim of which is dentated. The petals when present are equally numerous, the stamens are twice as many, and the styles number from 2 to 5. The fruit usually forms a capsule, and the leaves are opposite to each other, entire, and generally narrow.

The genus *Dianthus*, which includes the true Pinks, is easily recognisable by possessing bracts at the base of the calyx. As wild flowers they are scarce and local in Britain, though many species are favourite garden flowers. Rabbits are however so fond of these plants, that when they are numerous they often keep them eaten off so close

as to prevent them flowering at all, unless they are protected by wire netting.

Carthusian Pink—*Dianthus Carthusianorum* (Plate XV)

The handsome species which we have figured as a representative of the true Pinks is not uncommon on grassy slopes in many parts of Central and Southern Europe from June to September, but is not a native of the British Islands. The flowers grow two or three together on very short stalks, or stunted plants may bear only a single flower. They are remarkable for their dentated petals.

Soapwort—*Saponaria officinalis* (Plate XVI)

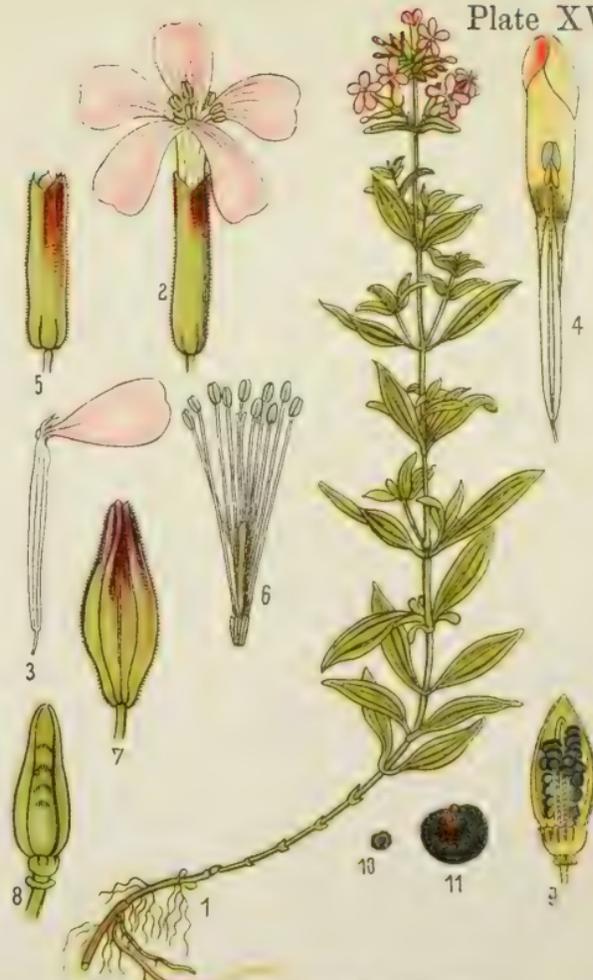
The Soapwort is found in hedges, on hill-sides, or on the borders of streams. It has perennial creeping roots, and spreads very rapidly. The leaves are clustered together, with three or more strongly marked longitudinal ribs. The flowers

Plate XV.



Carthusian Pink. (*Dianthus Carthusianorum*.)

Plate XVI.



Soapwort. (*Saponaria officinalis*.)

are also clustered together, almost without separate stalks. They are of a pale pink, or frequently white, and their odour is very sweet. A decoction of the plant in water or alcohol froths like soap when stirred up. Although the plant is not uncommon in many parts of England, botanists are inclined to regard it rather as a garden plant run wild than as a true native.

A fluid extract of the root has been used in gout, chronic rheumatism, and cutaneous affections.

Corn Cockle—*Agrostemma Githago*

(Plate XVII)

This is a common weed among corn, and nearly equals it in height. It may easily be recognised by the greyish down clothing the stem, leaves, and lower part of the calyx, and the large pink flowers growing singly on long stalks, with the long pointed teeth of the calyx projecting beyond the petals. The leaves are long and pointed, and the seeds are said to be poisonous.

Among other notable plants of this Order we

may notice the Bladder Campion and the Sea Campion (*Silene Cucubalus* and *maritima*), with white flowers, rising from a greatly inflated calyx; the Red Campion (*Lychnis dioica*), a common hedgside plant, 2 feet high, with red flowers smaller than those of the Corn-cockle and richer in colour; the White Campion (*Lychnis alba*), a similar plant, but with white flowers, which grows in fields and waste places; the Ragged Robin (*Lychnis Flos-cuculi*), with red quadrifid petals, a common plant in damp meadows; the Starwort (*Stellaria Holostea*) a star-shaped flower with narrow white expanded petals, common in hedges in spring; and the Chickweed (*Stellaria media*), a common garden weed with a small white flower.

A large number of insects feed on various species of *Caryophyllaceæ*, chiefly hiding in the seed-capsules, and devouring the seeds; others feed on the roots, leaves, or flowers, and some live in the capsules when young, and when older feed on the leaves. Among the leaf-feeders are several beautiful Tortoise-beetles, belonging to the genus *Cassida*. They are about a quarter of an inch long,

with short legs and antennæ, and broad flattened thorax and wing-cases, projecting over and concealing the head and abdomen, giving them a fancied resemblance in shape to a tortoise. The handsomest species is *Cassida nobilis*, which is yellowish, with a shining silver or golden band on the wing-cases; the under-surface of the body is black.

The Sea Campion (*Silene maritima*) is especially worthy of the attention of entomologists. It grows abundantly on the sea-slopes of the Hill of Howth, near Dublin, on the sea-cliffs near Douglas, Isle of Man, and in other localities, where many rare moths, the caterpillars of which feed in the pods or on the leaves, may be found flying over the flowers in the evening. Several of these belong to the genus *Dianthæcia*, which includes various brown or grey stout-bodied species, more or less varied with white, and measuring about an inch and a half across the wings. Other moths keep them company; among others the elegant Netted Pug (*Eupithecia venosata*), a moth rather less than an inch in expanse, with very slender body and long

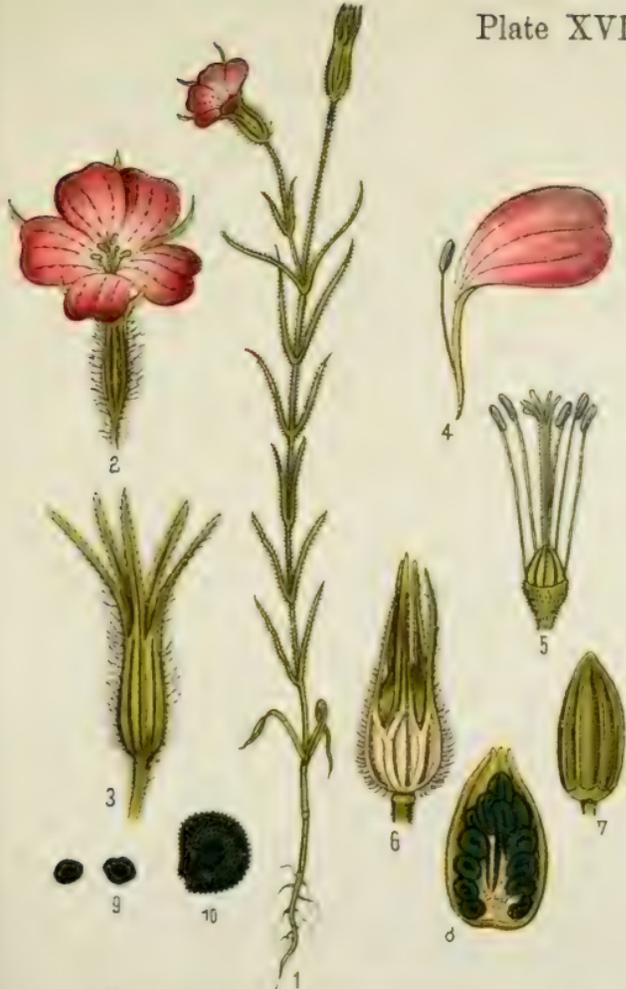
delicate wings, which are grey, with white markings, and short black almost reticulated lines.

Order XV. *Malvaceæ* (3 genera)

The Mallows are herbaceous or shrubby plants, more or less hairy, with alternate palmate leaves, and large bright-coloured flowers, with 5 sepals and petals, and numerous stamens, fused together into a tube; the carpels are clustered round an axis, and resemble a green miniature cheese in shape. They are often called "cheeses" by children in the country, and eaten. The plants grow in hedges, or by roadsides, and the flowers are generally rose-coloured, but occasionally bluish.

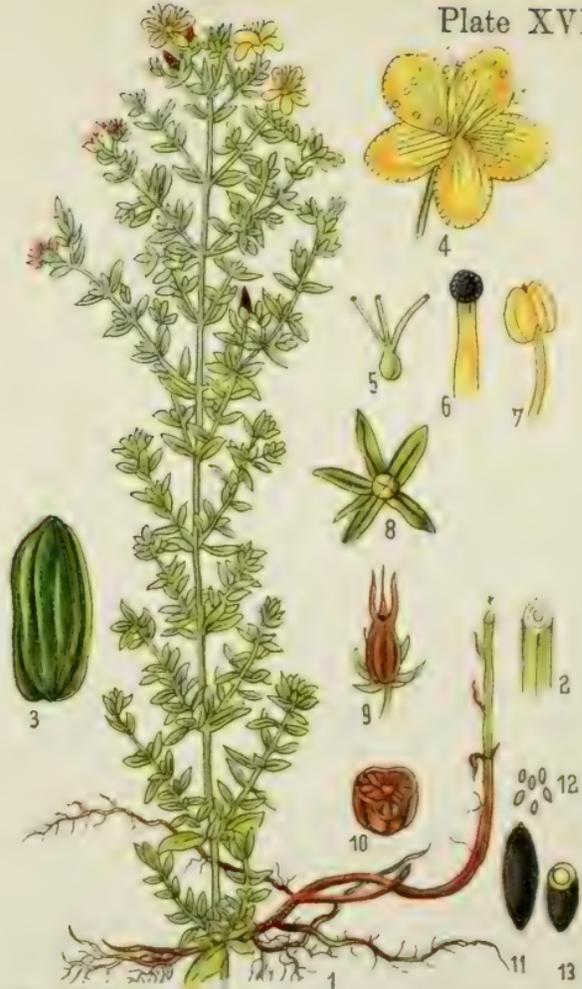
The Marsh Mallow (*Althæa officinalis*) is clothed with a thick pubescence on the stems and leaves. The stem is upright and woody, and the leaves are ovate, and more or less lobate. The shoots grow to the height of two or three feet, and bear clusters of pale rose-coloured flowers towards the extremity. The plant is very mucilaginous, and is cultivated in some places, a preparation of the

Plate XVII.



Corn-Cockle. (*Agrostemma Githago*.)

Plate XVIII.



St. John's Wort. (*Hypericum perforatum*.)

root being used to relieve coughs and colds. The root is also used to dress wounds.

One of the showiest of our garden flowers, the Hollyhock (*Althæa rosea*), belongs to the same genus as the Marsh Mallow, but is a much larger plant. Other important foreign plants allied to the Mallows are the Cotton Plants (*Gossypium*), which have large lobate leaves, and bell-shaped red or yellow flowers. The capsules are filled with a cottony substance, surrounding and protecting the seeds.

Order XVI. *Tiliaceæ* (1 genus)

The Linden, or Lime Tree (*Tilia europæa*), is much grown for its shade, and, like so many ornamental or useful plants, is considered to be rather naturalised than indigenous in Britain. Like most of our forest trees, it bears small and comparatively inconspicuous flowers. They are pale green, and hang in clusters. They have 5 sepals and petals, and yield small nuts, generally containing only a single seed. The leaves are broadly heart-shaped, with denticulated borders. The flowers exhale a

peculiarly sweet and powerful odour, which is perceptible at some distance from the tree, and is very attractive to insects.

More than a hundred species of insects of various Orders are recorded as feeding on this tree, the great majority being the caterpillars of moths. Two among them may be specially noticed. One is the Lime Hawk-moth (*Smerinthus tilie*). The caterpillar is two inches long, green and rough, with oblique stripes on the sides, red above and yellow below, and a rough horn on the back, near the extremity of the body, blue above and yellow below. The moth is two or three inches in expanse, with long and rather narrow irregularly dentated wings, varied with grey, yellowish, and lighter or darker green. It is perhaps the commonest of the Hawk-moths in the neighbourhood of London. The other Moth we propose to notice is the Canary-shouldered Thorn (*Ennomos tiliaria*), which has a brown humped looper caterpillar; but the Moth itself is stouter-bodied than Looper Moths generally are. It is yellow, with brown lines on the forewings, and the head and thorax are clothed with

canary-coloured down. It measures an inch and a half across the wings.

Order XVII. *Hypericaceæ* (1 genus)

These are herbaceous or shrubby plants, growing to the height of one or two feet, and bearing yellow flowers, with five sepals and petals, numerous stamens, gathered into three or five bundles, three styles, and a capsule with three divisions. The plants generally grow in or near woods.

St. John's Wort—*Hypericum perforatum* (Plate XVIII)

This handsome species is common in the British Islands. The root is long, and very ramose. The stem is upright, with two opposing ridges, and is smooth, and throws out numerous branches. The leaves are regular, ovate, and smooth, with the borders entire, and are furnished with black or semi-transparent glandular dots, which may be seen on holding them up to the light. The sepals are lanceolate and pointed, and the petals are oval,

marked with a row of short black lines on the borders. There is a black glandular spot at the extremity of the double anthers. The stigma is purple. The capsule is oval and cylindrical. The black glandular spots contain a blood-red liquid.

The plant has been used medicinally in catarrhal affections of the lungs and bowels, and also as an application to wounds.

Order XVIII. *Aceraceæ* (1 genus)

This Order contains two well-known British trees, the Maple (*Acer campestre*) and the Sycamore (*Acer Pseudo-Platanus*). The flowers have a deeply cleft calyx of 5 sepals, and a corolla of 5 petals, 8 stamens, and 1 style. The fruit is remarkable, being formed of two united nuts, with a spreading wing-like lamina on each side. When the seeds fall from the tree, they turn round and round with a fluttering motion till they reach the ground; and children often amuse themselves by throwing them up into the air to see them fly, and call them pigeons.

The Maple has palmate, lobate leaves, downy beneath, and small sweetly-smelling greenish-yellow flowers, growing in erect clusters. The bark is of a cork-like texture. The wood is mottled, and is much used for furniture.

The Sycamore is a larger tree, and the leaves are lobate, pointed, with the edges irregularly notched, and bluish green beneath. The flower-clusters are green and drooping. It is a tree which rapidly multiplies itself, and though of very quick growth, the wood is useful and durable.

The various species of Maple and Sycamore yield a sweet sap from which sugar can be obtained; and maple-sugar, made of sap for which the Sugar-Maple (*Acer saccharinum*) is tapped, is an important commodity in Canada and the northern United States.

Order XIX. *Geraniaceæ* (2 genera)

The Geraniums and Crane's Bills include only two British genera—*Geranium* and *Erodium*.

They have small pink or purple flowers, with 4 sepals and petals, and 10 stamens, of which 5 are rudimentary in *Erodium*. The style forms a long beak, curving upwards in *Geranium* and twisted in *Erodium*. The leaves are opposite, and more or less deeply divided. The flowers generally grow singly, or two together on short stalks.

These plants have a peculiar and rather unpleasant smell, more or less pronounced according to the species, and not confined to the flowers. Many foreign species are grown in our gardens, some of which are shrubby climbing plants, and though generally grown low, can easily be trained over a wall.

Mountain Geranium—*Geranium pyrenaicum* (Plate XIX)

This is a somewhat scarce species in the British Islands, but is found in many places growing on waste ground, though probably naturalised rather than truly indigenous. It flowers from July till late in autumn, and has a perennial root which

throws up several flower-stalks to the height of two or three feet. The root-leaves, which stand on long hairy stalks, are round, and brownish red on the margins, which are obtusely and irregularly dentated, and divided by 6 irregular and deeper incisions, and clothed with fine down both above and below. The flower-stalks are round and hairy, and divide into several branches. At each fork stands a pair of opposite, stalked, dentated and 5-lobate leaves, which become smaller, shorter-stalked, and trilobate as they approach the end of the stalk. The budding flowers hang down, but rise erect when they open. The sepals of the calyx are furnished with a scent-gland at the extremity: the petals are deeply bifid, and are pale purple, or sometimes almost white, each marked with five darker lines. There are 10 stamens, 5 of which are larger than the others, and are developed first. The ovary terminates in a long straight style or beak.

The best known of the British Wild Geraniums is Herb Robert (*Geranium Robertianum*), a plant rarely exceeding a foot in height, with reddish

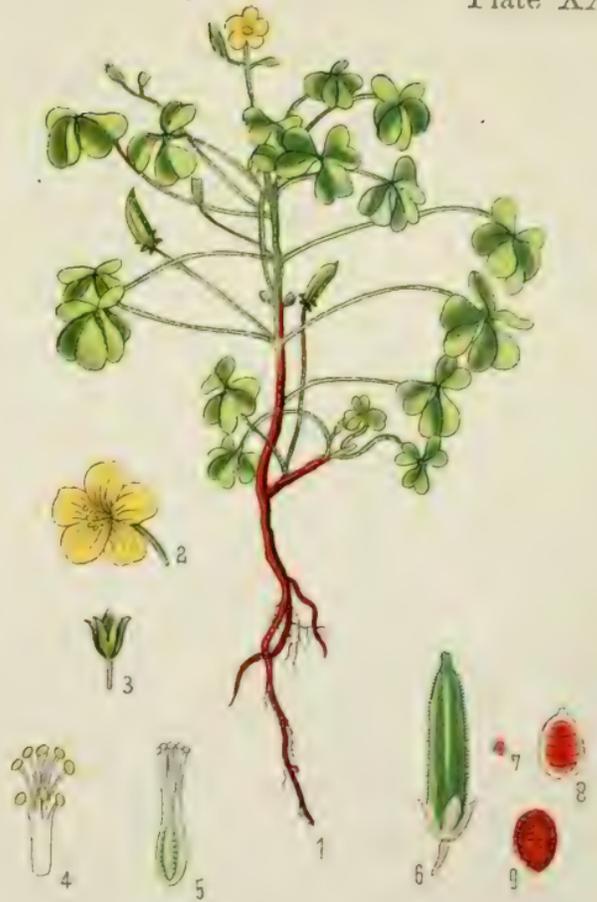
flowers, and emitting a very strong odour. It is common under almost every hedge.

The commonest British species of *Erodium* is the Crane's Bill (*E. cicutarium*), a hairy viscid plant a foot high, bearing clusters of from 2 to 12 small pink flowers; it is found in rough fields and by roadsides.

Comparatively few insects feed upon the Geraniums, but among them are the caterpillars of two interesting butterflies, both of which, however, will eat other low plants. The black spiny caterpillars of the Greasy Fritillary (*Melitæa Artemis*) hibernate under a web, and disperse in spring, when they feed singly on *Geranium*, etc. The butterfly measures an inch and a half across the wings, and is fulvous, with more or less regular transverse black bands. The under-surface is yellow, with a peculiar shiny appearance, as if greasy. The other insect is the short, stout, green, woodlouse-shaped caterpillar of the Brown Argus (*Polyommatus Astrarche*), a brown butterfly rather more than an inch in expanse, with a row of bright orange spots before the borders of all the wings.



Mountain Geranium. (*Geranium pyrenaicum.*)



Procumbent Oxalis. (*Oxalis corniculata.*)

Order XX. *Balsaminaceæ* (1 genus)

The only truly indigenous British species is the Yellow Balsam (*Impatiens Noli-me-tangere*), which is found in damp places in woods or in ditches, but is not very common in our islands. The plant grows to the height of one or two feet, with large drooping yellow flowers, spotted with orange; three or four in a cluster. There are 3 or 5 yellow sepals, the hindermost very large, produced into a spur behind, and the first two very small or absent; and there are 5 petals, the lateral pairs being united. There are 5 stamens, and 1 stigma, not raised on a style. If the 5-lobed ripe capsule is touched, it bursts open suddenly, and scatters the seeds.

Order XXI. *Oxalidaceæ* (1 genus)

This small family, represented in Britain by the single genus *Oxalis*, has 5 sepals and petals of equal size, and 10 stamens, united at the base; the seed-capsule is long and in 5 cells, but not

beaked. The leaves are completely divided into 3 leaflets of equal size.

Procumbent *Oxalis*—*Oxalis corniculata*
(Plate XX)

This is a low plant, with stems about 6 inches high, sometimes erect, and sometimes recumbent or creeping. The leaves stand on long stalks, and are trifid, the separate leaflets being again cleft, and thus heart-shaped. The small yellow flowers, 2 to 5 in number, are placed in the axils of the leaves. This plant is found occasionally on waste ground in the south of England, but it is not nearly so common as the Wood Sorrel (*Oxalis acetosella*), which grows in shady woods. The latter is a low-growing plant, only a few inches high, with larger leaves and flowers than those of the Recumbent *Oxalis*, rising singly from a stouter root-stalk. The leaves are broad, trifoliate, and slightly notched into heart-shape. The flowers are white, with a slight bluish tint, and the bud is not unlike that of a White Violet. The leaves have a slight acid taste,

but should not be eaten freely, as this is due to the presence of oxalic acid, a deadly poison which, when concentrated, is often improperly called "salts of lemon."

The ripe seed-capsules of both species of *Oxalis* split open and scatter their seeds, when touched, as in the case of the Yellow Balsam, already noticed.

Order XXII. *Linaceæ* (2 genera)

Flax—*Linum usitatissimum*

(Plate XXI)

Flax is cultivated in some parts of the country, but is also found occasionally growing wild. It is an annual, and grows to the height of two or three feet, the stem being set round with narrow pointed leaves, smooth, undivided, and sessile, of a greyish green colour. As the plant ripens, the leaves drop off. At the top the stem branches out, and bears bright blue flowers, on slender stalks, which flower in June and July. The calyx is

short, with 5 lanceolate sepals; there are also 5 petals, and as many stamens. The fruit is a capsule, imperfectly divided into 10 carpels, each of which contains a seed. The capsule is nearly round, pointed above, and ripens in August and September. The shining brown oval seeds are called linseed. There are several varieties of Flax, and the wild plant does not grow so high as the cultivated forms. Sometimes the capsules are allowed to explode in the sun and scatter the seed, and sometimes the plant is threshed out. The stalks have to undergo several processes before thread can be prepared from them, ready for spinning. They are first steeped, to rot the woody portions, and are then dried, broken up, and the woody particles removed by combing, or "carding" as it is called. The remaining silver-grey fibre is spun into thread. Linseed-oil is pressed out from the seeds, which are then used for cattle-food, under the name of "oil-cake."

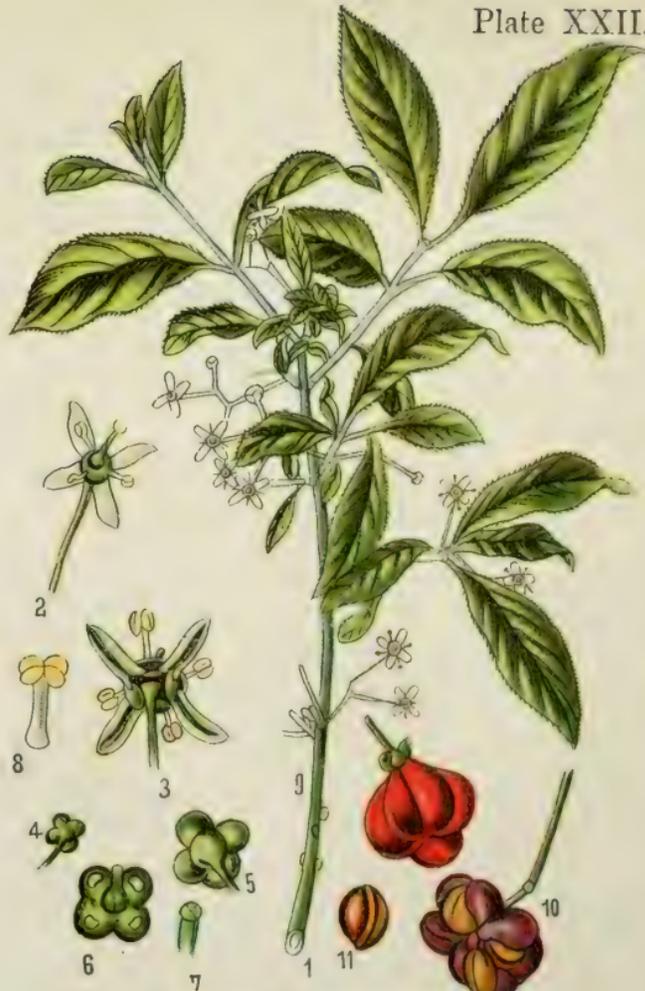
Flax-seed is used to make "linseed tea" for colds and coughs, and when crushed is used for poultices. Linseed oil is much used for lubricating

Plate XXI.



Common Flax. (*Linum usitatissimum*.)

Plate XXII.



Spindle-tree. (*Euonymus europaeus*.)

delicate machinery, and when mixed with equal parts of lime-water it is employed as an application to burns under the name of "carron-oil."

Besides the cultivated Flax, one or two wild species, also with blue flowers, are found in Britain. There is also the Purging Flax (*Linum catharticum*), a small plant rarely exceeding 6 inches in height, which is common in waste places, and bears a small white flower. A still smaller plant of the Flax family is called "All-seed" (*Radiola millegrana*), which grows in tufts, the stem, only an inch or two high, forking very much, and bearing small white flowers with only 4 sepals and petals. It is common in damp places, either sandy or boggy.

Several of the foreign species of *Linum* have pink or yellow flowers.

SUB-CLASS II. Calycifloræ

In this section of plants the petals are generally distinct, and the stamens are either attached to the calyx, or are placed upon the ovary.

Order XXIII. *Celastraceæ* (1 genus)

Spindle Tree—*Euonymus europæus*

(Plate XXII)

The only British species of this Order is a common shrub in woods and hedges, or is grown as an ornamental plant. The bark is ash-coloured, and the branches are quadrate when young, and afterwards rounded, opposite to each other, and the outermost horizontal. The leaves are also opposite, short-stalked or sessile, lanceolate, pointed, and finely denticulated on the edges. They are smooth, and pale green, but change to a translucent red in autumn.

In the axils of the leaves rise singly, smooth slender flower-stalks, which bear a cluster of from 3 to 5 greenish-white flowers. The flower is formed of a calyx of 4 or 5 sepals, and as many petals, alternating with as many stamens, and placed on the edge of a disk. The capsule has from 3 to 5 carpels, and the seeds are surrounded with pulp. There are 4 nectaries at the base of the flower. The stigma is awl-shaped. The

bright red fruit ripens in October and November, and when ripe opens at the corners, but the seeds do not fall out. The seeds are oval, and enclosed by a dark yellow shining membrane. The wood was formerly much used for spindles, whence the name of the tree. It is tough and delicately veined, and is used for a variety of small useful and ornamental articles; it also makes very good drawing-charcoal. The plant has a very unpleasant smell, and is more or less poisonous.

Order XXIV. *Rhamnaceæ* (1 genus)

The only British species of this Order are the Buckthorn (*Rhamnus cathartica*) and the Alder-Buckthorn or Black Alder (*Rhamnus Frangula*). They are common shrubs, with broad leaves, and small green flowers, with 4 or 5 petals, inserted opposite to an equal number of stamens on a disk at the bottom of the calyx, which has 4 or 5 teeth, and is attached to the ovary. The fruit is a berry containing 2 or 4 hard stones. The bark and the fruit of the British and of various foreign species are powerful purgatives, and are

also used to produce green and yellow dye-stuffs. The fruit of some foreign trees of this Order, however, is edible, and of considerable importance; among others, that of the Jujube Tree (*Zizyphus Jujuba*) and other allied Mediterranean and Oriental species.

The Buckthorn has strong thorns at the ends of the branches; the greenish flowers grow in clusters, and have 4 petals and stamens. The fruit is black, about as large as a pea, and contains 4 cells. The leaves are elliptical, rounded or heart-shaped at the base, and regularly serrated at the edges. The medical properties of the plant resemble those of Rhubarb.

The Alder-Buckthorn is without thorns; the leaves are thick and glossy, with the margins entire, and the greenish white flowers have 5 petals and stamens, and grow two or three together, not in clusters. The fruit contains only 2 seeds. It is red when unripe, but afterwards turns black.

Many insects feed on these shrubs, the most interesting being the smooth green caterpillars of the Brimstone Butterfly (*Gonepteryx rhamni*).



Alpine Buckthorn. (*Rhamnus alpina*.)



Bean-bush. (*Cytisus capitatus*.)

The butterfly may be found on the wing throughout a great part of the year, and is one of the earliest to appear in spring; it is also usually to be found in good condition, tattered or ragged specimens being rarely met with. It measures about two inches and a half across the wings, each of which is furnished with an angular projection; the antennæ are red and short, and the body is clothed with white silky hairs. The wings are bright yellow in the male, and greenish white in the female, and each is marked in the middle with a small orange spot.

The term "butterfly" is usually explained to mean "the fly which is seen in the butter season"; but this explanation never seemed to me to be satisfactory, and I consider it far more probable that the word originally meant "the butter-coloured fly," in allusion to the male of the Brimstone Butterfly.

Alpine Buckthorn—*Rhamnus alpina*

(Plate XXIII)

As a representative of this Order, we have figured a species which is common on the lower slopes of

the Alps, Pyrenees, etc., but which is not found in the British Islands. It is an upright branching shrub, about 7 or 8 feet high. The bark is smooth and shining, and of a reddish brown. The leaves are broad, shining, and strongly veined, with serrated margins. They are placed singly or alternately on short stalks, and are oval, more or less pointed, and green on both surfaces. The flowers are placed at the base of the young shoots, or in the lowest axils of the leaves, in small clusters, and the sexes are separate, as is the case also with the Buckthorn; whereas in the Alder-Buckthorn the flowers are bisexual or hermaphrodite.

The male flowers consist of a green calyx with 4 sepals, which are oval, concave, and pointed, and slightly curved at the tip. There are also 4 very small petals, which are narrow, brownish, and scale-like; 4 stamens, a short style, and a rudimentary ovary. The female flowers resemble the male, and contain a globular ovary, with a trifold style, and short thick rounded stigmas. The berry is round, first pale green and then black; it is trilocular, and contains 3 seeds.

Order XXV. *Leguminosæ* (19 genera)

This is a very large and important Order, containing a great number of plants useful either for food or fodder. Many species are low-growing plants, others are climbing plants; while others again are shrubs or trees. They are often called *Papilionaceæ*, from the resemblance of the flowers of many species to a butterfly. The calyx has 5 more or less distinct teeth, and is often bilobate. The corolla generally consists of 5 petals—a large upper one, the standard; 2 lateral ones, called the wings; and 2 lower ones, usually united, called the keel. There are 10 stamens, either all enclosed in a sheath, or 9 are thus united and the tenth is free.

The leaves may be either entire, trifid, or highly compound. The fruit is a pod, or legume, containing several seeds.

A number of very handsome plants belong to this Order, a large proportion of them with yellow flowers. One of these is the Furze or Gorse (*Ulex europæus*), a dark green thorny bush, common

throughout Western Europe, but very local in Central, and absent in Northern Europe. It begins to flower very early in the year. It is common in the British Islands; and when Linnæus visited England he fell on his knees in rapturous devotion at the sight of the masses of sweet-scented blooming furze. He afterwards tried in vain to grow it in a hot-house in Sweden, for it could not stand the winter.

An equally beautiful and very similar effect is produced by the fields of sweet-scented yellow Lupines, grown on the Continent to improve the soil. In the autumn the lupines are ploughed in, and it is said that very fine crops of corn are grown in the fields next year. The Lupines (best known to us by the blue garden flowers) belong to the same Order. So also does the Broom (*Sarothamnus vulgaris*), a shrub which is common in woods and on heaths, with yellow flowers like the Furze, but with slender thornless branches.

Seven thousand species are included in this extensive Order. The cultivated plants belonging to it are only secondary in value to the various kinds of corn.



Meadow Clover. (*Trifolium medium.*)



Crimson Clover. (*Trifolium incarnatum.*)

Bean-bush—*Cytisus capitatus*

(Plate XXIV)

This is a handsome shrub (allied to the Laburnum, or Golden Rain as the Germans call it), which, though not British, is common in hilly districts in Central Europe, especially on a calcareous soil. It flowers in June and July. The root throws up several unbranched woody stems. The stems are dark coloured, and set with short hairs. The leaves are trifid, and placed alternately on short hairy stalks, intermingled with smaller leaves. They are of a long oval shape, dark green, with a short spine at the tip, and furnished with a few long soft hairs on both sides. The flowers stand at the end of the stem on short hairy stalks, in clusters of 6 or 8 together. The calyx is inflated, pale green, hairy, bilobate, with the upper lobe broadest, and bifid; the lower is trifid. The corolla is golden-yellow, with a large oval veined and indented standard, larger than the wings and keel. The pod is long, flattened, brown, and very hairy; the oval seeds are brownish.

On waste ground we often meet with the Rest-harrow (*Ononis spinosa*), a creeping woody plant, under a foot high, with pretty pink flowers and strong spines. It is so tough that it is difficult to break the stalks with the finger.

Meadow Clover—*Trifolium medium*

(Plate XXV)

This species prefers dry hilly pastures, and flowers in June and July; it is a perennial. The stalks are three-sided below, and more rounded above, erect, but throwing out side-stems at an angle, from a thickening at the base of each. The leaves are long and narrow, smooth, and diverging from the stalk. The leaflets become more lanceolate with age. On the upper surface they are only slightly veined, and are often marked with two pale crescent-shaped longitudinal spots. On the under surface they are greyish green, more distinctly veined, fringed with rather long slender hairs, and finely denticulated. The flower-head is round at first, but afterwards becomes more oval.

The calyx is pale, the two upper teeth are equal, the two lower ones are rather longer, and the lowest is the longest. The corolla is purple.

Crimson Clover—*Trifolium incarnatum*

(Plate XXVI)

This is the most richly coloured of all the cultivated species of clover, but though sometimes grown in England for fodder, it is much less frequently seen than the Purple Clover (*Trifolium pratense*), which is closely allied to the Meadow Clover just described. Nor does the typical Crimson Clover appear to be a truly British plant, though a yellow variety is indigenous in Cornwall.

The Crimson Clover has a weak upright stem, with few or no side-shoots. The leaves are of moderate size, with rounded leaflets, with the lower borders parallel, and the extremity rounded and finely dentated. The leaf-stalk is long, hairy, and channelled on the upper surface. The flower-head is long or cylindrical, and obtuse above. The

calyx is hairy, 10-striped, and terminates in 5 rather long teeth of nearly equal length. The teeth are at first erect, but afterwards spread stiffly out. The corolla is long, and bright crimson. The standard is obtuse, and considerably longer than the other petals, and separated from them almost to the base. It flowers from June to October.

