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A HANDBOOK OF

BRITISH FLOWERING PLANTS

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BRITISH FLOWERING PLANTS

Edited by
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and
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GLOSSARY OF BOTANICAL TERMS

Other botanical terms are explained in the text and plant structures are shown in the figures illustrating the Key to Families.

achene : a small, hard, dry, one-seeded fruit, not dehiscent.
aril : an aftergrowth surrounding the seed. (Yew.)
axil : the angle at the junction of stem and leaf ; hence **axillary**, arising from the axil.
bract : a small leaf (often different in shape and texture from the other leaves).
bracteole : a minute bract.
capsule : a dry, dehiscent fruit, usually many-seeded, of more than one carpel.
carpel : one of the divisions of the pistil (the female structure) ; sometimes one carpel forms the complete ovary.
cauline : situated on the stem ; not radical.
clavate : club-shaped.
cleistogamous : of flowers which do not open and are self-fertilized (other flowers on the same individual plant may open and be cross-pollinated).
cordate : heart-shaped.
corymb : a flat-topped racemose inflorescence. (*Tansy.*)

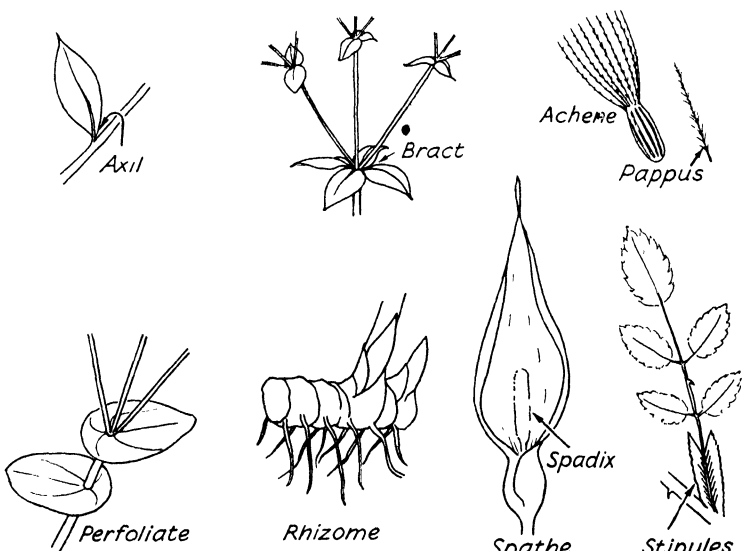


FIG. 1

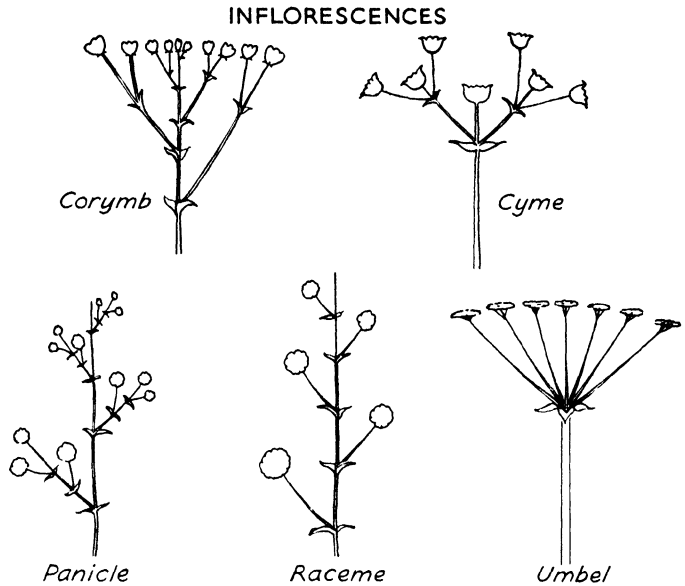


FIG. 2

cotyledon : a seed-lobe, often becoming one of the first leaves of a plant and usually differing in shape from the subsequent leaves.
cuneate : wedge-shaped.
cyme : a repeatedly forked inflorescence.
dehiscent : splitting open.
dioecious : with the male and female flowers on different individual plants.
drupe : a stone fruit, with fleshy envelope. (*Prunus.*)
epicalyx : a structure somewhat similar to and close outside the true calyx.
follicle : a dry fruit of one carpel, splitting open on one side only.
glabrous : without hairs ; hence **glabrescent**, becoming glabrous.
glaucous : of a sea-green colour, with a bluish bloom.
hastate : halberd-shaped, with two horizontal lobes.
hermaphrodite : with male and female organs in the same flower.
inflorescence : general term for the arrangement of the flowers on the flowering-stem.
internode : the portion of the stem between two nodes.
involucre : a whorl of bracts below a compact cluster or a head of flowers. (*Compositae.*)
lanceolate : lance- or spear-head-shaped.
-merous : a suffix denoting ' in parts or numbers of', e.g. **trimerous, in** threes.
monoecious : with male and female flowers on the same plane.
node : part of a stem from which a leaf or whorl of leaves spring.

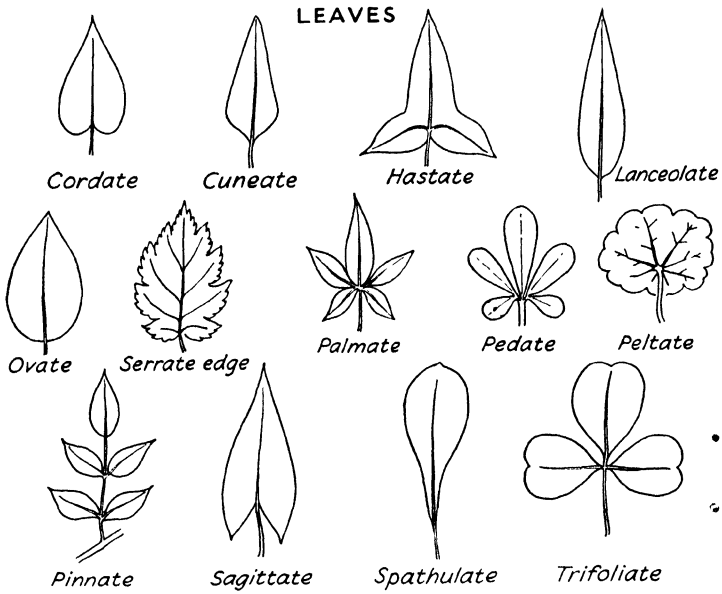


FIG. 3

ob- : a prefix meaning inversely or oppositely (e.g. **obovate**, egg-shaped but with broadest part above the middle.

ovary : a female organ containing the ovules.

ovate : egg-shaped.

ovule : a female organ containing the egg, which develops into the seed after fertilization.

palmate : with lobes spreading from the same point like the fingers of a hand.

panicle : a branched, racemose inflorescence.

pappus : the tuft of hairs on some achenes. (*Compositae.*)

pedate : palmately divided except that the lobes do not arise from the same point. (*Helleborus.*)

pedicel : the stalk of a single flower (i.e. the branch of a peduncle).

peduncle : flower-stalk common to a cluster of flowers.

peltate : with the point of attachment of the stalk not at the edge but on the lower surface of a leaf or flat organ. (*Hydrocotyle.*)

perfoliate : of a leaf through which the stem appears to pass. (*Blackstonia.*)

perianth : a floral whorl usually comprising sepals and petals when these are indistinguishable and are then termed **perianth-segments.**

pinnate : arranged with two rows of segments on opposite sides of an axis, as in a feather.

raceme : a spike-like inflorescence with the flowers on stalks ; hence **racemose.**

radical : arising from the base of the stem.
receptacle : the structure bearing the parts of the flower.
reniform : kidney-shaped.
reticulate : covered as if with a net-work.
rhizome : an underground stem which may produce both roots and shoots.
sagittate : shaped like an arrow-head. (*Saggitaria.*)
saprophyte : a plant living on dead organic matter. (*Neottia.*)
scarious : thin and membranous, not green.
serrate : toothed like a saw.
spadix : a fleshy spike. (Arum.)
spathe : a large bract enclosing a flower-cluster or a spadix. (Arum.)
spathulate : spatula- or spoon-shaped.
stellate : star-shaped, radiating from a centre.
stipule : an appendage at the base of a leaf-stalk, often leaf-like. (*Leguminocae.*)
stolon : an overground runner.
terete : round and un-furrowed.
ternate : in threes.
tomentose : densely covered with cottony hairs.
trifoliate : with three leaflets. (*Trifolium.*)
truncate : with a blunt end as though cut off. (See explanatory figure in Graminae.)
tuberculate : having tubercles or small protuberances.
umbel : an inflorescence with flower-stalks radiating from the same point, like the ribs of an umbrella. (*Umbelliferae.*)
valve : part of an organ opening as a door, especially the part of a capsule or pod opening to free the seeds.

FIGURE FOUR

(The numbers below correspond to those in brackets before the family name in the 'Recognition Key to Families'.)

Aconitum anglicum : *1*) flower (cowl-shaped) ; *2*) fruit of 3 many-seeded follicles. ***Ranunculus acris :*** *3, 4*) flowers ; *5*) fruit of 1-seeded achenes. ***Myosurus minimus :*** *6*) flower with an elongate receptacle. ***Aquilegia vulgaris :*** *7*) flower with spurred petals ; *8*) fruit of 5 many-seeded follicles. ***Fumaria officinalis :*** *9*) flower ; *10*) 2 branched stamens. ***Cochlearia officinalis :*** *11*) flower (s = sepal, p = petal, st = stamen, ps = pistil) ; *12*) fruit (silicula). ***Barbarea vulgaris :*** *13*) stamens (a = anther ; *14*) fruit (siliqua). ***Viola tricolor :*** *15, 16*) spurred flowers. ***Polygala vulgaris :*** *17*) capsule (cs) with persisting sepals 2 larger, petal-like). ***Stellaria holostea :*** *18*) flower ; *19*) capsule with persisting sepals. ***Sagina maritima :*** *20*) flower (petals are lacking) ; *21*) capsule. ***Chenopodium bonus-henricus :*** *22*) hermaphrodite flower (with stamens and pistil) ; *23*) female flower. ***Atriplex patula :*** *24*) fruit with 2 triangular, sepal-like bracts. ***Linum catharticum :*** *25*) flower ; *26*) stamens, joined into a tube at the base with tooth-like appendages between them and a pistil ; *27*) capsule with persisting sepals. ***Radiola linoides :*** *28*) flower with toothed sepals at the apex. ***Geranium sylvaticum :*** *29*) flower ; *30*) fruit (a lobed capsule, separating into 5 one-seeded portions). ***Euonymus europaeus :*** *31*) flower. ***Lotus corniculatus :*** *32*) flower (papilionate), consisting of a standard (sd), 2 wings (w) and a keel (k) ; *33*) standard ; *34*) wing ; *35*) keel ; *36*) pistil with 9 united stamens and 1 single stamen ; *37*) pod. ***Fragaria vesca :*** *38*) flower ; *39*) calyx (c) with epicalyx (e) ; *40*) fruit. ***Sedum acre :*** *41*) flower with carpels not joined together. ***Saxifraga granulata :*** *42*) flower ; *43*) flower cut lengthwise ; *44*) 2-horned capsule with a calyx. ***Epilobium montanum :*** *45*) flower ; *46*) flower from above. ***Circaea lutetiana :*** *47*) flower with ovary covered with hooks. ***Callitriche stagnalis :*** *48*) male flower, consisting of 1 stamen and 2 small bracts ; *49*) female flower with 1 carpel and 2 small bracts ; *50*) fruit (4-lobed capsule) ; *51*) cross-section of fruit. ***Cornus sanguinea :*** *52*) flower. ***Anthriscus sylvestris :*** *53*) flower ; *54*) fruit of 2 carpels, separating when ripe. ***Foeniculum vulgare :*** *55*) fruit with separated carpels. ***Euphorbia peplus :*** *56*) inflorescence with 4 large, 2-lobed disc-glands, several male flowers and a single female flower. ***Urtica urens :*** *57*) male flower ; *58*) female flower. ***Salix caprea :*** *59*) male flower ; *60*) female flower ; *61*) capsule with hairy seeds. ***Erica tetralix :*** *62*) flower ; *63*) stamen with awn-like appendages. ***Moneses uniflora :*** *64*) flower. ***Primula veris :*** *65, 66*) flowers with long and short styles, cut lengthwise (co = corolla, c = calyx, st = stamen, a = anther, f = filament, cr = carpel, sg = stigma, se = style, o = ovary) ; *67*) capsule. ***Lysimachia vulgaris :*** *68*) flower (rotate). ***Centaurium pulchellum :*** *69*) flower (funnel-shaped).

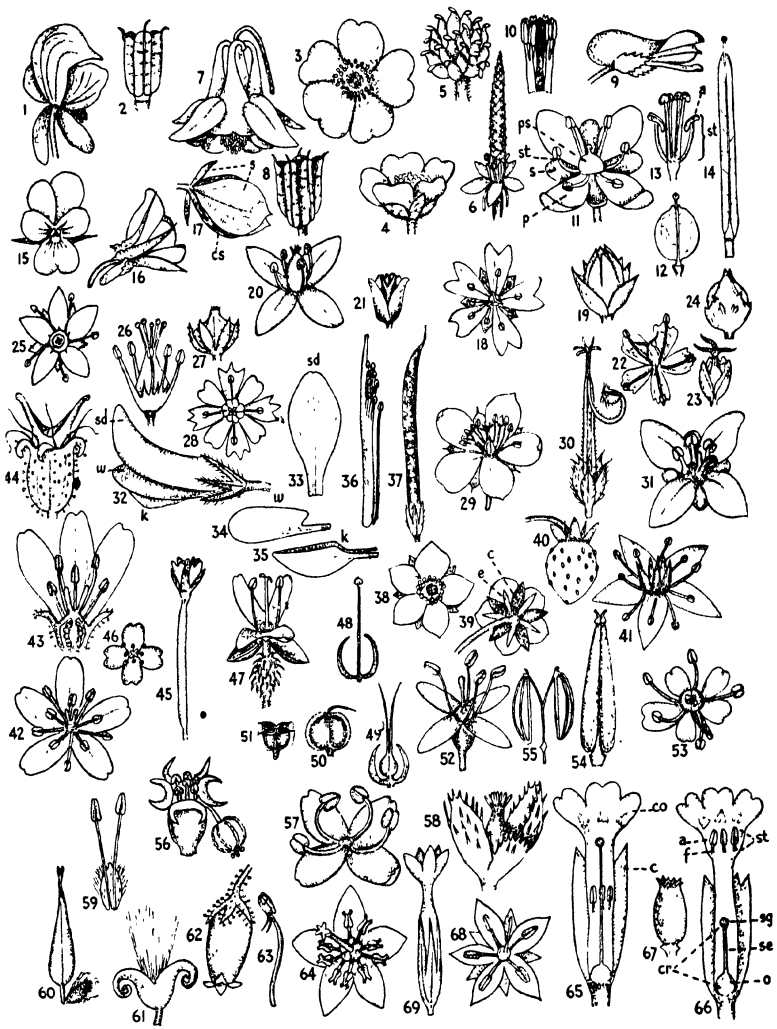


FIG. 4. Details of flowers and fruits 1–69

FIGURE FIVE

(The numbers below correspond to those in brackets before the family name in the ' Recognition Key to Families '.)

Symphytum officinale : *70*) flower (tubular-bell-shaped) with a calyx (c) and corolla (co) ; *71*) corolla laid open (scales alternating with stamens) ; *72*) pistil. ***Echium vulgare :*** *73*) flower; *74*) 4-lobed capsule, enclosed in a calyx. ***Convolvulus arvensis :*** *75*) flower (funnel-shaped). ***Solanum dulcamara :*** *76*) flower (rotate) with anthers joined by their edges into a cone ; *77*) fruit (berry). ***Verbascum thapsus :*** *78*) flower (rotate) with 3 hairy and 2 glabrous stamens ; *79*) capsule enclosed in calyx. ***Linaria vulgaris:*** *80*) flower (2-lipped, with a spur). ***Veronica chamaedrys :*** *81*) flower (rotate) ; *82*) pistil. ***Utricularia vulgaris :*** *83*) flower (2-lipped, with a spur) ; *84*) flower cut lengthwise. ***Lycopus europaeus :*** *85*) flower (funnel-shaped) ; *86*) fruit of 4 nutlets. ***Thymus serpyllum :*** *87*) flower (2-lipped). ***Teucrium scorodonia :*** *88*) flower (1-lipped). ***Plantago lanceolata :*** *89*) flower. ***Campanula rotundifolia :*** *90*) flower (bell-shaped) ; *91*) flower cut lengthwise ; *92*) capsule. ***Lobelia dortmanna :*** *93*) flower (2-lipped) ; *94*) anthers joined together in a tube round the style. ***Galium verum :*** *95*) flower ; *96*) fruit of 2 one-seeded portions. ***Viburnum lantana :*** *97*) flower (funnel-shaped) with 2 bracts at the base. ***Valeriana officinalis :*** *98*) flower (funnel-shaped tube slightly pouched at the base) with a reduced calyx, forming a feathery pappus in fruit ; *99*) fruit with a pappus. ***Scabiosa columbaria :*** *100*) flower with a cup-shaped calyx, prolonged upwards into bristle-like teeth. ***Achillea millefolium :*** *101*) head, consisting of an involucre of bracts and outer (ray-) and inner (disc-) flowers) ; *102*) ray-flower ; *103*) disc-flower) ; *104*) fruit (achene). ***Alisma plantago-aquatica :*** *105*) flower with numerous, not joined carpels in the middle ; *106*) single young carpel. ***Butomus umbellatus :*** *107*) flower with carpels in the middle. ***Hydrocharis morsus-ranae :*** *108*) male flower ; *109*) stamens ; *110*) female flower ; *111*) lobed stigma from above. ***Potamogeton natans :*** *112*) flower from the above, with 4 perianth segments, 4 anthers and a carpel. ***Ruppia maritima :*** *113*) cluster of fruits. ***Zannichellia palustris :*** *114*) inflorescence (1 male and 4 female flowers in a spathe) ; *115*) cluster of fruits (achenes). ***Narthecium ossifragum :*** *116*) flower. ***Allium vineale :*** *117*) flower ; *118*) capsule. ***Paris quadrifolia :*** *119*) flower ; *120*) fruit (berry), with persisting perianth segments. ***Luzula pilosa :*** *121*) flower ; *122*) capsule, with persisting perianth segments. ***Gymnadenia conopsea :*** *123*) flower. ***Platanthera bifolia :*** *124*) flower. ***Ophrys muscifera :*** *125*) flower. ***Sparganium simplex :*** *126*) male flower ; *127*) female flower ; *128*) fruit. ***Eriophorum angustifolium :*** *129*) flower with a perianth of numerous bristles ; *130*) fruit (nut with hairs). ***Schoenoplectus lacustris :*** *131*) flower with a perianth of 6 bristles and a glume ; *132*) fruit (nut with bristles). ***Carex arenaria :*** *133*) male flower ; *134*) female flower (both with a glume) ; *135*) fruit (nut enclosed within a perigynium). Examples of flowers with an inferior ovary are shown in the following figures : 42, 43, 45, 46, 47, 52, 53, 90, 91, 93, 95, 97, 98, 100–3, 123–5. All other flowers illustrated have a superior ovary.