Other familiar plants allied to Clover are Lucerne (*Medicago sativa*), a fodder plant, with pretty blue or yellow flowers, and curious downy twisted pods; the Sainfoin (*Onobrychis sativa*), which bears a pink flower in clusters, and has compound leaves, like the Vetches; and the different species of Trefoil (*Lotus*), with rather narrow trifid leaves at the base of which are usually a pair of rudimentary ones, and yellow flowers. Sometimes these flowers are called Lambs' Toes. In Ireland they are sometimes known as Shamrock; but this name is also applied to a small species of Clover (*Trifolium minus*) with pale yellow flowers, which is common in dry places in many parts of Great Britain and Ireland.

c

Kidney Vetch, or Lady's Finger—

Anthyllis Vulneraria

(Plate XXVII)

This is a plant which is common in most parts of Central Europe (including Britain) in dry stony places, and by roadsides, etc. It is occasionally grown as a fodder-plant, but is not of much value.

The root is slender and woody, pale brown outside and yellowish inside, and throws off numerous rootlets. The stems are erect, cylindrical, downy, and yellowish green. The root-leaves spread out on the ground, and are long, with long stalks, and undivided. They are smooth, of a pale green, and the leaf-stalks are rather thicker at the base than at the extremity. On the stems the leaves are without stalks, and imparipinnate; they consist of 3 or 4 pairs of regularly arranged narrow lanceolate leaflets, with a terminal leaflet much larger than the others. The flower-head at the end of the stalk is supported by large leafy bracts. The calyx is inflated, yellowish green, hairy, tubular, and consists of

5 teeth of unequal length. The flowers vary from dark yellow to reddish.

Tufted Vetch—*Vicia Cracca*

(Plate XXVIII)

This is a common plant in hedges and thickets, and also grows among corn as a weed; it flowers in June and July. The root is creeping and perennial. The stems are weak, erect or climbing, angular, furrowed, and downy. The leaves are numerous, often paired at the base, and stand on long forked downy stalks. The leaflets are sessile, or with very short stalks, and are pale green, entire, lanceolate, and downy on both surfaces. They terminate in three tendrils, which frequently subdivide. The stipules are semi-sagittate, and pointed, with even margins. The flowers stand on long furrowed downy stalks, forming a long cluster, drooping on one side of the plant. The calyx is short, slightly reddish, and dentated. The flowers are violet-blue, and the seed-pods are smooth, brown, pendent, and contain black or

brown seeds. The plant grows to the height of two or three feet.

There are many other important plants, British and foreign, belonging to the *Leguminosæ*. Among useful cultivated plants we have the Peas and Beans, both remarkable for the sweet odour of the flowers, though the variegated Sweet Peas of our gardens are mostly scentless. Lentils may also be mentioned. A species of *Acacia* is now largely grown as an ornamental tree: its large compound leaves and clusters of white flowers are very handsome; but it is somewhat a disadvantage that it comes into leaf late, and sheds its leaves early. From an African *Acacia* gum-arabic is obtained. Gum-tragacanth is also obtained from an Arabian species of the genus *Astragalus*; and senna-leaves from various species of *Cassia*. Several important fruit-trees belong to the same family, such as the Tamarind and the Locust-tree.

The Locust-tree, Carob, or St. John's Bread, is a tree common round the Mediterranean, which bears large pods filled with sweet pulp between

the hard seeds. The pods are eaten by the natives where the tree grows, and are also used for feeding cattle. They are supposed to be "the husks that the swine did eat" in the parable of the Prodigal Son; and the name "St. John's Bread" is derived from the strange idea that it was the fruit of the so-called "Locust-tree" on which John the Baptist fed in the wilderness. Very possibly the fruit may have formed part of his diet; but as locusts themselves are a staple article of food among desert tribes in the East, there is not the slightest reason to suppose that St. John did not eat the insects themselves.

The Mimosas or Sensitive Plants are also interesting; they are natives of India, Africa, and Australia. They are shrubs or small trees, usually with bipinnate leaves. When the leaves are touched, the leaflets close up, and the entire leaf sinks down, and only resumes its natural position after some little time.

There are probably few places more attractive to an entomologist than a Clover-field in full flower. Not only do the larvæ of a great number

of butterflies, moths, and beetles actually feed on the plants, but the flowers will not set their seeds unless fertilised by insects; and when Clover was introduced into New Zealand, it was necessary to import British humble-bees too before it could be cultivated with any chance of success. Besides, the sweet odour and the abundant honey in the flowers attract insects from far and wide, whether their larvæ actually feed on the plant or not.

The caterpillars of many conspicuous butterflies and moths feed on Clover and allied plants. Most of these caterpillars are green or yellowish, quite irrespective of the colours of the perfect insects. Most notable of all is the richly coloured Clouded Yellow Butterfly (*Colias edusa*), 2 inches across the wings, which are chrome-yellow, bordered with black above, and with hindwings green beneath; it is a very conspicuous butterfly, with an extremely rapid flight. It is sometimes accompanied by the Pale Clouded Yellow (*Colias hyale*), a much paler, and in Britain a much scarcer, insect. The short, thick caterpillars of several species of small butterflies also feed on

Clover; and the butterflies, which generally measure an inch and a quarter, or rather more, across their blue or brown wings (sometimes varied with red marginal spots, and generally grey on the under surface, with dark pale-centred spots), fly over the flowers. Among moths, the caterpillars of several species of Burnet Moths (*Anthrocera*) feed on Clover. The caterpillars are yellow, with black spots, and spin curious boat-shaped cocoons of yellow silk. The moths have rather long wings, expanding nearly an inch and a half, with five or six crimson spots on a deep greenish blue or purplish ground-colour, and crimson purple-bordered hindwings; more rarely the spots on the forewings are replaced by longitudinal stripes. Other butterflies and moths are also abundant as casual visitors, or their caterpillars have perhaps fed on grass or other plants among the Clover, such as (where it occurs) the Swallow-tail; the nettle-feeding Small Tortoiseshell; several species of Fritillaries, rich tawny, with black spots on the upper surface, and often spotted or streaked with silver on the lower; brown or tawny butterflies, such

as Meadow Browns, Small Heaths, etc., with one eye-spot at least near the tip of the forewings; also the small brown or tawny butterflies called Skippers, from their erratic flight, with large heads and slightly hooked antennæ. Moths, too, often swarm; among others, the purplish-brown Gamma Moth, or Silver γ (*Plusia Gamma*), so called from the peculiar mark in the middle of the forewings. These are accompanied by many other butterflies and moths, bees, grasshoppers, and swarms of other insects.

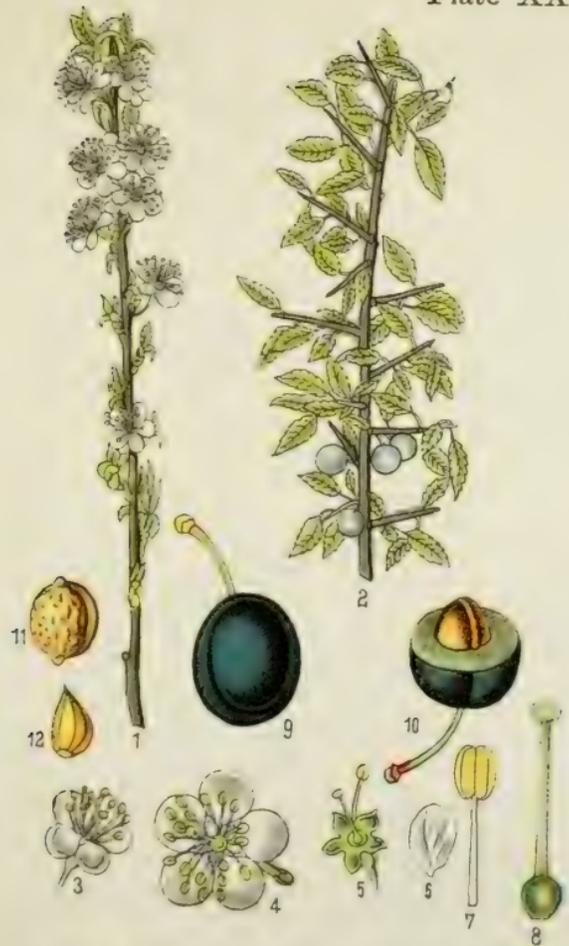
The grubs and caterpillars of several interesting insects feed on Peas and the seeds of other leguminous plants in their pods. Among these are the green or brown slug-shaped caterpillars of the Tailed Blue Butterfly (*Lampides beticus*), which is very common throughout Africa and Southern Asia, and reaches the extreme north-western limit of its range as an occasional visitor in the Channel Islands and in the south of England. The butterfly measures about an inch and a half across the wings, which are violet-blue in the male and brown in the female. The hindwings are provided

with a short tail, almost as in the Hairstreak Butterflies, and are streaked with white on the underside.

But a far more injurious insect is the Pea Weevil (*Bruchus pisi*). It is a small black beetle, clothed with whitish down, and the first four joints of the antennæ and the tarsi (or foot-joints), and part at least of the tibiæ (or shanks), are red. It is oval, with a short broad snout, and measures less than a quarter of an inch in length. The beetles are frequently to be seen on the blossoms of the peas, but their grubs often commit great ravages by devouring the peas in their pods. Another disagreeable quality of the weevils which infest peas and beans, as well as those which attack corn, is that they impart a poisonous quality to the pulse or grain on which they feed.

Order XXVI. *Rosaceæ* (18 genera)

This Order is very extensive, and not only includes the Roses, but nearly all our most important fruits, both native and foreign, such as Straw-



Blackthorn, or Sloe. (*Prunus spinosa*.)



Spring Cinque-foil. (*Potentilla verna*.)

berries, Raspberries, Blackberries, Apples, Pears, Quinces, Medlars, Plums, Cherries, Almonds, Peaches, Apricots, etc. It has even been asserted that no plant of this Order bears poisonous fruit, and that any strange or unknown plant belonging to it may be eaten with perfect safety. However, many plants of this Order contain more or less prussic acid in their pips and kernels, and often in the flowers or leaves or other portions of the plants; and the fruit of the laurel is poisonous, while bitter almonds contain a dangerous amount of poison, and it is very imprudent to eat more than a few kernels of any stone fruit, such as cherries, plums, apricots, etc.

The Roses generally have a 4- or 5-lobed calyx, a corolla with as many petals, an ovary of several carpels, and numerous stamens. Some are low-growing plants, but a large number are bushes or trees. The fruits differ much; some are dry, and others are succulent. The leaves are generally pinnate, with serrated edges. The Order includes about 2000 species, and is well represented in most parts of the world.

Blackthorn, or Sloe—*Prunus spinosa*
(Plate XXIX)

The Sloe, or Wild Plum, is a very common bush or small tree in hedges and thickets, especially on hill-sides. Its abundant white flowers appear in early spring, generally before the leaves.

The roots are very spreading, and throw up numerous suckers; the bark is rough, brownish black, and frequently studded with strong thorns. The leaves are smooth, lanceolate, and finely dentated on the margins. The fruit is rather smaller than a cherry. It is at first green, but when it ripens in October the skin becomes purple, and is covered with a bluish bloom. The pulp has a very sour, astringent taste, and cannot be regarded as edible. Within it is a hard stone, containing the kernel or seed.

Spring Cinquefoil—*Potentilla verna*
(Plate XXX)

This is a small plant which grows in dry hilly districts, and flowers in April. The leaves are

oval, hairy, and multilobate—most often quinquelobate. The petals are heart-shaped, larger than the calyx, and the lateral shoots of the plant droop downward.

Wild Strawberry—*Fragaria vesca*

(Plate XXXI)

The Wild Strawberry is common in open places in woods, on grassy slopes, and in similar situations. It flowers in April and May, and the fruit ripens in June and July. The root is perennial, reddish brown outside, and white inside. The plant throws out long creeping runners, which afterwards develop leaves, strike down roots, and become fresh plants. The stem is upright, 5 or 6 inches high, round, hairy above and bare below. The leaves are trifid, and stand on long stalks. The white flowers are also stalked, and stand at the summit of the plant. The calyx is flattened and hairy, and the petals are white and oval. The fruit is bright red, and very juicy. It is much smaller than the cultivated

varieties of the strawberry, but many people prefer the flavour of the wild plant.

Many insects often hide among cultivated strawberry plants, especially if they have been somewhat neglected and allowed to run at all wild. Among these are several kinds of Yellow Underwing Moths, brown, stout-bodied, downy moths, 2 inches in expanse, with bright yellow hindwings, with a black band varying in width according to the species, before the hind border.

The fruit, especially when over-ripe, is very liable to be attacked by slugs, earwigs, a small bright red centipede almost of the colour of a strawberry, and other pests.

The Genus Rubus

Rubus is a rather extensive genus, including low-growing or climbing shrubby and thorny plants. The flowers have 5 petals and sepals, and numerous stamens; and are succeeded by berries consisting of juicy carpels clustered round a tough central receptacle. The leaves are lobed,



Wild Strawberry. (*Fragaria vesca*.)



Cloudberry. (*Rubus Chamamorus*.)

segmented, or compound ; rarely simple. One of the most typical species is the Blackberry (*Rubus fruticosus*), but there are a large number of closely allied species or varieties, respecting which the best botanists hold very various views as to which of them should be regarded as truly distinct. The blossoms are sometimes white, and sometimes pink. In some the carpels are very numerous and crowded together ; in others they are larger, less numerous, and less crowded. The unripe fruit is first green and afterwards red, becoming black as it ripens. Some forms are perfectly black, but others, like the Dewberry (*Rubus cæsius*), bear fruit covered with a glaucous bloom. There are, however, some native species of *Rubus* which are perfectly distinct from the Blackberry and its numerous allied forms. One of these is the Raspberry (*Rubus Idæus*), well known as a garden plant, but also common in many places at wood-sides, in thickets, or on heaths. The wild plant is, however, not so large as the garden Raspberry.

The most interesting insect which feeds on Raspberry, Blackberry, etc., is the green, slug-

shaped caterpillar of the Green Hairstreak Butterfly (*Callophrys rubi*). The butterfly, which measures an inch across the wings, is brown above and green beneath, and flies about brambles and other bushes in spring.

Cloudberry—*Rubus Chamæmoris*

(Plate XXXII)

One of the most distinct species of *Rubus* is the Cloudberry, which we have figured as a representative of the genus. It is a low-growing plant, found on moors in mountainous districts, chiefly in the north of the British Islands. It bears a white flower, which is succeeded by a large berry, red at first, but turning more orange as it ripens.

Dog-rose—*Rosa canina*

(Plate XXXIII)

The Wild Roses much resemble the Brambles in habit, being either low-growing plants or climbing shrubs ; and in either case woody and prickly.

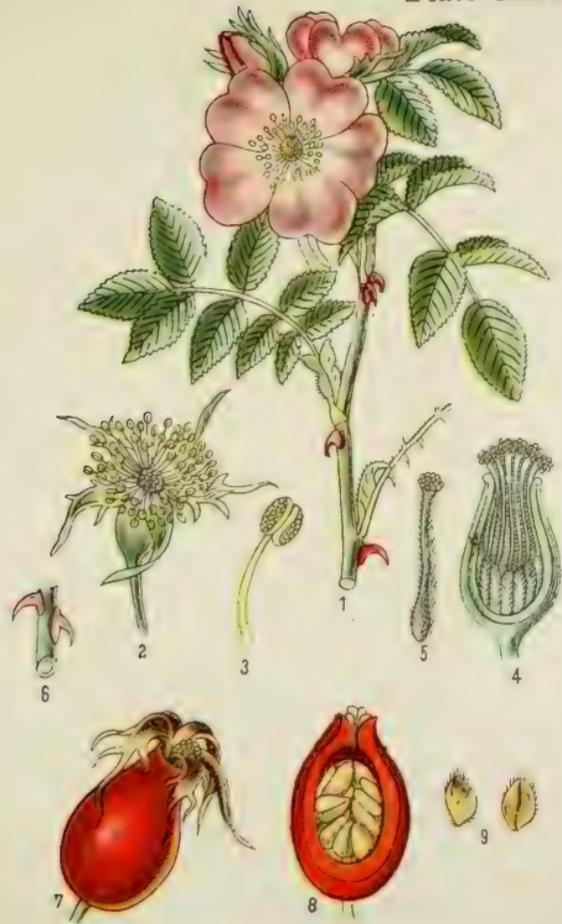
The flowers also are somewhat similar, though larger; but the fruit is very different, consisting of a tough calyx-tube enclosing a number of seeds surrounded with stiff and sometimes almost bristly hairs; this pod is called a hip. As in the case of the Blackberry, there are a great number of varieties or closely allied species resembling the Dog-rose, which are the despair of botanists. The slender stem grows from 3 to 9 feet in height, and is set with strong hooked thorns. The stem and branches are enclosed in a reddish-green bark. The leaf-stalks are furnished with glands, and on the lower surface with thorns. The leaves are compound, and are composed of from 7 to 9 leaflets, which are oval, pointed, and irregularly serrated on the margins. The leaves are smooth and dark green above, but more bluish green below. The flower is simple, of moderate size, with heart-shaped, indented petals, and sweet-scented. The flowers vary from white to pink, and the interior is white or yellow. The stamens are short, and of the sepals, 2 are pinnate, 2 not pinnate, and 1 pinnate on one side only. The ovary is smooth

and oval. The fruit is oval, smooth and shining, and of a bright scarlet when ripe. The seeds are yellowish, and very hard.

Among the other Wild Roses the most remarkable are the Sweetbriar (*Rosa Eglanteria*), with rather small pink flowers, and leaves which exhale a delicious odour when bruised; and the Burnet Rose (*Rosa spinosissima*), a low-growing, very prickly plant, with pink or white flowers, and red or black hips. It is common in many places on the sea-shore.

A great number of interesting insects feed on the Wild Roses, as well as on those of our gardens. One of the most brilliantly coloured of our British beetles is called the Rose Chafer (*Cetonia aurata*), because it likes to settle on Roses as well as on other flowers, to devour the pollen. It is nearly an inch long, and almost as broad, and has rather short antennæ, apparently knobbed at the end, but really terminating in a series of closely appressed lamellæ. It is bright metallic green above, with a few small white markings on the wing-cases, and coppery beneath. Its larva lives in the ground on decaying

Plate XXXIII.



Dog-Rose. (*Rosa canina*.)

Plate XXXIV.



Serviee-tree. (*Sorbus domestica*.)

vegetable matter, and is often found in ants' nests. Roses and Oaks are peculiarly liable to the attacks of Gall-flies, and the Wild Rose frequently bears a green mossy excrescence, as large or larger than a walnut, called a bedeguar. This shelters the grub of a Saw-fly (*Rhodites rosæ*). The fly is black, with four greyish transparent wings, a red abdomen tipped with black, and red legs, more or less black at the base. But gall-making insects are infested by parasites to a most extraordinary extent; and a great variety of small Ichneumon-flies, with four transparent wings, but in many cases brilliantly coloured bodies, may be bred from the bedeguar, or from other galls, besides, or instead of, the original occupant for which it was intended.

Roses are also very liable to be attacked by swarms of Aphides; plant-lice, or smother-flies, as they are frequently called; and the leaves and shoots are sometimes completely covered with these small green winged or wingless insects, and their sweet sticky secretion called honeydew.

The solitary Wild Bees belonging to the genus

Megachile cut neat circular pieces out of rose-leaves, as well as from other leaves and flowers, to line the burrows in which they deposit eggs and food for their grubs when hatched.

Service Tree—*Sorbus domestica*

(Plate XXXIV)

This is a tree which grows to a height of upwards of thirty feet. It is scarcely to be regarded as indigenous in England, but it is common in many parts of the Continent, especially in mountainous districts, and is largely cultivated for the sake of its fruit, which is extremely astringent when raw, but when cooked is much esteemed. It is also used to prepare a fermented drink. The bark is smooth, and ashy-grey; the young shoots are downy. The flowers are placed in clusters at the end of a branch, and expand in May and June. They are white, with 5 styles, and the fruit resembles a small red pear, with 5 seeds. The wood forms valuable timber.

By some botanists the Service-tree is considered to be only a larger variety of the Rowan, or Mountain Ash (*Sorbus Aucuparia*). This is an extremely handsome tree, but rarely attains a great height. It is frequently planted in shrubberies or along roads for ornament, but grows freely in woods, especially in hilly and mountainous districts. In many countries, as for instance in Scotland and Finland, it is regarded as a sacred tree. In Iceland, where the so-called "forests" at present chiefly consist of small scrubby birch or willows from 4 to 6 feet high, a Mountain Ash, 22 feet high, is said to be the largest tree on the island, and is looked upon with great admiration. The fruit is frequently reputed to be poisonous; but is not so in reality, though it has a very disagreeable taste when raw. However, jelly can be prepared from it, which is eaten with game; and, like that of the Service-tree, the fruit is sometimes used to make a fermented drink.

There are other interesting plants belonging to the *Rosaceæ* which we have not yet mentioned. The Meadow-sweet (*Spiræa ulmaria*) is a very

conspicuous plant in damp meadows and swampy places. It has large compound pinnate leaves, and yellowish-white flowers, small, but gathered together in large clusters at the ends of the stalks, and very sweetly scented. The Dropwort (*Spiræa filipendula*) is a very similar plant, but the flowers are more or less reddish at the tips. Foreign species of *Spiræa* are often grown in gardens or kept in rooms in pots. They closely resemble the British species, but are scentless.

Among trees, the Hawthorn, Whitethorn, or May (*Cratægus oxyacantha*), sometimes grows as a small tree, but more frequently forms a thick bush, and is the principal tree used for making quickset hedges in Britain. When the hedge is well grown, the thicker stems are partly cut through, and then bent down into the hedge. They continue to grow, and the interlaced branches and strong thorns render such a hedge almost impenetrable, when well made. Latterly, however, barbed wire and other fences have come into use, and a real old fashioned hedge is not nearly so common now as it was some years back. The compound leaves, and

the clusters of sweet-swelling white flowers, more or less varied with pink, and in cultivated varieties often wholly pink, are well known to every one. The fruit consists of a hard seed covered with a yellowish wax-like substance, and bright red outside. These fruits are called haws, and are edible, but rather tasteless. There is a popular idea that when hips and haws are numerous we may expect a hard winter, because a good provision has thus been made for the birds during the cold weather.

Many insects feed on Hawthorn, but most of them will also eat Blackthorn and other trees as well. Among these are the caterpillars of several interesting butterflies and moths; among others, those of the Black-veined White Butterfly (*Aporia crataegi*). The caterpillar is grey below, and black, with two reddish stripes, above; the butterfly, which measures $2\frac{1}{2}$ inches in expanse, is white, with slender black veins, but no spots. It appears in June, and has become very rare in England of late years, though formerly more common. The Brimstone Moth (*Rumia crataegata*), also named

after the Hawthorn, is, however, very abundant. The caterpillar is green or brown, with 3 small projections on the back, and 14 legs; the moth measures about an inch and a half in expanse; it has a slender body, and broad yellow wings, with some reddish brown spots on the front edge.

Another interesting insect attached to the Hawthorn is a large Saw-fly (*Trichiosoma lucorum*). Its green grub has 22 legs, which is alone sufficient to distinguish it from the caterpillar of a butterfly or moth, and it forms a hard brownish oval cocoon, which opens at the end like a round lid. The Saw-fly is nearly two inches in expanse; the body is black, stout and hairy, the four wings are transparent, with narrow brown borders, and the antennæ are knobbed at the end, almost like those of a butterfly.

The various wild species of Cherry are not the original stock of our orchard cherries, and their fruit is hardly edible; but the Crab Apple, the Wild Pear, and the Medlar are the trees from which most of the cultivated varieties of apples, pears and medlars have been derived. The Apple

and Pear belong to the genus *Pyrus*; and a handsome shrub (*Pyrus japonica*), with bright red flowers, is often grown in gardens, or trained over walls as an ornament. It bears a large green fruit with a woolly rind, which is horribly acrid, and quite uneatable.

Apple and Pear-trees are attacked by hundreds of different species of insects, especially by the caterpillars of moths. Among these are those of the Eyed Hawk-moth (*Smerinthus ocellatus*), which are green tinged with blue, with white stripes on the sides and a blue horn on the back. The moth is 3 inches in expanse; the wings are varied with pink and brown, and on the hindwings is a large black spot ringed with blue. The yellow black-spotted caterpillar of the Wood Leopard Moth (*Zeuzera osculi*) feeds inside the branches; the moth is $2\frac{1}{2}$ inches in expanse, white, with blue-black spots; and different species of Small Ermine Moths (*Hyponomeuta*) make white webs over Hawthorn, Apple, Box, and other trees, which, when numerous, they often strip completely of their leaves. The moths are white, spotted

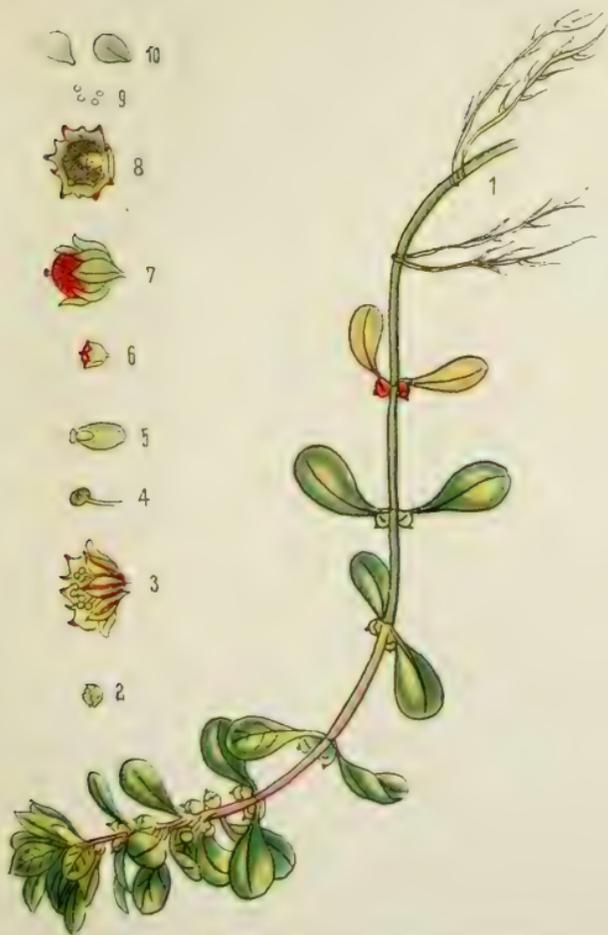
with black, and their narrow fringed wings measure about three-quarters of an inch in expanse.

Order XXVII. *Lythraceæ* (2 genera)

Only 3 species of this small family are found in Britain. They are low-growing plants. In the flowers the calyx is dentated and tubular, and the petals of the corolla (4 to 6 in number) are inserted near the top of the tube, and the stamens within it. The stamens are equal in number to the petals, or are twice as numerous. There is 1 style with a simple stigma, and the capsule is membranous.

The Purple Loose-strife (*Lythrum salicaria*) grows in damp meadows and ditches, and flowers from May to September. The leaves are regularly arranged, and are heart-shaped at the base, and then lanceolate. The flowers are large and purple, forming a clustered terminal spike. There are 12 stamens. This is a handsome plant, growing to the height of 2 or 3 feet; whereas the following species, figured as a representative of the Order, hardly exceeds as many inches in length.

Plate XXXV.



Water Purslane. (*Peplis Portula*.)

Plate XXXVI.



Rosemary Willow-herb. (*Epilobium Dodonæi*.)

Water Purslane—*Peplis Portula*

(Plate XXXV)

This little plant is common in most parts of Europe in ditches and swampy places, sometimes actually floating on the water. It has a creeping fibrous root, and creeping stems, which generally throw out roots at the joints. The leaves are stalked, smooth, oval, with the upper end rounded, and the flowers stand at the base of the leaves. The corolla is very small, or wanting; the petals, when present, are purplish. The calyx is smooth, dentated, greenish white, with red stripes.

Order XXVIII. *Tamariscinaceæ* (1 genus)

Although the Tamarisk is called *Tamarix anglica*, it is not believed to be indigenous in Britain. It is a green, feathery shrub, always found near the sea, and is planted abundantly for ornament on sea-slopes in many seaside resorts of the South of England.

Order XXIX. *Onagraceæ* (4 genera)

These are erect plants, growing to a height of from 1 to 5 feet, with large and handsome (or sometimes small) flowers, and long narrow leaves, generally entire, and not unlike those of a willow. In the flower the calyx is usually adherent to the ovary, and the sepals and petals are equal in number. The stamens may be equal in number with the petals, or more or less numerous. There is one filiform style, and the seed capsule is composed of 2 or 4 divisions.

Several species of Willow-herb (*Epilobium*) are found in the British Islands, chiefly in damp places, and they derive their name from the resemblance of their leaves to those of a willow, as already mentioned. The flowers in all the species are red or pink.

The Rose-Bay (*Epilobium angustifolium*) is found in damp woods in many places, but is not one of the commonest British species; it grows to the height of 3 or 4 feet. It has long, lanceolate, sessile leaves, entire, or with the margins finely denticu-

lated. They are grey-green on the under-surface, with very prominent veins. The corolla has four obovate, reddish-purple petals. The fruit is a quadrifid capsule, and the seed is furnished with a feathery awn. It is an astringent plant, sometimes used in medicine.

Rosemary Willow-herb—*Epilobium Dodonæi*
(Plate XXXVI)

This species is not British, but grows in the gravelly soil near rivers and streams, chiefly in mountainous districts, in Eastern Germany, Switzerland, etc. The root throws off thick lateral shoots of a purple colour, and clusters of stalks which are woody beneath the rind. The leaves are grass-green on both surfaces, rather fleshy, and are obtusely pointed. They are mostly entire, but often finely denticulated. The flower has 4 sepals, 4 petals, and 8 stamens. The stamens slope less than in the last species, but the style bends down in a curve.

Many caterpillars of Hawk-moths feed on differ-

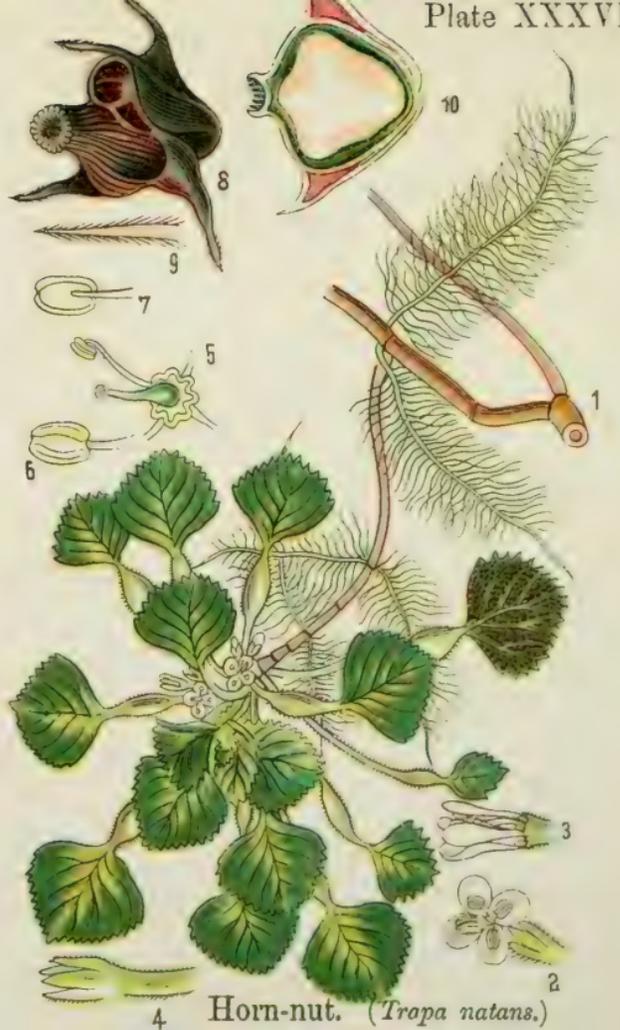
ent species of Willow-herb, especially those of the Large and Small Elephant Hawk-moths (*Chærocampa Elpenor* and *C. Porcellus*). These caterpillars are green or brown; the former with a short horn on the back, wanting in the latter. The front segments of the body are retractile, giving the caterpillars a fanciful sort of resemblance to an elephant's trunk, whence the name. The moths are very handsome; $1\frac{1}{2}$ or 2 inches respectively across the long and rather pointed wings, which are banded with green and rosy in the former species, and yellow with rosy borders in the latter.

Evening Primrose—*Ænothera biennis*
(Plate XXXVII)

This is an American plant, which was brought from Virginia in the year 1614, and has run wild in sandy places in many parts of Europe—in England more especially on the coast of Lancashire. The root is spindle-shaped and soft, yellow outside and white inside. The stem is erect, somewhat angular, rather rough and hairy, branching



Evening Primrose. (*E. biennis*.)



Horn-nut. (*Tropa natans*.)

below, and growing to the height of 3 feet or more. The root-leaves have long stalks; and the other leaves are sessile; the flowers rising singly in the axils of the latter at the ends of the stem and branches. The flowers are very short-stalked, and have 4 broad bright yellow petals, inserted in the tube of a long narrow calyx, the sepals of which are recurved. They do not expand in bright weather, but only in dull weather, or in the evening, when they uncloset with a slight sound after sunset. They only last a day. The root is sometimes used in salad.

The Green Humming-bird Hawk-moth (*Pterogon Proserpina*) was named *Sphinx antheræ* by some Austrian entomologists, because its dark green or grey caterpillar, which has a yellow spot centred with black in place of the usual horn, sometimes feeds on Evening Primrose, though its usual food is Willow-herb. The moth expands about an inch and a half across the wings, which are irregularly dentated on the hindmargin. The forewings are green and the hindwings orange, with a black border. It is found in Southern and South-Central Europe, but not in Britain; and it is somewhat

singular that this moth is attached to an American plant, for though it is not found in America, its nearest relationships are with American rather than with European species. The late Mr. H. T. Stainton called this moth "the most beautiful of the *Sphingina*."

Another interesting plant belonging to the *Onagraceæ* is the Enchanter's Nightshade (*Circea lutetiana*), which is found in damp shady places. It has only 2 white petals, more or less suffused with reddish, 2 stamens, and the fruit consists of 1 or 2 cells and is set with hooked bristles. The leaves are stalked, opposite, and more or less oval and pointed.

Horn Nut—*Trapa natans*

(Plate XXXVIII)

This very curious water-plant is a native of Central and Southern Europe, but does not now grow wild in the British Islands, though it was formerly a British plant, having been found by Mr. Clement Reid in the Pleistocene deposits

at Pakefield, Suffolk. It is a summer plant, growing in lakes, ponds, and standing water where the bottom is of clay, and it flowers from June till late in autumn. When the fruit ripens in autumn, it sinks to the bottom of the water, but does not germinate till the following spring. Then the first shoot throws out roots which fix themselves in the mud; and it also sprouts out digitate leaves under water. After this, it sends up a stalk, from which fresh shoots, leaves and stalks rise till the surface of the water is reached, when the true leaves at the end of the stem spread out in a circle on the water. They are placed on long stalks, and are trapezoidal, with denticulated margins, and are thick, smooth above, and brown and downy beneath. At first the leaf-stalks are round, but as the flowering season approaches they swell up, becoming bladder-like as the fruit ripens, thus buoying up the whole plant. When the fruit is quite ripe they sink down. The white flowers in the middle of the floating leaves produce a nut, which is first greenish black, then brownish black, and very hard and angular. The nuts are

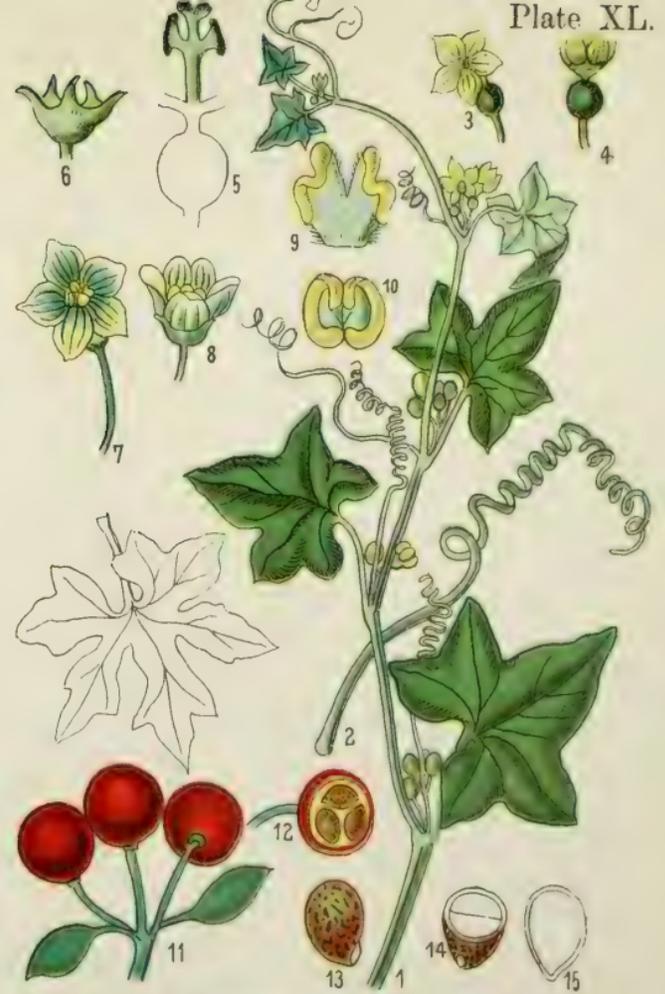
provided with 4 horns, which are developed from the calyx. They contain a white heart-shaped kernel, which looks like a chestnut, and is much eaten in China, to which the range of the plant extends.

Order XXX. *Halorrhagaceæ* (2 genera)

A small Order, represented in Britain by the Water Milfoils and the Mare's Tail. The Slender Milfoil (*Myriophyllum alterniflorum*) has only a few flowers on a spike, and the calyx of the male flower is quadrifid. There are 4 petals, 8 stamens, and 4 styles. The flowers are very small, and the corolla is reddish. The male flowers are at first drooping, but when fully developed, erect, at the summit of a spike, and the female flowers form a whorl at the base. The plant is common in ditches and shallow ponds, and grows under water, only the flower-stalks rising above the surface. There are two other closely allied species in Britain, differing slightly in the arrangement of the flowers.



Mare's-tail. (*Hippuris vulgaris*.)



Red Bryony. (*Bryonia dioica*.)

Mare's Tail—*Hippuris vulgaris*
(Plate XXXIX)

This curious water-plant has perennial fibrous roots, thrown off at the joints of the submerged root-stalk, which is hollow and jointed, and sometimes grows to the length of 2 or 3 feet in still water. The long narrow leaves are arranged round the stem in whorls of from 8 to 12, and stand out stiffly. The submerged leaves are drooping, linear, and without veins. The ovary is placed without a stalk in the axils of the leaves, and bears a single style and stamen. When the sexes are not united in the same flower, the upper ones are generally male and the lower female. The plant is widely distributed in ditches and ponds.

Order XXXI. *Cucurbitaceæ* (1 genus)
Red Bryony—*Bryonia dioica*
(Plate XL)

This is the only British representative of the Order to which it belongs, and it is a common

plant in hedgerows. The calyx is only half as long as the corolla, and the flowers are of a greenish white. The leaves differ considerably in form, and are more or less lobate. The stem is slender and climbing, and at each leaf-stalk rises a tendril which at first is straight. Afterwards the front part twists to the right, then towards the base, then to the left, and then sometimes turns to the right again. The berries are bright red, and, like the whole plant, are poisonous. The root has been employed in dropsy.

To this Order belong Gourds, Cucumbers, Melons, etc. Many species are edible, but others are poisonous, and every unknown plant of the Order should be regarded with suspicion.

Order XXXII. *Portulacaceæ* (2 genera)

A small Order in Britain, of which the different species of Purslane (*Portulaca*), which are garden herbs, are typical. They are South European plants, more or less naturalised in Central Europe. In *Portulaca* the leaves are more or less fleshy,

and alternate ; there are 2 sepals, 5 yellow petals, and from 8 to 15 stamens, often united at the base. There is a single capsule, with many seeds.

The Water-Chickweed (*Montia fontana*), of which there are several slight varieties, is the only truly indigenous British representative of this Order. It is a small plant, growing in tufts, and not exceeding 6 inches in height, growing in or by the side of shallow flowing water. The leaves are opposite, the corolla tubular, with 5 short but unequal white petals, and 3 stamens. The leaves are yellowish green, and the small flowers grow on short stalks, 1, 2, or 3 together, in the axils of the leaves. The seed-capsule explodes when ripe.

Order XXXIII. *Paronychiaceæ* (3 genera)

These are low plants, growing in sandy places, with trailing branches and small white or greenish flowers, with 5 sepals and 5 petals, which are frequently rudimentary or obsolete, and, if present,

alternate with as many stamens. There are 2 or 3 stigmas, sometimes sessile.

The species are all scarce or local in England. The best known is the Rupture-wort (*Herniaria glabra*), which has yellowish-green flowers, with the petals reduced to filaments.

Order XXXIV. *Crassulaceæ* (4 genera)

The plants of this Order may generally be recognised by their thick fleshy leaves, which are single, and generally opposite. There are from 3 to 20 sepals (most frequently 5), more or less united at the base, and as many petals. The stamens are as many, or twice the number. The carpels are equally numerous ; below them stands a small scale. The plants prefer dry sunny situations, and the flowers are generally white, yellow, reddish, or bluish.

The largest genus includes the Stonecrops (*Sedum*), and is very numerous on the Continent, chiefly in mountainous regions ; less so in Britain, though we have several British species, chiefly

growing in rocky or stony places. The Orpine (*Sedum telephium*) throws up annual stalks a foot high, with large oblong dentated leaves, largest at the base; and with a cluster of purple flowers at the summit. The White Sedum (*Sedum album*), with white, sometimes rose-tinted flowers, and purplish leaves, only grows to the height of 6 inches; and the Wall Pepper (*Sedum acre*) has yellow flowers, and rarely exceeds 3 inches in height. The last species has a sharp flavour when chewed, like pepper.

The House-leek (*Sempervivum tectorum*), an introduced plant, common especially on the roofs of old houses in the country, has a rosette of very thick leaves, from which the flower-stem rises to the height of a foot, bearing rose-coloured flowers, with more numerous sepals, petals, and stamens than in *Sedum*.

The most interesting insect that feeds on these plants is the black, red-spotted caterpillar of the beautiful Alpine butterfly *Parnassius Apollo*. It will eat Saxifrages too, but its favourite food is *Sedum telephium*. The butterfly is white, from 2

to 4 inches across the wings, and has several black spots on the forewings, and two large red spots, ringed with black and centred with white, on the hindwings. It is common in most of the mountainous parts of Europe, but is not British.

Order XXXV. *Ribesiaceæ* (1 genus)

This Order is included by some botanists in the Saxifrages, with which it agrees in its principal characters; but it is now usually considered to be distinct, on account of the fruit, which is a juicy, many-seeded berry, in a tough skin, and surmounted by the "fluff," or the remains of the withered calyx. The only British genus is *Ribes*, including the Gooseberry and Currants.

Smooth Gooseberry—*Ribes Grossularia*,
var. *Uva-crispa*

(Plate XLI)

The Gooseberry is known as a garden plant; but a variety with small yellowish fruit grows

wild in woods and hedges in many parts of the British Islands. It has small palmate and more or less lobate leaves, small green flowers, single or in pairs, and is set with numerous strong thorns, standing singly, or two or three together. The fruit of the cultivated Gooseberry is much larger, and is sometimes smooth, as in the variety figured, or else hairy. It varies in colour, shape, and size, being sometimes round, sometimes oval, and either green, yellowish green, or red.

Three species of Currant (two red and one black) are found wild in the British Islands. They differ from the Gooseberry in being destitute of thorns, and in the fruit growing in clusters. The leaves are larger than in the Gooseberry.

Mountain Currant—*Ribes alpinum*

(Plate XLII)

This species has trilobate leaves, with the under-surface smooth and shining, and erect flower-clusters, with lanceolate bracts, longer than the flower-stalks. The flowers are often diœcious. In the male

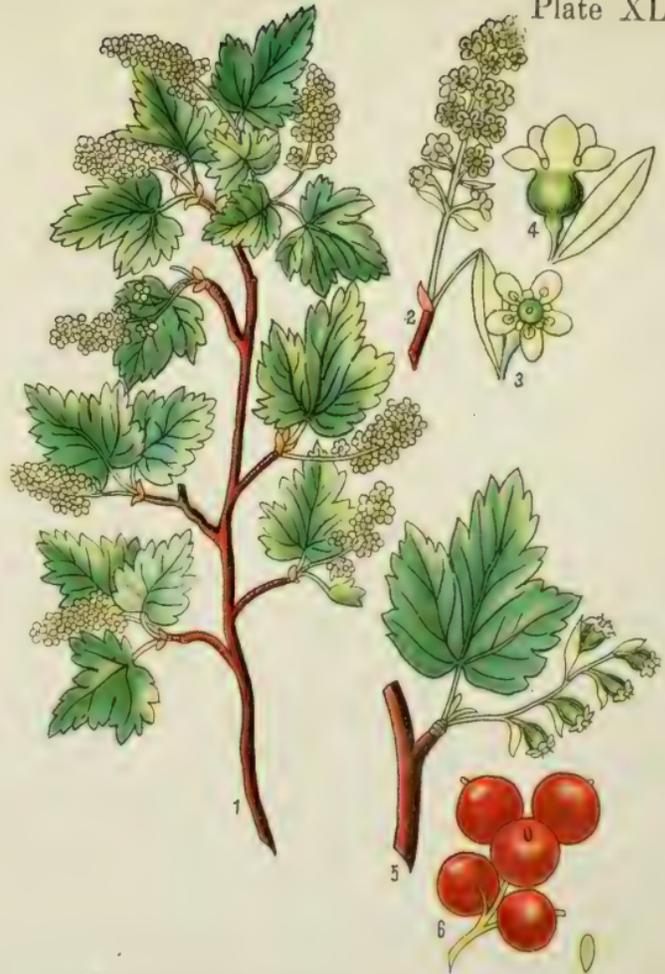
flowers the stamens are perfectly developed, but the ovary is absent. In the female flowers the stamen is absent, but the style is complete. The corolla is greenish white, and the berries are round, bright red, and flavourless. This shrub grows in the north of England, but is not very common.

The Red Currant (*Ribes rubrum*) resembles the last species, but the flowers are perfect, the leaves are larger, and the bracts are oval. The flowers are larger and yellower, and the berries are red, grow in larger bunches, and have much more flavour. The cultivated White Currant is considered to be a variety of this. Both this species and the next are found in woods in many parts of the British Islands.

The Black Currant (*Ribes nigrum*) has numerous glands on the under-surface of the leaves, which emit a strong and peculiar scent when bruised. The bracts are subulate, the calyx-tube is bell-shaped, and the corolla is reddish. The berries are black, and have a peculiar flavour, somewhat resembling the scent of the leaves.



Gooseberry. (*Ribes Grossularia*, var. *Uva-crispa*.)



Mountain Currant. (*Ribes alpinum*.)

Currants are much used for jam, and black-currant jam has frequently been used to disguise the flavour of nauseous medicine, especially in the case of children.

Gooseberry and currant bushes are very liable to the attacks of caterpillars, chiefly of moths and saw-flies, which often strip them entirely of their leaves.

The brown spiny caterpillar of the Comma Butterfly (*Vanessa C-album*) feeds on these as well as on other trees and bushes; its back is varied with reddish and yellowish. The butterfly is about 2 inches in expanse, and is easily recognised by its deeply and irregularly dentated wings, which are tawny, spotted with black, above, and blackish beneath, with a white mark like a C in the middle of the hindwings. It was formerly common in England, but, like several other butterflies, has been getting increasingly rarer and more local during the last century.

Three moths may here be specially noticed. One is the Currant Clearwing (*Trochilium tipuliforme*), the whitish caterpillar of which feeds on the pith

of currant bushes, inside the shoots. The moth is black, with long narrow wings, three-quarters of an inch in expanse, transparent in the middle, and bordered with black, varied with orange; the thorax is black, striped with yellow, and the long slender abdomen has three yellow belts and a black terminal tuft.

The caterpillars of most butterflies and moths have sixteen legs; but those of a large group of moths to which we have already alluded, called Loopers or Geometers, have usually only ten legs. Most of the moths have slender bodies, and broad, brightly coloured wings. Two species which feed on gooseberry and currant bushes are very common. One of these is the Magpie Moth (*Abraxas grossulariata*). It is about an inch and a half in expanse; the wings are white, varied with black and orange; and the caterpillar is also white, with black spots, and a yellow line on each side. This is one of the very few moths in which the moth and caterpillar have any resemblance in colouring. The other moth is the V-moth (*Halia wavaria*). It is smaller, measuring only an inch

and a quarter across the wings, which are ashy-grey, with four black spots on the front edge of the forewings, the second of which joins an angular mark in the middle of the wing, forming a black V or L.

Far more injurious than all the insects mentioned put together, however, are the "false caterpillars" of several species of saw-flies: little yellow black-spotted grubs with eighteen or twenty legs, which often leave scarcely a single leaf on the bushes. The most destructive develop into different species of the genus *Nematus*: small four-winged flies with shining bodies, varied with black and yellow, and four transparent wings about half an inch in expanse.

Order XXXVI. *Saxifragaceæ* (3 genera)

The British representatives of this Order are low-growing plants with alternate leaves, flowers with 4 or 5 lobes, petals 5 (or wanting in the Golden Saxifrage, *Chrysosplenium*), and 5 or 10 stamens. The flowers are mostly white or yellow,

but occasionally pink or purple. The species are found growing either in rocky places, often at a great elevation, or in damp places near water.

One of the commonest species is the Meadow Saxifrage (*Saxifraga granulata*), which is found on dry slopes and meadows. The stalk grows nearly a foot high, and bears only a few small leaves near the top; the lower leaves are larger, more numerous, and stalked. The root is formed of a number of small onion-like bulbs. The flowers are white, and rather large. The pink-flowered London Pride (*Saxifraga umbrosa*), so common in gardens, notwithstanding its name, is scarcely indigenous in the British Islands, except in one or two localities in the west of Ireland.

The Grass of Parnassus (*Parnassia palustris*) has large heart-shaped stalked leaves near the root; an upright stem, bearing only one sessile leaf, and large white flowers with longitudinal veins. There are 10 stamens, 5 rudimentary, and a tuft of white filaments tipped with yellow. It is found in swampy places.



Hare's-ear. (*Bupleurum rotundifolium.*)



Coriander. (*Coriandrum sativum.*)

Order XXXVII. *Umbelliferæ* (41 genera)

The *Umbelliferæ* are a very numerous Order of plants. They are generally perennials, the root-stock throwing up fresh shoots every year in place of those which died off the year before. The stem is hollow and ridged, and the leaves are generally compound and much divided. The flowers grow in a large cluster at the ends of slender branching stalks (umbels), like the ribs of an umbrella, whence the name of the Order. The flowers are generally small, and very similar; most frequently white, but sometimes yellow or red. The seeds are contained in doubleridged carpels (one in each carpel), and frequently contain an aromatic oil. Many species are of considerable economic value; others are poisonous.

Hare's Ear—*Bupleurum rotundifolium*

(Plate XLIII)

This curious plant grows as a weed among corn on a calcareous soil in many places in England, and

flowers from June to August. It has an erect, smooth, round branching stem, about a foot high, which is surrounded by alternate leaves, which are traversed at the base by the stalk and branches. The leaves are succulent, oval, entire, of a bluish green colour, and terminate in an obtuse point. The flower-clusters consist of only 4 or 5 umbels, with a common involucre; the partial involucres consist of about 5 long pointed bracts, which extend beyond the small yellow flowers.

This plant is sometimes called Throw-wax or Thorough-wax, probably from the curious similarity of its flowers to yellow wax.

Coriander—*Coriandrum sativum*

(Plate XLIV)

This is an introduced plant in Britain, and is an annual. The stem grows to more than a foot in height, and is erect, ridged, smooth, and bifurcating; the leaves are smooth, and those on the lower part of the stem are pinnate, oval and

obtuse, and obliquely lobate at the base; the terminal leaflet is trilobate. The leaves on the middle of the stem are bipinnate, and the leaflets more deeply lobate and indented. The upper leaves are bipinnate, narrower, and much divided, the divisions being linear. The umbels are terminal, and are usually 6 in number, and set with many white diverging flowers. The Coriander is much cultivated for its aromatic seed, which is frequently used in prescriptions, in combination with rhubarb and senna.

Among the wholesome plants of this Order, which are wild or naturalised in England, and most of which are cultivated, we may notice Celery (*Apium graveolens*), Parsley (*Petroselinum sativum*), Caraway (*Carum carvi*), Pig-nuts (*Bunium flexuosum* and *bulbocastanum*), Fennel (*Feniculum vulgare*), Samphire (*Crithium maritimum*), Parsnip (*Pastinaca sativa*), Carrot (*Daucus carota*), and Chervil (*Chærophylum sativum*).

On the Continent they do not bank up Celery, as is done in Britain, but they tie a knot in the young tap-root, which then swells up into a ball as

large as a small turnip. I have seen these in Covent Garden Market, labelled "Celerine from the South of France."

The Pig-nuts or Earth-nuts have tuberous roots (white within, with a black outer skin) instead of fibrous ones. They are found in dry pastures, and might be cultivated to ascertain if they could not be improved into useful vegetables.

Samphire is a seaside plant, best remembered by the celebrated passage in *King Lear*, relating to Shakespeare's Cliff at Dover, which is now falling into the sea.

Among poisonous *Umbelliferae* we may mention the Cowbane (*Cicuta virosa*), the Water-Dropwort (genus *Ænanthe*), and the Hemlock (*Conium maculatum*). The last is a handsome plant, 2 or 3 feet high, with a hollow branching stem, spotted with purple. All these have white flowers. Hemlock is celebrated as the poison with which Socrates was put to death, and is used medicinally in asthma and other convulsive diseases.

Large species of this Order, 6 or 8 feet high, and with flower-clusters several inches across, are



Dog-wood. (*Cornus sanguinea*.)



Mistletoe. (*Viscum album*.)

sometimes grown in shrubberies for ornament, but more often on the Continent than in Britain.

The most notable insect that feeds on Umbelliferous plants is the caterpillar of the Swallowtail Butterfly (*Papilio Machaon*). The caterpillar is green, with a black transverse band spotted with orange on each segment, and a red retractile fork on the neck, which it shoots out when disturbed. The butterfly measures 3 or 4 inches in expanse, and is black and yellow, with a long tail on the hindwings, and a large red spot at their inner angle. It is the largest British butterfly, but is now seldom found except in a few marshy places in the eastern counties of England, where the caterpillar feeds chiefly on Hog's Fennel (*Peucedanum palustre*). On the Continent, however, the butterfly is not local, as with us, but is generally distributed, and feeds on a great variety of Umbelliferous plants, and often on the common Carrot. The butterfly is found, slightly varying, throughout Europe, North Africa, Asia to the Himalayas and Japan, and even in North America, west of the Rocky Mountains.

Order XXXVIII—*Araliaceæ* or *Hederaceæ*
(1 genus)

The only British plant belonging to this Order is the Ivy (*Hedera helix*). It is the largest and most conspicuous of our native climbing plants, trailing on the ground, or over walls or trees, and fixing itself by its numerous root-like tendrils. The leaves are thick, glossy green, and vary considerably in size and shape, but are generally more or less lobate. As the plant is an evergreen, it does much to relieve the bare appearance of the woods in winter. Late in autumn it bears clusters of yellowish-green flowers, with the calyx 5-toothed, and 5 petals and stamens, succeeded by clusters of black berries, which have a purgative action. The flowers, appearing as they do in October and November, when most wild flowers are over, are extremely attractive to bees in the daytime and to moths in the evening; and it may almost be said that the season for collecting moths opens with willow bloom and closes with ivy bloom.

Order XXXIX. *Cornaceæ* (1 genus)Dogwood—*Cornus sanguinea*

(Plate XLV)

This is a tall shrub which is common in woods, bushy places, and rocky slopes in England and Ireland. The branches are opposite to each other, and are blood-red in autumn and winter, so that the plant is always easily recognisable. The young shoots are clothed with appressed hairs in the young plant only, but the leaf-stalks, the branching flower-stalks, and the calyx are always hairy. The leaves are opposite, elliptical, pointed, and with almost entire margins. They are dark green above and paler below, and turn red in autumn. The veins of the leaves are parallel, and extend almost to the tip. The flower-clusters are terminal, are placed on a long stalk without bracts, and are only slightly convex. At the base of the flower-stalks are small narrow stipules, which are soon shed. The flowers are white. The calyx is quadridentate, and there are 5 petals and stamens. The petals are lanceolate, and downy on the

outside. The glandular ring is yellow. The fruit ripens in autumn, and consists of round black berries with whitish dots. They are not edible.

The only other British species of this Order is the Dwarf Cornel (*Cornus suecica*), a small plant throwing up annual shoots about 6 inches high, found on moors in Scotland and the North of England. The Dogwood grows to the height of 5 or 6 feet.

SUB-CLASS III. *Corollifloræ*

The corolla is inserted on the ovary, and the stamens are attached to the petals.

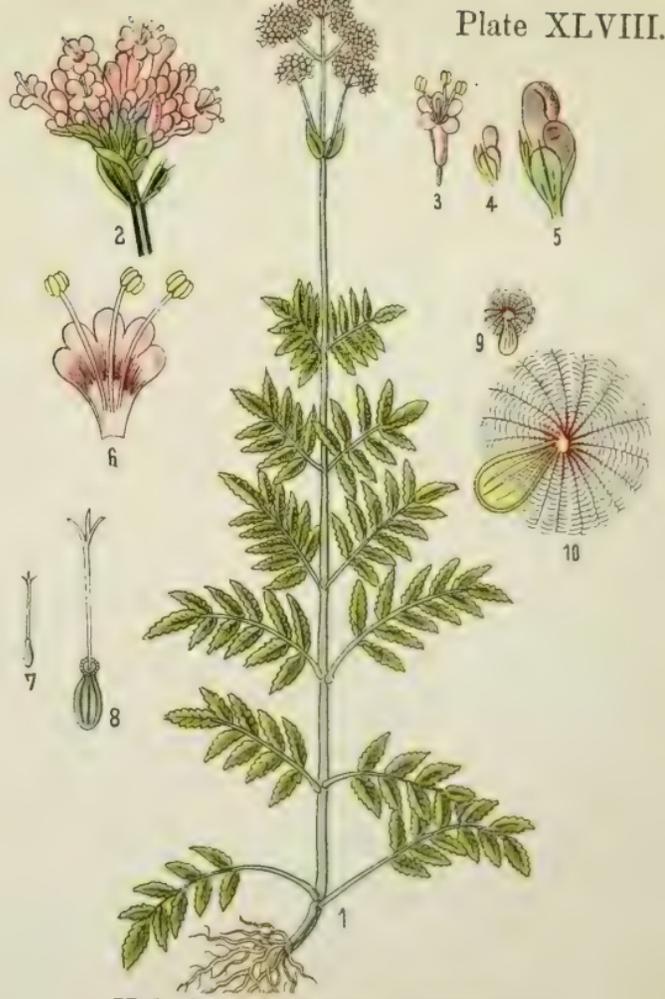
Order XL. *Loranthaceæ* (1 genus)Mistletoe—*Viscum album*

(Plate XLVI)

This a parasitic shrub, and the only representative of its Order in Britain. It grows on Apple, Poplar, and other trees, to which it is highly injurious, its roots penetrating beneath the bark. The stem is much branched, the leaves long and leathery,



Dyer's Madder. (*Rubia tinctorum.*)



Valerian. (*Valeriana officinalis.*)

the flowers terminal, and the bracts yellowish-green. The calyx is absent in the male flowers, and undivided in the female; and there are 4 petals and stamens. The berries are white, and very viscid; they are ripe at Christmas, and as the plant is an evergreen, it is much used at this season to decorate houses. The berries are used to prepare birdlime.

The mistletoe was regarded as a sacred plant by the Druids, especially when found growing on the oak—a very rare occurrence, as it very seldom attacks that tree. It was also regarded as sacred by the ancient Germans, because it never touches the ground. In the Scandinavian mythology we find it in another light. The goddess Frigga, when omens threatened her son Balder with death, took oaths from all existing things that they would not hurt him; only she thought the mistletoe too weak to be dangerous, and passed it over; and subsequently a spear was made of it, with which Balder was killed—for the Scandinavian Gods were not immortal. A poem, translated from the Swedish of Tegner on this

subject, will be found in any edition of Longfellow's works under the title of *Tegner's Drapa*.

Order XLI. *Caprifoliaceæ* (5 genera)

Most of the plants belonging to this Order are tall shrubs or climbing plants. The calyx and ovary are combined; the former is usually 5-cleft, and there are 4 or 5 petals and stamens, the stamens being inserted in the tube of the corolla. The fruit is a berry with from 1 to 5 seeds. The leaves are opposite.

The Elder (*Sambucus nigra*) is a large bushy shrub or small tree, which grows and spreads very rapidly. The leaves are pinnate, and the leaflets are long, pointed, and serrated. The white flowers form large more or less rounded and flattened clusters, called cymes, and are used to prepare an infusion known as "elder-flower water." The fruit is a black berry about the size of a pea, containing several small seeds. It somewhat resembles a small grape in appearance, and also (slightly) in flavour. It was formerly much used

for making "elder wine," which was drunk hot, as a cure for colds; but of late years this, like many other household remedies, has gone considerably out of fashion.

The Mealy Viburnum (*Viburnum Lantana*) is not an uncommon hedgerow bush in England, chiefly on chalk and limestone. The leaves are downy, dentated at the edges, but not lobate. The flowers grow in cymes, they are white, all fertile, and the corolla forms a tube with five divisions. The fruit is at first red, but turns black as it ripens.

The Guelder Rose, or Snowball Tree (*Viburnum Opulus*), has trilobate leaves, which are smooth above and downy below. The middle flowers of the cymes are small, sometimes yellowish, and fertile; but the outer flowers are large, white, and sterile. The ripe berries are dark red. It is much grown in shrubberies, and the flowers of the cultivated shrub are all large, white, and barren, forming a round cluster.

The Honeysuckle (*Lonicera Periclymenum*) is a common climbing plant in woods and hedges.

The leaves are ovate or entire, slightly downy beneath; and the flowers are terminal, and grow several together. They are white or yellow, and form a long tube, from which the stamens project conspicuously. The odour of the flowers is very sweet and strong. The berries are red, and about the size of large peas.

The Snowberry Tree (*Symphoricarpos racemosus*), which is common in shrubberies, and is sometimes met with half-naturalised in hedges, also belongs to this Order. It is a slender shrub, with rounded and entire leaves, bluish green beneath. The flowers are small, pink, and downy within. The fruit consists of snow-white berries, rather larger than those of the mistletoe, which they considerably resemble, except for their purer white colour. It is a North American plant.

The large flower-heads of the Elder are very attractive to insects. So are also those of the Honeysuckle, from their powerful scent; and many of the large Hawk-moths may be found from time to time hovering over the tubular flowers. Several caterpillars likewise feed on Honeysuckle,



Colt's-foot. (*Tussilago Farfara.*)



Ox-eye Daisy. (*Chrysanthemum Leucanthemum.*)

the most interesting being those of the White Admiral Butterfly (*Limenitis Sibylla*), and of the Twenty-plume Moth (*Alucita hexadactyla*). The White Admiral is a black butterfly with a white band of connected spots across the wings, which measure nearly $2\frac{1}{2}$ inches in expanse. A century ago it was common in almost every wood in England; but, like so many other butterflies it has been growing more and more rare and local, till very few places are left (except, perhaps, the New Forest) from which it has not almost or entirely disappeared.

The Twenty-plume Moth is the only British species in which each wing is divided almost to the base into six distinct feathers. It is a slender grey or yellowish moth, with broad wings, which it is fond of spreading widely as it sits on a wall or fence. In this position the wing-clefts are not seen, and it resembles one of the small brown Looper Moths called Pugs (genus *Eupithecia*). It measures rather more than half an inch across the wings. It is common in gardens in autumn, and its flesh-coloured caterpillar feeds in the un-

expanded buds of the honeysuckle. The chrysalis is brownish yellow.

Order XLII. *Rubiaceæ* (4 genera)

This is an extensive Order, comprising many plants of great economic importance, but it is poorly represented in Europe by a few herbaceous plants. They have angular stems and entire leaves, and stipules simulating and forming whorls with them. In the flower the calyx is combined with the ovary, and the corolla is more or less tubular, with 4 or 5 terminal lobes, alternating with the stamens. The fruit consists of two united carpels, each containing a single seed, and is dry or berrylike.

Dyer's Madder—*Rubia tinctorum*

Plate XLVII

This is not a British plant, but it closely resembles our Wild Madder (*Rubia peregrina*). Dyer's Madder is largely cultivated in Central and Southern Europe for the red dye obtained from

the roots. The root is perennial, creeping, and reddish yellow. It throws out in spring trailing quadrangular stems and shoots to the length of 4 or 5 feet, which are set with small prickles on the angles of the stem. The leaves are oval, stiff, and pointed, and the midribs and borders are also prickly. The leaves are arranged round the stem in threes or sixes. The flowers are yellow, and are placed at the ends of the stem and shoots.

The berries are smooth and round ; the fruit is first red, and then black. The plant can be grown either from seed or cuttings. It is a native of South Europe.

A small plant, about 6 inches high, with pink or blue flowers, which is common in cornfields, is the Field Madder (*Sherardia arvensis*). The fruit is surmounted by the lobes of the calyx.

Several species of Bedstraw (*Galium*) are found in fields, hedges, and marshy places. They are moderate-sized plants, with heads of white or yellow flowers, the yellow-flowered Ladies' Bedstraw (*Galium verum*) being one of the commonest

and most familiar. The caterpillars of a great number of handsome moths feed on *Galium*, among others those of the Humming-Bird Hawk-moth (*Macroglossa stellatarum*) and the Madder Hawk-moth (*Deilephila Galii*). The caterpillar of the former is greenish, with a white line on the back, and a bluish tail near the extremity of the body ; the moth measures nearly two inches across the forewings, which are dark brown ; the hindwings are dull orange, and there is a large tuft at the extremity of the body. It hovers over flowers, both in the daytime and at dusk, in the manner of a humming-bird, from which allied American species cannot be distinguished on the wing. It never settles, except on walls or tree-roots, where its colour conceals it from observation. The Madder Hawk-moth is a much rarer species in England. The caterpillar is green, with a yellow line and a grey horn on the back, and a row of large yellowish black-bordered spots on the sides. The moth, which flies over flowers at dusk, measures nearly three inches across the forewings, which are rather narrow and pointed, and dark green, with a



Arnica. (*Arnica montana.*)



Giant Bell-flower. (*Campanula latifolia.*)

whitish stripe from the middle of the base to the tip; the hindwings are black, bordered and banded with pale pink.

The Sweet-scented Woodruff (*Asperula odorata*) is an erect plant with whorled leaves, considerably resembling the Madder, and with small white flowers. It is a common plant, and is used in Germany to flavour Rhine Cup, a favourite summer drink in that country.

Among important foreign plants of this Order we may mention three in particular.

The Coffee Tree (*Coffea arabica*) is an evergreen, bearing white flowers in the axils of the leaves, which are succeeded by red berries resembling cherries. They contain two seeds surrounded by a parchment-like skin, which are known as "coffee-beans." Coffee is grown in Arabia, its native country, and also in Ceylon, the Sunda Islands, Brazil, and other tropical countries.

Its chief use in medicine is as an antidote in cases of narcotic (especially opium) poisoning.

Several species of evergreen trees belonging to

the genus *Cinchona* are found in the Andes of South America, and are cultivated in the mountains of India and elsewhere for their yield of "Peruvian Bark," from which quinine, one of the most valuable medicines in cases of fever, especially of the intermittent type, is prepared. It is a bitter tonic, and is much used as such in cases of debility arising from illness or overwork. It cannot, however, be used in all cases, for in some patients it causes severe headache.

Another important shrub belonging to this Order is *Cephaelis Ipecacuanha*, a Brazilian plant, from the roots of which the valuable medicine known as Ipecacuanha is prepared. Ipecacuanha is especially useful in small doses as an expectorant, and in larger doses as an emetic.

Order XLIII. *Valerianaceæ* (3 genera)

The flowers are tubular at the base, with 5 petals, and not more than 3 stamens inserted in the tube. The ovary is 3-celled, but only 1 cell contains a dry seed.

Valerian—*Valeriana officinalis*

(Plate XLVIII)

This plant grows in damp places, near water, or in swampy woods. It flowers in spring and summer. It has a perennial root, and an upright hollow stem, 2 or 3 feet high, surrounded by pinnate leaves, generally opposite, and divided above. The lowest leaves have the longest stalks. They are very long and broad, and consist of 9 or 10 pairs of lanceolate alternating leaflets, dentated at the edges; and 1 terminal leaflet. The flowers are white or pink, and the fruit is dry, and surmounted by a feathery pappus formed by the withered calyx. The flowers have a strong odour, which is very attractive to insects, and also to cats according to popular ideas. Medicinally the plant is employed in cases of hysteria.