FIG. 5. Details of flowers and fruits 70–135

RECOGNITION KEY TO FAMILIES

The purpose of the following key is to assist the reader in discovering the family to which a plant, unknown to him, may belong. The characters of the plants are given in two contrasting lines ; the first line is numbered on the left while the second is marked by '☆'. The reader has to choose which set of characters agrees with his plant. A bold number (e.g. **6**) on the right hand side shows which pair of lines should be referred to next, and this is then repeated until a GROUP is reached. The group is further dealt with on the page indicated by italic numerals, where the reader using the same method may arrive at the FAMILY. Each family name is followed by a number which gives the page on which the descriptions of the various species belonging to the family are set out. Numbers in brackets before the family name refer to diagram numbers in Figs. 4 and 5, showing details of flowers and fruits. These diagrams, not drawn to a uniform scale, are given to illustrate the characteristic features of the family and as examples of botanical structures (see Glossary).

It must be understood that although the groups are artificial they form an easy guide by which the plants may first be classified according to some striking characters so that the search for the family name is made considerably easier. If a plant possesses characters which are common to more than one group, it has been included under each. Thus, e.g. some aquatic plants (ALISMATACEAE, SPARGANIACEAE, CALLITRICHACEAE, SCROPHULARIACEAE) are placed not only in Group II, but also in Groups IV or V or VII. Some plants of CARYOPHYLLACEAE, LYTHRACEAE, RANUNCULACEAE, etc., which normally have sepals and petals (Group IV) are analysed also in Group VII, as at times the petals are absent. Before commencing identification the whole plant, especially its flowers, should be carefully examined, for in several families the inflorescence often resembles a single flower (e.g. heads of COMPOSITAE, EUPHORBIACEAE and DIPSACACEAE, spikelets of grasses and sedges, etc.). In some cases coloured bracts surrounding the inflorescence or flower may superficially resemble the perianth or a part of it and may not at first be apparent for what they are. Taking into account, however, that the bract is a modified leaf in the axil of which arises a flower or a branch of the inflorescence, no undue difficulty when dealing with such specimens should be experienced in running them down to their right families. Continual practice in the use of the key will soon enable the reader to dispense with it in the recognition of several families, e.g. COMPOSITAE, PAPILIONACEAE, CRUCIFERAE, LABIATAE, which have particularly distinctive characters.

The terms used in the key and in the descriptions are explained in the Glossary (pages 8 to 11).

ARTIFICIAL KEY TO FAMILIES

1. Trees or shrubs . . . . . Group I, *p. 17*
✲ Herbaceous plants 2
2. Aquatic plants with floating and/or submerged leaves. Group II, *p. 19*
✲ Land plants or plants growing in water, with at least some leaves above water 3
3. Not green plants (without chlorophyll) with scale-like leaves Group III, *p. 21*
✲ Green plants with normally developed leaves 4
4. Flowers with sepals differing in colour from petals. 5
✲ All perianth segments similar 6
5. Petals not joined together . . . . . Group IV, *p. 22*
✲ Petals joined at least at base . . . . . Group V, *p. 24*
6. Perianth corolla-like . . . . . Group VI, *p. 26*
✲ Perianth not corolla-like . . . . . Group VII, *p. 27*

GROUP I
TREES OR SHRUBS

1. Branches flattened into leaf-like, leathery, evergreen, sharply-pointed cladodes . . . . . LILIACEAE *p. 304*
✲ Branches not flattened into cladodes 2
2. Upper part of stem and branches fleshy, with numerous close joints; flowers very small, imbedded in excavations on the flowering branches CHENOPODIACEAE *p. 67*
✲ Stem and branches not fleshy; flowers not imbedded . . . 3
3. Leaves needle-like 4
✲ Leaves not needle-like 9
4. Needles broad, flattened; seed surrounded by a pink, fleshy aril TAXACEAE *p. 32*
✲ Needles narrow, not or slightly flattened; seed not surrounded by an aril 5
5. Trees . . . . . PINACEAE *p. 31*
✲ Shrubs 6
6. Needles prickly 7
✲ Needles not prickly 8
7. Flowers very small, not papilionate; fruit blue-black, berry-like CUPRESSACEAE *p. 32*
✲ Flowers conspicuous, yellow, papilionate; fruit a pod PAPILIONACEAE *p. 106*
8. Leaves whorled; flowers 4-merous; fruit a capsule [62, 63] ERICACEAE *p. 190*
✲ Leaves alternate; flowers 3-merous; fruit a black berry EMPETRACEAE *p. 196*
9. Leaves opposite 10
✲ Leaves alternate 24
10. Parasitic on branches of trees; stem green; leaves leathery, evergreen LORANTHACEAE *p. 150*
✲ Not parasitic 11
11. Climbing; fruits achenes with long, white, feathery styles, in large heads RANUNCULACEAE *p. 33*
✲ Not climbing; fruits not heads of achenes 12

12. Small shrubs 13
✲ Large shrubs or trees 16
13. Plants silvery mealy ; on muddy and sandy sea-shores CHENOPODIACEAE *p. 87*
✲ Plants not silvery mealy 14
14. Petals joined together ; stamens 8 or less 15
✲ Petals not joined ; stamens more than 8 . . . CISTACEAE *p. 70*
15. Leaves small, triangular or oval ; calyx coloured ; flowers in terminal clusters or in raceme-like inflorescences ; stamens 5 or 8 . ERICACEAE *p. 190*
✲ Leaves roundish ; calyx deciduous, not coloured ; flowers in pairs on a long stalk ; stamens 4 . . . . . CAPRIFOLIACEAE *p. 259*
16. Leaves pinnate 17
✲ Leaves not pinnate 18
17. Flowers appearing before leaves ; perianth absent . . OLEACEAE *p. 204*
✲ Plants leafy at flowering time ; with a white or yellow perianth CAPRIFOLIACEAE *p. 259*
18. Leaves palmately lobed 19
✲ Leaves simple 20
19. Trees ; flowers yellowish-green ; fruit dry, with a long wing ACERACEAE *p. 101*
✲ Shrubs ; flowers white ; the outer flowers in inflorescence sterile and much larger than the inner ; fruit a red drupe . CAPRIFOLIACEAE *p. 259*
20. Petals absent . . . . . BUXACEAE *p. 104*
✲ Petals present 21
21. Petals joined together 22
✲ Petals not joined 23
22. Corolla 4-lobed . . . . . OLEACEAE *p. 204*
✲ Corolla 5-lobed or strongly 2-lipped . . [97] CAPRIFOLIACEAE *p. 259*
23. Branches 4-angled, green ; flowers greenish ; fruit a 4-lobed, deep pink capsule with seeds enclosed in an orange aril [31] CELASTRACEAE *p. 103*
✲ Branches roundish, usually reddish ; flowers cream-coloured ; fruit a black berry . . . . . [52] CORNACEAE *p. 152*
24. Climbing by roots . . . . . ARALIACEAE *p. 153*
✲ Not climbing by roots 25
25. Leaves scale-like ; twigs falling with leaves . . TAMARICACEAE *p. 71*
✲ Leaves normal ; twigs not falling with leaves 26
26. Flowers in catkins 27
✲ Flowers not in catkins 31
27. Plants dioecious ; perianth absent 28
✲ Plants monoecious, male and female flowers in separate inflorescences ; perianth present at least in flowers of one sex 29
28. Leaves strongly aromatic, dotted with resin glands ; fruit compressed, 2-winged . . . . . MYRICACEAE *p. 182*
✲ Leaves not aromatic ; fruit a capsule ; seeds with long silky hairs [59–61] SALICACEAE *p. 187*
29. All flowers having a perianth ; fruit surrounded by a hard cup FAGACEAE *p. 186*
✲ Perianth in flowers of one sex only ; fruit not surrounded by a hard cup . 30
30. Male flowers having a perianth ; fruit flattened on the surface of a scale ; cup absent . . . . . BETULACEAE *p. 183*
✲ Perianth absent in male flowers ; fruit surrounded by a papery, leaf-like cup . . . . . CORYLACEAE *p. 184*
31. Flowers papilionate ; fruit a pod . . . . PAPILIONACEAE *p. 106*
✲ Flowers not papilionate ; fruit not a pod 32

32. Leaves fleshy, nearly round in section; plants of sea-shore and salt marshes . . . . . CHENOPODIACEAE *p. 87*
✲ Leaves flat, not fleshy 33
33. Leaves asymmetric at base; fruit compressed, broadly winged ULMACEAE *p. 181*
✲ Leaves not asymmetric; fruit not broadly winged 34
34. Flowers unisexual 35
✲ Flowers hermaphrodite 38
35. Leaves leathery, evergreen, with spiny teeth . . AQUIFOLIACEAE *p. 102*
✲ Leaves deciduous, not with spiny teeth 36
36. Leaves narrow, with silvery scales on both sides . ELAEAGNACEAE *p. 145*
✲ Leaves broad, not silvery-scaly 37
37. Leaves palmately 3–5-lobed; fruit a red berry . GROSSULARIACEAE *p. 141*
✲ Leaves entire, finely toothed; fruit a black berry . RHAMNACEAE *p. 105*
38. Stamens more than 10 39
✲ Stamens 10 or less than 10 40
39. Trees; leaves cordate; fruit a nut . . . . TILIACEAE *p. 90*
✲ Trees or shrubs; leaves pinnate or simple, but not cordate; fruits berries, drupes or groups of achenes . . . . ROSACEAE *p. 121*
40. Petals absent; sepals corolla-like . . . THYMELAEACEAE *p. 144*
✲ Petals present; sepals not corolla-like 41
41. Petals joined together 42
✲ Petals not joined 43
42. Stamens 8 or 10; anthers not joined . . . . ERICACEAE *p. 190*
✲ Stamens 5; anthers joined with their edges [76–77] SOLANACEAE *p. 221*
43. Leaves rusty tomentose below . . . . . ERICACEAE *p. 190*
✲ Leaves not rusty tomentose below 44
44. Leaves palmately 3–5-lobed . . . GROSSULARIACEAE *p. 141*
✲ Leaves not lobed 45
45. Twigs with usually 3-partite spines; leaves spinously toothed; flowers yellow; fruit a red berry . . . . . BERBERIDACEAE *p. 42*
✲ Twigs not spiny; leaves with an entire margin; flowers greenish white; fruit a black berry . . . . . RHAMNACEAE *p. 105*

GROUP II

AQUATIC PLANTS WITH FLOATING AND/OR SUBMERGED LEAVES

1. Small plants consisting of a floating discoid or a submerged oblong, toothed, stalked frond, with fine roots . . . . LEMNACEAE *p. 324*
✲ Plants not as above 2
2. Plants with floating and submerged leaves 3
✲ Plants with submerged leaves only 13
3. Floating leaves palmately lobed or cut . . . RANUNCULACEAE *p. 33*
✲ Floating leaves simple 4
4. Floating leaves round-kidney-shaped [108–111] HYDROCHARITACEAE *p. 300*
✲ Floating leaves not round-kidney-shaped 5
5. Leaves cordate or peltate, deeply cleft at the base; flowers large, about 1 inch or more across 6
✲ Leaves neither cordate nor peltate, not or weakly cleft at the base; flowers small, less than ½ inch across 7

6. Flowers single, on long stalks ; petals numerous, with an entire margin, not joined . . . . . NYMPHAEACEAE *p. 42*
✲ Flowers in clusters ; petals joined together ; corolla 5-lobed, with irregularly cut margins . . . . . MENYANTHACEAE *p. 210*
7. Floating leaves long-stalked ; flowers coloured 8
✲ Floating leaves not long-stalked ; flowers inconspicuous . . . 9
8. Plants with radical leaves ; stem not rooting at nodes ; flowers pale purplish, white or white with a dark purple patch at base, in a loose whorled inflorescence . . . . [105, 106] ALISMATACEAE *p. 298*
✲ Plants with a leafy stem, rooting at nodes ; flowers small, pink or red, in a dense spike . . . . . POLYGONACEAE *p. 175*
9. Leaves opposite ; floating leaves spathulate to ovate 10
✲ Leaves not opposite ; floating leaves neither spathulate nor ovate . 11
10. Floating leaves usually notched at the apex ; flowers unisexual, solitary or one of each sex in the axils of leaves ; fruit 4-lobed [48–51] CALLITRICHACEAE *p. 149*
✲ Floating leaves not notched ; flowers hermaphrodite, in small usually terminal clusters ; fruit a capsule, not 4-lobed . PORTULACACEAE *p. 86*
11. Stems floating ; leaves linear, thread- or bristle-like ; flowers hermaphrodite 12
✲ Stems not floating ; leaves elongate-linear, keeled or flat ; flowers unisexual, in separate globose heads . [126–128] SPARGANIACEAE *p. 325*
12. Stems and branches swollen at base ; flowers in small heads JUNCACEAE *p. 309*
✲ Stems and branches not swollen at base ; flowers in a small, terminal, always solitary spike . . . . . CYPERACEAE *p. 327*
13. Leaves divided into very narrow segments 14
✲ Leaves simple 18
14. Plants with small bladders on the green leaves or on colourless shoots [83–84] LENTIBULARIACEAE *p. 235*
✲ Bladders absent 15
15. Leaves alternate . . . . . RANUNCULACEAE *p. 33*
✲ Leaves whorled 16
16. Leaves once to thrice forked, with toothed segments ; flowers solitary in the whorls of leaves . . . . CERATOPHYLLACEAE *p. 43*
✲ Leaves pinnately divided ; flowers in inflorescences above water . 17
17. Leaf-segments very thin, round in section ; flowers inconspicuous, greenish, unisexual, in whorls in a terminal spike . MYRIOPHYLLUM *p. 148*
✲ Leaf-segments linear, somewhat flattened ; flowers large, pale purplish with a yellow throat, in a whorled raceme . . PRIMULACEAE *p. 198*
18. Leaves forming a radical rosette 19
✲ Leaves not forming a radical rosette 24
19. Small plants, less than 4 inches tall 20
✲ Large plants, more than 4 inches tall 22
20. Leaves sheathing at base ; flowers unisexual, solitary, on leafless stems which are shorter than the leaves. . . . PLANTAGINACEAE *p. 248*
✲ Leaves not sheathing at base ; flowers hermaphrodite, on leafy stems . 21
21. Plants tufted ; flowers in a raceme ; petals 4, arranged like a cross, not joined . . . . . CRUCIFERAE *p. 48*
✲ Plants creeping by runners, producing rosettes of leaves at the nodes ; flowers solitary in axils of leaves ; petals joined together ; corolla 5-lobed . . . . . SCROPHULARIACEAE *p. 223*

22. Leaves sharply toothed at edges, rigid . . HYDROCHARITACEAE *p. 300*
✲ Leaves not sharply toothed at edges, not rigid 23
23. Leaves long, ribbon-like, transversely jointed ; plants often not producing flowers . . . . . [105, 106] ALISMATACEAE *p. 298*
✲ Leaves short, linear, more or less recurved, not jointed ; plants producing 2-lipped flowers . . . [93, 94] LOBELIACEAE *p. 253*
24. Leaves 6 and more at the node . . . . HIPPURIDACEAE *p. 149*
✲ Leaves 3 or less at the node 25
25. Leaves 2–3 at the node ; margin of leaves minutely toothed . . 26
✲ Leaves opposite or alternate. 27
26. Leaves linear, apiculate, with ciliate sheaths ; flowers in axils of leaves NAJADACEAE *p. 304*
✲ Leaves oblong-lanceolate, subobtuse ; female flowers on a long, slender stalk above water, the male (very rare in Britain) usually breaking off and floating . . . . . HYDROCHARITACEAE *p. 300*
27. Leaves opposite 28
✲ Leaves alternate, sometimes involucral ones opposite . . . 31
28. Leaves long, thread-like ; flowers without a perianth, unisexual, solitary or in clusters in axils of leaves ; fruit horn-like [114, 115] ZANNICHELLIACEAE *p. 303*
✲ Leaves not thread-like ; fruit not horn-like 29
29. Leaves notched at the apex ; flowers unisexual, usually solitary in axils of leaves ; fruit 4-lobed . . . [48–51] CALLITRICHACEAE *p. 149*
✲ Leaves not notched at the apex ; flowers hermaphrodite ; fruit a subglobose capsule 30
30. Stem 4-angled ; leaves usually obovate-spathulate ; flowers usually 6-merous, solitary in axils of leaves . . . LYTHRACEAE *p. 142*
✲ Stem round ; leaves spathulate ; flowers 3–4-merous ELATINACEAE *p. 72*
31. Flowers unisexual, on one side of a flattened axis, enclosed in a leaf-sheath ; marine plants. . . . . ZOSTERACEAE *p. 302*
✲ Flowers hermaphrodite, in 2 alternating rows on axis, not enclosed in a leaf-sheath 32
32. Flowers in umbel-like clusters ; perianth absent ; each fruit on a slender stalk, which develops after flowering ; plants of salt or brackish pools [113] RUPPIACEAE *p. 303*
✲ Flowers in spikes ; perianth present ; fruits not stalked ; plants chiefly of fresh water . . . . . [112] POTAMOGETONACEAE *p. 302*

GROUP III

NOT GREEN PLANTS (WITHOUT CHLOROPHYLL) WITH SCALE-LIKE LEAVES

1. Slender, twining parasitic plants attached to the stem of the host plant by suckers ; flowers small, in lateral clusters. . CONVOLVULACEAE *p. 219*
✲ Not twining plants ; flowers large, in racemes or spikes. . . 2
2. Perianth segments not joined ; flowers in racemes ; saprophytes . 3
✲ Perianth segments joined together ; flowers 2-lipped, in one-sided racemes or spikes ; root-parasites . . . . OROBANCHACEAE *p. 233*

3. Flowers regular, 4–5-merous; inflorescence drooping in flower MONOTROPACEAE *p. 195*

✲ Flowers irregular; perianth of 6 segments, one of which is larger and different in shape from others ('lip'); inflorescence not drooping in flower. . . . . ORCHIDACEAE *p. 315*

GROUP IV

GREEN, LAND PLANTS WITH PETALS NOT JOINED TOGETHER

1. Creeping plants with peltate leaves, rooting freely at nodes HYDROCOTYLACEAE *p. 154*

✲ Leaves not peltate 2

2. Leaves 4 or more in a whorl near top of stem; flowers solitary, usually 4-merous; fruit a black berry . . [119, 120] TRILLIACEAE *p. 309*

✲ Leaves not whorled 3

3. Leaves opposite 4

✲ Leaves not opposite 18

4. Leaves fleshy 5

✲ Leaves not fleshy. 7

5. Annuals 6

✲ Perennials with runners; on sand dunes . CARYOPHYLLACEAE *p. 72*

6. Small plants; stem densely crowded with very small leaves; flowers usually 3-merous . . . . . CRASSULACEAE *p. 135*

✲ Larger plants; stem not densely crowded with leaves; basal leaves long-stalked; flowers 5-merous . . . . PORTULACACEAE *p. 86*

7. Leaves very narrow, awl-shaped or heath-like 8

✲ Leaves not narrow 9

8. Flowers pink; sepals joined together above the middle; style 1 FRANKENIACEAE *p. 71*

✲ Flowers white; sepals not joined; styles more than 1 CARYOPHYLLACEAE *p. 72*

9. Ovary inferior 10

✲ Ovary superior 11

10. Flowers in an umbel-like inflorescence, surrounded by 4 large white bracts; fruit red, berry-like. . . . . CORNACEAE *p. 152*