There are a few other British species of this Order, among which is the Corn Salad (*Valerianella olitoria*), which has smooth lanceolate dark green leaves with the borders entire. It is a small plant, not much more than 6 inches high, and the small

white flowers grow in dense cymes. It grows in fields and gardens, and is sometimes used in salad.

Order XLIV. *Dipsacaceæ* (3 genera)

This is a small Order in which the flowers are clustered together into one head, within an outer covering or involucre; and the calyx proper is double, enclosing the ovary in the separate flowers. There are 4 free stamens, inserted in the tube of the corolla, and the anthers are likewise free. The flowers are generally blue.

The Teazel (*Dipsacus fullonum*) is probably a naturalised plant, but is considered to be hardly distinct from the White Teazel (*Dipsacus sylvestris*), from which it differs by its hooked bristles. The cultivated plant, the heads of which have a general resemblance to those of a large thistle, is a native of South Europe, and is used for carding cloth. It grows to a height of 4 or 5 feet, and the stem and flower-stalks are prickly. The calyx is without bristles, but the scales of the receptacle are lanceo-



Flesh-coloured Heath. (*Erica herbacea.*)



Bog-Whortleberry. (*Vaccinium uliginosum.*)

late, spiny, very stiff, and, as before mentioned, hooked in the cultivated plant. The outer involucre is 8-furrowed. The corolla is lilac, and the flower-heads are very large, at first oval and afterwards more rounded.

In the Field Scabious (*Knautia arvensis*), the stem is without bristles, and the receptacle is not spiny, but hairy. It sometimes grows to the height of 3 feet, but is usually smaller. The corolla is quadrifid, blue or lilac, and the outer calyx is not furrowed. The leaves are more or less lobate or pinnate, and hairy. It grows in woods and fields.

The Devil's-bit Scabious (*Scabiosa succisa*) is generally a smaller plant, common in fields and waste places. The root-leaves are entire and pointed, and the leaves on the stem are pinnate. The flowers are bright blue, with long stalks. The peculiar shape of the lower part of the stem in this species has given it the odd name by which it is known. It looks as if the end had been bitten off.

A considerable number of insects feed on Scabious, among others the caterpillar of the Narrow-

bordered Bee Hawk-moth (*Hemaris bombylifomis*), which feeds on Field Scabious. It is green, with a nearly straight horn, and reddish brown spots on the sides. The moth, which much resembles the Humming-bird Hawk-moth in size and habits, has transparent wings bordered with brown; the body is green, and the abdomen is belted with black and yellow and tufted with black and yellow. It flies by day. The flower-heads of the Scabious are very attractive to many insects, such as Fritillaries, Blues and Coppers among butterflies, and to numerous moths, especially the blue-black crimson-spotted Burnet Moths (*Anthrocera*).

Order XLV. *Compositæ* (48 genera)

This is an extensive Order of plants, which is easily recognised by the separate flowers or florets, which are generally small, being massed together into a flower-head, surrounded by an outer involucre of green bracts. The flowers are inserted on a common base or receptacle, and the corollas are either all tubular, or all ligulate; or both.

Very frequently the tubular flowers are in the centre, and there is a ring or border of ligulate flowers round, as in the daisy, etc. The calyx of the separate flowers consists of a tube, often forming a downy or feathery crown or pappus, on the borders of the ovary. There are generally 5 stamens fixed in the tube of the corolla, and the anthers are fused together into a tube round the style. The fruit is dry.

Most of the *Compositæ* are low-growing plants; while others, like the thistles, though growing to the height of several feet, are annuals. Many of the British species of this extensive Order are among our commonest and most familiar plants. Our space will only allow us to mention a few representative species.

Colt's-foot—*Tussilago Farfara*

(Plate XLIX)

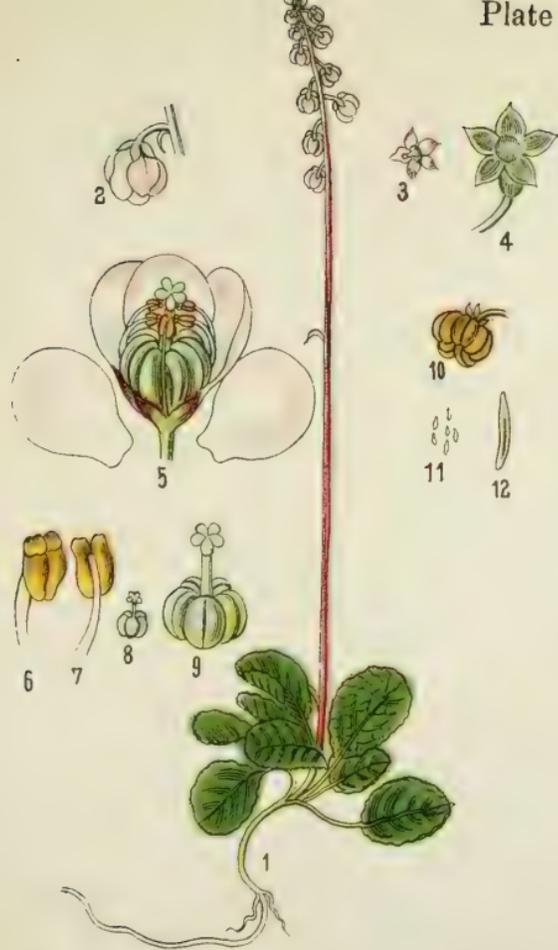
This is a very abundant plant on waste ground, preferring a damp clay soil, or chalk, or limestone; it often grows freely on railway banks. It spreads

very rapidly, and flowers in March and April. The stem is whitish, woolly, and thickly set with scaly bracts. The flower is golden-yellow. The seeds are surmounted by a long, shining, silky pappus. The leaves, which appear later than the flowers, are heart-shaped, angular, and serrated. They stand on moderately long stalks, and are clothed with a whitish wool on both surfaces, especially beneath. A decoction of this plant is still used as a remedy for colds in country places.

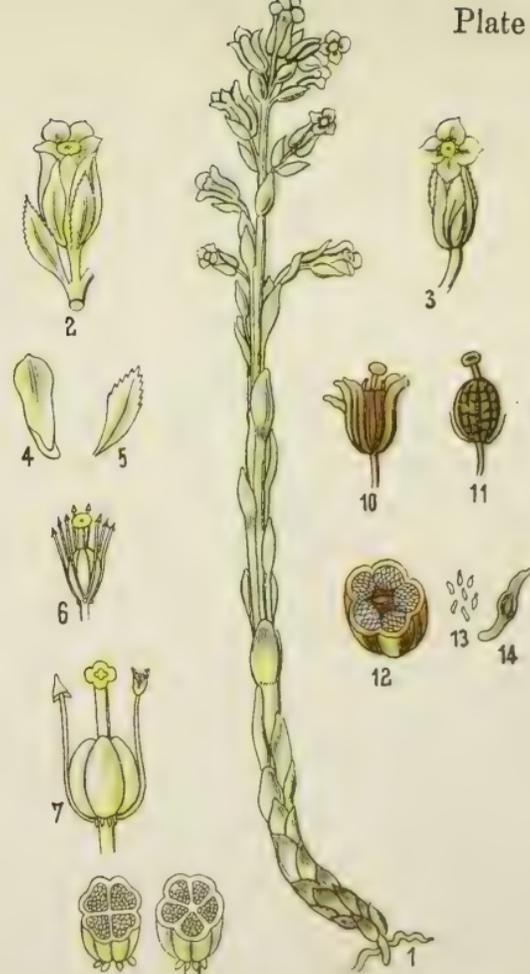
Ox-eye Daisy—*Chrysanthemum*
Leucanthemum

(Plate L)

This handsome flower is common in meadows, and is very similar to the favourite decorative flowers popularly called "Marguerites," the French name for a daisy. It flowers in May and June. It has an upright, slightly branching stem. The root-leaves are stalked, oval, and dentated on the edges. Those surrounding the stem are longer, narrower, and serrated. At the summit of the



Common Winter-green. (*Pyrola minor.*)



Yellow Bird's-nest. (*Monotropa Hypopitys.*)

stalk stands a single large flower-head, with white rays and a yellow centre. The seeds are black, lined with white, and end in a small yellow knob.

The Ox-eye Daisy grows to a height of 2 feet; but there are two other common plants which much resemble it in their flowers, with yellow centres and white rays. One is the Chamomile (*Anthemis nobilis*), which is common on waste ground, and may be recognised by its branching stem, bipinnate leaves, and peculiar odour. There are several other British species of Chamomile belonging to the genera *Anthemis* and *Matricaria*. The centre of the flower-head is always yellow, but the ray is white in some species and yellow in others. Chamomile tea is a household remedy for colds, but if drunk too freely will act as an emetic. An infusion of the flowers is sometimes used as an eye-wash, and a poultice of the flowers is used to relieve toothache or neuralgia.

The Daisy (*Bellis perennis*) grows everywhere in short grass, and has rather long, slightly dentated leaves, and flowers on long stalks, which grow to

the height of from 2 to 6 inches. The flowers are yellow-centred, with white rays more or less tipped with pink.

Arnica—*Arnica montana*.

(Plate LI)

This is not a British plant, but is found in open places in woods in hilly districts in various parts of Europe. It flowers in June and July. The stem is round, upright, and somewhat hairy and viscous. At the root is a rosette of three or four sessile, oval, and pointed leaves, not dentated, but clothed with hairs on both sides, not unlike the root-leaves of the plantains. The ray-flowers are large, and are tridentate at the extremity. The bracts of the involucre are reddish at the tips, and the seeds are surmounted with a hairy pappus. The flowers turn towards the sun, like the large yellow American Sunflower (*Helianthus annuus*), which derives its name from this habit. The seeds of the Sunflower yield an oil very similar to olive oil. Arnica lotion is much used to apply to bruises,

or the stings of insects, but in some persons causes irritation of the skin.

There are many interesting British plants of this Order with yellow flowers. The Groundsel (*Senecio vulgaris*) is common on waste ground, or as a garden weed, and grows about a foot high. It is a branching plant with yellow flowers, generally without a ray, and the seeds are surmounted by a silken pappus like that of the Dandelion, but much smaller. This plant is much used for feeding canaries.

The Ragwort (*Senecio Jacobææ*) is a much larger plant belonging to the same genus, with branching stems 2 or 3 feet high, and yellow flowers, surrounded by a yellow ray. It is generally found growing in or near woods, or in hilly districts. The plants will often be found to be attacked by the gregarious caterpillars of the Cinnabar Moth (*Euchelia Jacobææ*). These are black, conspicuously banded with orange; and the moth has black forewings, with two crimson longitudinal stripes, and two large spots of the same colour beyond, and crimson hindwings with narrow dark borders.

It measures about an inch and a half in expanse. It flies by day, and is not uncommon.

One of our commonest composite flowers besides the Daisy is the Dandelion (*Taraxacum officinale*); and, unlike the Daisy, it grows as freely in North America as in Europe. The leaves are long and large, generally more or less divided; the root is thick and perennial, and the flowers are large, of a bright yellow, and are succeeded by a large downy pappus over the seeds. The flowers are supported on long, hollow stalks, and the whole plant exudes a bitter milky-white juice when bruised. The root is sometimes used to make a sort of imitation coffee, and the young leaves can be eaten as salad, tasting something like Lettuce, which also belongs to the *Compositæ*.

The Woolly Bear, a large black caterpillar with long black and reddish hair, tipped with white, which rolls itself into a ball when disturbed, feeds on Dandelion, and on a great variety of other low plants. It is the caterpillar of the Tiger Moth (*Arctia caja*), a moth two or three inches in expanse, which is common both in Europe and



Holly. (*Ilex Aquifolium.*)



Ash. (*Fraxinus excelsior.*)

North America. The forewings are brown, with broad white ramifying streaks, and the hindwings are red, with blue-black spots. The abdomen is also red with black spots.

The Sow-thistle (*Sonchus oleraceus*) is a common weed, much taller than the Dandelion, though the yellow flowers are smaller, and stand several together at the end of a hollow stem 2 or 3 feet high. The borders of the leaves, the leaf-stalk and stem are more or less prickly, and the plant when bruised exudes a bitter milky juice, like the Dandelion.

Botanists distinguish nearly a hundred British species of Hawkweed (*Hieracium*), most of which bear yellow or (more rarely) reddish flowers, very like those of the Dandelion, but smaller, and the flower-stalks, which are either single, as in the Dandelion, or radiating from a stem, as in the Sow-thistle, are slender, solid, and often more or less hairy.

The Chicory (*Cichorium Intybus*) has a branching bristly stem 2 feet high, bearing large flowers on the sides and extremities of the branches, resembling

those of the Dandelion, but of a bright blue. It grows on waste ground, and the large perennial tap-root is used to adulterate coffee, a mixture which some people prefer to genuine coffee. It is considered to increase appetite and aid digestion.

To the *Compositæ* the numerous species of Thistles belong, easily known from other plants by their prickly stems and leaves, large flowers, generally red, and the conspicuous pappus, or thistledown, which, like that of the Dandelion and other plants of this Order, may often be seen floating in the air, or resting on the ground, sometimes at a considerable distance from the plant which produced it. Hence the rapidity with which these plants with wind-borne seeds spread.

The last British composite plant we propose to notice here is the Yarrow (*Achillea millefolium*), a common plant in fields and on waste ground, with a creeping perennial root, very tough short branches, with much divided leaves, and clusters of small white or pink flowers.

Asters, Dahlias and many other garden plants also belong to this Order.

Order XLVI. *Campanulaceæ* (6 genera)

In this Order the leaves are alternate, and the flowers are either single or composite. The calyx is 5-lobed, and is attached to the edge of a cup-shaped receptacle. There are 5 stamens inserted alternately with the lobes of the corolla on the borders of the receptacle, and the anthers are free, or united into a tube at the base. The British species have blue, or, more rarely, white flowers.

The Water Lobelia (*Lobelia Dortmanna*) grows in lakes in Scotland, Ireland and Wales, and in the West of England. The leaves form a thick rosette at the bottom of the water, and are hollow, linear, and truncated at the extremity. The flower-stalks are almost leafless, and the pale blue flowers rise several inches above the water. The corolla is irregular, and bilobate, the upper lip smallest, and bifid, the lower one less deeply trifid.

A plant about a foot high, bearing a composite blue flower, three or four branching from the end of the stem, is common on hillsides and waste

places. It is called the Sheep's Scabious (*Jasione montana*), and flowers in summer.

Giant Bell-Flower—*Campanula latifolia*

(Plate LII)

This is a very handsome plant, which flowers in June and August. It is found in woods, and is commoner in the north of England than in the south. The branching root throws up one or several stems, which are bare, or sometimes slightly hairy below, and ridged. The leaves are strongly serrated, and pointed at the tip; and are set with short bristles on the under-surface. The lower ones are oval, with long stalks, and the leaf-stalk is somewhat expanded; the middle ones are longer, oval or lanceolate, and the stalks are shorter; while the upper leaves are sessile, and reduced to bracts between the terminal flowers. The flowers are placed singly in the axils of the leaves, and are very large. The calyx is smooth, or near the receptacle slightly downy. The lobes are long, narrow, pointed, and set with fine hairs. The



Centaury. (*Erythraea Centaurium.*)



Obtuse-leaved Gentian. (*Gentiana obtusifolia.*)

corolla is violet-blue, rarely white. A South European species, which is known in English gardens as the "Canterbury Bell" (*Campanula medium*), has equally large blue flowers.

There are several other British species of *Campanula*, the commonest being the Harebell (*Campanula rotundifolia*), a small delicate plant only a few inches high, and bearing a drooping blue flower. It is specially fond of hillsides, and is the Bluebell of Scotland; though in England the Wild Hyacinth is known by that name. It is met with occasionally, like other plants of this Order, with white flowers.

Order XLVII. *Ericaceæ* (12 genera)

The plants belonging to this Order are generally low shrubs; more rarely herbaceous plants or trees, generally with drooping bell-shaped flowers, with the calyx and corolla 4 or 5-lobed: the stamens are generally twice as numerous, and are inserted in the tube of the corolla; and the anthers have two round or linear openings at the extremity.

The fruit is a juicy berry containing several seeds, or is dry.

The Strawberry Tree (*Arbutus Unedo*) is a native of South Europe, which reaches the extreme north-western limit of its range at Killarney, where it is abundant. It grows freely, when planted, at Dublin, and in other parts of Ireland; but does not grow wild in Great Britain. It is a thick, bushy evergreen shrub, with rough bark, slightly serrated leaves, and small drooping green or pinkish flowers, succeeded by a large soft berry, resembling a strawberry in appearance. In Ireland it hardly grows to more than the size of a large shrub, and the fruit is insipid; but in the Levant it is said to grow to the height of a tree, with fruit resembling the strawberry in flavour as well as in appearance.

The Bearberry (*Arctostaphylus Uva-ursi*) is a small trailing evergreen shrub with red flowers shaped like those of the *Arbutus*, and round red berries; it is found on heaths in the north of Great Britain and Ireland, but not in the south.

Flesh-coloured Heath—*Erica herbacea*

(Plate LIII)

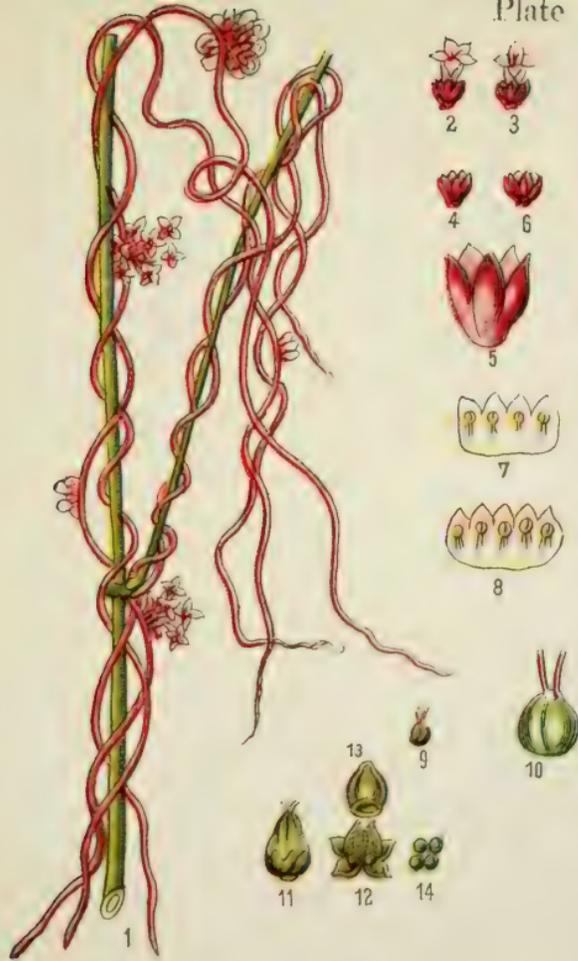
This plant, which we have selected to illustrate the Heaths, is not British, but is found in the mountainous districts of the Continent in open woods and clearings, and prefers dry sandy slopes. The roots are woody, strong and ramifying, and penetrate rather deeply into the ground; and they throw up woody stems, which divide into many offshoots. The leaves are small and dark green. The flowers either stand singly in the axils of the leaves, or form clusters on one side of the shoots. The calyx is quadrifid, rather long and pointed, and persistent. The corolla is flesh-coloured and tubular. There are 8 stamens, and the stigma is fringed with reddish hairs. The capsule has 4 cells, containing many small seeds. The flowers, like those of many other Heaths, are very attractive to bees.

Several species of Heath grow abundantly on waste ground or hillsides in the British Islands; but the many handsome species grown in our

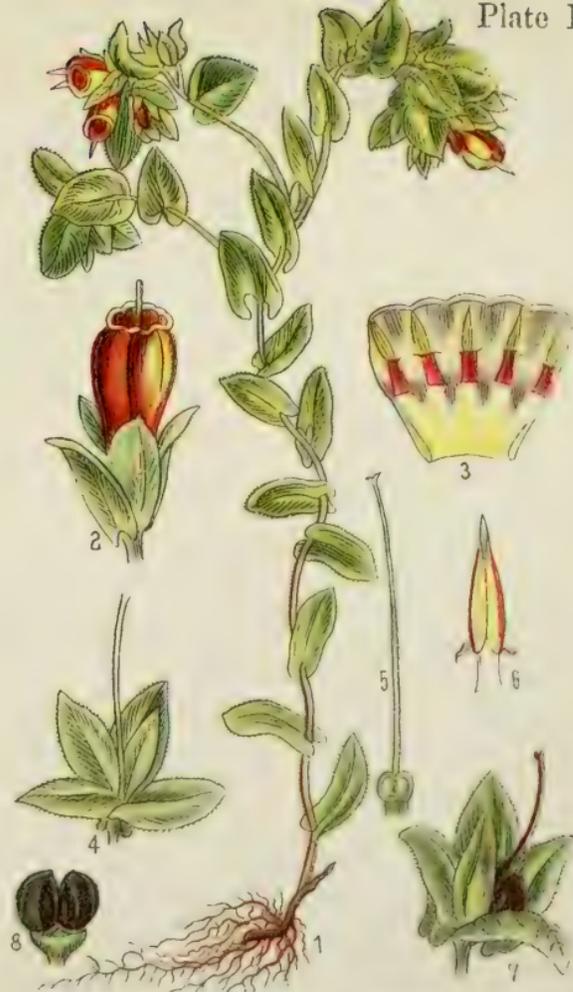
conservatories chiefly come from South Africa, where they are very numerous and beautiful.

The caterpillars of many handsome moths feed on Heath, among which is that of the Emperor Moth (*Saturnia Pavonia-minor*), the only British representative of the family *Saturniidae*, the Eyed Silkworm Moths, to which the largest moth known, the Indian Atlas Moth (*Attacus Atlas*) belongs. The full-grown caterpillar of the Emperor Moth is bright green, with transverse black bands on which stand pink tubercles, each of which bears a circle of stiff diverging hairs. The cocoon is flask-shaped, open at the narrowed end. The moth is grey, and measures $2\frac{1}{2}$ or 3 inches across the wings, which are bordered with brownish white, and adorned in the centre with a large black spot, surrounded with paler and darker rings, and marked with slender red and blue crescents. In the male the antennæ are strongly pectinated, and the hindwings are yellow.

Among foreign species of *Ericaceæ*, the Azaleas and Rhododendrons are chiefly Asiatic mountain shrubs and trees, though a few small species are



Greater Dodder. (*Cuscuta europaea.*)



Large Wax-Flower. (*Cerinthe major.*)

found in Europe, and one (*Azalea procumbens*) even on the mountains of Scotland. It bears small rose-coloured flowers.

Bog Whortleberry—*Vaccinium uliginosum*

(Plate LIV)

This plant is chiefly found in swampy places in mountainous districts, and flowers in April and May. It shoots up many woody, smooth, erect stems, which throw off alternate side-shoots. The leaves grow alternately on short stalks, and are obovate, smooth, obtuse, and sometimes slightly concave at the tip. The upper surface is green and shining, and the underside greyish green, with slender veins. The young leaves are fringed with hairs, which they afterwards lose. The flowers are white, or pale reddish, and stand in clusters at the ends of the twigs. The berries are large and blue-black, with no remarkable flavour.

The commonest plant of this genus is the Bilberry (*V. Myrtillus*), which grows in dry woods

and on heaths, and has black berries like the plant we have just described. The red-berried Cowberry and Cranberry (*V. Vitis-idaea* and *V. Oxycoccus*) are more local in the British Islands. On the Continent Bilberries are considered to be a remedy for diarrhoea.

Common Winter Green—*Pyrola minor*

(Plate LV)

This plant is found in shady woods, and is commoner in Scotland than in England or Ireland. It has a creeping root. All the leaves grow close to the root, and lie crosswise round the stem. They have short stalks, and are oval, and pointed at the extremity. They are smooth and stiff, with the edges slightly crenate; dark green above and paler below. From between the leaves rises an erect, perfectly smooth and bare red stalk, which terminates in a small head of round white or somewhat reddish flowers. The short stalks are protected by narrow lanceolate whitish bracts. The teeth of the calyx are long and pointed, and

red at the tips. The style is straight, and the stigma quinquepartite. The seeds resemble chaff, and are pointed at both ends.

Yellow Bird's Nest—*Monotropa Hypopitys*

(Plate LVI)

This curious plant grows in shady woods at the roots of large trees, especially pine and fir trees. It is not a truly parasitic plant, but its ramifying roots absorb decaying vegetable matter. It flowers in June and July. It has an erect stem clothed with oval scales, but no proper leaves. The root is perennial, and strikes deeply into the soil, where it forms an onion-like tuber, and the filaments attach themselves to the roots of trees. At the end of the stalk is the flower-head. The uppermost flower generally has 10 petals and stamens and a 5-celled capsule, while the other lateral flowers have only 8 petals and stamens and a 4-celled seed-capsule. The seeds are very small, and are easily scattered by the wind.

Order XLVIII. *Aquifoliaceæ* (1 genus)

Holly—*Ilex Aquifolium*

(Plate LVII)

The only British plant of this Order is the Holly (*Ilex Aquifolium*), a slow-growing shrub, which frequently attains the size of a tree in the British Islands, where it grows to most perfection. In France it is common, in Italy local; and though widely distributed in north-western Germany, is there often dwarfed to mere underwood. In England it is universally employed (alone, or with ivy, mistletoe, and other evergreens) to decorate houses, churches, shops, etc., at Christmas. The bark of the young tree is green, or ash-coloured, and smooth, but in older trees becomes grey and rough. The wood is very firm, hard, of fine texture, and white or yellowish. The bark of the young trees is used for making bird-lime. The leaves grow alternately, on short stalks on the young shoots, and are dark green, very thick, smooth, glossy, and oval. Those growing near



Borage. (*Borago officinalis*.)



Forgetmenot. (*Myosotis palustris*.)

the top of the tree are mostly smooth and entire, but the lower leaves have very jagged edges, and the projecting points are armed with strong prickles. (Compare Southey's poem on the Holly Tree.) The tree bears clusters of small whitish flowers in May, in the axils of the leaves; sometimes the flowers are complete, and sometimes the sexes are divided, some trees bearing only male and others only female flowers. The calyx has 4 or 5 teeth, and there are as many alternating petals and stamens. The scarlet berry is surmounted by the teeth of the calyx, and contains 4 seeds. The berries remain on the tree till spring. Some of the cultivated varieties have white-bordered or mottled leaves.

The leaves often exhibit whitish tortuous lines. These are produced by the yellowish-white mining grubs of a small black two-winged fly (*Phytomyza ilicis*).

Maté, or Paraguay Tea, much drunk in South America, is the infusion of the leaves of a plant allied to the Holly (*Ilex Paraguensis*). It has a bitter taste, and resembles coffee in its properties.

Order XLIX. (*Oleaceæ* 2 genera)

The plants of this Order are trees or shrubs, with opposite leaves, and the flowers in clusters, with 2 stamens, and the calyx and corolla either quadrifid or absent. There are 2 stamens, attached to the tube of the corolla, when it exists; and the ovary and fruit are 2-celled.

There are only two British plants belonging to this Order—the Privet and the Ash; but several important cultivated and foreign plants, such as the Lilac, Jasmine, and Olive, likewise belong to it.

The Privet (*Ligustrum vulgare*) is an evergreen shrub (except in severe winters), and is much used for garden hedges. It bears clusters of white flowers and black berries, sometimes used to form a gargle, or a wash for scurvy or soreness in the mouth. On its leaves, and on those of allied trees and shrubs, feeds the large green caterpillar of the Privet Hawk-moth (*Sphinx ligustri*). It has oblique white, lilac-bordered stripes on the sides, and a black and yellow horn on the back. In repose it holds the front of its body erect, in an

attitude which suggested that of a Sphinx to the older entomologists, whence its name. But notwithstanding the size and beauty of the caterpillar, its colours assimilate so well with the plant that its presence is often only detected, even by entomologists, by noticing its droppings under the bushes. The moth is pale brown, varied with grey and whitish, and expands 4 inches across the rather narrow and pointed forewings. The hindwings are banded with black and pink, and the rather stout abdomen is also transversely banded on the sides with pink. Many other insects feed on privet, etc., one of them being the caterpillar of an extremely delicate little moth (*Gracilaria syringella*), only half an inch across its narrow yellowish brown-spotted fringed wings. The caterpillar is whitish, and makes conspicuous mines in the leaves of the trees on which it lives.

Ash—*Fraxinus excelsior*

(Plate LVIII)

The Ash is a lofty tree which flourishes best in a rather damp soil. The trunk is erect, and the

bark is greyish brown, and smooth, except in old trees, when it becomes rugged. The buds are large and black, and surrounded with soft hairy scales. The leaves are opposite, unequally pinnate, and the leaflets are long, lanceolate, with a prominent apex, and coarsely serrated; the base is narrowed, entire, and almost sessile. The leaves, unlike those of the privet, are deciduous. The flower-clusters rise from the sides of the leaf-buds, near the tips of the young shoots, and the stamens are attached opposite to each other on the sides of the ovary; but many trees bear only male or only female flowers. The flowers appear in April or May before the leaves. The seed-capsule is long and tough, almost leathery, expanding into a wing above. It is two-celled, but only one seed ripens. The clusters are called ash-keys, or samaras.

The Blister Beetle (*Cantharis vesicatoria*), a narrow, brilliantly metallic green beetle, about half an inch long, feeds on the Ash, and a tree loaded with them is a magnificent sight. The insect, however, is scarce in Britain. It is the



Woody Nightshade, or Bittersweet.
(*Solanum Dulcamara*.)



Deadly Nightshade. (*Atropa Belladonna*.)

insect from which cantharides is chiefly obtained, though some yellow and black Chinese beetles are also used for that purpose.

Another conspicuous insect, very rare with us, but common on the Continent, the ashy-grey caterpillar of which feeds on the ash and several other trees, is the Clifden Nonpareil (*Catocala fraxini*). The moth measures nearly 4 inches across the broad forewings, which are bluish grey, varied with paler markings, and with zigzag black lines. The hindwings are black, with a broad pale blue central band. Notwithstanding its rarity, it is widely distributed in England, and a few years ago a specimen was taken in Hyde Park.

The Lilac (*Syringa vulgaris*), a native of Persia, is largely grown in gardens and shrubberies for its fragrant clusters of lilac or white flowers. The leaves are smooth, long, broad, and entire. The flowers form large upright clusters, and appear in May, and the long, compressed, pointed seed capsules ripen in September.

The Olive Tree (*Olea europæa*), which also

belongs to this Order of plants, is universally cultivated in Southern Europe and other regions bordering on the Mediterranean. It is an evergreen tree with entire leaves, and small clusters of white flowers, yielding a purple stone fruit, from which the valuable yellow olive oil is obtained. The fruit is also pickled in salt and water as an after-dinner relish. In England olive oil is chiefly taken with salad. It is also used in the manufacture of soap, and medicinally as an application to burns.

Order L. *Apocynaceæ* (1 genus)

Our British representative of this Order is the Periwinkle (*Vinca minor*), which is found in bushy places and shady woods. It has a creeping stem, and smooth shining evergreen leaves, elliptical or inclining to lanceolate, on short stalks. The blue (or rarely white) flowers are tubular, with the calyx and corolla 5-lobed, and 5 stamens. There are 2 ovaries, united above, with a common style and stigma, and the seed capsule is double; the seeds

are very small. A larger species (*Vinca major*), also with blue or white flowers, but with the borders of the divisions of the calyx and of the leaves fringed with hairs, is also occasionally met with.

Allied to the Periwinkle is the beautiful but poisonous shrub so common round the Mediterranean, the Oleander (*Nerium Oleander*). It has green lanceolate leaves, and red, or occasionally white or yellow, flowers. The caterpillar of one of the most beautiful of the European Hawk-moths, the Oleander Hawk-moth (*Daphnis nerii*) feeds on this shrub as well as on Periwinkle. It is green or yellowish, with a white line on each side, a blunt yellow horn on the back, and the front of the body yellow, with two blue spots surrounded with black on the back of the third segment behind the head. The moth is 4 inches in expanse, and is also green, varied with pink and violet. It is common throughout Africa and the warmer parts of Europe and Asia, but is only found in England as an occasional visitor of great rarity.

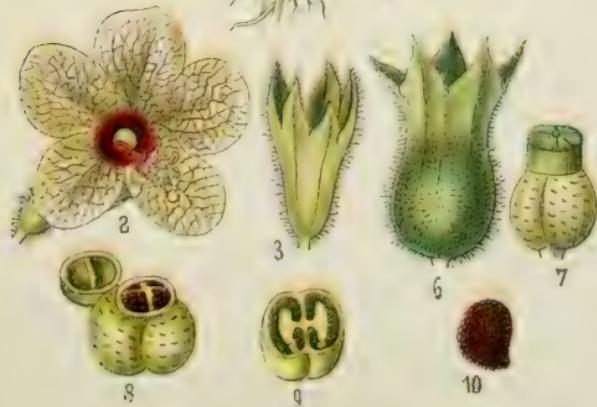
Order LI. *Gentianaceæ*

This Order resembles the last in its large tubular flowers, generally blue, pink, or yellow; but the corolla has from 5 to 8 lobes, and the two ovaries are not united.

Centaury—*Erythræa Centaurium* (Plate LIX)

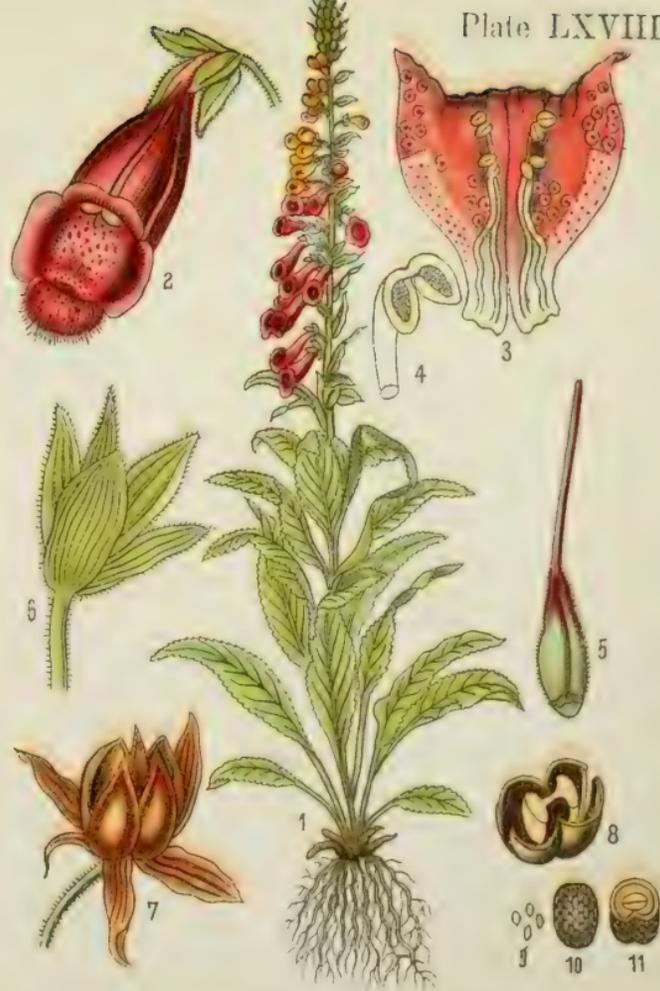
This pretty little plant is common in fields and meadows, preferring open sunny places, and flowers from June to September. It is an annual, and throws up from the root one or more smooth erect branching stems. The leaves are ovate or lanceolate, smooth, sessile, and opposite; and larger leaves form a thick rosette round the root. The flowers are pink, the tube of the corolla is longer than the calyx, and the open part is divided into 5 oval petals. The stigma of the ovary is rounded and cleft. The whole plant is very bitter, and, like many species of Gentian, has been employed in medicine as a valuable tonic.