✲ Flowers not surrounded by white bracts; fruit a long, narrow capsule or indehiscent, covered with hooked bristles [45–47] ONAGRACEAE *p. 145*

11. Flowers yellow; stamens more than 12 12

✲ Flowers white, red or purplish; stamens 12 or less . . . 13

12. Leaves often gland-dotted; styles 3–5, not joined; stamens joined into bundles . . . . . HYPERICACEAE *p. 67*

✲ Leaves not gland-dotted; styles 0–1; stamens not joined into bundles CISTACEAE *p. 70*

13. Leaves spathulate 14

✲ Leaves not spathulate 16

14. Calyx with 6 longer and 6 shorter lobes . . LYTHRACEAE *p. 142*

✲ Calyx with 2–4 lobes 15

15. Calyx with 3–4 lobes . . . . . ELATINACEAE *p. 72*

✲ Calyx with 2 lobes, or sepals 2, not joined . . PORTULACACEAE *p. 86*

16. Flowers purple; stamens 12 . . . . . LYTHRACEAE *p. 142*
✡ Flowers not purple; stamens less than 12 17
17. Ovary 4–5-celled; stamens joined usually into a tube, with tooth-like appendages at base . . . . . [25–28] LINACEAE *p. 93*
✡ Ovary 1-celled; stamens not joined and the tooth-like appendages are absent . . . . . [18–19] CARYOPHYLLACEAE *p. 72*
18. Leaves alternate 19
✡ Stem with radical leaves or a rosette 40
19. Flowers papilionate; fruit a pod . . [32–37] PAPILIONACEAE *p. 106*
✡ Flowers not papilionate; fruit not a pod 20
20. Leaves with sheathing stipules (ochreae) . . POLYGONACEAE *p. 175*
✡ Leaves without sheathing stipules 21
21. Leaves fleshy 22
✡ Leaves not fleshy. 23
22. Petals 4, stamens 6; fruit a silicula or siliqua [11–12] CRUCIFERAE *p. 48*
✡ Petals 4–5; stamens twice as many as petals; fruit a group of follicles [41] CRASSULACEAE *p. 135*
23. Stamens more than 12. 24
✡ Stamens 12 or less 28
24. Stamens joined into a tube . . . . . MALVACEAE *p. 91*
✡ Stamens not joined 25
25. Leaves with stipules 26
✡ Stipules absent 27
26. Flowers irregular; fruit a capsule open at the top RESEDACEAE *p. 62*
✡ Flowers regular; fruit not a capsule . . . . ROSACEAE *p. 121*
27. Sepals 2, deciduous; plants with milky juice . PAPAVERACEAE *p. 44*
✡ Sepals more than 2; without milky juice . [3–6] RANUNCULACEAE *p. 33*
28. Flowers irregular, spurred 29
✡ Flowers regular, not spurred 30
29. Sepals 2, deciduous; stamens 2, divided into 3 portions; petals 4, 1 or 2 of which are spurred or pouched; leaves much divided; stipules absent . . . . . [9, 10] FUMARIACEAE *p. 46*
✡ Sepals 5; stamens 5, not divided; petals 5, only 1 spurred; leaves simple; stipules present . . . . [15, 16] VIOLACEAE *p. 63*
30. Ovary inferior or nearly inferior 31
✡ Ovary superior 34
31. Climbing by tendrils; fruit a red berry . . CUCURBITACEAE *p. 172*
✡ Not climbing by tendrils; fruit dry 32
32. Petals 4, large; fruit an elongate capsule . . ONAGRACEAE *p. 145*
✡ Petals 5; fruit not an elongate capsule 33
33. Stamens 5; fruit consisting of 2 joined 1-seeded carpels, splitting in 2 portions at maturity. . . . . UMBELLIFERAE *p. 155*
✡ Stamens 10; fruit 2-horned capsule, with numerous seeds [42–44] SAXIFRAGACEAE *p. 138*
34. Leaves compound of 3 equal, obcordate or wedgeshaped and notched leaflets . . . . . OXALIDACEAE *p. 99*
✡ Leaves not compound of 3 equal leaflets 35
35. Petals 4; stamens 6, rarely 4 . . . [13, 14] CRUCIFERAE *p. 48*
✡ Petals 5; stamens 5 or 10 36
36. Stamens 5 37
✡ Stamens 10. 39

37. Leaves pinnate or pinnately lobed; capsule 5-lobed, separating into beaked, 1-seeded portions at maturity . . . GERANIACEAE *p. 95*
✲ Leaves simple, entire; fruit not a 5-lobed capsule 38
38. Stipules present; flowers small; fruit a 1-seeded nutlet enclosed in the calyx . . . . . CARYOPHYLLACEAE *p. 72*
✲ Stipules absent; flowers large, blue; fruit a capsule with numerous, flat seeds . . . . . LINACEAE *p. 93*
39. Leaves simple; flowers greenish-white; capsule not lobed PYROLACEAE *p. 194*
✲ Leaves palmate or palmately lobed; flowers purple, reddish-purple or pink; capsule 5-lobed, separating into beaked, 1-seeded portions at maturity . . . . . [29, 30] GERANIACEAE *p. 95*
40. Leaves with long, red glandular hairs . . . DROSERACEAE *p. 141*
✲ Leaves without long, red glandular hairs 41
41. Petals 3; leaves sagittate . . . . [105] ALISMATACEAE *p. 298*
✲ Petals more than 3; leaves not sagittate 42
42. Petals 4 43
✲ Petals 5 44
43. Stamens 6, rarely 4; style 1; fruit a silicula or siliqua . CRUCIFERAE *p. 48*
✲ Stamens 4 or 8; styles 3–5; fruit a capsule CARYOPHYLLACEAE *p. 72*
44. Stamens more than 10. 45
✲ Stamens 10 or less 46
45. Leaves with stipules; flowers with a calyx and epicalyx [38–40] ROSACEAE *p. 121*
✲ Leaves without stipules; epicalyx absent . . RANUNCULACEAE *p. 33*
46. Flowers with an elongate-conical receptacle . [6] RANUNCULACEAE *p. 33*
✲ Receptacle not elongate 47
47. Fruit 2-horned capsule. . . . . SAXIFRAGACEAE *p. 138*
✲ Fruit not a 2-horned capsule 48
48. Flowers purple; fruit a 5-lobed capsule, separating into beaked, 1-seeded portions at maturity . . . . GERANIACEAE *p. 95*
✲ Flowers white, greenish-white or pinkish-tinged; fruit not as above . 49
49. Leaves compound of 3 equal, obcordate or wedgeshaped and notched leaflets . . . . . OXALIDACEAE *p. 99*
✲ Leaves not as above 50
50. Radical leaves cordate at base; stem with 1 sessile deeply cordate leaf near the base . . . . . PARNASSIACEAE *p. 140*
✲ Leaves not cordate 51
51. Leaves palmately lobed; flowers in small, head-like umbels UMBELLIFERAE *p. 155*
✲ Leaves simple, entire; flowers not in heads 52
52. Styles 3–5 . . . . . CARYOPHYLLACEAE *p. 72*
✲ Style 1 . . . . . [64] PYROLACEAE *p. 194*

GROUP V

GREEN, LAND PLANTS WITH PETALS JOINED TOGETHER AT LEAST AT BASE

1. Leaves whorled, at least the lower 2
✲ Leaves not whorled 4

2. Corolla 4–5-lobed; all leaves whorled 3
✲ Corolla 2-lipped; the upper leaves opposite . SCROPHULARIACEAE *p. 223*
3. Corolla yellow, 5-lobed; stamens 5 . . [68] PRIMULACEAE *p. 198*
✲ Corolla purple, pink or white, 4-lobed; stamens 4. . RUBIACEAE *p. 254*
4. All leaves opposite 5
✲ Leaves alternate, sometimes opposite below, or forming a rosette . 16
5. Flowers in heads with a calyx-like involucre of bracts [100] DIPSACACEAE *p. 265*
✲ Flowers not in heads with involucral bracts 6
6. Flowers regular, all corolla-lobes similar 7
✲ Flowers irregular. 12
7. Corolla funnel-shaped 8
✲ Corolla rotate 10
8. Flowers in heads or in whorls in axils of leaves [85, 86] LABIATAE *p. 238*
✲ Flowers neither in heads nor whorls 9
9. Flowers solitary or in forked inflorescences; leaves and corolla-lobes not dotted . . . . . [69] GENTIANACEAE *p. 206*
✲ Flowers in dense racemes in the axils of leaves; leaves and corolla-lobes dotted . . . . . PRIMULACEAE *p. 198*
10. Anthers joined by their edges; fruit a berry . [76, 77] SOLANACEAE *p. 221*
✲ Anthers not joined; fruit a capsule 11
11. Glaucous plants; each pair of stem leaves joined at base; corolla 5–8-lobed; stamens 6–8 . . . . . GENTIANACEAE *p. 206*
✲ Green plants; stem leaves not joined; corolla 5-lobed; stamens 5 PRIMULACEAE *p. 198*
12. Corolla lipped 13
✲ Corolla not lipped 15
13. Corolla 2- or 1-lipped; stamens 4 or 2; ovary deeply 4-lobed [87, 88] LABIATAE *p. 238*
✲ Corolla 2-lipped; stamens 4; ovary not 4-lobed 14
14. Fruit of 4 nutlets separating at maturity . . VERBENACEAE *p. 237*
✲ Fruit a capsule with numerous seeds . [80] SCROPHULARIACEAE *p. 223*
15. Corolla salver-shaped, with 5 asymmetric lobes and an obconic tube hairy within; fruit of 2 follicles; creeping plants with evergreen leaves APOCYNACEAE *p. 206*
✲ Corolla rotate, with 4 asymmetric lobes; tube very short, not hairy within; fruit a flattened capsule; leaves not evergreen [80] SCROPHULARIACEAE *p. 223*
16. Some of petals joined together 17
✲ All petals joined together, at least at base 18
17. Leaves compound, rarely simple, with stipules; flowers papilionate; fruit a pod. . . . . [32–37] PAPILIONACEAE *p. 106*
✲ Leaves simple, entire; stipules absent; flowers not papilionate; fruit a capsule, enclosed by 2 sepals, resembling petals [17] POLYGALACEAE *p. 66*
18. Leaves in one whorl of 5–6 at the top of stem, with a few small, alternate leaves below . . . . . PRIMULACEAE *p. 198*
✲ Leaves not in one whorl at the top of stem 19
19. Ovary deeply 4-lobed; fruit of 4 nutlets; plants usually hispid [70–74] BORAGINACEAE *p. 211*
✲ Ovary not 4-lobed; fruit not of 4 nutlets 20
20. Flowers regular or nearly regular. 21
✲ Flowers irregular (corolla 2-lipped) 30

21. Leaves simple 22
✲ Leaves compound 29
22. Leaves round in outline, peltate; fruit a group of follicles CRASSULACEAE *p. 135*
✲ Leaves not peltate; fruit not a group of follicles 23
23. Climbing plants with large funnel-shaped flowers, usually shallowly 5-lobed or -angled . . . . . [75] CONVOLVULACEAE *p. 219*
✲ Plants not climbing 24
24. Stamens opposite corolla-lobes 25
✲ Stamens alternating with corolla-lobes 26
25. Flowers in round heads or in terminal branched spikes; fruit dry, 1-seeded . . . . . PLUMBAGINACEAE *p. 196*
✲ Flowers in umbels, whorls, leafy racemes or solitary in axils of leaves; fruit a capsule . . . . . [65–67] PRIMULACEAE *p. 198*
26. Ovary superior; stigma 1 27
✲ Ovary inferior; stigmas 2–5 . . [90–92] CAMPANULACEAE *p. 250*
27. Stamens 4 . . . . . SCROPHULARIACEAE *p. 223*
✲ Stamens 5 28
28. Flowers in terminal racemes or panicles; filaments of all stamens or at least of three hairy; fruit a capsule . [78, 79] SCROPHULARIACEAE *p. 223*
✲ Flowers not in terminal racemes or panicles; filaments glabrous; fruit a berry or a capsule enclosed in the calyx [76, 77] SOLANACEAE *p. 221*
29. Leaves of 3 leaflets; corolla-lobes pink outside, white within, fringed with long, white hairs . . . . . MENYANTHACEAE *p. 210*
✲ Leaves pinnate; corolla blue, rarely white, not fringed POLEMONIACEAE *p. 211*
30. Corolla spurred or pouched 31
✲ Corolla neither spurred nor pouched . . [93, 94] LOBELIACEAE *p. 253*
31. Plants with sticky glands; leaves in a basal rosette; corolla spurred; flowers solitary on leafless stem . . . LENTIBULARIACEAE *p. 235*
✲ Leaves not in a basal rosette; corolla spurred or pouched; flowers solitary in axils of leaves or forming terminal racemes SCROPHULARIACEAE *p. 223*

Group VI

GREEN, LAND PLANTS WITH A COROLLA-LIKE PERIANTH

1. Flowers in heads, simulating a single large flower, surrounded by a calyx-like involucre . . . . . [101–104] COMPOSITAE *p. 267*
✲ Flowers not in flower-like heads 2
2. Leaves whorled 3
✲ Leaves not whorled 4
3. Flowers 3-merous; perianth tubular-bell-shaped; stamens 6; fruit a globose, red berry . . . . . LILIACEAE *p. 304*
✲ Flowers 4-merous; perianth small, rotate; stamens 4; fruit small, dry, 2-lobed . . . . . [95, 96] RUBIACEAE *p. 254*
4. Leaves opposite 5
✲ Leaves alternate 8

5. Ovary superior ; stamens 5 ; stems creeping and rooting ; on sea-shores. . . . . PRIMULACEAE *p. 198*
✲ Ovary inferior ; stamens less than 5 ; stems erect, not rooting . 6
6. Leaves with simple (unbranched) nerves ; perianth segments 6, one of the perianth segments differing from the others in size and shape (' lip ') ; fruit a capsule . . . . . ORCHIDACEAE *p. 315*
✲ Leaves with pinnate nerves ; perianth segments less than 6 ; fruit not a capsule 7
7. Perianth segments not joined ; stamens 2 ; fruit dry, 1–2-seeded, covered with bristles . . . . . [47] ONAGRACEAE *p. 145*
✲ Perianth segments joined together ; corolla 5-lobed ; stamens 3 or 1 ; fruit not as above . . . . [98, 99] VALERIANACEAE *p. 263*
8. Leaves with sheathing stipules (ochreae) . . POLYGONACEAE *p. 175*
✲ Leaves without sheathing stipules 9
9. Leaves with simple (unbranched) nerves, flowers usually 3-merous . 10
✲ Leaves with pinnate or palmate nerves. 14
10. Ovary inferior 11
✲ Ovary superior 13
11. Flowers irregular ; one of the perianth segments differing from the others in size and shape (' lip '), sometimes with a spur [123–125] ORCHIDACEAE *p. 315*
✲ Flowers regular 12
12. Stamens 3 . . . . . IRIDACEAE *p. 313*
✲ Stamens 6 . . . . . AMARYLLIDACEAE *p. 311*
13. Leaves triangular ; stamens 9 ; fruit a cluster of carpels [107] BUTOMACEAE *p. 299*
✲ Leaves not triangular ; stamens less than 9, usually 6 ; fruit a capsule or berry . . . . . [116–118] LILIACEAE *p. 304*
14. Stamens more than 12 ; perianth sometimes with joined segments, spurred . . . . . [1, 2, 7, 8] RANUNCULACEAE *p. 33*
✲ Stamens 12 or less 15
15. Ovary inferior ; flowers regular ; fruit of 2 indehiscent carpels, separating when ripe . . . . [53–55] UMBELLIFERAE *p. 155*
✲ Ovary superior ; flowers irregular, spurred ; fruit not as above . 16
16. Leaves simple ; sepals usually 3, petal-like, one of which large, spurred ; fruit a capsule bursting into 5 portions which roll inwards BALSAMINACEAE *p. 100*
✲ Leaves much divided ; sepals 2, deciduous, not spurred ; one of petals spurred ; fruit not as above. . . . [9, 10] FUMARIACEAE *p. 46*

GROUP VII

GREEN, LAND PLANTS WITH A PERIANTH, NOT COROLLA-LIKE

1. Grass-like plants with linear leaves ; stamens usually 3 or 6 . . 2
✲ Plants not grass-like 9
2. Flowers in spikelets ; perianth strongly modified 3
✲ Flowers not in spikelets ; perianth of 3 or 6 segments . . . 4

3. Flowers with 2 bracts ; stem with hollow internodes ; leaves jointed at the junction with the sheath . . . . . GRAMINEAE *p. 332*

✲ Flowers with 1 bract ; stem solid ; leaves not jointed at the junction with the sheath . . . . . [129–135] CYPERACEAE *p. 327*

4. Flowers unisexual, the male and female in separate inflorescences or parts of the same inflorescence 5

✲ Flowers hermaphrodite. 6

5. Flowers in globose heads, of which the upper are male (smaller) and the lower female (larger) . . . [126–128] SPARGANIACEAE *p. 325*

✲ Flowers in large, dense, dark brown, cylindrical spikes, the male above and the female below . . . . . TYPHACEAE *p. 326*

6. Aromatic plants with sword-shaped leaves ; flowers in a small fleshy inflorescence (spadix) on one side of a flattened leaf-like stem ARACEAE *p. 323*

✲ Plants not aromatic ; leaves not sword-shaped 7

7. Perianth segments brownish, dry ; flowers in heads and in dense or loose cymes ; fruit a capsule . . . . [121, 122] JUNCACEAE *p. 309*

✲ Perianth segments greenish or yellowish, not dry ; flowers in racemes and spikes ; fruit a cluster of carpels 8

8. Stem leafy ; flowers long-pedicelled, in racemes, having bracts SCHEUCHZERIACEAE *p. 301*

✲ Stem not leafy ; flowers short-pedicelled, in racemes or spikes ; bracts absent . . . . . JUNCAGINACEAE *p. 301*

9. Leaves reduced 10

✲ Leaves not reduced 11

10. Leaves small, white, scale-like ; branches green, needle-like, in whorls LILIACEAE *p. 304*

✲ Leaves absent ; stem and branches fleshy, with numerous close joints CHENOPODIACEAE *p. 87*

11. Leaves whorled, 6–12 in a whorl ; flowers small, with reduced perianth, in the axils of emerged leaves ; in water or in wet places HIPPURIDACEAE *p. 149*

✲ Leaves not whorled 12

12. Leaves opposite, at least the lower 13

✲ Leaves not opposite 23

13. Leaves simple, with an entire margin 14

✲ Leaves compound, lobed or with toothed margin 19

14. Leaves large, with curved, unbranched nerves ; flowers with a perianth of 6 segments, one of which forming a lip . . ORCHIDACEAE *p. 315*

✲ Leaves small, with branched nerves ; flowers not lipped . . 15

15. Leaves usually spathulate 16

✲ Leaves not spathulate 17

16. Leaves usually notched at the apex ; stipules absent ; flowers unisexual ; fruit 4-lobed . . . . [48–51] CALLITRICHACEAE *p. 149*