Plate LXVII.



Henbane. (*Hyoscyamus niger*.)

Plate LXVIII.



Foxglove. (*Digitalis purpurea*.)

Obtuse-leaved Gentian—*Gentiana obtusifolia*

(Plate LX)

We have several British species of Gentian, all with blue or lilac flowers, but they are much more numerous on the Continent; and the species figured on our plate is a mountain form (not British), which flowers in August. The fibrous root is almost woody, and throws off several rootlets. The root-leaves spread out in a rosette, and are ovate; the leaves on the stem are sessile, opposite, and lanceolate, half embracing the stem at the base. The stem is angular, smooth, and branching. The calyx is bell-shaped, quinquepartite for half its length, narrowed towards the base, and then somewhat inflated, with lanceolate bracts. The corolla also divides into 5 blue petals above the tube, which are pointed at the tip, fringed with long hairs inside, and yellow towards the base. The stamens are separate, and project from the opening of the tube of the corolla.

Order LII. *Polemoniaceæ* (1 genus)

The only British representative of this Order is called Jacob's Ladder (*Polemonium cæsulum*), and is a rather scarce plant found in damp meadows, or on the borders of woods. The leaves are pinnate, the leaflets ovate-lanceolate and alternate. The stem is nearly two feet high, and the flowers are terminal, rather numerous, and blue, or occasionally white. They are bell-shaped or wheel-shaped, the tube being short; the calyx and corolla are quinquepartite, and there are 5 stamens, 3 stigmas, and 3 cells in the ovary and seed-capsule.

To this Order belong the favourite garden flowers known as Phlox.

Order LIII. *Convolvulaceæ* (2 genera)

These are climbing or trailing plants, with regular flowers, the calyx with 4 or 5 sepals, the corolla tubular and almost trumpet-shaped, with 4 or 5 petals, and as many stamens.

There are three British species of *Convolvulus*, or Bindweed, and other species are grown in our gardens, often with very ornamental flowers. The Small Bindweed (*Convolvulus arvensis*), has ovate or lanceolate leaves, and the flowers are pink or white. There are two small bracts on the stalk, not close to the flower. It is common in fields and waste places, trailing over the other herbage, often in large masses. The Larger *Convolvulus* (*Convolvulus sepium*) has broad leaves, expanded at the base and pointed towards the tip, and large white or occasionally pink flowers, and is usually met with climbing up hedges or bushes. Near the flowers are two large bracts. The Sea *Convolvulus* (*Convolvulus soldanella*), has large pink flowers, and grows on sandy ground near the sea. The bracts are placed as in the last species.

Among others, the caterpillars of three very interesting moths feed on *Convolvulus*. One is the *Convolvulus* Hawk-Moth (*Sphinx convolvuli*). The caterpillar is brown or green, with dull yellow stripes on the sides, and the moth, which measures 4 or 5 inches across the wings, is varied with

brown and grey, and the abdomen is marked with interrupted pink transverse bands.

Emmelia trabealis is a small slender moth nearly an inch across the wings, which are sulphur-yellow, with black lines and spots; the hindwings are brown. It is found by day in weedy places (especially on the edges of cornfields), where its caterpillar, which is green or brown with a yellow stripe on the sides, feeds on bindweed. It is not common in Britain, but is found occasionally in the eastern counties of England.

The caterpillars of several Plume Moths belonging to the genus *Pterophorus*, in which the forewings are more or less divided into two distinct feathers, and the hindwings into three, feed on *Convolvulus*; among others, that of the largest species, the White Plume Moth (*Pterophorus pentadactylus*), a very delicate creature, with snow-white wings often exceeding an inch in expanse, and long slender legs, which, but for their white colour, might almost remind us of those of a Daddy Longlegs. It is often common in weedy places, looking like a snowflake.



King Charles's Sceptre.

(*Pedicularis Sceptrum Canadense*.)



Sage. (*Salvia officinalis*.)

Greater Dodder—*Cuscuta europæa*

(Plate LXI)

We have figured this plant as the representative of a very curious genus of which we have several British species. They are without proper leaves or roots, and are entirely parasitic, consisting only of a bundle of long bare reddish filaments, twining round nettles, flax, and similar plants. The stems twist round each other, as well as round the plants which they infest. The pale reddish flowers stand 10 or 12 together in small clusters at intervals on the stems; they are without stalks. Both the calyx and corolla are sometimes 4-lobate and sometimes 5-lobate. The small seeds germinate in the ground, and as soon as the young filament touches a suitable plant it embraces it, attaching itself by its sucking tubercles; and the lower part of the thread, by which it was at first attached to the ground, withers away. It greatly impedes the development of the plants to which it attaches itself. Another species of Dodder (*Cuscuta trifolii*) attacks Clover, and is often very destructive.

Order LIV. *Boraginaceæ* (11 genera)

The plants included in this family are generally herbaceous, more or less hairy, with alternate leaves, the flowers regular, with the calyx and corolla 5-lobed, 5 stamens, and the ovary of 4 divisions, each containing a seed. The colour of the flowers is most frequently blue.

Large Wax Flower—*Cerinthe major*

(Plate LXII)

This handsome plant grows wild in Southern Europe, and is naturalised here and there in some parts of Central Europe, in waste hilly districts, but it is not found in the British Islands. The stem is upright, the leaves are sessile, long, oval, or heart-shaped, and embrace the stem. They are sea-green or bluish, and their borders are smooth or hairy. The leaves are often spotted with white, or studded with small white warts on the upper surface. The flowers hang in terminal clusters, and contain honey. They have bracts

between them, and are yellow or red, or yellow varied with red or blue. They derive their name from their peculiar wax-like appearance.

Borage—*Borago officinalis*

(Plate LXIII)

This plant is not uncommon on walls and on waste ground (especially if sandy), and is sometimes grown in gardens. It shoots up erect branching and succulent stems to the height of a foot, covered, like the leaves and the calyx, with coarse stiff hairs. The leaves are sessile, somewhat drooping, and embrace the stem. They are ovate, obtuse, entire, veined, and wrinkled. At the ends of the shoots rise forking flower-stalks, and the flowers droop to one side. The corolla is bright blue (or rarely white). If the dried plant is thrown into the fire it slightly explodes. The fresh plant tastes something like cucumber, and may be used in salad. The flowers are much frequented by bees.

Viper's Bugloss (*Echium vulgare*) is a similar

plant, but more low-growing, and the hairs are so thick as to be almost prickles. The flowers are first red and then blue.

The Comfrey (*Symphytum officinale*), is a larger and handsomer plant, which is common in water-meadows and by streams. The leaves are rather large and long, and the flowers are purple, yellow, or white.

Forget-me-not. *Myosotis palustris*

(Plate LXIV)

There are several different kinds of Forget-me-not—some, like the plant figured, growing best in very wet places, while others prefer drier situations. The present species has a creeping root, an erect 5-ridged stem, brown below and green above, which is hollow, succulent, and more or less hairy. The stem branches, and the leaves are tongue-shaped, bright green, and recurved at the ends, with the surface smooth or hairy. The flower-stems are erect, with a double row of flowers, not exceeding 20, with short stalks. The calyx is



Common Calamint. (*Calamintha officinalis*.)



Hemp Nettle. (*Galeopsis pubescens*.)

somewhat open, with 5 equal teeth. The corolla is large, and the tube is as long as the calyx, and colourless. The border is longer than the tube, and bright blue. The lobes are rounded, slightly notched, and at the base are yellow oval glandular scales. The stamens are very short, and are in the middle of the tube. The anthers are lanceolate, and the ovary rather small. The seeds are ova!

The plant derives its name from an old legend, according to which a lover, venturing too far into a river to gather one of these flowers for his lady, was carried away by the stream, but threw the flower on shore, crying out, "Forget me not." The German name is practically identical—"Vergissmeinnicht."

Order LV. *Solanaceæ* (4 genera)

This is a somewhat extensive Order, though poorly represented in Britain. It contains several plants of considerable economic value, among others the Potato (*Solanum tuberosum*), the Love Apple or Tomato (*Solanum lycopersicum*), and the

Tobacco Plant (*Nicotiana tabacum*). It also includes different species of Nightshade, and other plants which are dangerous poisons, but some of which are much used in medicine. They are shrubs or low-growing plants, with alternate leaves, large handsome brightly-coloured flowers, mostly tubular or bell-shaped, the calyx and corolla 5-lobed (rarely 4-lobed), and an equal number of stamens. The fruit is a 2- or 4-celled capsule, or a berry in many divisions.

Woody Nightshade, or Bittersweet—*Solanum Dulcamara* (Plate LXV)

This is a handsome climbing plant, common in hedges and among bushes, preferring a damp soil, though often met with in dry places. The perennial root throws off slender woody brittle shoots, which either straggle over the ground or climb up any plants within reach. The leaves and side-shoots are alternate. The leaves have long stalks, a smooth margin, and are of different shapes.

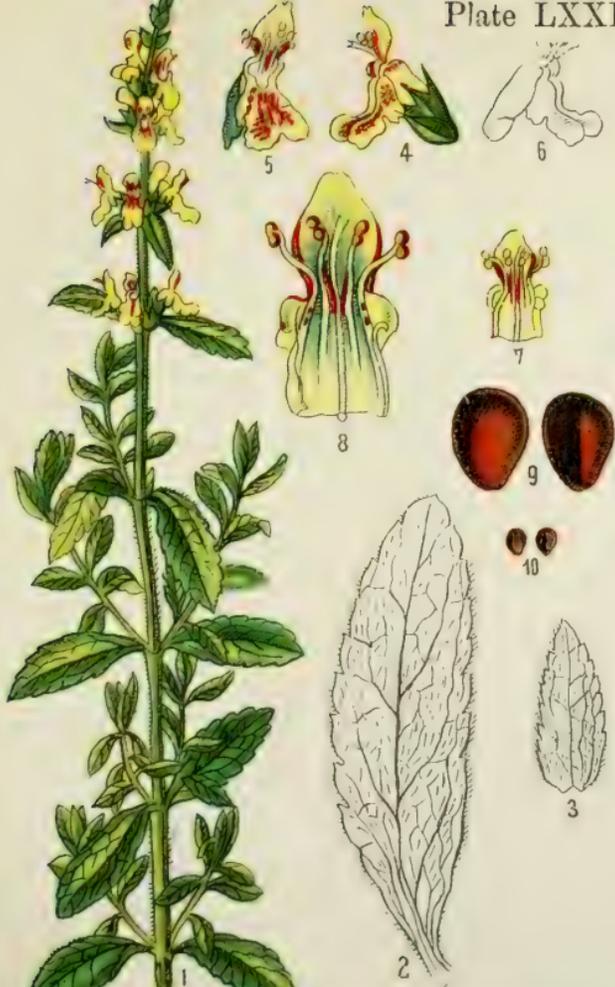
The lower ones are quite simple, ovate-lanceolate, and the upper ones have at the base 2 small ear-shaped leaflets. The flowers grow towards the ends and at the sides of the shoots, and stand on branching bifurcating stalks, forming irregular clusters. The flowers are dark violet-blue, and each petal of the corolla has 2 green spots towards the base. The fruit is an oval juicy bright scarlet berry. It is poisonous, like most plants of this Order; and is often mistaken, by those who are not botanists, for the Deadly Nightshade, a much more dangerous plant, which is not nearly so common in Britain.

The Black Nightshade (*Solanum nigrum*) is a smaller plant, about a foot high. The flowers are white, with a yellow centre, and much resemble those of the Potato, which is placed by botanists in the same genus. The Black Nightshade is highly poisonous, and the berries are generally black, but varieties with green or red berries are also met with. It is not a climbing plant. It grows on waste ground, or as a garden weed.

Deadly Nightshade—*Atropa Belladonna*

(Plate LXVI)

This is one of the most poisonous of our British plants, but is by no means so common as formerly. It is met with occasionally, however, on waste, stony, and bushy ground, sometimes growing to the height of 4 or 5 feet, though usually smaller. The leaves are large, oval, and glossy, and the bell-shaped flowers are pale violet, as large as those of the great *Campanula* figured on Plate LII., and are enclosed for half their length by the sepals of the calyx. The berry is nearly as large as a cherry, and is likewise enclosed by the calyx. It is green when unripe, and purplish-black when ripe. When many large plants are growing together, in full flower and fruit, they present a beautiful appearance, and I think it not improbable that this was the plant which suggested the deadly shrub described by Aubépine in his story of "Beatrice," better known by Nathaniel Hawthorne's translation, under the title of "Rappaccini's Daughter."



Upright Woundwort. (*Stachys recta*.)



Vervain. (*Verbena officinalis*.)

Belladonna is much used in medicine, especially for the relief of pain, either as an internal medication or as an external application, generally combined with heat. It is also used in ophthalmic surgery, and has the peculiar property of dilating the pupil of the eye. In poisoning by this plant, death is due to failure of the heart's action.

Henbane—*Hycoscyannus niger*

(Plate LXVII)

This is another handsome plant, which grows to a height of about two feet on waste ground, especially on a chalky soil. It is a biennial, and flowers in July and August. It has a long white fleshy root and an upright stem. The leaves and branches are alternate. The leaves are sessile, pinnate, and deeply dentated, and embrace the stem at their base. The flowers are sessile, and at the end of the stalk and branches they form a small loose head, surrounded with small bracts. The corolla is dull yellow, with a network of purplish veins; the tube is dark red. The whole

plant is hairy, succulent, and viscid, and emits a very unpleasant odour. It is well known as a poisonous plant, though it is very doubtful whether Shakespeare's story of the murder of Hamlet's father, by pouring the "juice of cursed hebenon" into his ears, would have been possible. Like belladonna, it is a sedative, and is used to relieve pain.

Another poisonous plant naturalised in Britain is the Thorn Apple (*Datura Stramonium*), originally a native of America. It is an annual, growing upwards of two feet high, and has very large toothed leaves, a very long tubular calyx, and a large white 5-lobed corolla. The fruit is green outside, and covered with spines; it is as large as a walnut. The plant is found occasionally growing on waste ground. Its medicinal action resembles atropine, and its principal use is in asthma.

The caterpillar of the largest of our British moths, the Death's-head Hawk-moth (*Acherontia Atropos*), feeds chiefly on *Solanaceæ*, and more especially on the leaves of the Potato. It is yellow, greenish, or blackish, with oblique purplish

stripes on the sides, and a rough rather twisted horn on the back. The large shining brown chrysalis, 2 inches long, is often dug up in potato fields. The moth, which is common almost throughout Europe, Asia, and Africa, is 5 or 6 inches across the forewings, which are brown, varied with ochreous; the hindwings are straw-colour, with two black bands. The body is black; on the thorax are curious pale grey marks, not unlike a skull in appearance, and the abdomen is black varied with blue, with a row of oblong straw-coloured spots on each side.

Order LVI. *Orobanchaceæ* (2 genera)

This is a small Order of parasitic plants. They have white stalks destitute of chlorophyll, and the leaves have degenerated into scales. The calyx is 2- or 4-lobed, and the corolla is usually bilobate, blue or purple, and traversed by darker veins. The seeds are small and glutinous. The species of Broom-rape (*Orobanche*) are all very similar white or yellowish plants with blue flowers.

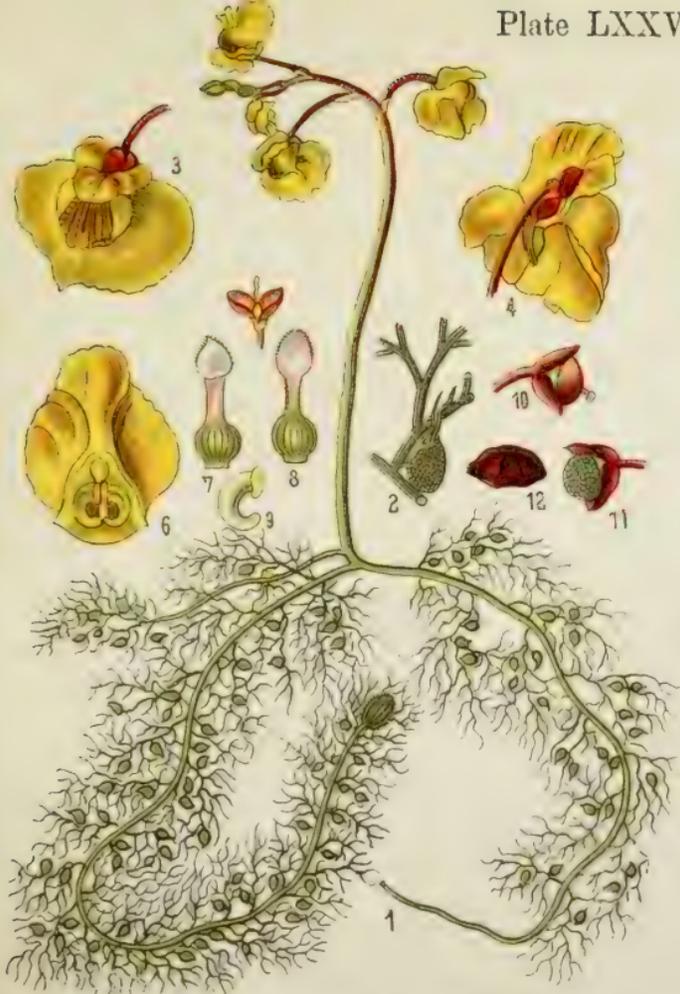
The Toothwort (*Lathræa Squamaria*) is pale rose-colour, with darker red flowers, in a cluster, but pendent. It is usually found growing on the roots of hazel bushes.

Order LVII. *Scrophulariaceæ* (16 genera)

This is a large and important Order of herbaceous plants. The calyx and corolla are either bilobate or 4- or 5-lobed. The ovary and capsule have generally two divisions, and the style is simple and the stigma bilobate. The seeds are numerous.

The species of Mullein (*Verbascum*) are conspicuous plants, 3 or 4 feet high, very woolly, with large leaves, and erect spikes of large flowers, generally white or yellow. The leaves are sometimes rolled into cigarettes, and are thought to be beneficial in asthma.

On Mullein feed the caterpillars of several of the long-winged moths called Sharks (genus *Cucullia*). The moths are light brown or grey, and about two inches in expanse; but the cater-



Greater Bladderwort. (*Utricularia vulgaris*.)



Cowslip. (*Primula veris*.)

pillars are very handsome, being yellow, spotted with black, and as they feed gregariously, are very easily observed.

Foxglove—*Digitalis purpurea*

(Plate LXVIII)

The Foxglove grows on banks, and on the borders of woods, and is one of the most beautiful of our summer flowers. It is a biennial, and flowers from June to August. The stem is erect, and grows 3 or 4 feet high; it is rounded, clothed with fine hairs, and branching. The leaves are very large, alternate, and bright green. They curve away from the stem, are finely hairy on both surfaces, and the edges are denticulated. The flowers form a long spike at the end of the stem. They are large and red, spotted within with darker red. They stand on separate stalks, and droop down on one side of the stem. The upper lip of the flower is entire. The seed-capsule has four divisions, and contains a number of minute seeds. Medicinally

this is a most valuable drug, and is much used in diseases of the heart. It slows the heart, while increasing the force and regularity of the beats. In poisoning, the circulation is checked, and death results from cardiac failure.

Occasionally a Foxglove is met with with white instead of red flowers; and there are some species on the Continent with yellow flowers. The name Foxglove is believed to be a corruption of "Folk's Glove," *i.e.* Fairy's Glove; the legendary connection between flowers and fairies being often very close; indeed, George Macdonald says, "Those whom you call Fairies in your country are mostly the young children of the Flower-fairies."

Allied to the Foxglove are the Snapdragons and their allies, in which the bifid lip of the corolla meets a lower lobe called the palate, completely closing the tube. They are best known as garden flowers, but one red or white species (*Antirrhinum majus*) grows in rocky places, and more especially on old walls, both in Britain and on the Continent.

A smaller Snapdragon with purple flowers

(*Antirrhinum Orontium*) is met with occasionally in waste stony places.

There are several British species of Toadflax (*Linaria*), with blue, white or yellow flowers, resembling the true Snapdragons, but with the calyx projecting from beneath the corolla in a long spur. Of these the commonest is the Yellow Toadflax (*Linaria vulgaris*) found in fields and hedgerows. The corolla is yellow (or more rarely white), and the palate is orange, which has given rise to the name of "Butter-and-eggs," by which the flower is often known in the country. The leaves, both in the Snapdragons and Toadflaxes, are rather small, long and narrow, and entire.

King Charles's Sceptre—*Pedicularis Sceptrum-Carolinum*

(Plate LXIX)

We have a few species of Lousewort (*Pedicularis*) in Britain, though the species here figured is not British, but is found on swampy moors in Northern and Eastern Germany. The root consists

of long thick fibres, and is perennial. The stem is erect, round, reddish, and for the most part smooth. The root-leaves are numerous, and form a rosette. They are erect and pinnate, with reddish veins. The leaflets are oval, notched, and slightly curved over at the edges. Below the middle of the stem are from two to four smaller sessile leaves. Oval, hollow, obtuse, and almost entire bracts, which are generally smaller than the calyx, stand singly under each flower. The flowers are large and very handsome, and are yellow, with the extremity blood-red. They are generally arranged three together in whorls, and form a long loose spike. The corolla is smooth, straight, tubular, and closed at the extremity. The calyx is oval, rather long, smooth, and its lobes are very strongly dentated. The capsule has two cells.

Most of the British species of *Scrophularia* and of the allied genus *Melampyrum* (Cow-Wheat) have purplish flowers; but some are yellow. A commoner and better-known plant, however, is the Yellow Rattle (*Rhinanthus Crista-Galli*), which grows plentifully among grass, and has conspicuous yellow



Sow-bread. (*Cyclamen europeum*.)



Upright Globularia. (*Globularia vulgaris*.)

flowers, and a round flat capsule, containing large seeds which make a rattling sound when dry.

Among the smaller plants belonging to this Order we may mention the different species of *Eyebright* (*Euphrasia*), small plants, with white, reddish or yellow flowers, growing among grass; and *Speedwell* (*Veronica*), with blue or occasionally white flowers, not unlike those of a *Forget-me-not*; but the leaves are broader and denticulated.

In former times a preparation of *Eyebright* was used as a specific for the eyes; and Milton tells us that when the archangel Michael was about to show Adam visions of the future of the world, he

“purged with euphrasy and rue
The visual nerve, for he had much to see.”

Order LVIII. *Labiata* (18 genera)

This is a large group of herbaceous plants and shrubs, with opposite leaves and tubular flowers, with the corolla usually bilobate. There are 2

stamens, or 4 in pairs, the ovary has 4 cells, each containing a single seed, and a single style rises from the centre of the carpels.

Several of the plants included in this Order are aromatic, such as *Mint*, *Sage*, *Marjoram*, *Thyme*, *Lavender*, etc.

Sage—*Salvia officinalis*

(Plate LXX)

This is a common garden plant, but is a native of Southern Europe, and is not indigenous in Britain, though there are a few wild species belonging to the same genus. The root throws up several woody stems, and the leaves are stalked, rather long and narrow, and wrinkled. They are soft to the touch, and of a pale green colour. The flowers stand in whorls at the ends of the stems, and form a long loose spike. They are most often blue, but sometimes white or lilac. The calyx has 5 pointed teeth. The corolla has 2 stamens, and the style is long and curved. The leaves are used for flavouring.

Common Calamint—*Calamintha officinalis*

(Plate LXXI).

This is a widely distributed plant, but is less common in Britain than on the Continent. The fibrous root thickens considerably in loose soil. The stem is upright or creeping, quadrangular, and clothed with straight hairs. In the angles of the leaves rise short infertile offshoots, and the stem generally divides into from 3 to 5 flowering branches. The leaves are opposite, stalked, oval, and serrated, except at the base and tip. They are grass-green, strongly veined, hairy on both surfaces, and thickly covered with impressed glands beneath. The loose, leafy flower-heads, in which the stem and branches terminate, are formed of clusters of 3, 5, or more flowers on the same level. The calyx is generally reddish brown, covered with very short down. The upper lip is curved upwards, and has large oval teeth; the lower is formed of two long pointed teeth, and is curved slightly inwards. The hollow of the calyx is slightly hairy. The corolla is pale pink, shading

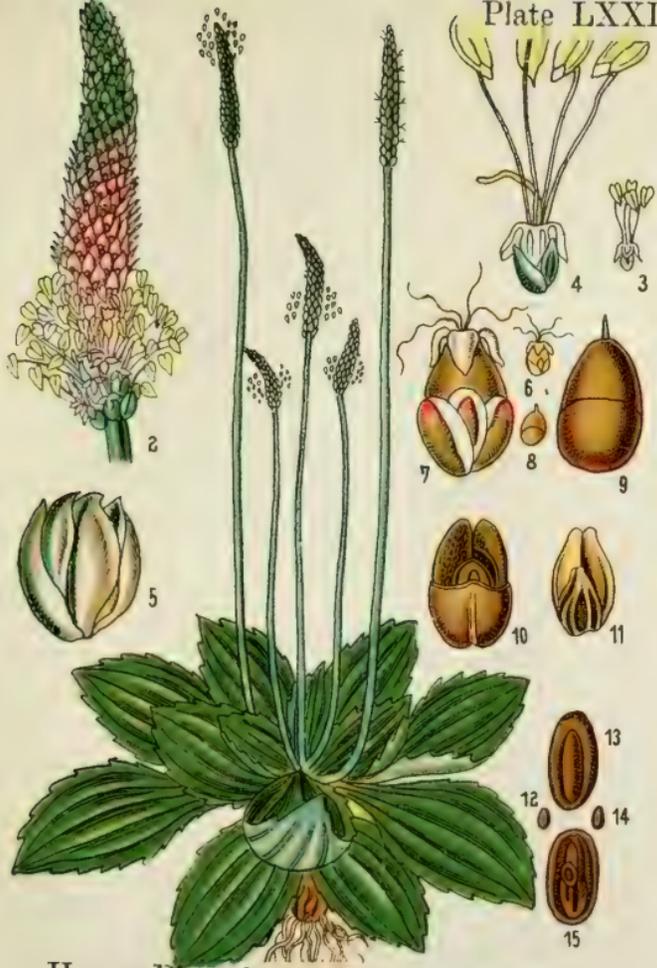
into bluish, with purple spots at the base of the lower lip. The upper lip is straight, and deeply emarginate at the extremity. The carpels are globular, brown, smooth, with two shallow cavities at the axis. The plant varies considerably in size, sometimes exceeding 2 feet in height; and the leaves also vary in size and denticulation.

Hemp Nettle—*Galeopsis pubescens*

(Plate LXXII)

This is not a British plant, but is common in Central Europe. There are, however, several British species of the same genus. The stem is clothed with appressed down, and beneath the joints it is expanded and bristly. The leaves are broad, oval, and pointed; the tubes of the corolla are longer than the calyx; the middle lobe of the lower lip is almost quadrangular, smooth, finely notched, slightly emarginate, and marked with two yellow spots before the tube.

There are several British species of Dead-nettle (*Lamium*), with white, red, or yellow flowers.



Hoary Plantain, or Lamb's Tongue.
(*Plantago media.*)



Perennial Goosefoot. (*Cheopodium Bonus-Henricus.*)

They derive their name from their general resemblance to Nettles, but they do not sting. They are also smaller, seldom exceeding a foot in height. The White Dead-nettle (*Lamium album*) is one of the commonest of our wild flowers, on every hedge and bank, and its large white flowers make it very conspicuous. It flowers from spring to autumn. On the Continent a preparation of this plant is used internally to check hæmorrhage.

Upright Woundwort—*Stachys recta*

(Plate LXXIII)

This plant is common in Central and Southern Europe in rocky places, and flowers from the end of June till autumn. It is not British, though other species of the genus are found in the British Islands. The root is woody, branching and nodular. The stems are erect or ascending, simple or branched, quadrangular, and hairy, like the Calamint. The leaves are longer or shorter, lanceolate, with serrated edges, and narrowed into a short stalk. The lower leaves are obtuse, the

upper ones pointed, and those which stand among the flowers gradually pass into oval sessile awn-bearing bracts. The flower-whorls consist of six or more flowers together, and finally form a long interrupted flower-spike. The calyx becomes gradually broader above; its tube is not hairy, and the teeth end in a bare prickly awn. The tube of the corolla is rather obliquely constricted below the middle, and is furnished with an oblique fringe of hairs at the constriction.

The Bugle (*Ajuga reptans*) is a common plant in swampy places, growing to the height of nearly a foot, and bearing a thick spike of conspicuous blue flowers.

Order LIX. *Verbenaceæ* (1 genus)

Vervain—*Verbena officinalis*

(Plate LXXIV)

This is the only British plant of its Order, and it is not uncommon in waste places both in Britain and on the Continent. It has an upright quadrangular stem nearly two feet high, which throws

out obliquely ascending branches on opposite sides. The leaves are sessile, opposite, and hairy on both surfaces. The upper leaves are almost entire, but the lower ones are mostly divided into three long lanceolate lobes with jagged edges. At the end of the stem and branches rise several long upright slender flower-spikes, with pale bluish or reddish flowers, having 4 stamens of unequal length. The ovary is undivided, and is surmounted by a style; otherwise this Order much resembles the last in its characters.

Order LX. *Lentibulariaceæ* (2 genera)

This is a small Order of aquatic plants. The calyx has two or more lobes, and the corolla is bilobate, with a spur at the base. There are 2 stamens. The ovary forms a single cell, but contains several seeds. The capsule is round, and divided into two or more cells. There are several British species of the Order.

The Butterwort (*Pinguicula vulgaris*) is not uncommon in boggy places in mountainous districts.

The leaves are light green, and form a rosette round the root; the flower-stalks grow nearly 6 inches high, and the corolla is purplish blue, and always marked with two white spots. The spur is straight, pointed, and almost as long as the corolla.

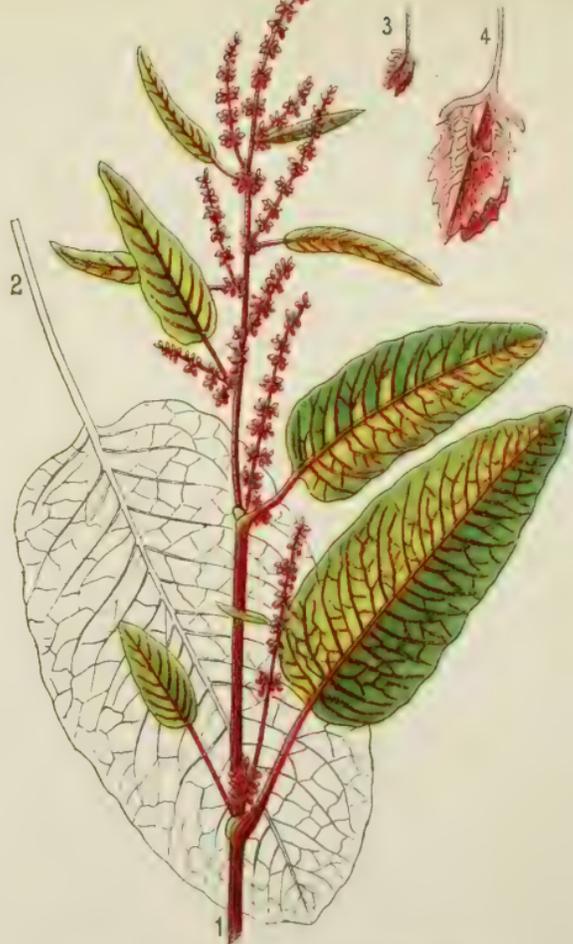
Greater Bladderwort—*Utricularia vulgaris*

(Plate LXXV)

This curious plant grows in standing or slowly running water, and flowers in June and July. The root is fibrous, and passes gradually into the stem, which is round, smooth, and forking, and extends under water. The leaves are pinnate and much divided, and the divisions are hairlike, and are covered with rounded, rather compressed bladders; the outer ones end in a pair of bristles. The flower-stalk is erect, round, with a few scales, and bears from 4 to 10 flowers. The flowers stand at the extremity on slender stalks, and are furnished at the base with an oval coloured bract. The calyx is bilobate, coloured, and permanent. The corolla is yellow. The upper lip is erect, oval, almost



Garden Orache. (*Atriplex hortensis*.)



Broad Dock. (*Rumex obtusifolius*.)

trilobate, obtuse at the extremity, and slightly waved at the edges. The lower lip is rounded, curved downward at the sides, and slightly folded. The lower part of the corolla is cordate, orange, and as long as the upper lip. The nectary is a conical spur rising from the base of the corolla, and projecting from the lower lip. There are 2 stamens with anthers turned inwards connected with the stigma. The pistil has a round ovary, and a cylindrical permanent style, ending in a short tooth, and in the flattened depressed stigma. The stigma is bare on the side turned towards the stamens, but clothed with fine hairs on the other side. The capsule is round, opening circularly, 1-celled, and surmounted by the persistent style. The seeds are 6-cornered, raised in the middle on both sides, and attached to the loose seed-capsule.

The leaf-bladders are filled with water at first, and hold the plant under the surface. But before the plant flowers, the bladders become full of air, and float it up to the surface. When the flowering-time is over, the air is expelled from the bladders,

and they again become full of water, and the plant sinks below the surface as before.

Order LXI. *Primulaceæ* (9 genera)

This Order includes low plants, with rather large leaves. The calyx is persistent, and has from 5 to 7 sepals; the corolla has 5 petals (rarely 4 or 7), or is absent. The stamens are opposite to the petals, and equal them in number. The ovary consists of only 1 cell, and the style and stigma are of ordinary form. The flower is succeeded by a capsule.

Cowslip—*Primula veris*

(Plate LXXVI)

The Cowslip is common everywhere in meadows, and flowers in May. The root is white, and considerably forked. The leaves, which cluster round the root, are stalked, oval, obtuse, wrinkled and notched, and are gradually narrowed into the stalk. The stem is simple, smooth, round, and comparatively tall. The flowers, which are arranged

in small clusters, are placed on short stalks, and are all pendent. The calyx is ovate, with 5 short teeth, and like the tube of the corolla, is slightly inflated. The corolla is quinquelobate, fragrant, and is lemon-yellow, spotted with red at the base. The stamens are placed at the bottom of the tube, to which they adhere. The ovary is round, with a cylindrical style and globular stigma. Cowslip-wine, and sometimes cowslip tea, is made of the flowers.