✲ Leaves not notched at the apex ; stipules present, very small ; flowers hermaphrodite ; fruit a globose capsule . . LYTHRACEAE *p. 142*

17. Leaves in 4 rows ; plants with milky juice . . EUPHORBIACEAE *p. 173*

✲ Leaves not in 4 rows ; milky juice absent 18

18. Flowers sessile, unisexual ; female enclosed into 2 triangular bracts ; fruit an achene . . . . . [24] CHENOPODIACEAE *p. 87*

✲ Flowers pedicelled, hermaphrodite, not enclosed in bracts ; fruit a capsule or 1-seeded nutlet. . . [21] CARYOPHYLLACEAE *p. 72*

19. Leaves compound of three 3-lobed, stalked leaflets; flowers in small heads . . . . . ADOXACEAE *p. 262*
✲ Leaves simple 20
20. Flowers hermaphrodite; leaves round in outline, usually sinuate-toothed . . . . . SAXIFRAGACEAE *p. 138*
✲ Flowers unisexual; leaves not as above 21
21. Twining plants; leaves palmately lobed . . CANNABINACEAE *p. 180*
✲ Plants not twining; leaves toothed 22
22. Plants with stinging hairs; perianth segments 4 . URTICACEAE *p. 179*
✲ Stinging hairs absent; perianth segments 3 . [56] EUPHORBIACEAE *p. 173*
23. Leaves in a rosette 24
✲ Leaves alternate 29
24. Flowers solitary; leaves very narrow 25
✲ Flowers in inflorescences; leaves broader 26
25. Perennial plants with far creeping runners, producing leaf-rosettes at nodes; flowers unisexual, on leafless stems which are shorter than the leaves . . . . . PLANTAGINACEAE *p. 248*
✲ Annual plants without runners; flowers hermaphrodite, with an elongate-conical receptacle; leafless stems longer than the leaves [6] RANUNCULACEAE *p. 33*
26. Flowers in panicles, spikes or ovate heads 27
✲ Flowers in small, globose heads with lead-coloured bracts ERIOCAULACEAE *p. 304*
27. Perianth segments 6, one forming a lip. . . ORCHIDACEAE *p. 315*
✲ Perianth segments 4, not lipped 28
28. Leaves kidney-shaped; flowers in a loose panicle; fruit broadly winged . . . . . POLYGONACEAE *p. 175*
✲ Leaves not kidney-shaped; flowers in dense spikes or ovate heads; fruit a capsule, not winged . . . . [89] PLANTAGINACEAE *p. 248*
29. Twining plants with entire, cordate leaves . . DIOSCOREACEAE *p. 314*
✲ Plants not twining 30
30. Flowers in heads, simulating a single large flower, surrounded by calyx like involucre . . . . . COMPOSITAE *p. 267*
✲ Flowers not in flower-like heads 31
31. Leaves with sheathing stipules (ochreae) . . POLYGONACEAE *p. 175*
✲ Leaves not with sheathing stipules 32
32. Leaves narrow 33
✲ Leaves broad 34
33. Plants with yellowish-green, not fleshy leaves; flowers in terminal racemes . . . . . SANTALACEAE *p. 151*
✲ Plants with glaucous-green, often reddish tinged, fleshy leaves; flowers in small clusters in axils of leaves. . . . CHENOPODIACEAE *p. 87*
34. Leaves with simple (unbranched) nerves 35
✲ Leaves with branched nerves 36
35. Flowers in a dense, fleshy spike (spadix), surrounded by a yellowish-green, sometimes purplish-spotted spathe; leaves triangular-hastate, appearing in spring . . . . . ARACEAE *p. 323*
✲ Flowers in loose, not fleshy spike, not surrounded by a spathe; leaves oblong-ovate or lanceolate . . . . . ORCHIDACEAE *p. 315*
36. Leaves simple, lobed or divided 37
✲ Leaves compound 43

37. Leaves pinnately nerved **38**
✲ Leaves palmately nerved **42**
38. Plants with milky juice ; flowers unisexual, reduced, in a flower-like cluster, surrounded by an involucre with several yellow glands [56] EUPHORBIACEAE *p. 173*
✲ Plants without milky juice ; inflorescence not as above . . . **39**
39. Flowers in a raceme **40**
✲ Flowers in small clusters arranged in branched inflorescence . . **41**
40. Stamens 6 ; fruit a flattened, ovate silicula, notched at the top, not open before maturity . . . . . CRUCIFERAE *p. 48*
✲ Stamens more than 6 ; fruit a nearly globular capsule, open at top long before maturity . . . . . RESEDACEAE *p. 62*
41. Softly hairy perennials ; leaves herbaceous, entire ; flowers 4-merous [57–58] URTICACEAE *p. 179*
✲ Glabrous, mostly annuals ; leaves somewhat fleshy, usually lobed or toothed ; flowers mostly 5-merous . [22–23] CHENOPODIACEAE *p. 87*
42. Leaves kidney-shaped or cordate ; stipules absent ; stamens twice as many as perianth segments ; fruit a capsule . . SAXIFRAGACEAE *p. 138*
✲ Leaves palmately lobed or divided ; stipules leaf-like ; stamens as many as perianth segments or less . . . . ROSACEAE *p. 121*
43. Leaves once-pinnate ; stipules leaf-like ; flowers in heads ROSACEAE *p. 121*
✲ Leaves 2–3-pinnate ; stipules absent ; flowers not in heads . . **44**
44. Flowers in clustered panicles or racemes ; stamens more than 5, spreading and providing the colour of flowers . RANUNCULACEAE *p. 33*
✲ Flowers in compound umbels ; stamens 5, not providing the colour of flowers . . . . . UMBELLIFERAE *p. 155*

SUB-DIVISION: GYMNOSPERMAE

CLASS : CONIFERAE

Spermataphyta (Seed Plants), the only kind covered in this book, are divided into *Gymnospermae* and *Angiospermae*. The former have seeds unenclosed by an ovary ; the latter have the ovule enclosed in an ovary. The Gymnospermae are the older and smaller sub-division. In Britain the only native Class in this sub-division consists of the *Coniferae*, and of this class only 3 genera are truly indigenous.

THE PINE FAMILY

PINACEAE

Evergreen trees, usually found in poor, dry, porous soils. Generally grow in ' pure ' or unmixed forests, and are truly wild only in Scotland. Trees have high resin content.

PINUS

SCOTS PINE *Pinus sylvestris*

Evergreen tree, occurring wild in a few forests in Scotland, frequently planted and naturalized elsewhere in the British Isles. Grows 50–100 feet high, flowers May and June, matures 70–100 years old. Outline at first conical, but flat-topped with maturity. Trunk straight, up to 12 foot girth, with insignificant, slender twigs. Upper part of trunk copper-coloured. Pointed, blue-green, needle-like leaves are very finely toothed and grooved ; in pairs, 2–3 inches long, on short shoots. Separate male and female flowers in cones on same tree. Yellow, egg-shaped male cones release clouds of pollen on wind. Female cones, 2½ inches, purplish and erect, but after fertilization greyish brown and pendulous. Small winged seeds generally drift beyond shade of parent tree. Pine is a ' soft wood ', timber being valued for manufacture and firewood. *Pinus* derived from Greek name ; *sylvestris*, of woods.



SCOTS PINE
Pinus sylvestris
(A) Seed (B) Old cone
(C) Male flower
(D) Female flower
(E) Male catkin
(F) Ripe cone

THE CYPRESS FAMILY

CUPRESSACEAE

The members of this family are distinguished from Pines in having leaves and cone scales in whorls, instead of singly in spirals. Ovules erect instead of inverted.

JUNIPERUS

JUNIPER [Pl. 14] *Juniperus communis*

Evergreen shrub, or small tree, locally common on mountains and sunny slopes of chalk downs. Grows up to 10 feet; flowers April and May. Stem short, usually erect, but often prostrate in exposed situations. Bark stringy and reddish brown. Rigid narrow leaves, usually in whorls of 3, are sharply pointed, ¼–¾ inch long, green below, glaucous above. Male and female flowers on separate plants. Male: small, yellow, oblong cones, several stamens, 3 in each whorl. Female: budlike, with upper whorl of fleshy scales which after fertilization form a small blue-black, soft, juicy berry-like fruit. Hard bony seeds dispersed by birds. Fruit yields medicinal oil; also used for flavouring gin. *Juniperus* is the classical name; *communis*, common.

THE YEW FAMILY

TAXACEAE

TAXUS

YEW [Pl. 14] *Taxus baccata*

Small evergreen tree, common in old churchyards and in a few places on southern downs. Grows up to 30 feet; flowers February to June. Old trees have fluted trunks of great girth, developed from deep, branching roots. Bark rosy, flaking. Leaves narrow, dark green, leathery, pointed, ½–1½ inches, in two apparently opposite rows on shoot. Inconspicuous, male and female flowers usually on separate trees. Male: yellow, globular, with pollen sacs that rupture in dry weather. Female: naked ovules surrounded by small green scales, receiving wind-blown pollen. Fruit: after fertilization seed is surrounded by a fleshy, pink, sweet, cup-shaped aril, attracting birds which ensure seeds' dispersal. Produces new shoots from dormant and secondary buds, thus useful for topiary work. All green parts highly poisonous. Tough, insect-proof wood contains no resin, takes high polish, gives out great heat when burnt, and is more durable than any other European wood. Trees live for several thousand years. *Taxus* probably from Greek *toxon*, a bow, the wood formerly being much used in the manufacture of bows; *baccata*, berried.

SUB-DIVISION: ANGIOSPERMAE

CLASS: DICOTYLEDONES

THE BUTTERCUP FAMILY

RANUNCULACEAE

leven common native genera ; all but one (Traveller's Joy) herbaceous, usually with alternate leaves. Most species perennial and acrid. Perianth undifferentiated or of distinct sepals and petals, usually with honey-gland at base. Stamens numerous ; fruit usually 1 or more follicles, a cluster of achenes, or berries.

Term ' Buttercup ' applied impartially to several golden flowered species of Ranunculus. The name ' Crowfoot ', sometimes an alternative, refers to divided leaves.

CALTHA

Genus *Caltha* comprises some 16 semi-aquatic species in all, only 1 British.

MARSH MARIGOLD [Pl. 2] *Caltha palustris*

A striking perennial of marshes and wet meadows. Grows 1 foot high ; flowers March to May or later. Tap-root replaced by bunch of unbranched, fleshy root fibres, with main stem forming short, horizontal rhizome. Thick, hollow, spreading, aerial stems have long-stalked, kidney-shaped, glossy, glabrous leaves, with toothed stipules. Flowers few, large (up to 2 inches across), burnished gold, fragrant. Petals absent ; replaced by 5–8 yellow sepals. Numerous stamens surround 5–10 carpels, which secrete much nectar. Fruit: follicles which when ripe split down the side and release double row of seeds.

Other names : Kingcup, Horse Buttercup, Gilty-cup, Gowan, Gowland, Golland, Blobs, Water-blob, May-blob, Mary-blob, Mary-bud, Bassinet, Soldier's Button. Poisonous and avoided by cattle, but pickled flower buds sometimes used as capers. *Caltha* from Greek *kalathos*, a cup ; *palustris*, of marshes.



MARSH MARIGOLD
Caltha palustris
(A) Ripe seed follicles (B) Root

TROLLIUS

Genus *Trollius* consists of about a dozen species—only 1 British.

GLOBE-FLOWER [Pl. 2] *Trollius europaeus*

The Globe-flower is a perennial herb forming large tufts in moist ground in mountains of Wales, Northern England and Scotland. Not common. Grows up to 2½ feet high ; flowers June to August. Short thick rhizome sends up separate leaf-stalks, whose leaves are large, roundish in outline, 3–5-lobed, coarsely toothed. Stem leaves similar but smaller and sessile, usually 3-lobed. Flowers solitary, terminal, globular, pale yellow, slightly fragrant, 1½ inches across. Sepals, about 10, concave, overlapping, concealing equal number of insignificant, strap-shaped nectaries. Many stamens surround at least 5 beaked carpels, and mature simultaneously with stigmas. Insect visitors few ; flowers probably frequently self-pollinated. Fruit : transversely wrinkled follicles each containing 2 rows of 3-sided, black seeds. *Trollius* from Latinized form of old German word *Trol*, a bowl ; *europaeus*, European.

HELLEBORUS

STINKING HELLEBORE *Helleborus foetidus*

Uncommon perennial herb of chalky soil in S., W. England and Wales up to 3 feet high ; flowers February to April. Robust, over-wintering branched leafy stem arises from a stout blackish rhizome. No radical leaves. Lower stem leaves long-stalked, sheathing at the base, pedate, with 3–9 segments ; other stem leaves with enlarged sheaths and reduced blades, becoming bract-like towards the top. Flowers numerous, in loose panicles. Sepals 5, large yellowish-green, tinted purple, petaloid, concealing minute 5–10 green nectaries. Numerous stamens surround 2–5 carpels. After fertilization nectaries and stamens fall, sepals spread out. Fruit : many-seeded follicles. Highly poisonous and cathartic, with offensive smell. Root formerly used for settering cattle—hence popular name. Also called Setterwort. *Hellebore* is from Greek *elein*, to injure, and *bora*, food, indicating its poisonous qualities ; *foetidus*, evil smelling.

GREEN HELLEBORE, or BEAR'S FOOT *Helleborus viridis*

Much rarer native species found occasionally in S. England on chalky soil ; flowers February to April. About 1 foot high. Differs from Setterwort in having, usually, 2 radical leaves, palmately-lobed upper stem leaves, 2–4 flowers, and in greenish-yellow more spreading sepals. Extremely poisonous ; *viridis*, green.

ACONITUM

MONKSHOOD *Aconitum anglicum*

A perennial 1½–3 feet ; local on shady streamsides in Wales and the South-West, flowering May and June. Stem erect, with stout, blackish rootstock and deeply divided soft leaves. Recognized by its tall spike of bluish-mauve, cowl-shaped flowers. The fruit consists of 3 many-seeded follicles. Poisonous. *Aconitum*, from *akoniton*, is the classical name ; *anglicum*, English.

ACTAE.1

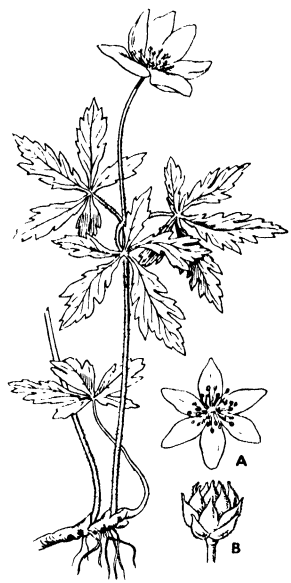
BANEBERRY, HERB CHRISTOPHER — *Actaea spicata*

A very local perennial on limestone in N. England. Erect stem 1–2 feet, with stout, blackish rhizome ; leaves toothed and divided into 3 segments. The spike of oval fruits, shining black when ripe, is more conspicuous than when in flower. Sepals and petals small, whitish. Fruit, a berry with several seeds. Poisonous. *Actaea* derived from *aktea*, elder-tree, because of similarity in leaf-shape ; *spicata*, spike-like.

ANEMONE

WOOD ANEMONE — *Anemone nemorosa*

Small, beautiful perennial, in woodlands throughout country. Reaches 8 inches ; flowers March to June. Rhizome short, slender, black, woody, perennial, nearly cylindrical, and horizontal in direction. Radical leaves on slender stalks, sent up some distance from flower-stalks, are 3-lobed, the lobes further divided into toothed segments, green. Three stalked, involucral bracts, halfway up flower-stalk, closely resemble true leaves. Flowers white, sometimes tinged pink or purple, hairless, eventually spread horizontally. Petals absent, replaced by 5–9 oblong sepals. Cluster of pistils surrounded by numerous stamens ; carpels short, beaked and downy. Flowers may often be self-pollinated. Fruit : single-seeded achenes, in a globular cluster. Also called Windflower, because it is supposed that flowers do not expand until blown by wind. Generic name from Greek *anemos*, wind ; *nemorosa*, of the woods.



WOOD ANEMONE
Anemone nemorosa
(A) Full flower
(B) Fruit

PASQUE FLOWER [Pl. 1] — *Anemone pulsatilla*

Much rarer, beautiful species found only in E. England on chalk downs and limestone pastures. Perennial, 8 inches high ; flowers April and May. Stout woody rootstock grows deeply into ground. Whole plant grey and silky, with long soft hairs. Narrowly divided radical leaves in rosette at base of flower-stalk ; involucre, resembling leaves, just below flower. Flowers purple. Petals absent, but 6-pointed sepals, in 2 whorls of 3, form long bell-shaped tube with abundant honey. Stamens numerous, topped with golden anthers surrounding numerous carpels. After flowering sepals fall, peduncle elongates and bears head of single-seeded achenes, each with long feathery tail. Drug *pulsatilla* originally came from leaves.

Pulsatilla from *pulsare*, to beat ; possibly same significance as *anemos*, wind. ' Pasque ', Eastertide, with reference to flowering season.

CLEMATIS

Clematis is represented in this country by only one native species, being also the only shrub among the *Ranunculaceae*.

TRAVELLER'S JOY [Pl. 2] *Clematis vitalba*

Clematis vitalba is a climbing perennial shrub abundant on chalky soils in hedgerows south of the Midlands. Flowers July to September. Young stems dark olive-green, slightly downy. Plant climbs over other shrubs and hedges by means of leaf-stalks used as tendrils ; grip is tight and may sometimes strangle supporting plant. Leaves in opposite pairs divided into 5 or more leaflets on long, slender stalks. Flowers greenish to cream-white, honeyless, slightly scented. Absent petals replaced by 4–6 thick, downy sepals. Stamens and carpels numerous ; styles long and thread-like. In autumn each little shaggy achene in fruit ends in long, curling, white plume, giving dense white feathery effect. Many local names—Old Man's Beard, Virgin's Bower, White Vine, Grey-beards, Snow-in-Harvest, Hag-rope, Bindwith, Withybind, Smoke-wood, Smoking-cane. Extremely acrid ; wood used in basket-making and rustic pipe stems. *Clematis* from Greek *klema*, vine, twig or tendril ; *vitalba* from *vitis*, vine, and *alba*, white.

RANUNCULUS

MEADOW, COMMON, or UPRIGHT BUTTERCUP [Pl. 2] *Ranunculus acris*

Erect perennial of meadows and pastures ; 6–36 inches high ; flowers June and July. Rootstock stout, not stoloniferous ; stem erect, much-branched, with lower leaves, long-stalked, intricately divided. Foliage softly hairy. Flowers golden yellow, on unfurrowed hairy stalks. Sepals 5, hairy. Petals 5, broad, nearly flat when fully open. Fruit is a cluster of dry, 1-seeded achenes, with a short horned beak. Extremely acrid. *Ranunculus*, Latin for little frog ; *acris*, sharp to the taste.

CREEPING BUTTERCUP [Pl. 2] *Ranunculus repens*

Small creeping perennial of cultivated fields and waste grassland ; stems 1–2 feet long ; flowers May to August. Stem and foliage similar to *R. acris*, but rootstock is stout, with long, quickly-rooting runners forming new plants. Difficult to eradicate. Terminal leaf-segment stalked ; flower-stalk hairy, furrowed. Flowers similar to others with rather spreading sepals and petals, followed by single-seeded achenes. *repens*, creeping.

BULBOUS BUTTERCUP *Ranunculus bulbosus*

Erect, hairy perennial, common in meadows. Grows 6–12 inches high ; flowers April to July. Identified by turnip-shaped swellings at base of stem which form loose bulb and act as food store. No runners sent out. Aerial stem erect, with toothed leaves divided into 3-stalked segments. Flowers golden on hairy furrowed stalks ; petals cup-shaped ; sepals reflexed. Fruit is a cluster of 1-seeded carpels ; browsing animals repelled by acridity. *bulbosus*, bulbous.

CORN BUTTERCUP *Ranunculus arvensis*

Annual cornfield weed, 1–2 feet high; flowers May to July. Root fibrous, stem erect, branching, with pale green leaves, deeply lobed. Flower-stalks hairy, unfurrowed. Flowers light golden; sepals spreading, hairy; carpels and stamens relatively few. Achenes flattened, with hooked prickles to aid in dissemination. Also called Corn Crowfoot, Hungerweed. Very acrid; often ripens with corn. *arvensis*, of cultivated fields.

HAIRY BUTTERCUP *Ranunculus sardous*

Uncommon annual of damp ground and ditches. Grows 6–18 inches high; flowers June to October. Stems several, erect, with divided leaves. Flowers numerous, paler than other Buttercups; sepals reflexed; furrowed flower-stalks extremely hairy. Achenes compressed, with small warts near margins. *sardous* is the classical name.



HAIRY BUTTERCUP
Ranunculus sardous
(A) Fruit

SMALL-FLOWERED CROWFOOT *Ranunculus parviflorus*

Another rare annual, on sunny dry banks. 6 inches high; flowers May to August. Stem much-branched, spreading, with round, segmented leaves. Small yellowish flowers with 3–5 petals. *parviflorus*, small-flowered.

GOLDILOCKS *Ranunculus auricomus*

Common perennial thriving in rich leaf-mould on sunny banks and in dry copses. Grows 1 foot high; flowers April and May. Rhizome short, with numerous fibrous rootlets; aerial stem much-branched with orbicular, 3–7-lobed lower leaves on long usually downy stalks; upper leaves deeply segmented. Flower stalks not furrowed. Flowers numerous, pale yellow, ¾ inch across; sepals downy spreading; petals 5, often incomplete, defective or entirely absent. Achenes compressed, stalked. Also called Wood Crowfoot. *auricomus* from Latin *aurea*, golden, and *coma*, hair, from general yellow effect.

GREAT SPEARWORT [Pl. 2] *Ranunculus lingua*

Much rarer perennial of marshes, ditches and lake margins; 2–4 feet high; flowers June to September. Thick, hollow green stems. Submerged leaves 7–9 inches, green, hairless, ovate to oblong, sheathed at base. Aerial leaves 6–10 inches, on very short stalks, acutely lance-shaped, erect, leathery and sometimes hairy. Flower stalks not furrowed, hairy. Flowers handsome creamy yellow, 1–2 inches across, with very glossy petals. Carpels numerous; nectar abundant. Fruit: single-seeded achenes with broad, strong, slightly hooked beak. One of the loveliest



LESSER SPEARWORT
Ranunculus flammula
(A) Root

species. 'Spearwort' refers to the shape of the leaves. *lingua*, tongue, from shape of upper leaves.

LESSER SPEARWORT *Ranunculus flammula*

Variable perennial in ditches and wet ground; 6–18 inches high; flowers May to September. Dense mass of fibrous roots, suited to muddy situations, sending up branching, ribbed stems, at first prostrate, rooting at lower joints, later erect. Lower leaves on long stalks, oval smooth, slightly toothed. Upper leaves sessile, lance-shaped, narrower, entire. Flowers numerous, ¾ inch across; sepals 5, erect; petals 5, shining golden; Carpels numerous. Stigmas mature before anthers. Fruit: single-seeded achenes. Self-fertilization, though not usual, is possible. *flammula*, little flame, with reference to marked acridity of foliage.

SNAKE TONGUE or SERPENT'S TONGUE SPEARWORT *Ranunculus ophioglossifolius*

Rare marsh annual, 1 foot high, flowering June to August. Slender 8-inch stem at first prostrate, then erect, with long-stalked, heart-shaped leaves. Flowers yellow, small and numerous. *Ophioglossifolius*, ophioglossum-leaved, from the resemblance of leaves to adder's-tongue fern, *Ophioglossum*.

CELERY-LEAVED BUTTERCUP *Ranunculus sceleratus*

Uncommon annual of ditches and wet ground. Grows up to 2½ feet high; flowers April to September. Stem thick, hollow, with lower leaves on long stalks, upper ones becoming sessile. Leaves glossy, smooth, bright green. Flowers small, pale yellow, freely produced. Sepals reflexed, yellowish green; petals spreading, with easily accessible nectary; carpels numerous, stigmas ripening first. Achenes single-seeded. The extremely poisonous acrid juices were formerly used by beggars to induce sores. *sceleratus*, infamous, harmful.

IVY-LEAVED CROWFOOT *Ranunculus hederaceus*

Annual in ditches and wet ground, growing a few inches high; flowering May to July. Stems root readily at nodes. Long stalks, sheathed at base, bear kidney-shaped, fleshy, green leaves, shallowly 5–7-lobed, with lobes broadest at their base. Flowers rather small, solitary, on shorter stalks, with 5 green sepals, 5 white petals. Stamens few, carpels more numerous.

Self-pollinating. Fruit : transversely wrinkled achenes on a glabrous receptacle. *hederaceus*, ivy-like.

Related species, with no finely dissected submerged leaves, are the following : *R. lenormandi* (Lenormand's Water Crowfoot), with the leaf lobes narrowest at their base ; *R. lutarius* (Mud Crowfoot), with a hairy receptacle and deeply-lobed leaves.

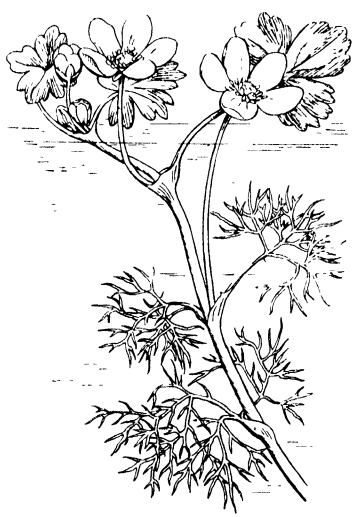


IVY-LEAVED CROWFOOT
Ranunculus hederaceus
(A) Stem roots at node
(B) Fruit
(C) Individual achene
(D) Flower

WATER CROWFOOT

Ranunculus aquatilis

This, in a broad sense, is a group of aquatic, mostly perennial plants, growing in ponds, ditches and rivers, flowering in summer, with underwater stems that may reach some feet in length. The submerged leaves are extremely finely dissected ; floating leaves, when present, are broadly lobed ; flowers, borne singly above the surface, are white with spreading petals and the fruits are heads of achenes. Known to botanists as an aggregate species, the component segregates vary in dissection of leaf, flower size, hairiness of achenes and other details but the group is not difficult to recognize. *aquatilis*, aquatic.



WATER CROWFOOT
Ranunculus aquatilis

LESSER CELANDINE [Pl. 2]

Ranunculus ficaria

Beautiful perennial, common in hedgerows and sunny banks. Grows 6 inches high ; flowers February to May. Root is cluster of stout, unbranched fibres with numerous, white, fig-shaped tubers, up to 1 inch long. Stem short, may be erect, with pairs of stalked leaves, or prostrate rooting at nodes. Small bulbils sometimes in leaf axils. Leaves very variable, mainly heart-shaped, wavy at edges ; glossy bright green, sometimes stained purplish black, with membranous sheath at base. Flowers brilliant golden star-like, on long stalks, 1 inch across. Usually 3 greenish sepals, 9 golden petals. Open about

9 a.m., close about 5 p.m. Honey gland, covered by scale, visited by short-tongued insects. Stamens mature before carpels are receptive. Propagation usually by root tubers and axillary bulbils. Fruit : the numerous, slightly downy achenes are often abortive. Also called Fig-wort, Pilewort—from tubers. Leaf acridity largely disappears with boiling ; cooked as spinach on Continent. As weed may be eradicated by dressing ground with wood or coal ashes. *ficaria*, fig-like.

MYOSURUS

MOUSE-TAIL *Myosurus minimus*

Rare annual (only native member of genus) of cultivated land in E. and S.E. England. Grows 2–6 inches high ; flowers April to June. Leaves erect, narrow, smooth, fleshy, direct from rootstock. Numerous axillary leafless flower-stalks, also direct from rootstock, end in single terminal small, yellowish flower. Sepals 5, narrow, spurred ; petals 5, strap-shaped, greenish yellow. Stamens few, surrounding numerous carpels on lengthening spike. Fruit : achenes. After petals fall, slender receptacle bearing ripened carpels lengthens to 2 or 3 inches, like a tail—hence, Mouse-tail. *Myosurus* from Greek *mus*, a mouse, and *oura*. a tail ; *minimus*, smallest.

AQUILEGIA

Genus *Aquilegia* consists of 8 European species, only 1 of which is native to this country.



COLUMBINE
Aquilegia vulgaris
(A) Fruit

COLUMBINE *Aquilegia vulgaris*

Uncommon, erect, herbaceous perennial of dense woods in England, Wales, S. Scotland, Channel Is., and Ireland, especially on chalky soils. Grows 3 feet high ; flowers May to July. May often be escape from cultivation. Short, fleshy branched root throws up rosettes of long-stalked radical leaves, with 3-lobed, glaucous leaflets, sometimes reddish and hairy below. From rosettes of leaves rise long flower-stalks with panicles of drooping flowers. Sepals 5, petaloid, thin, broad, blue, dull purple or white ; petals 5, spurred, similarly coloured, with honey in spurs. Stamens die off in succession, maturing before stigmas. Carpels 5. Fruit : a cluster of many-seeded follicles. When mature flower-stalks straighten up follicles split along upper part of their inner sides, and the numerous black, shiny, smooth seeds scatter

with each wind-jerked movement. Possibly most interesting and beautiful species of genus. Columbine from Latin *columba*, dove, from a fancied likeness to this bird. *Aquilegia* from Latin *aquila*, eagle, comparing spurred petals with eagles' claws; *vulgaris*, common.

THALICTRUM

Thalictrum comprises about 80 species in cooler regions of the northern hemisphere, with 3 natives in this country.

COMMON MEADOW-RUE *Thalictrum flavum*

Erect perennial herb frequent in fens, swamps, marshes and river banks. Grows 2–4 feet high; flowers July and August. From long, creeping, branching, yellow rhizome rise stout, annual stems, bright green, strongly furrowed. Large smooth leaves are compound, dull green, long-stalked. Flowers small bright yellow, on upright stalks crowded into conspicuous umbellate clusters. Sepals 4, small, greenish, soon falling; petals are lacking; stamens numerous, spreading and providing the colour of the flower; carpels 6–10. Nectarless. Pollination by wind and insects. Fruit: a group of 1-seeded achenes. Largest and most conspicuous species of the genus. Leaves have been used to allay fevers; root sometimes used in dyeing. Common name from resemblance of compound leaves to Rue. *Thalictrum*, classical name; *flavum*, yellow.



COMMON MEADOW-RUE
Thalictrum flavum
(A) Achenes
(B) Fruit and an individual flower

Two other species of Meadow-Rue are less common in this country.

ALPINE MEADOW-RUE *Thalictrum alpinum*

Tiny perennial, 6 inches high, in wet ground on mountains in Wales, Northern England and Scotland; flowers June to August. Single wiry stem; radical leaves on long stalks. Purplish white flowers in drooping sprays; numerous stamens, few carpels. *alpinum*, alpine.

LESSER MEADOW-RUE *Thalictrum minus*

Very variable, 6–24 inches high. Grows in rocky places or sandy soil; flowers June to August. Stem furrowed, branching. Flowers drooping, yellow with greenish tinge. *minus*, lesser.

THE BARBERRY FAMILY

BERBERIDACEAE

The Barberry family includes herbaceous perennials, although genus *Berberis* (Barberries), comprising about 100 species, is entirely shrubby. Family is represented in Britain by only 1 species, although imported ornamental species are commonly seen.

BERBERIS

BARBERRY [Pl. 4] *Berberis vulgaris*

Common spiny shrub of hedge and copse; 3–6 feet high; flowers April to June. Stem wood bright yellow, with whitish bark. Long and short shoots; former bear 3-pronged spines (modified leaves); latter spring from axils of these, with tufted leaves, and end in pendulous racemes of yellow flowers. Leaves 1–2 inches long, highly polished, oval, spinously toothed; astringent when young, containing free malic acid. Flowers ⅓ inch across; sepals 8 or 9, petaloid; 6 yellow petals, in 2 rows, with 2 large nectaries at base of each petal. Stamens 6 in 2 whorls, surround single carpel. When filaments are touched by insect, they move in towards ovary, 2 valves in anthers open, and insect is showered with pollen. Unpleasant scent. Fruit: oblong berry, conspicuously red, ½ inch long, compressed, juicy, extremely acid. Make a pleasant preserve. Roots have been used with lye as a yellow dye. Roots and bark also purgative. Menace to corn and wheat fields because it supports parasitic fungus Wheat Rust (*Puccinia graminis*). *Berberis* from Arabic *Berberys*, name of the fruit, or from Phoenician *Barar*, a brilliant polish with possible reference to leaves; *vulgaris*, common.

THE WATER-LILY FAMILY

NYMPHAEACEAE

Water-lilies not to be confused with our 'Lilies', such as Lily-of-the-Valley and Madonna Lily, which belong to *Liliaceae*, and are entirely unrelated. Family is represented by only 2 native genera, each with 2 species.

NYMPHAEA

WHITE WATER-LILY [Pl. 2] *Nymphaea alba*

Fairly common, perennial aquatic plant of stagnant or slow-moving water. Flowers June to September. From stout, starchy rhizome embedded in mud rise long smooth, round stems. Leaves large, floating, leathery, almost circular, often red or purple beneath. Flowers white, solitary, floating, 3–5 inches across. Open from about 7 a.m. to 4 p.m., and when closed submerge. Sepals 4, greenish white, alternating with 4 white petals, alternating with 4 inner petals, and so on, in 8 spiral series, generally of 4 petals each. Innermost ones gradually narrow and become

stamens (up to 100) with yellow anthers. Numerous carpels embedded in fleshy receptacle fused into ovary with 15–20 chambers holding many seeds. United stigmas form rayed disk. Fruit : large, pulpy, globular berry-like capsule, ripening under water. Seed surrounded by spongy aril holding air bubbles. When fruit rots, seeds float to surface, are carried downstream, and as air escapes, sink to mud where they germinate. Generic name from the Greek, *nymphe*, a water-nymph ; *alba*, white.

NUPHAR

YELLOW WATER-LILY [Pl. 2] *Nuphar lutea*

Common aquatic perennial of sluggish waters, more general than the last. Flowers June to August. From thick, creeping, fleshy rhizome, rich in tannic acid, rise thick fleshy stalks, those of the leaves with flattened upper surface, containing air pipes for buoyancy. Leaves, 2 types : submerged, on short stalks, thin, almost colourless ; floating, like White Water-Lily, but smaller. Solitary yellowish flowers on long stalks a little above water ; globular, unpleasantly scented. Sepals 5, large, greenish yellow, incurved. Petals, within sepals, 18–20, spirally arranged, small, yellow, secreting nectar at base. Stamens, indefinite number in spiral, with anthers curving away from ovary. Carpels 15–20, fused to form similar ovary to last species. Fruit : large, flask-shaped, green berry, ripening and breaking away on surface. Seeds have no aril, but containing carpel holds air bubbles ; when carpel rots, seeds sink. Also called Brandy-bottle, probably from alcoholic smell and shape of fruit. *Nuphar* from Arabic name for Lotus ; *lutea*, golden yellow.

LEAST YELLOW WATER-LILY *Nuphar pumila*

A local perennial, mainly in N. Scottish lakes, with smaller leaves and flowers than those of *N. lutea*, and fewer rays on the stigma-disk at the top of the ovary. *pumila*, dwarfish.

N. intermedia, a local native plant in N. England and Scotland, lakes and ponds, intermediate between Yellow Water-Lily and Least Yellow Water-Lily, probably a hybrid between these plants.

THE HORN-WORT FAMILY

CERATOPHYLLACEAE

CERATOPHYLLUM

HORN-WORT *Ceratophyllum demersum*

A local, submerged, aquatic perennial, up to 3 feet long, flowering from July to September. Leaves of very narrow, toothed segments, once or twice forked, densely-whorled, particularly towards the ends of the branches. Flowers inconspicuous, male and female solitarily in the leaf-whorls. Fruit a warty, oval nut with two spines at the base. *C. submersum* is similar but rarer, its leaves are 3-forked, and fruit without basal spines. The only genus of *Ceratophyllaceae*. *Ceratophyllum*, from *keras*, horn, and *phyllos*, leaf ; *submersum*, *demersum*, submerged.

THE POPPY FAMILY

PAPAVERACEAE

A smallish family, annuals or perennials, generally herbaceous, mostly confined to temperate regions of Europe and Asia. Plants contain milky juice called *latex*; all narcotic or acridly poisonous. Cultivated since Stone Age. Only a few of the several genera are native to this country.

PAPAVER

Papaver is the most common native genus; plentiful throughout Europe. All species are annuals, suffer from frost, and thrive in sunny places. Milky fluid has narcotic properties and in some species is made into opium.

FIELD POPPY — *Papaver rhoeas*

An abundant annual herb, regarded as troublesome weed of cultivation, especially in fields in England; rare and local in N. Scotland. Reaches 2 feet; flowers June to September. In dry soils the slender branching root sends up erect branching stem rough with spreading, stiff hairs. Alternate leaves pinnately divided, hairy, finely toothed, without stipules. Flowers solitary, scarlet (3 or 4 inches across), borne on very long, slender, hairy stalks. Sepals 2, concave, falling when petals open; petals 4, soft, red, crumpled; numerous black stamens; indefinite number of carpels united in single-celled ovary. Familiar 'poppy-head' topped by rayed disk formed of 8 to 12 stigmas. No nectar but ample pollen; cross-pollination usual. Fruit: short, smooth, stalked capsule, holding numerous small, wrinkled, kidney-shaped seeds. Seeds shaken out and dispersed through series of minute valves just under projecting stigmas. Also called Common Red Poppy, Corn Poppy. When green, plant is poisonous to stock. *Papaver* probably from Celtic *papa*, thick milk; *rhoeas* from Greek *rheo*, I flow, with reference to abundant milky juice.



FIELD POPPY
Papaver rhoeas
(A) Seed head
(B) A main leaf

Three other species, less common, deserve a mention.

ROUND ROUGH-HEADED POPPY
Papaver hybridum

A small annual of dry chalky soils in S. England; flowers May to July. Scarlet flowers 1–2 inches across; stigmatic disk of 4–8 rays. Capsule rounder than in previous species, prickly. *hybridum*, hybrid.