The Primrose (*Primula acaulis*) is closely allied to the Cowslip, but has larger and paler flowers, each growing singly on a stalk; and in mild winters it flowers almost all the year round. It is fonder of shade than the Cowslip, and is more frequently found on hedge-banks or in woods than in the open fields.

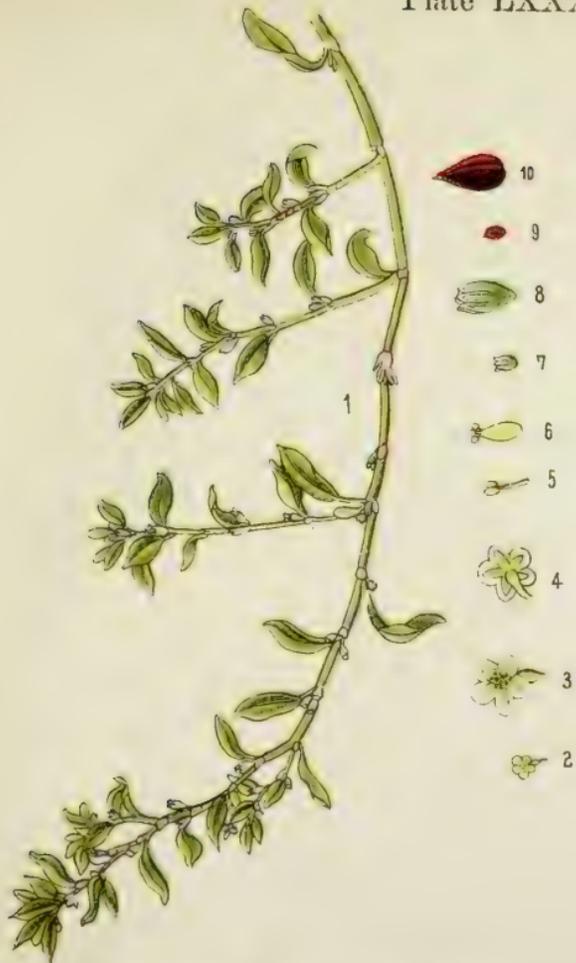
Sow-bread—*Cyclamen europæum*

(Plate LXXVII)

This curious plant, though naturalised in England, is more often to be seen on artificial rockeries

than wild. It is common in mountainous countries in different parts of Europe, and also grows in shady woods. The root is perennial, and consists of a fleshy bulb, brownish yellow outside but white within, from which rise several broad heart-shaped leaves with sinuated borders, on long stalks. The upper side of the leaves is dark green varied with whitish, and the under-surface is purplish. The flowers appear before the leaves, and rise on long stalks directly from the root. Every stalk bears only one flower, which is purple, red or white, and more or less fragrant. When they first expand, the petals are closely connected, but as they expand they turn back, and the tube becomes conspicuous. The pistil is longer than the stamens. When the flowers are over, and the ovary begins to expand, the flower-stalk twists spirally back to the ground, and then the fruit ripens. The fruit is a capsule, filled with white pith, which contains the seeds. Pigs are very fond of the tubers, whence the popular English name of the plant.

A smaller and commoner plant of this Order, very unlike those already described, is the Scarlet



Knot-grass. (*Polygonum aviculare*.)



Oleaster. (*Elaeagnus angustifolia*.)

Pimpernel (*Anagallis arvensis*), which is common in cornfields and on waste ground. It bears a small flower, generally of a bright scarlet, but sometimes pale pink, white, or even blue. In cloudy weather the petals close over the flowers, from which it is sometimes called the Poor Man's Weather-glass.

tufts of long leaves, from which rise bare stems 3 or 4 inches high, bearing a head of pink or, more rarely, white flowers. Though by preference a seaside plant, it thrives well in gardens, and is often used for borders.

Order LXII. *Plumbagineæ* (2 genera)

The species belonging to this Order are usually found growing near the sea. They are small tough plants. The leaves are long, narrow, and near the root; the calyx is tubular and persistent, and, like the corolla, 5-lobed. The 5 stamens are inserted at the base of the tube of the corolla, and there are 5 styles or stigmas.

The Sea Lavender (*Limonium vulgare*) has long slender ribbonlike root-leaves several inches long, and stalked; and flower-stems exceeding a foot in length, forked above, and bearing a terminal spike of purple flowers. It is found in salt marshes, etc.

The Thrift (*Statice maritima*) grows commonly on slopes near the sea, forming thick grasslike

Order LXIII. *Globulariaceæ*

This is a small Order not found in Britain, but in Alpine and Southern Europe and in Africa. It is classed by some authors with the *Scrophulariaceæ*. The calyx has 5 teeth, the corolla is persistent, and bilobate, the upper lip being bifid and the lower trifid. There are 4 stamens, inserted high in the tube of the corolla, and 1 style and stigma.

Upright Globularia—*Globularia vulgaris*

(Plate LXXVIII)

This plant grows in sunny, rocky places, and flowers in May. The root is perennial, and fibrous, and from this rises a smooth pale green angular unbranched stalk, somewhat curved at the base.

The root-leaves are oval, obtuse, of a bright green, with white veins, and smooth. The leaves are alternate, entire, but last year's leaves are emarginate at the extremity, with a short spike in the middle of the depression; the young leaves are tridentate. They have rather long stalks. The leaves on the stem are alternate, sessile, lanceolate, pointed, smooth and shiny; and the upper leaves gradually become smaller and narrower. At the end of the stem the flowers form a single round conglomerate flower-head, which is supported by an involucre formed of scale-like bracts one above another. Between each separate flower stands a hairy lanceolate and almost prickly bract, on the common receptacle. The true calyx is tubular and 5-cleft, with the incisions pointed and hairy. The small blue corolla is tubular at the base, and unequally bilobate. The upper lip divides into 2 very short and narrow lobes; the lower lip into 3 similar ones of unequal length. The 4 anthers and stamens are blue. The style is also blue, and nearly as long as the stamens. The seeds are oval.

The Scarce Green Forester (*Adscita globulariæ*)

is named after this plant. It is a day-flying moth, about an inch in expanse, with green or greenish-blue forewings, light brown hindwings, and long pointed antennæ. It is found on the Sussex Downs. In England its black, green-spotted caterpillar feeds on Knapweed (*Centaurea scabiosa*), a plant belonging to the Order *Compositæ*, which bears a purple flower.

Order LXIV. *Plantaginaceæ* (2 genera)

In these plants the calyx is persistent, and the calyx and corolla are quadrifid. There are 5 stamens alternating with the petals, inserted in the tube of the corolla, or on the receptacle, and curved inwards in the bud. The style is long and threadlike, and the fruit is a capsule.

Hoary Plantain, or Lamb's Tongue—*Plantago media*

(Plate LXXIX)

This and several allied plants are common everywhere in fields and waste places; it flowers in May



Mezereum. (*Daphne Mezereum.*)



Birthwort. (*Aristolochia Clematitis.*)

and June. The leaves are short, broad, and stalked, and rest flat on the ground, forming a rosette. The flower-heads are rather thick, and incline to reddish. The leaves are elliptical and entire, or slightly serrated, and clothed with short hairs on both surfaces. The flower-stalks are curved at the base, but then rise straight upwards; they are slightly ridged, and downy. The bracts are oval, with membranous edges, and the teeth of the calyx are broad, oval, obtuse, membranous, and whitish, with a green keel. The tube of the calyx is bare. The capsule generally contains 4 seeds.

A great number of caterpillars feed on Plantain; among others, the black spiny caterpillars of three British species of Fritillary butterflies (*Melitæa Artemis*, *Cinxia* and *Athalia*). They are all tawny, with black lines and spots, but with no silver spots beneath, and measure about an inch and a half across the wings. The Greasy Fritillary (*M. Artemis*) has a peculiar glazy lustre on the hindwings beneath; the Glanville Fritillary (*M. Cinxia*) has large black spots towards the base of the hind-

wings beneath; and the Pearl-bordered Likeness (*M. Athalia*) has neither of these special characteristics. Owing to the increase of cultivation all are becoming scarce and local in Britain at present, though formerly common and widely distributed.

SUB-CLASS IV. **Monochlamydææ**

In the Orders belonging to this Sub-class there is no proper calyx or corolla, but they are replaced by a single circle of petals, called a perianth, which is sometimes wanting.

Order LXV. *Chenopodiaceæ* (7 genera)

The perianth is green, most frequently with 5 lobes, but sometimes with only 3 or 4. The stamens are inserted at the base of the perianth, opposite to the petals, and are of equal number or fewer. There are 2 or 3 styles or stigmas, and sometimes only 1. There is a single ovary, with 1 ovule at the base. The fruit is generally dry.

Many plants of this Order, to which Spinach, Beet, and other plants useful for food or medicine belong, prefer a saline soil.

Perennial Goose-foot—*Chenopodium Bonus-Henricus*

(Plate LXXX)

This is a naturalised plant, found in waste places. It has a thick root and large leaves, and grows to the height of a foot. It was formerly much grown in kitchen gardens; as also the following plant.

Garden Orache—*Atriplex hortensis*

(Plate LXXXI)

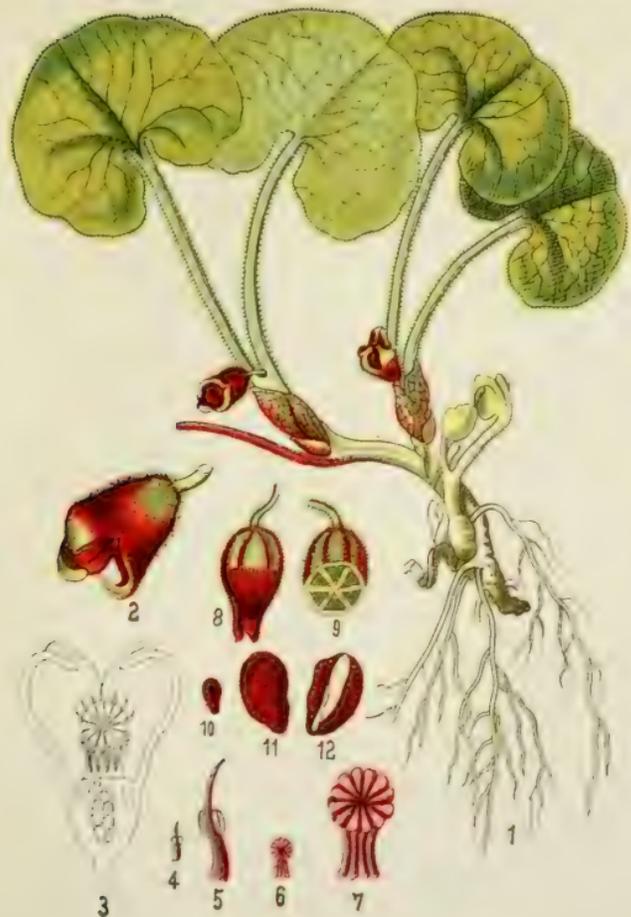
This is hardly naturalised, but is met with occasionally, having probably escaped from cultivation. As in the case of the Beet, which is allied, this plant sometimes shows a tendency to assume a red instead of a green colour. Among the British species of this Order are several belonging to the genera *Cheno-*

podium, *Atriplex*, etc. Some of these are sea-shore plants, as also the Sea Beet (*Beta maritima*), which is closely allied to the cultivated plant, if not the wild original from which the latter was derived.

There are several cultivated varieties or closely allied species of Beet, in some of which the thick fleshy root assumes a round form and large size. Among these are the Red Beet (used for pickling); the White Beet, or Sugar Beet, largely grown on the Continent for the manufacture of sugar; and the Mangold Wurzel (properly Mangel Wurzel, or Famine Root), extensively grown in Britain as winter provender for cattle.

Order LXVI. *Polygonaceæ* (4 genera)

An Order of moderate extent, distinguished by the stem being surrounded by a circle of bracts. The flowers have a divided perianth, and several styles and stigmas. The ovary is single, with a single ovule, which develops into a small nut.



Asarabacca. (*Asarum europaeum*.)



Sea Spurge. (*Euphorbia Paralias*.)

Broad Dock—*Rumex obtusifolius*

(Plate LXXXII)

The different species of Dock and Meadow Sorrel belonging to the genus *Rumex* are very similar, and several are very common in Britain, either in fields, like the present species, or in swampy places. The Broad Dock grows 2 or 3 feet high, and the stems, flowers, and leaf-veins are reddish. Several other species are more or less red, like this; but others are green. The Great Water-Dock (*Rumex hydrolapathum*) is common in fenny districts, and grows to the height of 5 or 6 feet. The leaves of the species of *Rumex* are very succulent, and those of two small meadow species (*Rumex acetosa* and *R. acetosella*) have a pleasant acid flavour when chewed, and are called Meadow Sorrel, or Sheep's Sorrel.

The green wood-louse shaped caterpillars of the Copper Butterflies feed on Dock. The Small Copper (*Lycæna phlæas*) is still common; it is bright coppery-red, with black spots, and measures an inch and a quarter across the wings. The

Large Copper (*Lycæna dispar*), more than twice the size, with fewer black spots above, and the hindwings blue beneath, which used to feed on the Great Water-Dock in the Fens, was exterminated by the draining of the Fens about sixty years ago.

Knot-grass—*Polygonum aviculare*

(Plate LXXXIII)

The species of *Polygonum* are straggling plants, with slender hollow stems with numerous knots and simple alternate leaves. The small flowers grow in whorls and clusters. Some of the species, like that figured, are found in dry fields, and are troublesome weeds; others grow in swampy places, or by the sea-shore. This plant is so great a favourite with caterpillars that it is a rule among entomologists to offer it to any caterpillar about the food of which they are uncertain; and in many cases it is accepted, and the insects are reared upon it without difficulty.

Among cultivated plants of this Order we may mention the Rhubarbs and the Buck-wheat. The

former are grown for food or medicine; and the latter, which stands about a foot and a half high, and bears large heads of white flowers stained with pink, is occasionally grown in Britain as food for pheasants; but much more extensively on the Continent, where it is used for cakes.

Order LXXVII. *Elæagnaceæ* (1 genus)

This is a small Order including much-branched shrubs or trees, with long entire alternate leaves, and small flowers, the perianth with 2 or 4 stamens, inserted in the tube of the male flower, and a single style and stigma in the female flower. The latter is succeeded by a stone fruit, surrounded by the enlarged and succulent perianth. The plants are thorny, and more or less covered with silvery scales.

The Sea-Buckthorn (*Hippophaë rhamnoides*) is a thorny shrub with willow-like leaves and orange-coloured flowers growing near the sea in the south of England. It grows to the height of 5 or 6 feet. The perianth of the male flower is deeply bifid;

that of the female flower is tubular and bifid. The leaves are smooth above, and clothed beneath with silvery-white scales. The berries are rust-coloured.

Oleaster—*Elæagnus angustifolia*

(Plate LXXXIV)

The Sea-Buckthorn is the only British species of this Order; but we have figured the Oleaster or Wild Olive, a small tree about twenty feet high, which is a native of south-eastern Europe, and being largely cultivated or grown for ornament in other parts of the Continent, has naturalised itself here and there. The young shoots and leaves are clothed with silvery-white scales, and feel velvety to the touch. The leaves are long, pointed, and entire, and the branches are covered with long and short thorns. The small flowers are silvery on the outside and yellow on the inside, and stand on short stalks, singly or together, in the axils of the leaves. They have an agreeable odour, which is perceptible at some distance. The fruit resem-



Rose Willow. (*Salix purpurea*.)



Alder. (*Alnus glutinosa*.)

bles a small olive (whence the name of the tree), with sweet white firm pulp, and a long stone.

Order LXXVIII. *Thymelacææ* (1 genus)

Mezereon—*Daphne Mezereum*

(Plate LXXXV)

Only two shrubs belonging to this Order are found in Britain, both belonging to the genus *Daphne*: the Mezereon (*Daphne Mezereum*), with red berries; and the Spurge Laurel (*Daphne Laureola*), with dark purplish berries. The Mezereon grows wild in damp woods, but is oftener to be seen in shrubberies, being a very ornamental plant, which begins to flower as early as February. It grows to the height of 2 or 3 feet, and the twigs are slender and flexible. The bark is smooth and yellowish grey. The leaves stand on short stalks towards the ends of the branches, and are smooth, entire, flexible, and of a pale green. The pink flowers appear before the leaves, and form small clusters of two or three together round the branches near their extremity. They have a sweet and

penetrating odour. The perianth has 4 petals, and 8 stamens inserted in the tube. The anthers open longitudinally. There is 1 short style, with a stigma; and a 1-celled ovary, with 1 pendent ovule. The leaves do not fully appear till the flowers have fallen. The berries are almost round, smooth, and juicy, and contain a rather large yellowish seed. They are ripe in July. All parts of this shrub are extremely acrid and poisonous; and even the odour of the flowers, though fragrant, has been known to produce headache and sickness. The berries have at first a sweetish taste.

It will be remembered that *Daphne* was the name of the nymph who was changed into a laurel tree as she was fleeing from Apollo, as related in the first book of Ovid's "Metamorphoses."

Order LXXIX. *Santalacææ* (1 genus)

A small family, to which the fragrant Sandalwood of the East Indies belongs; represented in Britain by a single species only. The Flax-leaved Thesium (*Thesium linophyllum*), is a plant with a

woody root, parasitic on the roots of other plants, and throwing out recumbent shoots round it several inches long. It is confined in Britain to chalky districts. The small greenish yellow flowers, with white petals, have the perianth deeply cleft, and united to the ovary; 4 or 5 stamens opposite the petals; and a single style. Ovary with 1 cell and 2 pendent ovules.

Order LXXX. *Aristolochiaceæ* (2 genera)

This is another small family, chiefly tropical and subtropical, represented in Britain by 2 species only. They have tubular flowers, with an oblique lobe, the perianth united with the ovary, and several stamens placed on the ovary, which is formed of several cells containing many seeds.

Birthwort—*Aristolochia Clematitis*.

(Plate LXXXVI)

This is a South European plant, naturalised in various places in Central Europe, in hedges, on rubbish-heaps, especially about vineyards; and in

England chiefly about ruins. It has an upright smooth stem, nearly 2 ft. in height, large smooth heart-shaped leaves, and yellow flowers in the axils of the leaves. The root is sometimes used in medicine.

Asarabacca—*Asarum europæum*

(Plate LXXXVII)

This is a widely-distributed but not very common plant, found under hedges and in damp woods. The large leaves grow two together from the root-stem, and are entire, leathery, shining above, and of a paler green below, reticulated with veins; the borders are entire. The perianth is greenish red outside, and dark purple inside. It is trifid, and attached to the ovary; and has, like the root, a sharp penetrating odour, due to an essential oil which it contains.

Order LXXXI. *Empetraceæ* (1 genus)

There is only one British species of this Order, the Crowberry (*Empetrum nigrum*), which is found



Yew. (*Taxus baccata*.)



Herb Paris. (*Paris quadrifolia*.)

on high-lying moors. It is a small shrub with a procumbent stem and erect thickly-leaved branches. The leaves are rather long and narrow, with the edges curled over, and are arranged in whorls. The small purple flowers stand in the axils of the leaves, and the sexes are generally separate. The perianth is composed of a double row of three lobes each (called by some writers calyx and corolla), and is surrounded by bracts. There are 3 stamens, and a short style of several divisions. The fruit is a small black berry, containing several seeds.

Order LXXXII. *Euphorbiaceæ* (3 genera)

A large and important Order, but poorly represented in Britain. The plants are herbs or shrubs, with the stamens and pistil either on separate flowers, or, in *Euphorbia*, the stamens are gathered round a single female flower, within a common involucre. The ovary generally consists of three carpels, separating round an axis in the fruit.

The Box Tree (*Buxus sempervirens*) is a shrub or small tree with small, thick, entire, evergreen leaves. The yellowish-white flowers stand in small clusters in the axils of the leaves. It is much grown in gardens and shrubberies, and a dwarf form is used for borders, but it is not often seen growing wild in any abundance, except at Box Hill, near Dorking, where it forms a large wood. The tree is poisonous, like most plants of the Order. It grows very slowly, and the wood is extremely hard, and much used by turners, etc.

The Dog's Mercury (*Mercurialis perennis*) grows a foot high in bushy places, and flowers in April and May. The stem is round and not branched, and the green flowers are placed two or three together, rather far apart, on long flower-stalks. The leaves are long, oval, pointed, and dentated. The capsule is hairy. The plant is a dangerous poison, and has a close ally, the Annual Mercury (*Mercurialis annua*), which is common on waste ground, and may be distinguished by its being much branched.

Sea Spurge—*Euphorbia Paralias*

(Plate LXXXVIII)

Several species of Spurge are found in Britain, some on waste ground, others in woods, and others, like the plant figured, on sand-hills near the sea. It has a strong root, and a stem about a foot high, forking towards the top, and bearing heads of green and yellow flowers. The leaves are narrow towards the root of the plant, and broad towards the summit. All the species of Spurge contain a highly acrid milky juice, and are dangerous poisons. Nevertheless many interesting insects feed upon them, the most beautiful being the caterpillar of the Spurge Hawk-moth (*Deilephila euphorbiæ*). It is black, with red head, legs, tail, and horn, and red and yellow spots and lines. The moth is olive-green, the forewings being rosy-grey, obliquely banded with olive-green, and the hindwings red and black. It is a very rare species in Britain, but about a century ago it seems to have been common on Sea Spurge at Braunton Burrows, in Devonshire, for a few

seasons, and then, for some unexplained reason, disappeared entirely.

Order LXXXIII. *Ceratophyllaceæ* (1 genus)

The Hornworts (*Ceratophyllum demersum* and *C. submersum*) are small plants found in standing water. They have greenish flowers, with a cluster of small bracts in place of a perianth, surrounding numerous stamens, and a rough fruit, which in the first species is spined on each side.

Order LXXXIV. *Callitrichaceæ* (1 genus)

This is another small Order, including a few species known as Water Starworts (genus *Callitriche*), found floating in stagnant or slowly running water. The lower leaves are linear, with three nervures; the upper ones are broader, and form a floating rosette. The flowers are generally accompanied by two sickle-shaped bracts.



Frogbit. (*Hydrocharis morsus-ranae*.)



Early Purple Orchis. (*Orchis mascula*.)

Order LXXXV. *Urticaceæ* (2 genera)

The few British species of this Order are plants with strong fibrous stems, alternate hairy leaves, and small clusters of flowers, with the perianth quadrilobate (or sometimes bilobate in the female flowers), and 4 stamens.

The most typical plants of this Order are the Nettles (genus *Urtica*), which are easily recognised by their large toothed leaves, covered with stinging hairs, and green flowers. There are three different kinds in Britain, from 1 to 3 feet high, two being annuals, and one having a perennial creeping root, which renders it very difficult to extirpate. The young leaves may be boiled in spring, and eaten like spinach. In tropical countries (as in some parts of Australia) there are species of Nettle which attain the height of trees, and sting with such severity as to be fatal to man and beast.

The only other British plant belonging to this Order is the Wall Pellitory (*Parietaria officinalis*), in which the leaves are ovate-lanceolate, scarcely toothed, downy, and covered with shining sub-

hyaline spots. The flower is bell-shaped. It grows in waste places.

A considerable number of insects feed on Nettle; among them the black or grey spiny caterpillars of three of our handsomest butterflies—the Small Tortoiseshell, the Peacock, and the Red Admiral (*Vanessa Urticæ*, *Io*, and *Atalanta*). The last butterfly is black, banded with red, and spotted with white towards the tips, and is an especially beautiful butterfly. It appears late in the summer, and being fond of decaying fruit, is often seen in orchards as well as in flower gardens. Several slender-bodied moths are also frequently disturbed among clumps of Nettles, on which their caterpillars feed. One is the Snout (*Hypena proboscidalis*), a brown moth, with darker lines, measuring an inch and a half across the rather broad wings. The forewings are pointed at the tips, and the palpi extend like a beak in front of the head. The caterpillar is green. The Mother-of-Pearl Moth (*Botys verticalis*) has narrower and more rounded wings, of a shining yellowish grey; the caterpillar is greenish, and semi-transparent.

The Small Magpie Moth (*Botys urticata*) is about an inch and a quarter across the brown and white wings; the thorax is yellow, and there are two yellow marks at the base of the forewings. The larva is whitish, with a green line on the back. Another insect sometimes found among Nettles is the curious little Coccide (*Dorthesia urticæ*), which is covered with a snow-white waxy secretion.

Order LXXXVI. *Cannabinaceæ* (1 genus)

The only British representative of this Order is the Hop (*Humulus lupulus*). It is a climbing plant found in hedges, and largely cultivated in the south of England (especially in Kent) for flavouring beer. The perianth is quadrilobate; the male flowers grow in small clusters, and the females in catkins; the perianth of the latter is pitcher-shaped. The stem is rough, and the leaves are 3- or 5-lobed. They grow on long stalks.

The Ghost Moth (*Hepialus humuli*) is named after the Hop, because its whitish subterranean caterpillar feeds on the roots of Hop, as well as on

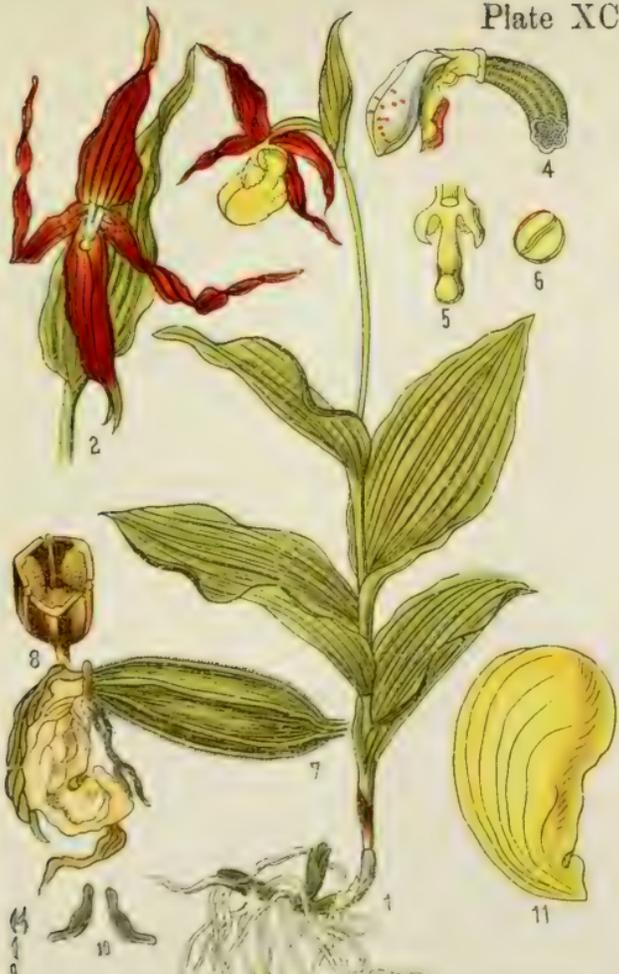
those of Nettle and many other plants. The male is white above and brown below; the female is also brown below, but the forewings are yellow, with reddish markings, and the hindwings dull reddish. The hovering flight of the white male on summer evenings appears to have suggested the name. It is common in meadows, and likewise, doubtless, in country churchyards.

Closely allied to the Hop is Hemp (*Cannabis sativa*), an Indian plant cultivated in some parts of Europe for its fibre. It has stems thickly clothed with short hair, and pinnate leaves, with 5 or 7 serrated lanceolate leaflets.

The fibres of Hemp have been used from very early times to make rope and clothing. The dried leaves are chewed or smoked in the East to produce intoxication, and are called Bhang or Hashish. Medicinally Hemp is used to quiet the nervous system and to relieve pain, especially in cases of asthma and mania.

The allied Order *Moraceæ* is not represented in Britain. It includes the different species of Mulberry, which have juicy fruit resembling a

Plate XCV.



Lady's Slipper. (*Cypripedium calceolus.*)

Plate XCVI.



German Flag. (*Iris germanica.*)

large blackberry; and the leaves are of great value for feeding silkworms. Among the *Moraceæ* we also find the Fig, the Bread-fruit tree, the India-rubber tree, the Banian tree, and other useful or interesting plants. By some authors, however, both the *Cannabinaeæ* and *Moraceæ* are included in the *Urticaceæ*.

Order LXXXVII. *Ulmaceæ* (1 genus)

A small Order, represented in Britain by two species only—the Elm and the Wych Elm (*Ulmus campestris* and *U. glabra*). The flowers are bisexual, and the perianth is bell-shaped, with from 4 to 6 teeth. The ovary is 2-celled, but rarely produces more than one seed, which forms the centre of a winged nut. The leaves are alternate and irregular, for the leaf-stalk does not run straight through the middle, but divides them into two unequal halves.

The caterpillars of two important butterflies feed on Elm: the Large Tortoiseshell (*Vanessa Poly-chloros*) and the White Letter Hair-streak (*Thecla*

W-album). The caterpillar of the former is greyish brown and spiny; the butterfly is fulvous, with black spots, and a marginal row of blue spots on the hindwings only; it measures nearly three inches in expanse. The Hair-streak is a dark brown, almost black, butterfly, measuring less than an inch and a half across the wings; on the hindwings is a short slender projection called a tail. There is an orange spot near the hinder angle of the hindwings above. Beneath, the hindwings have a row of marginal black spots adjoining an orange band; and a very distinct white line crosses both wings nearer to the base, and is sharply angulated into a **W** on the hindwings.

Order LXXXVIII. *Amentiferae* (10 genera)

This is an extensive Order, to which most of our deciduous forest trees belong, and also a few shrubs. The male flowers are always, and the female flowers very frequently, agglomerated in small clusters, mixed with scale-like bracts. In the female flowers a perianth (cleft or entire) is some-

times present, and the fruit is often hard and solid; rarely a berry.

There are a great number of different species of Willow, some of which are high trees, and others tall shrubs; and many of the species are fond of wet situations, and grow close to the water. Several small trailing species are, however, found in mountainous regions, or with dwarf birch in the Arctic regions. The shrub-like Willows are called Osiers or Sallows, and the Osiers are largely cultivated, and used for basket-work.

Rose Willow—*Salix purpurea*

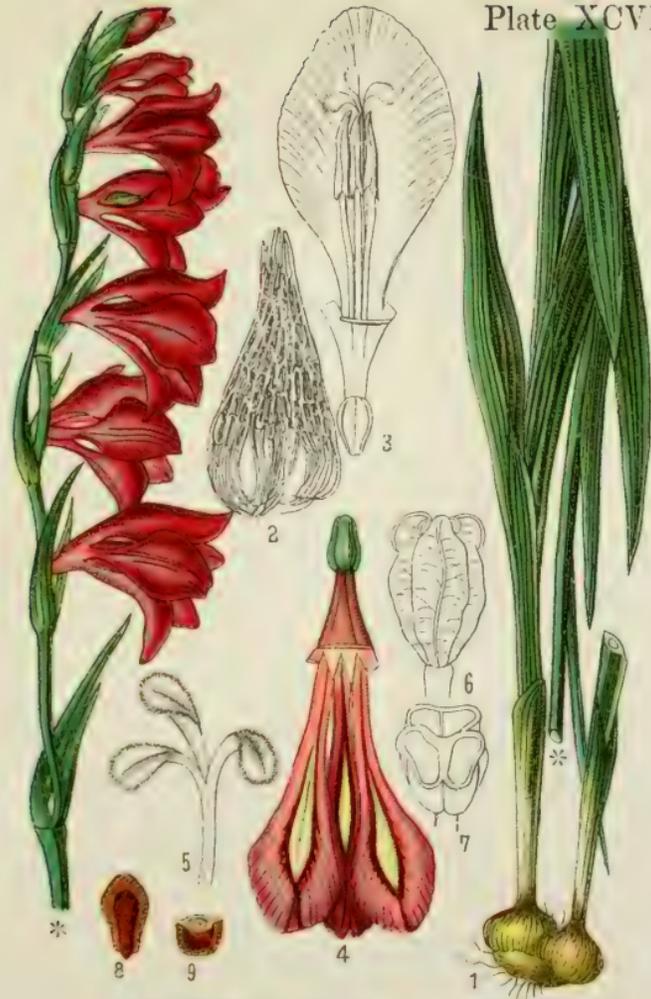
(Plate LXXXIX)

This Willow grows on river banks, and in ditches and marshes, and is one of the species cultivated as Osiers. It flowers in March and April. The shoots are upright, very slender, and covered with blood-red bark. The leaves are lanceolate and alternate. The male catkins are at first clothed with blood-red scales.

Most species of Willow and Sallow flower quite

early in the spring, from February to April; and they are very attractive to wild bees and also to moths. The season for collecting moths opens with Sallow-bloom and closes with Ivy-bloom. There are also large numbers of insects which feed on Willow, at least in their earlier stages. Among these are the black, red-spotted spiny caterpillars of the Camberwell Beauty (*Vanessa Antiopa*). The butterfly, which measures nearly three inches in expanse, is chocolate-brown, with a broad whitish or pale yellow border, within which is a row of blue spots. The trunks of the larger species of Willow are liable to be riddled by the flesh-coloured boring caterpillars of the Goat Moth (*Trypanus Cossus*). They will attack other trees, but are most often found in Willows. The moth is a thick-bodied insect, with broad grey wings lined with black, and often measures over three inches in expanse.

The caterpillar of the Puss Moth (*Cerura vinula*) feeds on Willow. It is a stout green caterpillar, with a blunt head, reddish-brown in front, and a wide, reddish-brown, saddle-like mark over the



Gladiolus. (*Gladiolus communis*.)



Spring Crocus. (*Crocus vernus*.)

back; at the end of the body are two long appendages containing retractile reddish filaments, with which the caterpillar tries to whip away any cause of annoyance. The moth is two or three inches across the wings, and is white and fluffy, with a few black lines and streaks.

The green caterpillar of the Herald Moth (*Scoliopteryx libatrix*) also feeds on Willow. The forewings of the moth, which measure an inch and a half in expanse, are reddish brown, blotched with red, and angulated and scalloped; the hindwings are pale grey. The moth hibernates, and is often disturbed in winter.

Willows are also greatly infested by "false caterpillars," or the larvæ of saw-flies, especially by black and yellow species of the genus *Nematus*, allied to those which infest gooseberry and currant bushes. Some of these form small galls on the willow leaves.

The different species of Poplar (*Populus*) are allied to Willow; but are erect trees, throwing off short branches which slope upward. The leaves are oval, more or less dentated, and downy below,

and the catkins are surrounded by a small perianth, which is wanting in the Willow.

The caterpillar of the Poplar Hawk-moth is green, with yellow dots and oblique lines, and a yellowish horn. The moth (*Smerinthus populi*) is light brown, with a large red blotch at the base of the hindwings. It measures three inches in expanse.