LONG POPPY-HEAD [Pl. 3] *Papaver dubium*

Annual, resembling *P. rhoeas*, of cornfields, old quarries and wasteland. Grows 1½ feet high ; flowers May to August. Petals large, broad, paler than *P. rhoeas*. Stigmatic disk has 6–12 rays. Capsule smooth, slender, tapering, lacks short stalk. *dubium*, doubtful, from the close superficial resemblance of this plant to others of the genus.

LONG PRICKLY-HEADED POPPY *Papaver argemone*

Smallest British species, resembling *P. hybridum*. Grows in cornfields, flowering all summer. Petals slender, of a lighter red ; 4–6 stigmatic rays. Capsule club-shaped, prickly. *argemone*, probably from *argemon*, cataract, a disease of the eye, for which an infusion of this plant was considered a cure.

MECONOPSIS

Only 1 European species.

WELSH POPPY [Pl. 3] *Meconopsis cambrica*

Small beautiful perennial of mountainous regions, liking moisture and shade. Generally found in western districts, but not confined to Wales. Reaches 2 feet ; flowers June to August. Rhizome stout, perennial, with thick rootlets and tufted branches. Aerial stem soft, leafy, branched, brittle, woolly at base with nearly upright hairs. Leaves smooth, pale green, stalked, pinnate. Solitary, lemon-yellow, fragrant flowers, 2–3 inches across on top of very long stalks. Nectarless. Sepals 2, hairy ; petals 4, nearly circular ; stamens many, short, ringing smooth large ovary of 4–6 united carpels. Single-celled ovary topped by convex, 4–6-rayed stigmatic disk, with rays free. Fruit : capsule with minute valves below style allowing numerous finely-pitted, black seeds to escape. *Meconopsis* from Greek *mekon*, poppy, and *opsis*, resemblance ; *cambrica*, Welsh.



YELLOW HORNED POPPY
Glaucium flavum
(A) Opening flower bud

GLAUCIUM

Glaucium closely allied to *Chelidonium*, comprising about a dozen maritime species, with only one native.

YELLOW HORNED POPPY *Glaucium flavum*

Handsome maritime biennial or perennial, of shingle or loose sand, occurring on most coasts. Grows 2 feet high ; flowers June to October. From long, fleshily enlarged tap-root which anchors deeply in sand, grow much-branched stems, round, glaucous, and smooth, erect or ascending. Basal root, leaves numerous, pinnately-lobed or divided, 4–5 inches long, rough, erect, hairy. Stem leaves short, broad, wavy at margins, sessile,

with bases enfolding stem. All leaves thick, leathery, glaucous. Flowers solitary, large, golden, 3–4 inches across, on very short stalks. Nectarless. Structure resembles *Papaver rhoeas*, but sepals are hairless. Numerous stamens fall off with petals on second day of flowering. Fruit: 6–12 inches long, narrow, 2-chambered capsule. Each chamber holds 2 rows of numerous brown pitted seeds. Fruit develops very early. Latex pale orange. *Glaucium* from Greek *glaucion*, bluish, an allusion to colour of leaves; *flavum*, yellow.

CHELIDONIUM

Chelidonium is confined to Europe and Asia, comprising but 2 species, of which our British *C. majus* is very doubtfully indigenous, being probably an escape from old cottage gardens where it was formerly cultivated medicinally.

GREATER CELANDINE [Pl. 4] *Chelidonium majus*

A fairly common herbaceous perennial of hedgerows and waste places near habitations. Grows 2 feet high; flowers May to August. Slender, erect, branching stems spring from thick, fleshy rootstock, abounding in bright orange latex, with acrid taste and fetid smell. Leaves large, bluish green, much divided into deeply lobed leaflets. Flowers small, pale yellow, in loose umbels on slender hairy stalks. Nectarless. Two small green sepals protect 4 yellow petals. About 30 stamens surround short-styled ovary. Fruit: long, single-celled capsule with 2 valves. Small black seeds have white stalk down one side. Anthers sometimes ripen in bud and self-pollination occurs. Poisonous to stock. Used anciently to cure warts. *Chelidonium* from Greek *kelidon*, a swallow (plant blossoms at coming of swallows and withers at their departure); *majus*, greater.

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THE FUMITORY FAMILY

FUMARIACEAE

Fumitory family is closely related to Poppy family, sometimes included in it. Distinguished by irregular petals and absence of latex. There are 2 native genera.

CORYDALIS

Corydalis differs from *Fumaria* in its fruit. Comprises 90 species, with only one truly wild in Britain.

CLIMBING CORYDALIS *Corydalis claviculata*

Delicate, slender annual herb, widely distributed in copses, bushes, on hillsides in moist or sandy soil—never abundant. Climbs 3 or 4 feet over other plants; flowers June to August. From slender, branching root rises climbing stem, with much divided, oval, greenish blue leaves. These

end in thin, branched tendrils which help plant to climb. Flowers small, nearly-white, in short crowded racemes, borne opposite a leaf. Structure similar to *Fumaria officinalis* : 2 sepals, 4 petals, 2 stamens, each with 3 branches. One of outer pair of petals has honey in spur. Fruit : single-celled ovary develops into narrow, lance-shaped, 2-valved capsule, containing 2–3 black, lustrous seeds. Also called White Climbing Fumitory. *Corydalis*, from Greek *korydalos*, a lark, from shape of flowers, spur of which resembles spur of a lark ; *claviculata*, equipped with forked tendrils.



CLIMBING CORYDALIS
Corydalis claviculata
(A) Seed pods (B) Flower

FUMARIA

Genus *Fumaria* comprises some 42 species, of which about 10 are British. Differ from *Corydalis* in being almost all annuals, with 1-seeded fruit.

COMMON FUMITORY *Fumaria officinalis*

Common annual herb of roadsides and open dry fields. Reaches 3 feet ; flowers May to September. Forms pale green, delicate, spreading tuft, though sometimes rampant, climbing by petioles. Thin leaves very finely divided. Stem contains clear, watery, slightly acid juice. Flowers rosy purple, on short axillary stalks in graceful racemes. Sepals 2, broad, toothed, quickly shed ; petals 4, in 2 unequal pairs. Upper of 2 large outer petals spurred at base, with nectar in spur. Petals unite to enclose stamens and ovary in corollary tube. Stamens 2, each with 3 branches. Ovary single-celled. Fruit : globose, 1-seeded nut. Formerly had high reputation in healing. *Fumaria* from Latin *fumus*, smoke, referring to its smoke-like appearance as it rises from ground ; *officinalis*, used medicinally.



COMMON FUMITORY
Fumaria officinalis
(A) Flower (B) Seed

'HE WALLFLOWER OR CRUCIFER FAMILY

CRUCIFERAE

arge family comprising some 3,000 species, nearly all herbs. Thirty-five enera regarded as British, containing about 80 species. Almost all very milar in structure of flowers ; many edible. Rich in pungent oils and ılphur, non-poisonous. Leaves generally scattered, simple, often deeply ivided. Inflorescence—raceme of white or yellow flowers, less commonly ed, pink or lilac. Sepals and petals 4, arranged alternately at right ngles, like a cross—hence family name. Stamens nearly always 6 occasionally 2 or 4), in 2 whorls, 2 short, 4 long. Two united carpels orm single-celled ovary ; membranous partition generally makes it 2-elled. Fruit : 2-valved with many seeds ; siliqua—more than 3 times nger than broad ; silicula—less than 3 times longer than broad.

BRASSICA

'URNIP or NAVEN [Pl. 3] *Brassica rapa*

Common annual or biennial weed of cultivation, up to 3 feet high ; lowers May to September. Fairly stout, erect stem, branched, with hairy, laucous, lyre-shaped lower leaves. Upper leaves lobed, embracing stem. 'lowers pale orange, bright yellow or buff according to variety, in conical aceme. Fruit : long slender, somewhat flattened siliqua, with a long beak, pods, splitting when ripe. Turnip, swede and rape are all sub-species or varieties of *B. campestris* group. *Brassica*, classical name of several kinds of cabbage ; *rapa*, classical name of turnip.



TURNIP or NAVEN
Brassica rapa
(A) Flower
(B) Seed pods
(C) Main leaf

WILD CABBAGE *Brassica oleracea*

Much more local species, found on S.W. shores and elsewhere on the coast. Stout, twisted perennial, 2 feet high ; flowers May to August. Leaves large, fleshy, smooth, glaucous, upper ones dilated at base. Flowers large, cream-coloured or pale yellow, in elongated racemes. Fruit : long, cylindrical, with a short beak. Parent of our cultivated broccoli, cauliflower, cabbage, Savoy, Brussels sprout, kale or borecole, and kohl-rabi. *oleracea*, edible, vegetable.

BLACK MUSTARD [Pl. 3] *Brassica nigra*

Somewhat resembles Charlock. Has distinctive, 4-sided pod (siliqua), closely pressed against stem, ending in slender, awl-shaped beak. *nigra*, black.

RHYNCHOSINAPIS

ISLE OF MAN CABBAGE — *Rhynchosinapis monensis*

A biennial confined to the West coast of Great Britain, including the Isle of Man. Allied to *Brassica*, but with deeply divided leaves and fruits with 3-ribbed valves. Name from *rhynchos*, beak, and *sinape*, mustard; *monensis*, manx.

SINAPIS

Sinapis includes most of the mustards, and differs from *Brassica* (Cabbages) in that sepals are in half spreading position as compared with erect sepals in *Brassica*, and in the nervation of the fruits.

CHARLOCK or WILD MUSTARD [Pl. 4] — *Sinapis arvensis*

Tough, hairy, annual weed of cornfields and similar situations. Grows up to 2½ feet high; flowers May to July. Rough branched stem with stalked, lyre-shaped lower leaves, edges coarsely toothed. Upper leaves stalkless, lance-shaped. Flowers bright yellow, largest among mustards (¾ inch across). Flower-stalks very short; petals spoon-shaped, spreading. Fruit: pods (siliquae) up to 2 inches spread outwards from stem, straight-sided, with a long conical beak. Seeds 10–12, finely pitted. Also called Wild Mustard. Seeds long-lived and may germinate any time up to 25 years after burial. Almost identical with Turnip seed. They contain poisonous mustard oil. *Sinapis*, an ancient name; *arvensis*, of cultivated fields.

WHITE MUSTARD — *Sinapis alba*

Also resembles Charlock. Has shorter pod (siliqua), constricted into several bead-like portions, ending in a curved, sword-like beak, longer than remainder of pod and sometimes 1-seeded. *alba*, white.

Name Charlock is often applied indiscriminately to either species.

DIPLOTAXIS

WALL ROCKET — *Diplotaxis muralis*

An annual or biennial, 6–18 inches of waste ground, arable land and walls, flowering July to September. Stems herbaceous, unbranched, hairy, leafy at the base. Leaves narrowly oval, toothed or lobed. Petals yellow, twice as long as the spreading sepals. The fruit is a long, narrow, flattened, beaked siliqua, with many seeds in 2 rows, on a short stalk. *Diplotaxis*, from *diploos*, double, *taxis*, arrangement; *muralis*, of walls.

PERENNIAL WALL ROCKET — *Diplotaxis tenuifolia*

A perennial, 1–2 feet, differing from *D. muralis*, in having a weedy-based, branching, leafy stem, almost hairless, narrower leaves, larger flowers and longer fruit-stalks. *tenuifolia*, narrow-leaved.

RAPHANUS

WILD RADISH [Pl. 4] — *Raphanus raphanistrum*

Annual weed of cultivation, of cornfields. Grows 2 feet high; flowers June to September. Superficially resembles Charlock in its branching habit, but has upright sepals and white flowers veined with purple. Also

called Rurch, White Charlock or Jointed Charlock from the pods which appear jointed. Cultivated Radish is *R. sativus*. *Raphanus* from Greek *raduos*, early, and *phaino*, I appear, from its speedy growth from seed ; *raphanistrum*, the addition of *istrum*, implies that it is a useless member of the genus.

CRAMBE

SEA KALE — *Crambe maritima*

Uncommon maritime perennial, though commonly cultivated and eaten as vegetable. Mostly on sandy shores in England ; 2 feet high ; flowers May to August. Rootstock long and fleshy, 1 inch thick. Stems many, spreading from root. Radical leaves few, large, fleshy, glaucous, up to 1 foot long, with lobed and wavy edges. Stem leaves shorter. Flowers white, ½ inch across, with honey-like smell, in panicles. Sepals soon falling ; stamens yellow ; ovary with purple pistil. Fruit : oval pod (silicula) containing single seed, on short, stalk-like structure. Vegetable is forced in dark greenhouses, the blanched growths being eaten cooked or raw. *Crambe* from Greek *krambos*, dry, arid, because it usually grows in sand ; *maritima*, maritime.



SEA KALE
Crambe maritima
(A) Flower (B) Leaf
(C) Fruit

CAKILE

SEA ROCKET [Pl. 4] — *Cakile maritima*

Uncommon, straggling, maritime herb, annual, of sandy shores. Grows 9 inches high ; flowers June and July. Stem much branched, with long, semi-prostrate, fleshy, haphazard stalks. Leaves few, narrow, fleshy, glaucous with bluntly lobed edges. Flowers pale lilac, in small terminal clusters ; petals spreading. Fruit : angular, erect pods (siliquae), 1 inch long. *Cakile*, Arabic name for this plant ; *maritima*, maritime.

LEPIDIUM

PEPPERWORT — *Lepidium campestre*

Fairly common annual or biennial in England, of cultivated and waste ground, preferring dry and hilly situations. Uncommon elsewhere. Reaches 15 inches ; flowers May to August. All foliage minutely hairy. Radical leaves spoon-shaped, sometimes toothed, forming irregular rosette on ground. Stem branched near top, with stalkless, eared, clasping leaves, somewhat arrow-shaped. Flowers minute, white, in close panicles at top of each branch ; petals hardly longer than sepals ; stamens yellow ; ovary globose with short style. Fruit : flattened, short pods (siliculae),

with the valves strongly winged, somewhat flaky or scaled. Lower fruits ripening while flowers are opening further up. Also called Field Cress ; formerly used as antidote for poison. *Lepidium* from Greek *lepidion*, a scale, referring to pods ; *campestre*, of the plains.



PEPPERWORT
Lepidium campestre
(A) Flower (B) Pod
(C) Root

SMITH'S CRESS or
SMITH'S PEPPERWORT *Lepidium smithii*

Hairy perennial of neglected fields and roadsides, closely resembling *L. campestre*. Stems several ; stamens with violet anthers ; pod (silicula) always smooth. *smithii*, in honour of Sir J. E. Smith.

NARROW-LEAVED PEPPERWORT
Lepidium ruderale

An annual (or biennial) up to 1 foot, of waste places and waysides, particularly in E. England, flowering May to July. Characterized by its many upward-curving branches ; narrow leaves, the lower divided ; small, deeply-notched fruits, narrowly-winged above. *ruderale*, of waste places.

DITTANDER *Lepidium latifolium*

Larger but very rare perennial of salt marshes and wet sand. Stems 4 feet, leafy ; flowers small, white, in terminal clusters, appearing in late summer. *latifolium*, broad-leaved.

CORONOPUS

WART-CRESS *Coronopus squamatus*

Small annual herb of cultivated fields and meadows in S. England ; flowers June to September. Stems thick, light green, prostrate ; leaves deeply segmented. Also called Swine-Cress. *Coronopus* from Greek *korone*, a crow, and *pous*, a foot, from the crowfoot shape of leaves. *squamatus*, scaly.

LESSER SWINE-CRESS *Coronopus didymus*

A widespread annual or biennial weed of waste and cultivated ground, flowering July to September. Differs from *C. squamatus* markedly in its fruit, which is shorter than its stalk, constricted in the middle and notched. *didymus*, in pairs, referring to the two lobes of the constricted fruit.

CARDARIA

HOARY CRESS *Cardaria draba*

Locally common perennial of similar places to Pepperwort ; 18 inches high ; flowers April to June. Stems almost hairless ; leaves light green, sessile, alternate, eared, clasping, and slightly toothed. Flowers minute,

white, in short racemes. Fruit broadly heart-shaped, with 1 flat, brown seed in each of 2 partitions. *Cardaria* from Greek *kardia*, heart, with reference to the cordate fruits. *draba*, acrid, biting.

ISATIS

Isatis comprises only a few species, mostly from Mediterranean region. Only one, not truly native, in this country.

WOAD [Pl. 4] *Isatis tinctoria*

Uncommon, erect, biennial herb, mostly in southern counties (where it may be an escape from cultivation) ; near R. Severn (may be truly wild) and parts of Lincolnshire and near Guildford (where it has long been cultivated). Grows 3 feet high ; flowers July and August. Stem smooth, erect, rather thick, branching ; radical leaves lance-shaped, on long stalks ; stem leaves arrow-shaped, sessile, clasping stem at their base. Flowers numerous, small, yellow, in terminal corymbs ; sepals equal at base. Fruit : oblong pods (siliculae), about ½ inch long, brown when ripe, hanging from slender stalks. Woad used extensively for dyeing before indigo. Ancient Britons smeared their bodies with it. Leaves pounded to paste and left for fortnight to ferment. *Isatis*, Greek name for Woad ; *tinctoria*, used for dyeing.



WOAD
Isatis tinctoria
(A) Fruit

IBERIS

WILD CANDYTUFT *Iberis amara*

An annual, 6–12 inches, locally common in chalky fields, flowering in July and August. Stem erect, leafy, branched mostly above. Leaves narrow, somewhat spatula-shaped, with few teeth. Flowers white or mauve, in clusters which elongate on fruiting. The fruit is almost circular, with wings broad at the top, making a deep notch. *Iberis*, a classical plant name ; *amara*, bitter.

THLASPI

Thlaspi comprises some 60 species, 3 or 4 being British. Plants have equal petals, roundish pods (siliculae) with more than 4 seeds, straight cotyledons.

FIELD PENNY CRESS *Thlaspi arvense*

Common cornfield or roadside weed in lowlands, scarce further

north. Annual, over 1 foot high; flowers May to July. Little-branched stem with oblong arrow-head leaves, margins wavy, toothed. Flowers small, white, ¼ inch across, in racemes. Nectaries 4, small, green, at base of 2 shorter stamens. Ovary elliptic, compressed, with very short style. Fruit: heart-shaped, flattened pods (siliculae) (farthing size) on elongated peduncle, holding 10–16 dark, oblong seeds, ridged and pitted. English name refers to shape of fruit. *Thlaspi* from Greek *thlao*, I flatten; *arvense*, of cultivated fields.



FIELD PENNY CRESS
Thlaspi arvense
(A) Pod (B) Root
(C) Flower

There are a few quite local British species of the genus, biennial or perennial.

ALPINE PENNY CRESS *Thlaspi alpestre*

Found on high ground, 6–10 inches tall, flowers June to August. Leaves similar to previous species; flowers ⅛ inch across, sometimes pinkish. Heart-shaped pods (siliculae) ¼ inch long, with 8–16 red-brown seeds. *alpestre*, alpine.

GREEN PENNY CRESS *Thlaspi virens* or *Thlaspi calaminare*

A type of *T. alpestre*; inhabits limestone rocks of Matlock, Derbyshire. Pod (silicula) has prominent projecting style, and only slight, broad, shallow notch. *calaminare* probably from *calamine*, an ore of zinc found in limestone.

PERFOLIATE PENNY CRESS *Thlaspi perfoliatum*

Confined to small limestone area in West Country; 6 inches tall; flowers April and May. Leaves clasp the stem, and white flowers are only ⅛ inch across. Small pods (siliculae) with very short styles, containing 8–12 pale seeds. *perfoliatum*, perfoliate.

TEESDALIA

SHEPHERD'S CRESS *Teesdalia nudicaulis*

Very small annual of sandy and stony places. Grows 2–6 inches high; flowers April to June. Leaves deeply lobed, forming rosette close to ground, 3 inches across. Flowers white, minute, clustered in terminal racemes on long stalks. *Teesdalia*, named after Yorkshire botanist Robert Teesdale; *nudicaulis*, having naked stems.

CAPSELLA

Capsella is represented by 1 variable species in this country (see p. 54).



SHEPHERD'S PURSE
Capsella bursa-pastoris
(A) Fruit (B) Leaf

SHEPHERD'S PURSE
Capsella bursa-pastoris

Very common annual weed of cultivated or waste land throughout the country, with preference for light soils. Grows 1–24 inches high; flowers all summer. Slender, tapering tap-root often reaches great depths. Stem and leaves often covered in star-shaped hairs. Radical leaves large, usually pinnately lobed, form rosette. Stem leaves arrow-shaped, often toothed, upper ones clasping the stem. Flowers small, white, in terminal racemes; may be self-pollinated; only a few open at one time. Stalks elongate after fertilization, and ovary develops into characteristic, heart-shaped fruit which splits downwards into 2 valves, spilling the many seeds. Also called Pickpocket. Anciently used as pot-herb. English and Latin names from shape of fruit which resembles an old-time shepherd's purse. *Capsella* from *capsula*, a little box; *bursa*, purse, and *pastoris*, shepherd's.

HORNUNGIA

ROCK HUTCHINSIA *Hornungia petraea*

A rare annual, of limestone rocks, a few inches high, flowering from March to May. Stem slender, leafy and from a basal rosette; leaves very small, deeply divided with narrow segments. Flowers small, white. Fruits small, pouch-like, on horizontal stalks. Named after E. G. Hornung, a European scientist; *petraea*, of rocks.

COCHLEARIA

Cochlearia comprises several British species, at one time regarded as variants of 1 species.

COMMON SCURVY-GRASS [Pl. 4] *Cochlearia officinalis*

Smooth fleshy biennial, or perennial of muddy shores and sea-cliffs. Grows 6–12 inches high; flowers May to August. Long, slightly branched tap-root throws up cordate radical leaves on long stalks. Stem-leaves angular or lobed, sessile. Flowers small, white, in short racemes. Fruit: globular pods with persistent style, holding few, large pitted seeds. Scurvy-grass popularly so-called because of its use as an antiscorbutic by our

seamen in early days. *Cochlearia* from Latin *cochleare*, spoon, with reference to shape of radical leaves ; *officinalis*, used medicinally.



COMMON SCURVY-GRASS
Cochlearia officinalis
(A) Seed pod (B) Rootstock
(C) Flower

LONG-LEAVED SCURVY-GRASS *Cochlearia anglica*

Similar to Common Scurvy-Grass, but much larger. Found in roughly same places ; grows 18 inches high. Leaves fleshier, cuneate at the base, flowers and fruits larger, style longer. *anglica*, English.

DANISH SCURVY-GRASS *Cochlearia danica*

Maritime herb uncommon in Scotland and Ireland. Radical leaves more pointed ; all leaves stalked. Pods (siliculae) long, narrow, inflated. *danica*, Danish.

ALPINE SCURVY-GRASS *Cochlearia alpina*

Found in mountains ; differs only slightly from *C. officinalis* in more slender habit, less fleshy leaves, and longer, narrow, tapering pods (siliculae). *alpina*, alpine.

SCOTTISH SCURVY-GRASS *Cochlearia scotica*

Rare, of coasts in Northern Scotland and Ireland. Few inches high ; with reniform or truncate, thick, fleshy, radical leaves and pale purplish petals. *scotica*, Scottish.

SUBULARIA

AWLWORT *Subularia aquatica*

A small, local annual, about 3 inches, growing in lakes in the North and West. Flowering, sometimes under water, from June to August. Its aquatic habitat, few small flowers, small oval fruits arranged alternately up the stems and its basal rosette of awl-shaped leaves distinguish it. *Subularia* from *subula*, an awl ; *aquatica*, aquatic.

DRABA

HOARY WHITLOW GRASS *Draba incana*

A northern biennial or perennial ; 4–12 inches, flowering in June and July ; growing at sea level on sandhills to high up on mountains. Stem simple or branched with slender tap-root and small, narrow, slightly-clasping, toothed leaves. The basal rosette dies off as the fruit ripens. Flowers small, white. Fruits a narrow, oval, twisted silicula, many-seeded.

Numerous star-shaped hairs are typical of this plant. Other species of *Draba* are rare and local. *Draba* from *drabe*, classical name of a plant; *incana*, hoary.

EROPHILA

WHITLOW GRASS — *Erophila verna*

Small annual of old walls and dry, stony places, common. Rarely exceeds 4 inches in height; flowers March to June. All leaves radical, forming neat rosette on ground; lance-shaped, slightly toothed, minutely hairy, with slender, forked and stellate hairs. Leafless flower stem springs from centre of rosette. Flowers white, insignificant, in small terminal clusters. Petals 4, white, deeply notched. Fruit: pods (siliculae) small, flat, oblong, on long stalks, divided into 2 partitions holding many very small seeds. *Erophila*, spring-lover; *verna*, spring.



WHITLOW GRASS
Erophila verna
(A) Ripe fruit
(B) Flower

CARDAMINE

Cardamine comprises some 50 species in temperate and cold regions, of which 5 are British. Name Bitter Cress often applied to whole genus, though strictly belonging to one species, *C. amara*.

LADY'S-SMOCK [Pl. 4] — *Cardamine pratensis*

Pleasing perennial, one of first spring-flowering plants, common everywhere in wet, undrained meadowland. Grows up to 2 feet high; flowers March to June. Rootstock very short, thickened, often bearing scales or tubers. Radical leaves pinnate, with rounded leaflets, and when lying on damp ground produce bulbils which root. Stem leaves with lance-shaped leaflets. Flowers large, white to mauve, in terminal clusters. Fruit: pod (siliqua), 1 inch holds seeds in 2 partitions. When ripe valves open from bottom upwards, jerking seed to some distance. Leaves sometimes eaten like Watercress; flowers often used medicinally. Also called Cuckoo-flower (blooming during Cuckoo's stay), Milkmaids, Meadow-cress. *Cardamine* from Greek *kardia*, the heart, and *damao*, to subdue, alluding to its use in medicine; *pratensis*, of meadows.

LARGE-FLOWERED BITTER-CRESS — *Cardamine amara*

Of river banks, uncommon. Flowers April to June. Roots by runners from main slender rhizome. Flowers largish, creamy white, with purple anthers. *amara*, bitter.

NARROW-LEAVED BITTER-CRESS *Cardamine impatiens*

Of shady woods in Midlands and south ; 1 foot high ; flowers May to August. Flowers large, white, in panicles ; stamens have yellow anthers. Leaves with fringed lobes at base ; ripe pods (siliquae) burst when touched. *impatiens*, impatient.

FLEXUOUS BITTER-CRESS *Cardamine flexuosa*

Uncommon delicate little biennial or perennial, of moist and shady places. Stem branched, wavy, slightly hairy ; leaves with bluntly toothed leaflets ; flowers, minute, white, on slender stalks in terminal racemes ; pods (siliquae) long, narrow. *flexuosa*, wavy, from manner of growth of stem.

HAIRY BITTER-CRESS *Cardamine hirsuta*

Dull green annual found on wall-tops and sandy places. Grows 6–12 inches high ; flowers March to September. Foliage covered with scattered hairs. Radical leaves usually form a rosette with a few rather rounded leaflets. Stem leaves few, smaller, with narrower leaflets. Flowers few, small, white, in terminal racemes, usually having only 4 stamens. *hirsuta*, hairy.

DENTARIA

Dentaria, closely allied to *Cardamine*. Distinguished from *Cardamine* mainly by broad winged stalk to seeds.

CORAL-WORT [Pl. 4] *Dentaria bulbifera*

Rather rare perennial, probably confined to S. and E. England, sometimes plentiful in old, shady woods. Grows 2 feet high ; flowers April to June. Creeping rhizome, covered with shiny, fleshy, white knobs, hot and bitter to taste. Erect stem unbranched. • Lower leaves composed of 1 or 2 pairs of leaflets ; higher leaves less divided. Little scaly bulbils borne in axis of upper leaves, eventually these drop and root as new plant. Flowers 4 or 5, scentless, dark lilac, on short stalks. Rarely visited by insects. Fruit is a short, pointed pod (silicula). Seeds seldom seen, hardly ever perfected, reproduction being effected by bulbils and creeping rhizome. Also called Toothed Violet, Foxholes, Toothwort, Coral Root. *Dentaria*, toothed, referring to peculiar ridges on root ; *bulbifera*, having bulbs.

BARBAREA

WINTER CRESS [Pl. 4] *Barbarea vulgaris*

Fairly common biennial showing tufts of shiny dark green leaves over winter, and sending up flowering stem (1–2 feet) in spring. Of roadsides near water and damp hedgerows. Flowers May to August. Stiff, deeply furrowed, erect stem generally branched towards top. Lower stem leaves deeply pinnately cut with large terminal lobe. Upper stem leaves sessile, glossy, with wavy margin, conspicuously eared at base. Dense clusters of small yellow flowers in terminal racemes. Fruit : short-styled ovary develops into long, narrow, erect pod (siliqua) with persistent style.

Numerous seeds finely pitted. Similar to Watercress in appearance ; once called Land Cress to differentiate. Also called Yellow Rocket. Leaves sometimes boiled and eaten. *Barbarea*, dedicated to St. Barbara ; *vulgaris*, common.

ARABIS

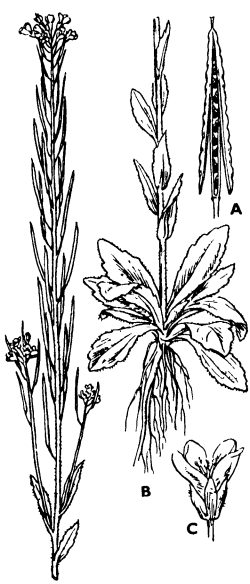
Rock-cresses are generally cultivated for ornament, but there are 4 native species of *Arabis*, 3 of which are very rare.

ALPINE ROCK-CRESS — *Arabis alpina*

A rare alpine of Welsh and Scottish mountains. Grows 4–8 inches high ; flowers July to September. Leaves mostly radical, stalked, lobed. Flowers white, small, on stalks ¼ inch long. Pods (siliquae) ½–1 inch long. *Arabis*, origin of the name obscure ; *alpina*, alpine.

HAIRY ROCK-CRESS — *Arabis hirsuta*

Stiff, erect biennial or perennial, locally common in rocky and dry situations. Grows 1–2 feet high ; flowers June to August. Stem slender, erect, usually unbranched. Leaves small, alternate, sessile, lance-shaped, coarsely toothed ; radical leaves form rosette, large, spreading, shortly stalked. All leaves covered with stiff, forked hairs. Flowers inconspicuous, white, in lengthening raceme ; sepals about half as long as petals. Fruit : a slender, narrow, erect pod (siliqua), holding single row of flattened, winged seeds. *hirsuta*, hairy.



HAIRY ROCK-CRESS
Arabis hirsuta
(A) Ripe fruit
(B) Rootstock
(C) Flower

TURRITIS

TOWER MUSTARD — *Turritis glabra*

A local biennial, 1–3 ft., of banks, cliffs and roadsides ; flowering from May to July. Recognized by its very upright stem with narrow clasping leaves and long fruiting portion of upright, long siliquae, which have two rows of seeds. The basal rosette soon dies. Flowers small, yellowish. *Turritis* from *turris*, a tower ; *glabra*, hairless.

NASTURTIUM

Nasturtium is no relation to cultivated garden so-called Nasturtium, which is really species of genus *Tropaeolum*.

WATERCRESS — *Nasturtium officinale*

Common perennial aquatic herb of ponds, streams and ditches. Grows 6–9 inches high ;

flowers May to October. Hollow stem may reach length of 4 feet; floats in water or creeps in mud, rooting from the under side. Leaves alternate, dark green, pinnately lobed, slightly toothed—discoloured if exposed to strong sunlight. Flowers minute, white, in small, terminal clusters. Petals broad, spoon-shaped, twice as long as the sepals. Fruit: a slender 2-valved, 1-inch pod (siliqua), holding many finely-pitted seeds. Well-known salad plant; wild tastier than cultivated variety. *Nasturtium* from Latin *nasi tortium*, twisted nose, alluding to the faces pulled when eating the hot leaves; *officinale*, used medicinally.



GREAT YELLOW-CRESS
Rorippa amphibia
(A) Fruit (B) Leaf
(C) Flower

RORIPPA

Closely allied to *Nasturtium* with 3 native species, distinguished by yellow petals.

CREEPING YELLOW-CRESS *Rorippa sylvestris*

Of similar wet places, with 18-inch stem. Flowers yellow, in small clusters, June to August. Petals are twice as long as the sepals. Pod (siliqua) slender, $\frac{3}{8}$–$\frac{3}{4}$ inch long. *sylvestris*, of woods.

MARSH YELLOW-CRESS *Rorippa islandica*

Flowering June to October. Leaves lyre-shaped; flowers tiny, yellow. Swollen pod (siliqua) usually oval. Petals hardly longer than the sepals. *islandica*, Icelandic.

GREAT YELLOW-CRESS [Pl. 3] *Rorippa amphibia*

Of wet places. Flowering June to August. Tall stout stem up to 3 ft. Oval pod smaller than in preceding species, but flowers slightly larger. *amphibia*, amphibious.

MATTHIOLA

STOCK, GILLIFLOWER *Matthiola incana*

A shrubby perennial, up to $2\frac{1}{2}$ ft.; found rarely on southern sea cliffs; flowering May to July. Stem erect, stout, with narrow entire hoary leaves. Flowers large, purple (sometimes red or white), fragrant, attracting butterflies. Fruit a long cylindrical glandless siliqua. Doubtfully native. *Matthiola* after P. A. Matthiolo, an Italian physician; *incana*, hoary.

SEA STOCK *Matthiola sinuata*

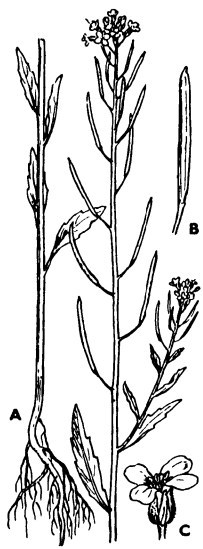
A native biennial, found also on Irish coasts, differing from *M. incana* mainly in its more spreading, herbaceous stems, wavy or long-lobed lower leaves, compressed glandular pods and paler purple flowers. *sinuata*, wavy.

ERYSIMUM

The genus *Erysimum* is represented by only 1 native species in this country.

TREACLE MUSTARD *Erysimum cheiranthoides*

An annual weed of fields and roadsides, more common in S. England. Grows up to 2 feet high ; flowers June to August. Round, straight, leafy stem with narrow, lance-shaped leaves. Small yellow flowers ; slender square pods. Whole plant covered with branched hairs. *Erysimum*, a classical Greek name ; *cheiranthoides*, Wallflower-like.



TREACLE MUSTARD
Erysimum cheiranthoides
(A) Rootstock
(B) Fruit (C) Flower

CHEIRANTHUS

Small genus probably introduced from the Mediterranean region—now thoroughly naturalized.

WALLFLOWER [Pl. 3] *Cheiranthus cheiri*

Perennial, uncommon in wild state, chiefly of old walls and rocky cuttings. Grows 1–2 feet high ; flowers May to June. Stems sturdy, slightly woody, branched, covered with 2-armed hairs lying close to surface. Leaves lance-shaped, undivided. Almost entire foliage hairy. Flowers large, fragrant, in lax racemes. Sepals erect, tinged with red ; petals heart-shaped, pure yellow, with narrow ends extended to form tube within sepals. Large anthers almost close this tube. Stamens with nectaries at bases of the shorter anthers. Ovary formed of 2 long, united carpels, with partition down middle. Style short, with 2-lobed stigma. Fruits up to .2½ inches long (siliquae). When ripe they split from bottom upwards to release numerous reddish, slightly winged, seeds. Flowers may be cross- or self-pollinated. Many beautiful garden varieties are known, distinguished by their colours. *Cheiranthus* possibly from Greek *cheir*, hand, and *anthos*, flower, i.e. convenient for carrying in the hand, or from Arabic *cheiri*, a sweet-scented flower.

ALLIARIA

Alliaria is closely related to *Hesperis*, *Erysimum* and *Sisymbrium*, under each of which Garlic Mustard has at some time been classified.

GARLIC MUSTARD [Pl. 4] *Alliaria petiolata*

Common hedgerow weed, annual or biennial. Grows 3 feet high ; flowers May and June. Long, branching, slender tap-root throws up slightly branching aerial stem, often prostrate at base. Leaves large, thin, prominently veined, freshly green, heart-shaped, coarsely toothed, all stalked. Flowers small, white, massed into corymbs. Honey secreted at

base of short stamens, but flowers largely self-pollinated owing to scarcity of insects at early season of year. Fruit a four-angled siliqua on a short, stout, spreading stalk, rising erect with slight curve to length of 2½ inches. Black seeds oblong, slightly furrowed. Also called Jack-by-the-Hedge, Leek-Cress, Sauce-alone, Poor Man's Treacle. Powerful odour of garlic when bruised. Troublesome agricultural weed because it harbours Flea Beetle or Turnip Fly. *Alliaria* from Latin *allium*, garlic ; *petiolata*, petioled, a petiole being a leaf stalk.

SISYMBRIUM

Sisymbrium comprises over 80 species, of which 9 are found in this country. Only one is British.

HEDGE MUSTARD *Sisymbrium officinale*

Erect, tough annual weed, very common by roadsides and other waste places. Grows up to 2 feet ; flowers June and July. Stem rounded, with many stiffly horizontal branches ; generally dull, dusty, yellowish-green, sometimes tinged red. Whole plant covered with fine, bristly hairs. Most leaves are on lower part of stem, deeply and unevenly cut or lobed, toothed, hairy. Flowers minute, yellow, in little corymbs, on long slender branches. Sepals hairy ; petals spoon-shaped. Fruit : erect, awl-shaped pods (siliquae) over ½ inch long, downy, pressed close to main stalk, on very short, thick stalk. Seeds 12, rounded, with flat top. Also called Lucifer Matches (in Worcestershire) from effect of small clusters of pale yellow flowers. *Sisymbrium*, classical name of sweet scented water plant ; *officinalis*, because juice was often used medicinally.



HEDGE MUSTARD
Sisymbrium officinale
(A) Leaf
(B) Terminal shoot
(C) Flower

LONDON ROCKET *Sisymbrium irio*

Rarer than Hedge Mustard ; flowers May to September. Flowers small, yellow ; pods (siliquae) long, round, smooth. So-called because abundant in London after Great Fire of 1666. *irio* from Greek *eryo*, I heal. *S. orientale*, not *S. irio*, thrived on bombed sites after 1940–5.