The Bog-Myrtle (*Myrica gale*) is a low bush with resinous, ovate, and more or less dentated leaves, which emit a delicious odour when bruised. It is a plant that only grows in very boggy places, and has been exterminated in many parts of the British Islands by drainage.

The Birch (*Betula*) is a tree with a very slender stem in proportion to its height, and hence often grows more or less stooping rather than erect. The bark is white, and flakes off easily. The twigs are used for brooms, or for birch-rods for flagellation (more frequently a century ago than at present); but in the north of Europe they are freely used for self-flagellation in the vapour-baths, to stimulate the circulation.

Alder—*Alnus glutinosa*

(Plate XC)

The Alder, like the Willows, is a water-loving tree, and flourishes best in swampy woods, where it often grows in large thickets. The bark is brownish red, and when old is fissured. The wood is red when fresh, and the freshly gathered leaves feel sticky. They are alternate, and irregularly dentated, with prominent veins on the under-surface. The male catkins are long and pendulous. They appear towards the end of autumn, and in spring lengthen, and shed their pollen. The female catkins are oval, and first appear as green and then as blackish tassels. The seeds are not winged, and ripen late in autumn.

The Beech (*Fagus sylvatica*) is a large tree with smooth bark and slightly serrated leaves. It bears small triangular nuts, which are called beech-mast, and which are sometimes used for feeding pigs. Readers of "Uncle Tom's Cabin" will remember the clever negro who pushed a beech-nut under the saddle of Haley's horse to

cause a stampede, and thus to delay the pursuit of Eliza.

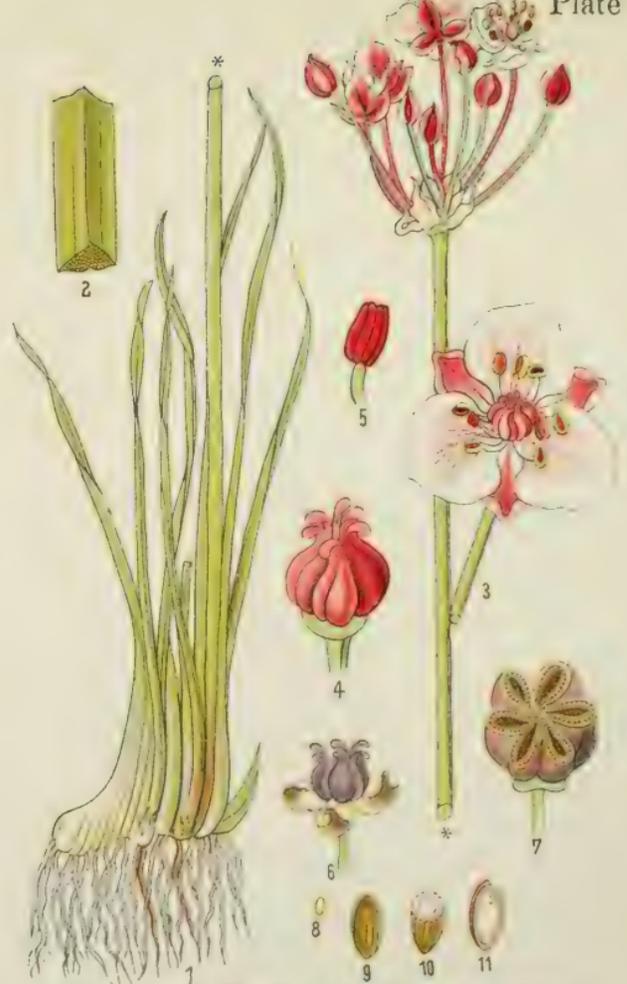
The Sweet Chestnut (*Castanea sativa*), so abundant in Southern Europe, is met with in some parts of England; but whether truly indigenous or naturalised has been much disputed by botanists. The sweet nuts, white, with a tough brown skin, enclosed on the trees two or three together in a green bristly case, are to be bought in any shop, being largely imported. The branches are spreading, and, like those of the oak, sweep on the ground round large trees, if not trimmed. The long spikes of greenish-white flowers have an extremely sweet and sickly odour.

The so-called Spanish Chestnut, which is not a British tree, is so frequently planted that it is much more often seen in England than the Sweet Chestnut. It is allied to the Maple. (Compare p. 46.)

The Oak (*Quercus robur*), of which there are several varieties, is easily recognised by its rugged bark, irregular branches, deeply-cleft leaves, and the peculiar round or oval fruit, called an acorn. An acorn is surrounded by a tough green skin,



Summer Snow-flake. (*Leucoium aestivum*.)



Flowering Rush. (*Butomus umbellatus*.)

and is enclosed in a scaly involucre called a cup. Acorns are very bitter, especially when ripe, but are much used for feeding pigs. Some of the South European species of oak, however, bear sweet instead of bitter acorns. Oak-bark has long been used for tanning leather; cork is obtained from the bark of some species; and ink is manufactured from the galls which grow on others.

Hundreds of different species of insects feed on, or are associated with, the Oak. Among beetles the large Stag-Beetle (*Lucanus cervus*) lives as a white grub in the wood of the Oak and other trees. It varies much in size: some of the large males are nearly 3 inches long, while others are much smaller, and with much smaller mandibles. The mandibles of the females are small, and not branched, but nip severely. The beetles are blackish, with reddish-brown wing-cases. These beetles feed on the sap of trees; their grubs, as already mentioned, on the solid wood of trees. The white grubs of different species of Cockchafer (brown or grey beetles with the end of the antennæ formed of expanding laminæ like a fan) do much

harm by feeding on the roots of grasses; but the beetles themselves, when abundant, are almost equally injurious to trees, flying round them in the evening, and sometimes, when excessively numerous, devouring the leaves of whole forests, almost like a swarm of locusts.

Two very interesting butterflies, both of a prevalingly blue or purple colour, are associated with the Oak. The Purple Hairstreak (*Zephyrus Quercus*) is found commonly flying about Oaks in summer. It has a short tail on the hindwings; and the under-surface is bluish grey. It measures an inch and a half across the wings. The caterpillar feeds on Oak; it is of a yellowish grey with yellow spots, and woodlouse-shaped. The Purple Emperor (*Apatura Iris*) is a much larger butterfly, measuring 3 inches across the wings, which are brown, banded with white, and marked with a black spot in a yellow ring near the hinder angle of the hindwings. The male is magnificently shot with purple. The green caterpillar, with two horns on its head, lives on Sallow; but the butterflies, especially the males, are fond of flying round the summits of the

tallest forest trees, especially Oaks, and are very difficult to capture.

The hairy caterpillar of two large stout-bodied moths feed on Oak. One of them is the Lappet Moth (*Gastropacha quercifolia*). The caterpillar is grey or brown, with two transverse blue bands near the front of the body. The moth has brown dentated wings, averaging 3 inches in expanse, and is marked with transverse black lines.

The Oak Eggar (*Lasiocampa Quercus*) derives its name from the tough egg-shaped cocoon. The caterpillar is brown, with white spots on the back and sides. The moth is about the same size as the last, but the wings are entire, tawny brown with a yellow band in the male, and tawny with a yellow border in the female. In the centre of the forewings is a white spot.

One of the commonest moths which lives on Oaks is the Green Oak Tortrix (*Tortrix viridana*). The forewings are green, less than an inch in expanse, broad, and square at the tip; the hindwings are rounded, and brown. It is a most abundant insect, and often, when an oak bush

is shaken, numbers of the moths will flutter down to the ground, while the small green caterpillars will drop themselves down and remain swinging at the end of a long thread, waiting till the danger seems to be past, when they will climb up again.

The oak-shoots and leaves are very much infested by galls and oak-apples, the former hard and the latter soft excrescences produced by small transparent-winged, four-winged flies, as a nidus for their brood. These flies have generally very smooth shining rounded red or black bodies. But, in addition to the proper tenant, these galls are infested by an enormous number of small parasites, mostly belonging, like themselves, to the great Order Hymenoptera, of which Bees, Wasps, and Ants are more familiar examples.

The Hazel, or Nut Tree (*Corylus avellana*), is a bushy shrub 5 or 6 feet high, which grows abundantly as underwood, or in hedges. The leaves are nearly rounded, with denticulated edges, and the flowers appear very early in the spring, the male flowers being long yellow drooping catkins, and the female flowers small, with short crimson



Arrow-grass. (*Triglochin maritimum*.)



Lily of the Valley. (*Convallaria majalis*.)

stigmas. The fruit is the well-known brown hazel nut (or the Spanish nut of the shops), and is surrounded, not by a cup, like the acorn, but by a green husk, formed of enlarged bracts, which turns brown when it withers.

We often see nuts with a hole in, and on breaking them, find inside a white maggot, some black dust, and more or less of a partly devoured nut. The insect is the grub of the Nut Weevil (*Balaninus nucum*), a small black beetle, about a quarter of an inch long, with a long pointed snout and red legs.

The Hornbeam (*Carpinus betulus*), resembles the Hazel-nut, but grows to a larger size; both the male and female flowers are pendent, and the nuts are small and angular, and placed at the base of long leafy bracts, hanging in small clusters.

SUB-CLASS V. *Gymnospermæ*

This sub-class only includes the

Order LXXXIX. *Coniferæ* (3 genera)

To this the Pines and Firs belong. They are evergreen trees, with needle-like leaves and resinous

sap; and the flowers have neither calyx, corolla, nor perianth, the flowers either hanging in catkins, or placed singly at the end of a twig. The fruit is either a cone, in which the seeds are clustered round an axis among scaly bracts; or else is a berry.

Yew Tree—*Taxus baccata* (Plate XCI)

The Yew grows as a close shrub or hedge, or as a detached tree. The leaves are dark green above and pale green below. It is an extremely poisonous plant, and the clippings are often fatal to cattle. It bears a bright red berry, the pulp of which is harmless, though insipid; it is the only part of the plant which is not poisonous, for even the seed which it contains is so.

Yew-berries are ripe in autumn, and, like Ivy-blossom, are very attractive to moths in the evening, and many rare species have been found feeding on them.

The Juniper (*Juniperus communis*) is a thick branching bush or shrub, growing on dry hills,

and producing a blue-black berry, which is used for flavouring gin. Oil of juniper is distilled from the unripe fruit, and in Lapland the bark is twisted into ropes. The oil is used medicinally to increase the action of the kidneys, especially in cases of dropsy.

The Scotch Fir (*Pinus sylvestris*) is a spreading tree, and varies considerably in colour and durability; the best variety has rough reddish bark and reddish wood. Although it is the only species of Fir or Pine tree which is considered to be truly indigenous in the British Islands, there are several other species which are easily acclimatised, and are frequently planted. Some of these are European trees, such as the Pinaster (*Pinus pinaster*); the Stone Pine (*Pinus pinea*), which bears edible fruit; the Larch (*Larix europæa*); and the Spruce Fir (*Abies excelsa*). Others are altogether of foreign origin, such as the Cedar of Lebanon (*Cedrus Libani*), and the great Mammoth Tree (*Sequoia gigantea*), and Redwood (*S. sempervirens*) and the Douglas Pine (*Abies californica*), from the Western States of America. The Mammoth Tree grows

to the height of 300 feet, and is one of the tallest trees known, except some of the Blue Gum Trees (*Eucalyptus*) of Australia. It has not, however, been planted sufficiently long in Britain for specimens to have yet attained any very considerable size in this country.

CLASS II

MONOCOTYLEDONES

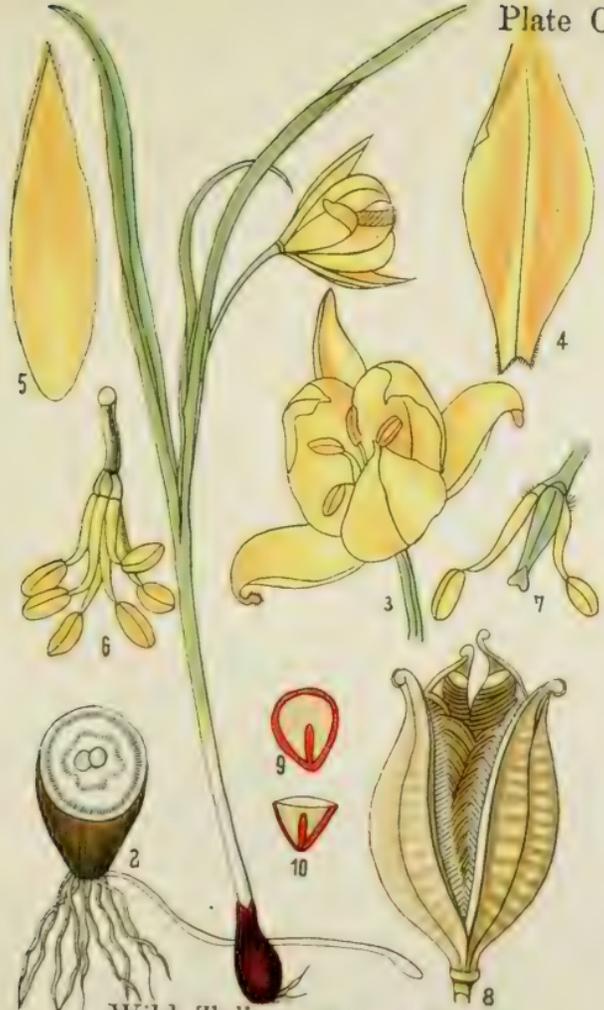
In these plants the stem is fibrous, and the plant springs from a single shoot, instead of rising in two uniform leaves. The leaves are simple or entire; and the calyx and corolla, when present, are usually combined into a 6-lobed perianth.

To this Class belong reeds and grasses, as well as many bulbous plants, like Orchids, Onions, and Lilies.

SUB-CLASS I. Dictyogenæ

Leaf-veins reticulated; flowers without glumes.

Plate CIII.



Wild Tulip. (*Tulipa sylvestris*.)

Plate CIV.



Broad Garlic. (*Allium ursinum*.)

Order XC. *Trilliaceæ* (1 genus)Herb Paris—*Paris quadrifolia*

(Plate XCII)

This is the only British species of its Order, and is easily recognisable by its creeping root, simple stem, 4 whorled and veined leaves (less frequently 3 or 5), and terminal green flower. The perianth is composed of 8 or 10 narrow segments, with an equal number of stamens; and the ovary has 4 or 5 cells, and an equal number of free stamens. The berry is blue-black. The plant grows in shady woods and thickets, but is not very abundant. It is a dangerous poison. It flowers in May and June.

Order LXXV. *Dioscoreaceæ* (1 genus)

This is a small family of climbing plants, rising from a thick and often tuberous root-stalk. The species of the typical genus *Dioscorea* are cultivated like potatoes in tropical countries, and are called

Yams. The only British species is the Black Bryony (*Tamus communis*), which is a beautiful hedge-plant, with some resemblance to the Red Bryony (our Plate XL) in general appearance, though the large heart-shaped leaves are undivided, the flowers are much smaller, greener, with a 6-lobed perianth and 6 stamens, and are succeeded by a close cluster of rather large berries, first green and then red. It is a poisonous plant, like the Red Bryony, and the fresh root will raise a blister. The extract or tincture is employed in dropsy and chronic bronchitis.

SUB-CLASS II. *Floridæ*

Leaf-veins parallel, flowers without glumes.

Order XCI. *Hydrocharidaceæ* (3 genera)

A small family of plants growing in or under water, of which there are three species in Britain. The leaves are sometimes long and narrow, but at other times broad. The flowers

are coloured, and are remarkable for their trilobate perianth.

Frogbit—*Hydrocharis Morsus-ranæ*

(Plate XCIII)

This curious plant grows in ponds and ditches, and the leaves float on the surface of the water. The flowers are white, and the male flowers are larger than the female ones. The name appears to be derived from the truncated appearance of the seed-capsule.

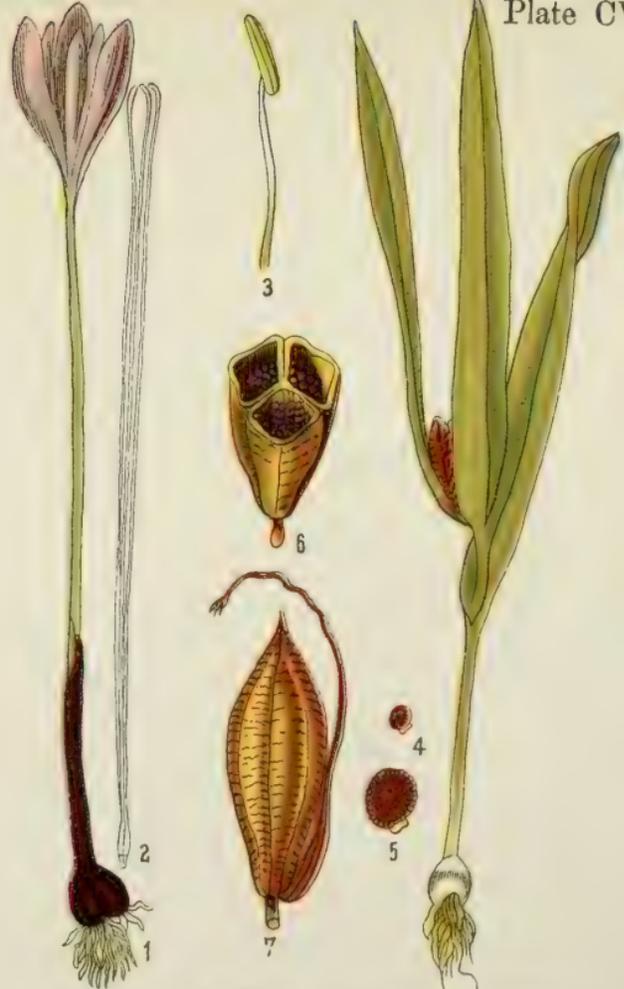
Another plant belonging to this Order is the American Water-weed (*Elodea canadensis*), accidentally introduced into England about sixty years ago. It has whorls of ovate leaves, and small pink flowers with a long tube, ending in a 3- or 6-lobed perianth on the surface of the water. At one time it spread so rapidly through the rivers and canals of England that it threatened to block them up; but at present its vitality seems to be failing, as none but female plants have reached England, and it therefore spreads only by budding.

Order XCII. *Orchidaceæ* (18 genera)

This is a rather large and important Order of plants, of which we shall only be able to notice a few representative species. The root is fibrous, sometimes thickened into one, two or four bulbs or tubers. The leaves are generally long, narrow, and pointed. The perianth, which is usually placed on the ovary, is tubular, terminating in three outer and two inner segments of the upper lip or flag, beneath which the third segment of the inner row forms the lower lip or labellum, sometimes ending in a hollow pointed spine. The ovary is often twisted, and in the middle the three stamens are generally united into a column. Most of the flowers are extremely handsome, and often sweetly scented. They frequently (even in British species, and much more in tropical countries, where many species are epiphytes, or tree-parasites), assume very curious forms; leading to their being called Fly Orchis, Bee Orchis, Spider Orchis, Green Man Orchis, etc. In Europe many species prefer a calcareous soil, while others grow in meadows. They are not



Yellow Dayflower. (*Hemerocallis flava*.)



Meadow Saffron. (*Colchicum autumnale*.)

regarded as poisonous, and a drink called salop used to be prepared from the tubers. Many of the species are fertilised by pollen being conveyed from one plant to another by bees and other insects; a subject to which Charles Darwin and other eminent naturalists have devoted much attention.

Early Purple Orchis—*Orchis mascula*
(Plate XCIV)

This is one of the species in which we find two tubers at the base of the plant. Each year a new one is formed on the side of that which has flowered, while the older one on the other side decays, next year's plant growing from the new tuber; and thus the plant moves slowly in one direction year by year. The Early Purple Orchis flowers in spring, and is one of the handsomest and commonest of our meadow species. It grows to the height of upwards of a foot, and bears a large spike of purple, or more rarely pink or white flowers. Most of the leaves form a rosette round the root; they are long, narrow, and spotted with

purple—a very frequent characteristic of our British Orchids.

Lady's Slipper—*Cypripedium Calceolus*
(Plate XCV)

This is a rare species in the north of England, and, though commoner on the Continent, is one of those plants which have been exterminated by reckless botanising in many places where it was formerly met with. The fibrous root, oval veined leaves, and remarkably handsome flower are well shown in our figure. The plant grows to the height of 18 inches, and occasionally bears two flowers instead of one.

Order XCIII. *Iridaceæ* (5 genera)

These are plants with a thick fibrous or bulbous root-stalk, long, radical leaves, embracing the stem, and large handsome flowers, the perianth with 6 petals, 3 stamens, and a 3-celled ovary and seed-capsule.

The British species are not numerous. We have given illustrations of three of the principal genera.

German Flag—*Iris germanica*

(Plate XCVI)

This species, which much resembles some of our common garden Flags, is found in dry places (hills and walls) in various districts of Central and Southern Europe. The perianth is 6-lobed, and unites below into a tube which surrounds the pistil, which terminates in 3 large petal-like stigmas, which curve over the stamens.

Although one of our native flags is sometimes pale blue, our commonest species is the Yellow Flag (*Iris pseudacorus*), which grows everywhere in ditches and swamps. The Blue Flags, common in North America, are also found in marshy places.

Gladiolus—*Gladiolus communis*

(Plate XCVII)

This is a flower which is more often seen in gardens than wild, for it is not very abundant on the Continent; and in England it is very scarce, the New Forest and (once) the Isle of Wight being

the only recorded localities. It grows from a tuber, and the spike of reddish-purple flowers extends on one side only of the flower-stalk. The perianth is formed of 6 petals, united and tubular at the base, and then forming an upper and lower lip of 3 petals each. There are 3 stamens, and the single stigma is surmounted by 3 spatulate stigmas. Except in colour, the spike has some slight resemblance to the wild hyacinth (bluebell). It varies somewhat in colour in different localities. The British plant belongs to var. *illyricus*; it flowers in June.

Spring Crocus—*Crocus vernus*

(Plate XCVIII)

The true Crocuses are easily distinguished by their very long tube and divided stigma. The leaves and flowers are enclosed in a thin scaly sheath. The plant grows from a bulb, and flowers in spring, the flowers being either purple or yellow. The Spring Crocus is a very local plant in England.



Great Wood-Rush. (*Luzula sylvatica*.)



Cuckoo-Pint. (*Arum maculatum*.)

Order XCIV. *Amaryllidaceæ* (3 genera)

This Order includes the Daffodils and Snowdrops, which, like so many of our handsomest wild flowers, are far more frequently seen growing in gardens than in the open fields and woods. The root is a bulb, from which spring long narrow veined leaves, and a flower-stalk, generally bearing one or several white or yellow flowers, with a 6-lobed perianth, and 6 stamens. The ovary is 3-celled, and the fruit is a capsule or berry.

Of the genus *Narcissus* we have two native species. The Daffodil (*N. Pseudo-Narcissus*) bears one large yellow scentless flower on a stalk; and the Two-flowered Narcissus (*N. biflorus*) is sweet-scented, and bears two flowers, with white petals and a yellow centre, on each stalk. They are meadow plants, and more or less poisonous.

Summer Snowflake—*Leucoium æstivum*
(Plate XCIX)

This is a plant very similar to the well-known Snowdrop (*Galanthus nivalis*), which also ranks

as a British species; but it grows to the height of upwards of a foot, and flowers in early summer. There are 6 stamens, and a large clavate style, which serves to attract insects.

Order XCV. *Alismaceæ* (6 genera)

This is a small Order of water-plants, of which we have several representatives in Britain. The perianth of the flower is formed of 6 petals; the three inner ones are often smaller than the others. The flower-heads form spikes or panicles.

Flowering Rush—*Butomus umbellatus*
(Plate C)

This is one of the prettiest of our water-plants, and is common in ponds and near the banks of slowly flowing rivers among reeds and sedges. It is a conspicuous plant, growing to the height of upwards of 2 feet. The leaves are long and narrow, and the flowers grow in an umbel, 20 or 30 together, and are protected by bracts at the base of the umbel. The large flowers have 3 red and

3 white petals, 9 stamens and 6 pistils. The fruit is 6-celled, opens towards the centre, and contains numerous seeds.

Arrow-grass—*Triglochin maritimum*

(Plate CI)

This is a plant which grows in small tufts near the sea. The stalk is long, slender, and rather thicker at the base, with long slender straight leaves, and small flowers on a long stalk. They have 6 petals stamens and pistils soldered together. The fruit is a capsule, with 6 carpels, each containing a seed. The pistils mature before the stamens, and the flowers are fertilised by the wind.

Order XCVI. *Asparagaceæ* (5 genera)

In this Order the perianth has 4, 6, or 8 lobes, and there are an equal number of stamens. The styles, if more than one, are united at the base; but the fruit is a berry, and not a capsule, and the root is not bulbous.

Among the plants included in this Order is the Asparagus (*Asparagus officinalis*), which grows wild in some places on the west coast of England, Wales, and the opposite coast of Ireland. It is a branching feathery plant, with small green flowers and red berries.

Lily of the Valley—*Convallaria majalis*

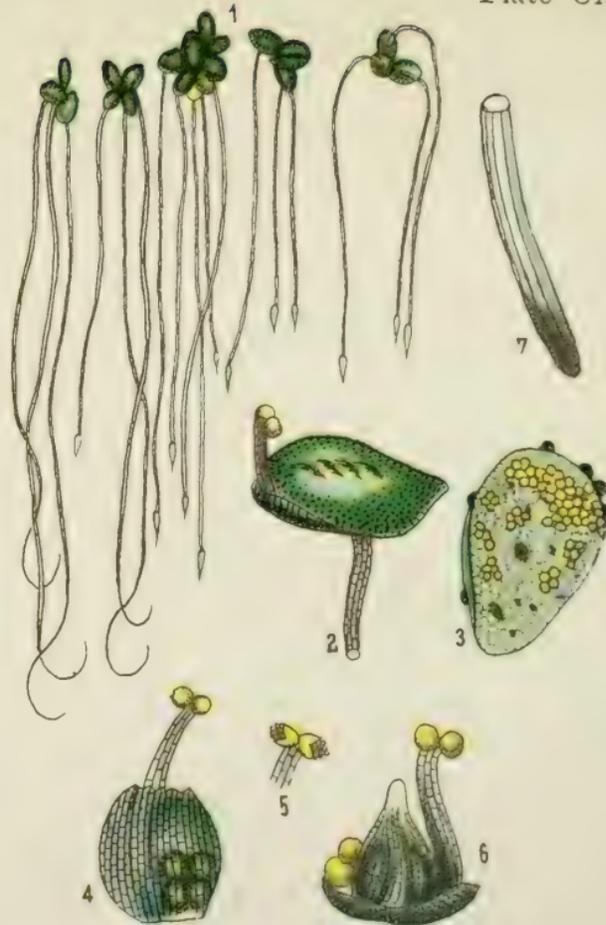
(Plate CII)

The Lily of the Valley grows in shady woods, and is local in Britain, though common where it is found, as it is a gregarious plant, with a creeping root-stalk, and multiplies rapidly. The flowers are sweet-scented bells, drooping on one side the stalk; with a 6-lobed perianth and 6 stamens. They are succeeded by a red berry. The leaves are long and broad, tapering at each end, and generally rising in pairs within a sheath. A preparation of the flowers is used in heart disease, its action being similar to that of Digitalis.

Allied to this are the different species of Solomon's Seal (*Polygonatum*), grown in gardens,



Marsh Arum. (*Calla palustris*.)



Lesser Duckweed. (*Lemna minor*.)

but also met with wild. They are larger plants with more numerous leaves, and with rather long and narrow greenish-white flowers, drooping on one side of the flower-stalk, like the Lily of the Valley.

Order XCVII. *Liliaceæ* (11 genera)

Though considerably restricted by the removal of several small groups of plants, the *Liliaceæ* still include a considerable number of plants, with large handsome flowers, with a 6-lobed perianth and 6 stamens, and generally a bulbous root and large leaves. To this Order, as restricted, belong the Tulips, Lilies, Onions, Hyacinths, etc.

Wild Tulip—*Tulipa sylvestris* (Plate CIII)

The Wild Tulip flowers in May and June, but is a scarce flower in the south of England. The bulb is succulent throughout, not fibrous. The flower-stalk bears only a single yellow flower, of an agreeable odour. There are 3 long and 3 short stamens, which are rough and hairy at the base.

Broad Garlic—*Allium ursinum* (Plate CIV)

This is one of the commonest species of wild Garlic in the British Islands; though there are several others. It usually grows in damp woods. The flower-stalk is almost bare, the flower-heads are arranged in equally long umbels, and the leaves are stalked, broad, and lanceolate. The roots consist of long whitish bulbs, clustered together. There are about 12 white, strongly smelling flowers in each flower-head. The seed is almost kidney-shaped, black and wrinkled.

Yellow Day-flower—*Hemerocallis flava* (Plate CV)

This is not a British plant, but is allied to the Hyacinths, among which the Bluebell (*Endymion nutans*), with its long leaves, hollow stalk, and heads of bright blue flowers, is common in woods in spring in most parts of the country.

The Yellow Day-flower is found in swampy woods

in some parts of Germany, Austria and Switzerland, and flowers in June. It grows to the height of 2 feet, the roots are fleshy, and the leaves are linear, and all radical. The flowers are large, and grow in panicles, on short stalks. The petals are equal, yellow and fragrant, and the petals are curved inwards. The fruit is a capsule containing a few black seeds.

Meadow Saffron—*Colchicum autumnale*

(Plate CVI)

The Meadow Saffron and one or two allied plants are sometimes separated from the *Liliaceæ* as a distinct Order, under the name *Melanthaceæ* or *Colchicaceæ*, because the styles are not united but separate. The species figured has a large bulb (or corm) covered with brown scales, from which rise long broad leaves in spring, which afterwards wither, and are succeeded in autumn by a purple flower with a very long tube, traversed by three styles throughout its whole length. Our figures are much reduced; the leaves are often

9 or 10 inches long, and the tube of the flower is funicular. It is a common meadow plant in many parts of the country, but is carefully extirpated by farmers, for it is a powerful poison, and sheep and cattle sometimes die from its effects.

In poisonous doses the plant produces vomiting and purging; but a medicine is obtained from the corm and seeds, which is of great value in easing gout, and is also useful in dropsy, liver complaints, and asthma.

Order XCVIII. *Juncaceæ* (2 genera)

These plants are called Rushes, and there is a considerable number of species. Nearly all the species of the typical genus *Juncus* inhabit more or less swampy places, while the Wood Rushes (*Luzula*) prefer dry places. They have a thick creeping root called a rhizome, from which rise hollow green stems containing pith, with long, narrow, cylindrical, sharp-pointed or grass-like leaves, and panicles of dry flowers resembling those of grasses. The perianth has 6 segments, with



Broad Pond-weed. (*Potamogeton nodosus*.)



Cotton-grass. (*Eriophorum latifolium*.)

6 stamens (sometimes 3), and the ovary 3-celled. There is 1 style with 3 stigmas, and the fruit is a capsule.

Great Wood-Rush—*Luzula sylvatica*

(Plate CVII)

This is one of the larger species, growing to the height of 2 feet, and is not uncommon in dry woods. The leaves are very long and hairy at the edges, and are sometimes jointed. The flowers are reddish.

Order XCIX. *Eriocaulaceæ* (1 genus)

The only British species is found in the Hebrides and West of Ireland; and being unknown on the continent of Europe, though a native of North America, presents one of those curious problems in the geographical distribution of animals and plants which we have not yet sufficient data to solve. The Pipewort (*Eriocaulon septangulare*) is a tufted plant, with a white jointed root creeping

in the mud at the bottom of lakes, tufts of pointed leaves, and a compact flower-head, with 4 lobes in the perianth, the inner ones scarcely divided in the males, 4 stamens and 2 stigmas. The flowers are very small, and rise above the surface of the water.

Order C. *Typhaceæ* (2 genera)

A small family of water-plants, including two British genera, *Typha* and *Sparganium*. They resemble reeds, and the flowers are closely clustered together round long stalks, the male flowers above and the female flowers below. The perianth consists of 3 or more scales or bristles, and there are 3 stamens and 1 ovary. The fruit is nutlike, and contains a single seed.

The Reed-Mace (*Typha latifolia*) is one of our tallest water-plants, 6 or 7 feet high, with long sword-like leaves, and a flower-spike several inches long, the upper part yellow when in flower, and the lower part brown and downy. Several of the beautiful metallic beetles of the genus *Donacia*,

which we have mentioned while noticing the Water-lilies, frequent the Reed-Mace, as well as other water-plants; and the pale-coloured caterpillars of more than one species of the ochreous-brown or greyish moths of the genus *Nonagria* feed on the pith inside the thick stems. The moths measure $1\frac{1}{2}$ or 2 inches across the wings, and their bodies are moderately stout and long; they belong to the great group of Noctuæ, so called because most of the moths included in it fly in the evening or at night.

In the species of *Sparganium* the flower-heads are rounded, and the round prickly seed-clusters of some species have been compared to a hedgehog.

Order CI. *Araceæ* (2 genera)

This family includes the Arums, which are poorly represented in Europe. The perianth is either wanting or replaced by a few small scales, and are gathered round a flower-spike generally enclosed by broad leaves, called a spathe, which fall away

when the clusters of red berry-like fruit are ripe. The roots are thickened into tubers.

Cuckoo-pint—*Arum maculatum*

(Plate CVIII)

This plant is common under hedges in spring, and the green spathe, and, later in the year, the red berries on a bare stalk, make it very conspicuous. The leaves are on long stalks, large, and shaped like a spear-head, and are often spotted. The club is violet, and the flowers are clustered at the lower end, the male flowers above and the female flowers below. Between them are nectaries. After flowering, the root-stalk swells into a tuber, the club falls off, and the berries only remain. They are first green and then bright red. It is a highly poisonous plant, though the roots are farinaceous, and can be made to yield a wholesome flour, as in the case of the equally poisonous *Mandioca* (a *Euphorbiaceæ* plant), from which tapioca is obtained. When the root is macerated in water it froths like soap.

Plate CXIII.



Bath Carex. (*Carex Davalliana.*)

Plate CXIV.



Fox-grass. (*Carex vulpina.*)

Marsh Arum—*Calla palustris*

(Plate CIX)

This is hardly a British plant, though common in many parts of central and northern Europe, and naturalised in one or two places in England. The root-stock creeps in the water, the leaves are cordate, and the club is small and covered with flowers. The spathe is short, green outside and white inside. It is a poisonous plant like the last, but is used like fir-bark, moss, and other substitutes for wholesome food, in times of famine, in Finland, the roots being pounded in a mortar.

Another plant of this Order, the Sweet Flag (*Acorus calamus*), is much used in medicine, being a stimulating aromatic tonic, prescribed in cases of dyspepsia. It is found chiefly, as a British species, in the eastern counties of England, where it grows to the height of several feet. It has long sword-shaped leaves, and the spathe is a continuation of the flower-stalk, and does not enclose the flower-spike, on which the yellowish flowers are

clustered. The whole plant is highly odoriferous when crushed.

Order CII. *Lemnaceæ* (2 genera)

These are plants which swim on the surface of the water, with single flowers on the side of an expanded leaf-like swimming stalk, composed of two or more similar segments. The perianth is undivided, containing 2 stamens and a single ovary with from 2 to 4 seeds. The species are all very similar, and often cover the surface of stagnant water.

Lesser Duckweed—*Lemna minor*

(Plate CX)

In this species the fronds are oval, almost smooth, each with a single rootlet. It is very common in ditches and ponds.

Order CIII. *Potamogetonaceæ*

(3 genera)

These are water-weeds, with the perianth entire, divided, or wanting. There are 1, 2, or 4 stamens,

and 4 or more ovaries, each containing a single seed, and 1 style or sessile stigma. The fruit is a small nut.

Broad Pond-weed—*Potamogeton natans*

(Plate CXI)

The species of *Potamogeton* are very numerous and variable, and special attention has been paid to them by several eminent botanists. The flowers in this genus are furnished with 4 stamens and ovaries, surrounded by 4 scales resembling petals. The leaves grow on long stalks, and vary in shape. The plants swim on the surface of stagnant or slowly-flowing water.

The Sea-Grass, or Grass Wrack (*Zostera marina*), one of the few flowering plants inhabiting sea-water, is placed by some writers in a separate Order (*Naiadaceæ*). The long grass-like leaves may often be seen among cast up seaweed on the sea-shore. It has no perianth, and only a single ovary. The fruit is a small white nut.

SUB-CLASS III. *Glumiferæ*

This section includes the Sedges and Grasses, and may be distinguished by the long leaves with parallel veins, and the scaly bract-like flowers arranged in ears or panicles.

Order CIV. *Cyperaceæ* (10 genera)

The flowers grow in spikes or racemes, each accompanied by basal bracts. The perianth is either absent, or consists of several long bristles, threads or scales. There are 3 stamens and 1 style with 2 or 3 stigmas. Most of the species are found in wet places, or on poor soil.

Cotton-grass—*Eriophorum latifolium*

(Plate CXII)

The different species of Cotton-grass are found only in boggy places, or in very damp meadows. The white bristles surrounding the flowers grow to a considerable length, looking, after the plant has flowered, like balls of white cotton. The



Acute Carex. (*Carex acuta*.)



Vernal Grass. (*Anthoxanthum odoratum*.)

species figured is widely distributed in the British Islands, though not one of the commonest. It grows to the height of upwards of a foot; there are several flowers on a spike, and the leaves are more flattened than in the allied species.

Bath Carex—*Carex Davalliana*
(Plate CXIII)

The species of Carex are very numerous, and nearly eighty are recorded as British. They are grass-like plants, and are generally known as Sedges. Most of them, but not all, grow in wet places. The Bath Carex grows about 6 inches high, and is found on peaty moors. It used formerly to grow near Bath, but is now believed to be extinct in Britain. It is found in damp meadows in South France, Switzerland, North Italy, and Eastern Germany, being particularly common near Stettin; it flowers from April to June. The male and female flowers grow on separate stalks, some consisting of stamens only, and others of a pistil with two stigmas.

Fox Sedge—*Carex vulpina*
(Plate CXIV)

This is a handsome and easily recognisable species, which grows plentifully in ditches, swampy places, etc. It grows to the height of 3 or 4 feet, and the spike is broken up into several divisions, having male flowers on the upper portion with 3 stamens, and female flowers on the lower portion with a pistil with two stigmas. It flowers in summer.

Acute Carex—*Carex acuta*
(Plate CXV)

This is a common species in swampy places and water-meadows. It grows to the height of 2 or 3 feet, and flowers in early summer. In most species of Carex the stem is rough and triquetral, and sufficiently hard in large specimens to draw blood if pulled quickly through the hand.

Order CV. *Gramineæ* (50 genera)

The Grasses are plants with fibrous roots and a hollow stem, sometimes containing pith, interrupted

by knots, where the stem is thickened, and the hollow space within is closed by a partition. The leaves are long, narrow, and entire, and sheathe the stem at their base. Where the leaf-sheath passes into the blade there is a delicate membrane called the ligula. The flowers are arranged in terminal spikes or panicles; they are very small, and are surrounded by scaly bracts called glumes; they are succeeded by hard seeds. When the flower-head forms a spike it is called an ear in the case of corn; for the various kinds of corn are really cultivated grasses. Our native species are only a few feet in height, but in foreign countries they grow much taller; and the Bamboos of the tropics, which grow to the height of 100 or 200 feet, are really different species of large grasses.

The flowers are generally arranged in the spikes or panicles in threes. These clusters are called spikelets, and usually one flower only of the three is fertile. Each flower is enclosed by two small boat-shaped bracts called glumes. The flower proper consists of an ovary with 2 small feathery stigmas and 3 stamens. The ovary is enclosed

by two very delicate scales, representing the perianth.

The British grasses are very numerous in genera and species, and we have only space to notice a few representative species.

Vernal Grass—*Anthoxanthum odoratum*
(Plate CXVI)

This is a sweet-scented grass, to which the odour of new-made hay is largely due. It is a perennial plant, upwards of a foot high, with a straight, slender, smooth stalk, and rather short leaves. The flowers are purple or yellow, and stand at the extremity of a loose rather pointed spike. They are composed of 2 stamens and 1 style.

Fox-tail Grass—*Alopecurus pratensis*
(Plate CXVII)

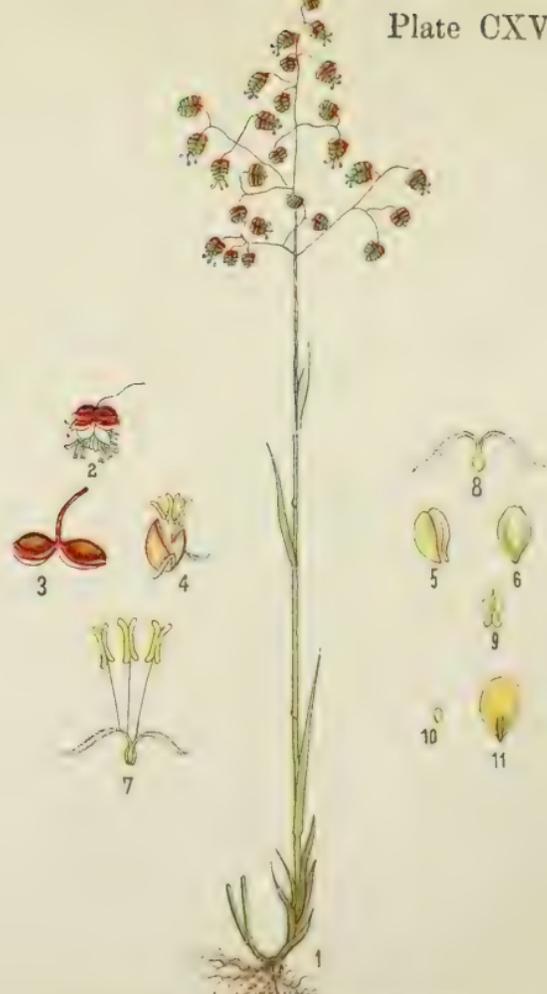
This is another common meadow-grass. It is a perennial, growing to the height of 2 or 3 feet,

Plate CXVII.



Foxtail Grass. (*Alopecurus pratensis*.)

Plate CXVIII.



Quaking Grass. (*Briza media*.)

with a nearly straight stem and narrow leaves. The flowers are placed on a long obtuse spike, and have 3 stamens and 1 style.

Quaking Grass—*Briza media*

(Plate CXVIII)

This is a less succulent grass than the two preceding species, and is found less abundantly in dry meadows. It is about eighteen inches high, and has a very slender straight stem and short pointed leaves. The flowers are gathered several together in small pendent green and purple oval spikelets, which sway in the wind. When gathered they do not usually drop, like other grasses, but may be dried and preserved for a long time.

Dog's-tail Grass—*Cynosurus cristatus*

(Plate CXIX)

This is another common species which prefers dry fields to damp meadows. It has a straight

slender stalk about two feet high, with smooth linear leaves, and terminates above in a rather long ear or spike, composed of numerous spikelets of two different kinds; glumes furnished with pistils and stamens, and barren glumes destitute of either, resembling small crests, from which the plant derives its Latin name.

Cock's-foot Grass—*Dactylis glomerata*

(Plate CXX)

This grass is common in woods and pastures, and sometimes grows to a height of upwards of two feet. It is rough to the touch, and the leaves are long and smooth. The numerous flowers are gathered into large compact clusters, each hanging on one side of their stalk, and forming an interrupted spike.

Among the various plants of economic importance at home and abroad which belong to the Grasses, we may mention wheat, barley, oats, rye, maize or Indian corn, rice, sugar-cane, etc.

The "beard" of wheat and barley is composed

of the long persistent bristles projecting beyond the glumes. The cultivation of rice is peculiar: it is sown in shallow ponds, which dry up as the plants grow. In Germany the word Korn is applied to rye, other words being used in the general sense in which we use our word corn. This is a good illustration of the manner in which the same word alters its meaning in different languages. But a still better illustration of this is to be found in the Latin word *domus* (original meaning, a house): it has been adopted into most European languages, but in some it means a house, in others a cathedral, and in English simply a cupola (dome).

One of the commonest caterpillars which feed on grasses is that of the Drinker Moth (*Odonestis*

potatoria). It is dark brown, with yellow stripes and white tufts on the sides, and two black pointed tufts on the back—one near the head and one near the tail. The male moth is brownish yellow, and the female brighter yellow, with an oblique black line running nearly to the tip of the rather pointed forewings. The female measures $2\frac{1}{2}$ inches in expanse; the male is smaller.

There is a genus of small moths called *Elachista*, the caterpillars of which mine in the leaves of grasses. They often measure considerably less than half an inch across the wings; the forewings are generally dark, with white or golden markings, and the hindwings have long fringes; a few species, however, are grey or whitish, with dark markings.



Dog's-tail Grass. (*Cynosurus cristatus*.)



Cock's-foot Grass. (*Dactylis glomerata*.)



EXPLANATION OF PLATES

PLATE I. Frontispiece

Traveller's Joy—*Clematis Vitalba* (page 24)

- Fig. 1. Plant
- „ 2. Stamen
- „ 3. Carpel
- „ 4. Fruit with awns
- „ 5. Achene
- „ 6. Section of achene

PLATE II. Frontispiece

Pasque Flower—*Anemone Pulsatilla* (page 24)

- Fig. 1. Plant
- „ 2. Leaf
- „ 3. Upperside of leaflet
- „ 4. Lowerside of leaflet
- „ 5. Stamens
- „ 6. Ripe seed, with awn

PLATE III. Facing page 26

Buttercup—*Ranunculus auricomus* (page 26)

- Fig. 1. Plant
- „ 2. Root-leaf
- „ 3. Flower (natural size)
- „ 4 and 5. Petals
- „ 6. Calyx

PLATE IV. Facing page 26

Monkshood—*Aconitum Napellus* (page 27)

- Fig. 1. Upper portion of plant (reduced)
- „ 2. Root
- „ 3. Flower (spread out)
- „ 4. Fruit
- „ 5. Follicle
- „ 6. Seed

PLATE V. Facing page 28

Baneberry—*Actæa spicata* (page 28)

- Fig. 1. Upper portion of plant
 „ 2. Calyx
 „ 3. Sepal (natural size)
 „ 4. Flower
 „ 5. Petal (enlarged)
 „ 6. Stamen (much enlarged)
 „ 7. Pistil, with four petals (enlarged)
 „ 8. Pistil alone (much enlarged)
 „ 9. Berry
 „ 10 and 11. Transverse and longitudinal sections
 of berry
 „ 12. Seeds
 „ 13. Longitudinal section of seed
 „ 14. Cluster of fruit

PLATE VI. Facing page 28

Barrenwort—*Epimedium alpinum* (page 29)

- Fig. 1. Plant (reduced)
 „ 2 and 3. Flower (upperside—natural size and
 enlarged)
 „ 4. Flower (lowerside)
 „ 5. Petal (innerside)

Fig. 6. Petal (outerside)

„ 7. Nectaries

„ 8. Calyx (much enlarged)

„ 9. Stamen

„ 10. Pistil

PLATE VII. Facing page 30

White Water-Lily—*Nymphaea alba* (page 30)

Fig. 1. Flower (reduced)

„ 2. Leaf (reduced)

„ 3. An outer stamen

„ 4. Two inner stamens

„ 5 and 6. Seeds in reticulated envelope

„ 7 and 8. Seeds without covering

„ 9. Fruit

„ 10. Cluster of carpels

PLATE VIII. Facing page 30

Corn Poppy—*Papaver Rhœas* (page 31)

Fig. 1. Plant (reduced)

„ 2. Petal

„ 3. Opening bud

„ 4. Pistil and stamens

„ 5. Stamen (enlarged)

- Fig. 6 and 7. Seed capsules
 „ 8. Section of seed capsule
 „ 9 and 10. Seeds

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 „ 4. Sepal
 „ 5. Ovary
 „ 6. Fruit
 „ 7. Seed
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- Fig. 3. Flower (upperside)
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 „ 13. Part of pod and spines (magnified)
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 „ 15. Open pod
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Woad—*Isatis tinctoria* (page 34)

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 „ 2 and 3. Flower (natural size and enlarged)
 „ 4. Flower without petals (much enlarged)
 „ 5 and 6. Calyx (underside)
 „ 7. Closed pod
 „ 8. Open pod
 „ 9. Transverse section of pod
 „ 10. Longitudinal section of ovary
 „ 11 and 12. Seeds

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Sweet Violet—*Viola odorata* (page 38)

- Fig. 1. Plant (half natural size)
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 „ 3. Calyx (with part of stalk, showing bracts)
 „ 4. Stamens
 „ 5 and 6. Pistil
 „ 7. Stamen (without appendage)
 „ 8. Stamen (with appendage)
 „ 9. Seed capsule
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Wild Pansy, or Heartsease—*Viola tricolor* (page 39)

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 „ 4. Seed capsule
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 „ 5 and 6. Seed capsule (natural size and enlarged)
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 membranous covering
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 „ 3. Flower (under-surface)
 „ 4. Calyx
 „ 5. Pistil and stamens in natural position
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 „ 4. Scale with unopened anther
 „ 5. Flowering male catkin
 „ 6. Male flower
 „ 7. Female catkin
 „ 8. Separate flower
 „ 9. Innerside of female flower
 „ 10. Catkin in seed
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 „ 13. Twig with developed leaves

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Alder—*Alnus glutinosa* (page 134)

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 „ 3. Flowering male and female catkins
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 „ 6. Male scale and flower (lowerside)

- Fig. 7. Flower
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 „ 7. Female flower (magnified)
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 „ 3. Pollen mass

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- Fig. 1. Plant
 „ 2. Flower with the labellum removed
 „ 4. Pistil and anthers
 „ 5. Column, or abortive anther, with fertile lateral anthers
 „ 6. Upperside of column
 „ 7. Seed capsule, with withered flower
 „ 8. Section of seed capsule
 „ 9 and 10. Seeds
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 " 5. Hind view of lobate stigma and stamen

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- Fig. 1. Plant (reduced)
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 " 3. Petal of upper lip, with stamens and pistil
 " 4. Petals of lower lip
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 " 6. Seed capsule
 " 7. Section of seed capsule
 " 8. Seed
 " 9. Section of seed

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Spring Crocus—*Crocus vernus* (page 142)

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 " 2. Flower-stalk, with stamens and pistil
 " 3. Style and trifid stigma

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- Fig. 1. Plant (reduced)
 " 2. Flower
 " 3. Pistil and stamens
 " 4. Style
 " 5. Seed capsule
 " 6. Seed

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Flowering Rush—*Butomus umbellatus* (page 143)

- Fig. 1. Plant (reduced)
 " 2. Portion of stalk
 " 3. Flower (natural size)
 " 4. Pistil
 " 5. Stamen
 " 6. Fruit
 " 7. Section of fruit
 " 8 and 9. Seeds
 " 10. Transverse section of seed
 " 11. Longitudinal section of seed

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Arrow-grass—*Triglochin maritimum* (page 144)

- Fig. 1. Plant (reduced)
 „ 2. Flower-spike (natural size)
 „ 3. Flower (enlarged)
 „ 4 and 5. Six-lobed capsule
 „ 6. Section of capsule
 „ 7 to 9. Separate carpels, with and without seeds
 „ 10 and 11. Seed
 „ 12. Section of seed

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Lily of the Valley—*Convallaria majalis* (page 144)

- Fig. 1. Plant (reduced)
 „ 2. Flower (natural size)
 „ 3. Flower opened out to show stamens and pistil
 „ 4. Pistil
 „ 5. Stamen
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 „ 7. Transverse section of berry
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Wild Tulip—*Tulipa sylvestris* (page 145)

- Fig. 1. Plant (reduced)
 „ 2. Section of bulb, showing germ springing from near the roots
 „ 3. Flower
 „ 4. Inner petal
 „ 5. Outer petal
 „ 6. Stamens
 „ 7. Pistil with two stamens
 „ 8. Seed capsule
 „ 9. Seed
 „ 10. Section of seed

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Broad Garlic—*Allium ursinum* (page 145)

- Fig. 1. Plant (reduced)
 „ 2. Flower
 „ 3. Petal and stamen
 „ 4. Pistil
 „ 5. Ripe seed capsule
 „ 6. Ripe seed capsule, open
 „ 7 and 8. Seeds

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Yellow Day-flower—*Heemerocallis flava* (page 145)

- Fig. 1. Plant (reduced)
 " 2. Portion of leaf
 " 3. Front view of stamen
 " 4. Hind view of stamen
 " 5. Pistil
 " 6. Portion of style with trilobate stigma
 " 7. Unripe seed capsule (reduced)
 " 8. Ripe seed capsule (open)
 " 9 and 10. Seeds
 " 11. Flower (natural size)

PLATE CVI. Facing page 140

Meadow Saffron—*Colchicum autumnale* (page 146)

- Fig. 1. Plant in flower (reduced)
 " 2. Pistil and 3 styles
 " 3. Stamen
 " 4 and 5. Seeds
 " 6. Section of seed capsule
 " 7. Seed capsule
 " 8. Plant in leaf and seed

PLATE CVII. Facing page 142

Great Wood-rush—*Luzula sylvatica* (page 147)

- Fig. 1. Plant (reduced)
 " 2. Portion of leaf
 " 3. Panicle (natural size)
 " 4 and 5. Capsule in perianth
 " 6. Capsule without covering

PLATE CVIII. Facing page 142

Cuckoo-pint—*Arum maculatum* (page 148)

- Fig. 1. Plant (reduced)
 " 2. Spadix with male flowers in the middle between double rows of nectaries, and female flowers below
 " 3. Nectary
 " 4. Anthers
 " 5. Female flower
 " 6. Ripe berries
 " 7. Longitudinal section of berry
 " 8 and 9. Seeds

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Marsh Arum—*Calla palustris* (page 149)

- Fig. 1. Plant
 „ 2. Section of spadix
 „ 3. Pistil and stamens
 „ 4. Berry
 „ 5 and 6. Seeds
 „ 7. Cluster of fruit

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Lesser Duckweed—*Lemna minor* (page 149)

- Fig. 1. Plants (natural size)
 „ 2. Flower-bearing leaf, with stamen projecting from the perianth
 „ 3. Under-surface of leaf of an old plant with eggs of water-animals
 „ 4. Perianth, with developed stamen projecting, and undeveloped stamen within
 „ 5. Upper end of stamen with open anthers
 „ 6. Flower with perianth removed, and ovary in the centre. Stamen on the left still undeveloped

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Broad Pond-weed—*Potamogeton natans* (page 150)

- Fig. 1. Plant (reduced)
 „ 2 and 3. Flower (natural size and magnified)
 „ 4 and 5. Petal
 „ 6 and 7. Stamen
 „ 8 and 9. Pistil
 „ 10. Four seeds
 „ 11. Single seed

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Cotton Grass—*Eriophorum latifolium* (page 150)

- Fig. 1. Plant (reduced)
 „ 2. Flowering stalk (natural size)
 „ 3. Flower
 „ 4. Flower with bract (magnified)
 „ 5. Flower (more strongly magnified)
 „ 6. Barren flower
 „ 7. Fruit with bristles (natural size)
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Bath Carex—*Carex Davalliana* (page 151)

- Fig. 1. Male plant
 " 2. Glume and male flower (enlarged)
 " 3. Female flower-head (enlarged)
 " 4. Female flower
 " 5. Glume of female flower
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Fox Sedge—*Carex vulpina* (page 151)

- Fig. 1. Plant (reduced)
 " 2. Male flower spike
 " 3. Female flower spike
 " 4. Male flower
 " 5 and 6. Female flowers
 " 7. Fruit
 " 8. Section of fruit

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Acute Carex—*Carex acuta* (page 151)

- Fig. 1. Flowering plant (reduced)
 " 2. Upper portion of stalk

- Fig. 3. Male flower spike (natural size)
 " 4. Male flower
 " 5. Portion of stalk with lowest female flower spike
 " 6. Female flower with ovary, 2 stigmas, and glume
 " 7. Fruit with glume
 " 8. Fruit without glume
 " 9. Section of seed
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Vernal Grass—*Anthoxanthum odoratum* (page 152)

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 " 3. Bud
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 " 5. Open flower
 " 6. Glumes
 " 7. Pistil and 2 stamens
 " 8. Nectary (outer view)
 " 9. Nectary (inner view)
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Foxtail Grass—*Alopecurus pratensis* (page 152)

- Fig. 1. Plant (reduced)
 „ 2. Spike or ear (natural size)
 „ 3. Opening flower
 „ 4 and 5. Front view of open flower
 „ 6. Back view of closed flower, showing glumes
 „ 7. Open glumes
 „ 8. Glume
 „ 9. Pistil and stamens
 „ 10. Anthers just emerging from the glumes

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Quaking Grass—*Briza media* (page 153)

- Fig. 1. Plant (reduced)
 „ 2. Flowering spikelet
 „ 3. Glumes
 „ 4. Flower enclosed by glumes
 „ 5. Lower glume
 „ 6. Upper glume
 „ 7. Pistil and stamens
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 „ 3 and 4. Flowering spikelets
 „ 5. Sterile spikelet
 „ 6. Closed flower
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 „ 9. Pistil and stamens (magnified)
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PLATE LXXXIX. Facing page 124

Rose Willow—*Salix purpurea* (page 132)

- Fig. 1. Twig with male catkins
 " 2. Bud
 " 3. Scale
 " 4. Scale with unopened anther
 " 5. Flowering male catkin
 " 6. Male flower
 " 7. Female catkin
 " 8. Separate flower
 " 9. Innerside of female flower
 " 10. Catkin in seed
 " 11. Twig with opening leaves
 " 12. Young leaf-shoot
 " 13. Twig with developed leaves

PLATE XC. Facing page 124

Alder—*Alnus glutinosa* (page 134)

- Fig. 1. Branch in leaf
 " 2. Young male catkin
 " 3. Flowering male and female catkins
 " 4 and 5. Male scale and flower (upperside)
 " 6. Male scale and flower (lowerside)

- Fig. 7. Flower
 " 8. Female catkin
 " 9. Scale from above
 " 10. Scale from below (with styles)
 " 11. Young seed catkin
 " 12. Ripe seed catkin
 " 13 and 14. Scale, with seed
 " 15 and 16. Seeds
 " 17. Transverse section of seed
 " 18. Longitudinal section of seed

PLATE XCI. Facing page 126

Yew Tree—*Taxus baccata* (page 137)

- Fig. 1. Spray with berries (reduced)
 " 2. Leaf with male flower in axil (natural size)
 " 3. Male flower, showing stamens (enlarged)
 " 4. Connectivum (upperside)
 " 5. Connectivum (lowerside)
 " 6. Female flower (natural size)
 " 7. Female flower (magnified)
 " 8. Unripe fruit
 " 9. Ripe fruit
 " 10 to 12. Seeds

PLATE XCII. Facing page 126

Herb Paris—*Paris quadrifolia* (page 139)

- Fig. 1. Plant
 „ 2. Flower (natural size)
 „ 3 and 4. Stamen
 „ 5 and 6. Pistil
 „ 7. Berry, and withered flower
 „ 8. Section of berry
 „ 9 and 10. Seeds

PLATE XCIII. Facing page 128

Frogbit—*Hydrocharis Morsus-ranæ* (page 140)

- Fig. 1. Male plant (natural size)
 „ 2. Female flower
 „ 3. Two stamens from outer row
 „ 4. Stamen from inner row, with rudimentary style at the base
 „ 5 and 6. Abortive pistil of male flower
 „ 7 to 10. Pistil and 6 bifid styles
 „ 11. Fruit
 „ 12. Section of fruit (enlarged)
 „ 13. Seed

PLATE XCIV. Facing page 128

Early Purple Orchis—*Orchis mascula* (page 141)

- Fig. 1. Plant
 „ 2. Flower, denuded of perianth
 „ 3. Pollen mass

PLATE XCV. Facing page 130

Lady's Slipper—*Cypripedium Calceolus* (page 141)

- Fig. 1. Plant
 „ 2. Flower with the labellum removed
 „ 4. Pistil and anthers
 „ 5. Column, or abortive anther, with fertile lateral anthers
 „ 6. Upperside of column
 „ 7. Seed capsule, with withered flower
 „ 8. Section of seed capsule
 „ 9 and 10. Seeds
 „ 11. Labellum

PLATE XCVI. Facing page 130

German Flag—*Iris germanica* (page 142)

- Fig. 1. Flower and buds (reduced)
 „ 2. Lower part of plant

- Fig. 3. Petal
 „ 4. Lobate stigma and stamen
 „ 5. Hind view of lobate stigma and stamen

PLATE XCVII. Facing page 132

Gladiolus—*Gladiolus communis* (page 142)

- Fig. 1. Plant (reduced)
 „ 2. Root-scales
 „ 3. Petal of upper lip, with stamens and pistil
 „ 4. Petals of lower lip
 „ 5. Stigmas
 „ 6. Seed capsule
 „ 7. Section of seed capsule
 „ 8. Seed
 „ 9. Section of seed

PLATE XCVIII. Facing page 132

Spring Crocus—*Crocus vernus* (page 142)

- Fig. 1. Plant
 „ 2. Flower-stalk, with stamens and pistil
 „ 3. Style and trifold stigma

PLATE XCIX. Facing page 134

Summer Snowflake—*Leucoium aestivum* (page 143)

- Fig. 1. Plant (reduced)
 „ 2. Flower
 „ 3. Pistil and stamens
 „ 4. Style
 „ 5. Seed capsule
 „ 6. Seed

PLATE C. Facing page 134

Flowering Rush—*Butomus umbellatus* (page 143)

- Fig. 1. Plant (reduced)
 „ 2. Portion of stalk
 „ 3. Flower (natural size)
 „ 4. Pistil
 „ 5. Stamen
 „ 6. Fruit
 „ 7. Section of fruit
 „ 8 and 9. Seeds
 „ 10. Transverse section of seed
 „ 11. Longitudinal section of seed

PLATE CI. Facing page 136

Arrow-grass—*Triglochin maritimum* (page 144)

- Fig. 1. Plant (reduced)
 „ 2. Flower-spike (natural size)
 „ 3. Flower (enlarged)
 „ 4 and 5. Six-lobed capsule
 „ 6. Section of capsule
 „ 7 to 9. Separate carpels, with and without seeds
 „ 10 and 11. Seed
 „ 12. Section of seed

PLATE CII. Facing page 136

Lily of the Valley—*Convallaria majalis* (page 144)

- Fig. 1. Plant (reduced)
 „ 2. Flower (natural size)
 „ 3. Flower opened out to show stamens and pistil
 „ 4. Pistil
 „ 5. Stamen
 „ 6. Berry
 „ 7. Transverse section of berry
 „ 8. Longitudinal section of berry
 „ 9. Seeds

PLATE CIII. Facing page 138

Wild Tulip—*Tulipa sylvestris* (page 145)

- Fig. 1. Plant (reduced)
 „ 2. Section of bulb, showing germ springing from near the roots
 „ 3. Flower
 „ 4. Inner petal
 „ 5. Outer petal
 „ 6. Stamens
 „ 7. Pistil with two stamens
 „ 8. Seed capsule
 „ 9. Seed
 „ 10. Section of seed

PLATE CIV. Facing page 138

Broad Garlic—*Allium ursinum* (page 145)

- Fig. 1. Plant (reduced)
 „ 2. Flower
 „ 3. Petal and stamen
 „ 4. Pistil
 „ 5. Ripe seed capsule
 „ 6. Ripe seed capsule, open
 „ 7 and 8. Seeds

PLATE CV. Facing page 140

Yellow Day-flower—*Hemerocallis flava* (page 145)

- Fig. 1. Plant (reduced)
 " 2. Portion of leaf
 " 3. Front view of stamen
 " 4. Hind view of stamen
 " 5. Pistil
 " 6. Portion of style with trilobate stigma
 " 7. Unripe seed capsule (reduced)
 " 8. Ripe seed capsule (open)
 " 9 and 10. Seeds
 " 11. Flower (natural size)

PLATE CVI. Facing page 140

Meadow Saffron—*Colchicum autumnale* (page 146)

- Fig. 1. Plant in flower (reduced)
 " 2. Pistil and 3 styles
 " 3. Stamen
 " 4 and 5. Seeds
 " 6. Section of seed capsule
 " 7. Seed capsule
 " 8. Plant in leaf and seed

PLATE CVII. Facing page 142

Great Wood-rush—*Luzula sylvatica* (page 147)

- Fig. 1. Plant (reduced)
 " 2. Portion of leaf
 " 3. Panicle (natural size)
 " 4 and 5. Capsule in perianth
 " 6. Capsule without covering

PLATE CVIII. Facing page 142

Cuckoo-pint—*Arum maculatum* (page 148)

- Fig. 1. Plant (reduced)
 " 2. Spadix with male flowers in the middle between double rows of nectaries, and female flowers below
 " 3. Nectary
 " 4. Anthers
 " 5. Female flower
 " 6. Ripe berries
 " 7. Longitudinal section of berry
 " 8 and 9. Seeds

PLATE CIX. Facing page 144

Marsh Arum—*Calla palustris* (page 149)

- Fig. 1. Plant
 „ 2. Section of spadix
 „ 3. Pistil and stamens
 „ 4. Berry
 „ 5 and 6. Seeds
 „ 7. Cluster of fruit

PLATE CX. Facing page 144

Lesser Duckweed—*Lemna minor* (page 149)

- Fig. 1. Plants (natural size)
 „ 2. Flower-bearing leaf, with stamen projecting from the perianth
 „ 3. Under-surface of leaf of an old plant with eggs of water-animals
 „ 4. Perianth, with developed stamen projecting, and undeveloped stamen within
 „ 5. Upper end of stamen with open anthers
 „ 6. Flower with perianth removed, and ovary in the centre. Stamen on the left still undeveloped

PLATE CXI. Facing page 146

Broad Pond-weed—*Potamogeton natans* (page 150)

- Fig. 1. Plant (reduced)
 „ 2 and 3. Flower (natural size and magnified)
 „ 4 and 5. Petal
 „ 6 and 7. Stamen
 „ 8 and 9. Pistil
 „ 10. Four seeds
 „ 11. Single seed

PLATE CXII. Facing page 146

Cotton Grass—*Eriophorum latifolium* (page 150)

- Fig. 1. Plant (reduced)
 „ 2. Flowering stalk (natural size)
 „ 3. Flower
 „ 4. Flower with bract (magnified)
 „ 5. Flower (more strongly magnified)
 „ 6. Barren flower
 „ 7. Fruit with bristles (natural size)
 „ 8 and 9. Fruit without bristles

PLATE CXIII. Facing page 148

Bath Carex—*Carex Davalliana* (page 151)

- Fig. 1. Male plant
 " 2. Glume and male flower (enlarged)
 " 3. Female flower-head (enlarged)
 " 4. Female flower
 " 5. Glume of female flower
 " 6 and 7. Fruit

PLATE CXIV. Facing page 148

Fox Sedge—*Carex vulpina* (page 151)

- Fig. 1. Plant (reduced)
 " 2. Male flower spike
 " 3. Female flower spike
 " 4. Male flower
 " 5 and 6. Female flowers
 " 7. Fruit
 " 8. Section of fruit

PLATE CXV. Facing page 150

Acute Carex—*Carex acuta* (page 151)

- Fig. 1. Flowering plant (reduced)
 " 2. Upper portion of stalk

- Fig. 3. Male flower spike (natural size)
 " 4. Male flower
 " 5. Portion of stalk with lowest female flower spike
 " 6. Female flower with ovary, 2 stigmas, and glume
 " 7. Fruit with glume
 " 8. Fruit without glume
 " 9. Section of seed
 " 10. Seed
 " 11. Section of seed

PLATE CXVI. Facing page 150

Vernal Grass—*Anthoxanthum odoratum* (page 152)

- Fig. 1. Plant (reduced)
 " 2. Spike (natural size)
 " 3. Bud
 " 4. Glumes
 " 5. Open flower
 " 6. Glumes
 " 7. Pistil and 2 stamens
 " 8. Nectary (outer view)
 " 9. Nectary (inner view)
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PLATE CXVII. Facing page 152

Foxtail Grass—*Alopecurus pratensis* (page 152)

- Fig. 1. Plant (reduced)
 „ 2. Spike or ear (natural size)
 „ 3. Opening flower
 „ 4 and 5. Front view of open flower
 „ 6. Back view of closed flower, showing glumes
 „ 7. Open glumes
 „ 8. Glume
 „ 9. Pistil and stamens
 „ 10. Anthers just emerging from the glumes

PLATE CXVIII. Facing page 152

Quaking Grass—*Briza media* (page 153)

- Fig. 1. Plant (reduced)
 „ 2. Flowering spikelet
 „ 3. Glumes
 „ 4. Flower enclosed by glumes
 „ 5. Lower glume
 „ 6. Upper glume
 „ 7. Pistil and stamens
 „ 8. Pistil
 „ 9. Nectary
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Dog's-tail Grass—*Cynosurus cristatus* (page 153)

- Fig. 1. Plant (reduced)
 „ 2. Flowering spike or ear (slightly enlarged)
 „ 3 and 4. Flowering spikelets
 „ 5. Sterile spikelet
 „ 6. Closed flower
 „ 7. Flowers and glumes
 „ 8. Pistil and stamens (natural size)
 „ 9. Pistil and stamens (magnified)
 „ 10 and 11. Nectary
 „ 12 and 13. Seeds

PLATE CXX. Facing page 154

Cock's-tail Grass—*Dactylis glomerata* (page 153)

- Fig. 1. Plant (reduced)
 „ 2. Flowering spray
 „ 3 and 4. Spikelet
 „ 5. Perianth
 „ 6. Glumes
 „ 7. Flower between glumes
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