ARABIDOPSIS

THALE CRESS OR COMMON WALL CRESS *Arabidopsis thaliana*

Wayside weed, locally plentiful, of sandy or stony places. Grows about 18 inches high ; flowers May to September. Stem slender, erect, rather



THALE CRESS
Arabidopsis thaliana
(A) Fruit (B) Flower
(C) Rootstock

bare, rising from rosette of toothed, stalked, radical leaves. Upper leaves hairy, narrower, sessile. Flowers tiny, white, in small dense clusters. Petals white, rather narrow. Fruit : a curved pod (siliqua) about 1 inch long, on spreading stalk ; seeds many, small, brownish. Formerly called *Sysimbrium thaliamum*. *Arabidopsis*, resembling Arabis ; *thaliana* from Greek Muse *Thalia*, luxuriant, blooming.

DESCURAINIA

FLIXWEED *Descurainia sophia*

Grows near refuse dumps, etc. ; 3 feet high ; flowers June to August. Branches numerous ; leaves deeply segmented. Flowers minute, yellow ; pods (siliquae) slender, round, 1 inch long. Also called Fine-leaved Hedge Mustard, ' Wisdom of Surgeons '. Common name refers to its use in dysentery. *Descurainia*, after Descurain, a French pharmacist; *sophia*, wisdom.

THE MIGNONETTE FAMILY

RESEDACEAE

This family is represented in Great Britain by but 1 genus with 2 species, although in Europe there are nearly 20 species. The family, taking its name from the genus *Reseda*, is closely related to the *Cruciferae*.

RESEDA

Reseda consists of annual or biennial herbs containing watery juice and adapted to dry, sunny conditions. Remarkable for inequality of their petals.

WELD *Reseda luteola*

Biennial herb, similar to following species but taller and more erect. Common in England and Ireland, rare in Scotland, preferring light soil and sun ; found too on walls and chalky soils. Grows 3 feet high ; flowers June to September. Tap-root long, tapering, much-branched. Stem

stiff, hard, frequently unbranched. Leaves long, undivided, hairless, with shining polish. Individually small flowers, yellowish green, in very long, slender, spike-like racemes. Sepals 4, small; petals, usually 3 or 4, rarely 5, very unequal. Fruit: capsules shorter and broader than in following species, wide open at top, exposing numerous minute seeds. Also called Dyer's Mignonette, Dyer's Weed, Dyer's Yellow-weed, Dyer's Rocket, Yellow-weed, or Yellows. Boiled whole in bud, the plant provides beautiful yellow dye for wool, linen, silk or cotton. Still used for dyeing to a limited extent. *Reseda* from Latin *resedo*, I calm, an allusion to reputed sedative properties of the genus. *luteola*, yellowish.



WILD MIGNONETTE
Reseda lutea
(A) Flower (B) Fruit (C) Stem

WILD MIGNONETTE *Reseda lutea*

Common biennial or perennial herb, doubtfully wild in Scotland and Ireland, thriving on sunny slopes of bare chalk in England. Grows 1 foot high; flowers June to September. Root short, stout, acrid, smelling of radishes, formerly endowed with medicinal properties. Stem branched, ribbed; leaves with wavy margins. Flowers pale yellow, in dense inflorescences on long, stiff, erect stalks. Sepals 6; petals 6, irregular, yellow (3-lobed, 2-lobed and entire). Stamens 16–20, curving inwards. Ovary single-chambered, of several united carpels—open at the top. Wild species scentless, but nectar is secreted in cup-shaped cavity. Fruit: an open capsule, ¾ inch long, 1-celled, with many small, ear-shaped, black, smooth, shining seeds. Also called Crambling Rocket. *lutea*, yellow.

Sweet Mignonette (*R. odorata*) is cultivated species, similar, but scented. *Mignonette*, little darling (Fr.), doubtless applied to cultivated variety.

THE VIOLET FAMILY

VIOLACEAE

A small but widespread family of varied habit, comprising some 300 species in 15 genera. Two-thirds of species belong to genus *Viola*.

VIOLA

Viola is the only European genus. It is almost cosmopolitan, and includes some of our most popular wild and cultivated flowers.

SWEET VIOLET *Viola odorata*

Highly valued spring perennial, southwards from Dumbarton and Angus, and in Ireland ; wild in southern and eastern counties of England, naturalized in many other localities ; of sheltered banks, hedgerows and woods. Grows a few inches high ; flowers sometimes from January (usually February or March) to May. Short rootstock has knotted appearance, giving off runners freely. All leaves radical, broadly heart-shaped, very slightly hairy, on long stalks ; they enlarge and become more pointed after flowers have died. Flowers deliciously fragrant, on long, usually sharply curved stalks thus inverting the flowers ; colours vary from white and yellow to red, purple or blue. Sepals 5, oblong, green with spreading appendages ; petals 5, free, unequal, consisting of 2 pairs and one larger odd petal at bottom with long spur holding nectar. Stamens 5, situated round single-celled ovary (formed by union of 3 carpels). Fruit : a slightly hairy capsule, splitting into 3 boat-like valves, each holding a number of small, round, hard, polished seeds. In spring flowers fertilized by bees. Later plant dispenses with showy flowers and bears cleistogamous flowers, which are bud-like, and never open. Sepals never expand, petals are minute but anthers ripen and pollen is produced, coming into contact with stigmas. These flowers, not the showy spring ones, produce the greatest amount of seed. As valves dry they shrink, and squeeze off seeds in succession. Sweet Violet has inspired many poets, especially Shakespeare, for it grows abundantly at Stratford-on-Avon. Symbol of humility. *Viola* is Latin diminutive of Greek *ion*, an allusion to Ionian race ; *odorata*, scented.



SWEET VIOLET
Viola odorata
(A) Fruit

HAIRY VIOLET *Viola hirta*

Locally plentiful perennial, of chalky soils. Resembles small hairy edition of Sweet Violet ; flowers April to June. No stolons. Leaves narrower. Appendages of sepals appressed. Flowers blue, purple or rarely white, usually scentless. *hirta*, hairy.

COMMON VIOLET *Viola riviniana*

Closely resembles Sweet Violet, but is scentless, taller, growing profusely on banks, and all its organs are larger. Perennial ; flowers May to August. Sepals narrow, pointed, with large appendages. Petals usually blue-violet, spur paler than petals. Leaves do not enlarge after flowers have died. *riviniana* in honour of Rivinus, 17th-century German botanist.

WOOD VIOLET *Viola reichenbachiana*

Common perennial with slender rootstock. Leaves broadly heart-shaped, with long, narrow, toothed stipules. Appendages of sepals small. Petals blue, spur darker than petals. *reichenbachiana* in honour of German botanist Reichenbach.

HEATH (DOG) VIOLET *Viola canina*

A very variable perennial of heaths, grasslands and dunes, flowering later than *V. riviniana* and also differing in the absence of a central non-flowering rosette, in somewhat narrower leaves, pure blue petals, shorter yellow spur and shorter, less toothed stipules. *canina*, of dogs (meaning common).

MARSH VIOLET *Viola palustris*

Widely distributed perennial herb, common throughout the British Isles, but absent from several Eastern and Midland counties and Channel Islands; local elsewhere. Thrives in bogs and wet ground; grows a few inches high; flowers April to July. Leaves all radical, few, fairly large, thin, smooth, broadly heart-shaped or nearly circular, on long slender stalks. Flower stems longer than leaf stalks. Flowers small, pale blue, lilac or white, with purple veins, scentless. Lowest petals have short, broad spur; anthers orange. Fruit: hairless capsule, like that of Sweet Violet. Also bears cleistogamous flowers. *palustris*, of marshes.



MARSH VIOLET
Viola palustris
(A) Seed capsule



COMMON VIOLET
Violet riviniana
(A) Split seed capsule
(B) Flower

FIELD PANSY or HEARTSEASE [Pl. 2] *Viola arvensis*

Beautiful small familiar annual, widely distributed throughout the country in waste land, hilly pastures and cornfields. Grows 3 or 4 inches high; flowers April to September. Has large, leafy, lobed stipules and spoon-shaped, slightly hairy leaves on long stalks. Flowers small on long stalks. Petals 5,

upper 2 erect, usually purplish, lower 3 yellowish ; large lower petal has spur containing honey, with dark guide lines. Fruit : like Sweet Violet. No cleistogamous flowers. Staring, face-like corolla has originated many names, such as Herb Trinity, Three-faces-under-a-hood, Johnny-jump-up, Jump-up-and-kiss-me, Kiss-me-behind-the-garden-gate. Pansy comes from French *pensée*, a thought, from which also is derived Fancy. Heartsease refers to plant's reputed curative properties in heart diseases ; *arvensis*, of cultivated fields.

There are many other species of Wild Pansy [Pl. 3].

V. lutea is a rare alpine perennial with much larger yellow flowers and creeping rootstock. *V. tricolor* is another form, annual or perennial with large flowers. *V. curtisii* is a small yellow-flowered perennial of sand dunes.

THE MILKWORT FAMILY

POLYGALACEAE

Polygalaceae is an isolated family with complex floral structure. It comprises a world-wide distribution of some 700 species in 15 genera, more than half the species belonging to the genus *Polygala*, which is the only British native, with 6 species, 3 of them rare or local.



MILKWORT
Polygala vulgaris
(A) Fruit (B) Flower

POLYGALA

MILKWORT *Polygala vulgaris*

Widely distributed, small perennial herb, of cliff-tops, chalk hills, heaths and dry pastures throughout the country. Rarely exceeds 9 inches ; flowers May to September. Slender, short, tufted rootstock sends up many branches, with lance-shaped, leathery, alternate leaves. Flowers irregular, pink through blue to white, in slender, terminal racemes. Sepals 5, 3 green and small, 2 large and petaloid, brightly coloured. Petals 3 or 5, smaller, united with stamens, lowest petal ending in hood with crest of 2 tufts of finger-like lobes. Stamens usually 8, united below in tube, but separate above in 2 sets of 4 ; anthers open by pores. Ovary 2-celled, has curving, 2-lobed style with gaping, spoon-shaped stigma. Nectar is secreted. Fruit : compressed capsule, narrower than the inner sepals, bursting when ripe along its margins to discharge two downy seeds. Sepals turn

green when fruit sets. Plant sometimes cultivated as garden ornament *Polygala* from Greek *poly*, much, and *gala*, milk ; formerly this plant was supposed to stimulate cattle to a greater milk yield ; *vulgaris*, common.

CHALK or PROLIFEROUS MILKWORT *Polygala calcarea*

Uncommon perennial, of chalky soils in S. England ; flowers April to August. Lower leaves crowded into rosettes ; sepals longer and narrower than the capsule. *calcarea*, chalky.

THE ST. JOHN'S WORT FAMILY

HYPERICACEAE

Hypericaceae comprises several genera widely distributed, consisting of herbs, shrubs or small trees. Flowers usually symmetrical, made up in fives, with numerous stamens. One genus only in this country, *Hypericum*.

HYPERICUM

Hypericum comprises 12 native usually having yellow flowers, tufted stamens and free styles. Many species of this handsome genus are in cultivation.

TUTSAN [Pl. 5] *Hypericum androsaemum*

Not very common shrubby perennial of hedges, thickets and open woods, usually in West of England. Grows up to 3 feet high ; flowers June to September. Stem shrubby, smooth, with two raised lines. Leaves oblong, sessile, with minute pellucid glands, giving off strong aromatic smell when rubbed. Flowers few, pale golden, ½–¾ inch across. Sepals blunt, with black glands (not on margins), unequal, 3 large and 2 small ; petals deciduous, very oblique at base ; stamens numerous, in 5 bundles. Fruit : globose, purplish black, somewhat pulpy capsule, with 3 short, hooked styles. *Hypericum* from Greek *hyper*, beyond, and *eikon*, image, supposedly because of its use as an amulet against evil spirits ; *androsaemum* from Greek *andros*, man's, and *haima*, blood, probably from claret-coloured juice of capsule.

COMMON ST. JOHN'S WORT [Pl. 5] *Hypericum perforatum*

Commonly distributed perennial throughout England and Wales, of thickets, banks and copses. Grows 1–3 feet high. Flowers July to September. Root long and wiry, making short runners. Aerial stems erect, smooth, with 2 longitudinal ridges. Leaves small, oblong, sessile, opposite, thickly dotted with minute oil glands whose transparency gives illusion of perforations when held up to light. Flowers yellow, star-like, in terminal leafy cymes. Sepals 5, very acute. Petals 5, with black glands ; stamens numerous, gathered into 3 bundles, with deep orange anthers ; ovary



ST. JOHN'S WORT
Hypericum perforatum
(A) Seed capsule (B) Petal

large, pear-shaped, topped with 3 long, slender, free styles. Fruit: long, golden capsule divided into 3, splitting to reveal many finely marked seeds. *perforatum*, perforated, i.e. the leaves.

SQUARE-STEMMED ST. JOHN'S WORT
[Pl. 5] *Hypericum tetrapterum*

Common perennial, usually of wet ditches. Grows 18 inches high; flowers June to August. Stems stiff, erect, tough, with 4 green wings. Leaves broader than in last, with translucent veins as well as glands. Flowers bunched in rather denser cymes than in *H. perforatum*, somewhat paler; individually may be ¾ inch across. Sepals erect, lance-shaped, entire. Petals have few black glands round their margins. Ovary has numerous oil-sacs. Fruit: similar to *H. perforatum*. Also called Square-stalked St. John's Wort or St. Peter's Wort, since June 29th, St. Peter's day, is fair average date for flowering. *tetrapterum*, four-winged.

TRAILING ST. JOHN'S WORT *Hypericum humifusum*

Small, perennial, much-branched herb, frequently seen in dense spreading tufts on heaths and commons, or sometimes in gardens or even in swampy places. Grows 10 inches long; flowers July and August. Stems creeping, compressed, usually smooth, green, sometimes tinged red, prostrate, slender. Leaves small, pale green, opposite, sessile, with few or no transparent dots, but usually a few black glands on margin. Flowers small, yellow, up to ½ inch across, in short, lax cymes. Sepals 5, unequal, perhaps faintly toothed, with a few glands visible. Petals 5, free, also with a few glands. Stamens in 3 bundles around 3-chambered, 3-styled ovary. Fruit: oval capsule, surrounded by persistent petals and sepals. Also called Creeping St. John's Wort. *humifusum*, trailing along the ground.

UPRIGHT ST. JOHN'S WORT *Hypericum pulchrum*

Slender, rather small erect perennial, of commons, heaths, and woods. Grows 1–2 feet high; flowers June to August. Stems slender, smooth, round. Leaves sessile, in opposite pairs, heart-shaped, with characteristic pellucid glands towards edges. Flowers small, yellow, in loose panicles. Sepals 5, small, oblong, edged with black glands, as are also the yellowish petals. Stamens carry red anthers; ovary smooth, 3-chambered, topped with 3 slender styles. Fruit: capsule, enclosed by persistent petals, containing numerous, narrow, finely pitted seeds. Also called Slender St. John's Wort. *pulchrum*, beautiful.

HAIRY ST. JOHN'S WORT [Pl. 5]
Hypericum hirsutum

Widely distributed in open woods and thickets. Grows 2½ feet high; flowers June to August. Stems erect, round, hairy. Resembles Upright St. John's Wort, but has longer leaves, with usual oil glands. Flowers ½–¾ inch across. Petals yellow, twice as long as narrow sepals, sparsely glandular at tips. *hirsutum*, hairy.

MOUNTAIN ST. JOHN'S WORT
Hypericum montanum

A local perennial, 1–2 feet, of hedge banks and hillsides, on limestone, flowering June to August. Stem erect, round, as in *H. hirsutum*, but not hairy, scarcely branched and bearing a denser inflorescence. The leaves are sessile, puberulous, and with glandular dots at the margin. *montanum*, of mountains or hills.



TRAILING ST. JOHN'S WORT
Hypericum humifusum
(A) Rootstock (B) Full flower

MARSH ST. JOHN'S WORT *Hypericum elodes*

Succulent, downy perennial, of spongy bogs and shallow water in marshes, etc., scattered throughout the British Isles. Grows 9 inches high; flowers June to September. Stems prostrate below, branching freely at first, rooting at nodes, then bending upwards, becoming erect. Ascending branches round or slightly angular. Leaves sessile, rounded, sometimes heart-shaped at base, up to 1 inch long, with minute pellucid glands, covered like stem with soft, shaggy down of long, simple, colourless hairs. Flowers pale yellow, ½ inch across, in terminal, few-flowered cymes, lacking gloss or metallic sheen of Perforated St. John's Wort. Sepals blunt, smooth, except for pretty marginal fringe of short, red, glandular hairs. Petals, with green midribs, expand only in bright weather. Stamens in 3 bundles; ovary one-chambered, with 3 styles. Fruit: small many-seeded capsule. *elodes* from Greek *helodes*, swampy.

IMPERFORATE ST. JOHN'S WORT [Pl. 5] *Hypericum dubium*

Rather uncommon. Lacks usual pellucid glands on leaves; stems have 4 ridges. *dubium*, doubtful.

THE ROCK-ROSE FAMILY

CISTACEAE

Rock-Rose family comprises 4 genera with some 160 species, of which 120 belong to genus *Helianthemum*, the sole representative in Britain. They are nearly all natives of the North Temperate Zone, thriving in dry, sunny places with warm soils, sandy or more frequently, chalky.

HELIANTHEMUM

COMMON ROCK-ROSE [Pl. 3] *Helianthemum chamaecistus*

Common shrubby perennial of chalky and gravelly soils. Grows 1 foot high; flowers June to September. Rootstock, and procumbent much-branched stems, tough and woody. Herbaceous flowering shoots sent up each year from ends of woody branches. Leaves small, simple, narrow, oblong, in opposite pairs, with upper surface green, rarely hairy, and lower surface greyer, covered with branched hairs. Stipules longish, slender. Flowers large, yellow, attractive. Sepals 5 (3 large, 2 small); petals 5, large, heart-shaped, yellow, rather flabby, soon falling; stamens numerous, clustering round fused carpels which form 3-celled ovary with a long slender style. Fruit: capsule splits into 3 valves along midribs or carpels; the numerous albuminous seeds are attached to middle of each valve. No nectar, but pollen abundant and insect visitors frequent. Flowers close at night and in bad weather. Most beautiful are cultivated forms of *Helianthemum chamaecistus* with wide variety of different coloured flowers. *Helianthemum* from Greek *helios*, sun, and *anthos*, flower, describing flowers' dependence on sunshine; *chamaecistus*, *chamai*, on the ground, and *kistos*, a classical Greek name of a Mediterranean plant (cistus).



ROCK-ROSE
Helianthemum chamaecistus
(A) Fruit

WHITE ROCK-ROSE
Helianthemum apenninum

A perennial, flowering June and July, limited to limestone rocks in Devon and Somerset. It is distinguished from *Helianthemum chamaecistus* by its white flowers and narrower leaves hoary on both surfaces. *apenninum*, of the Apennines.

There are several other species, such as the HOARY ROCK-ROSE (*H. canum*), with small yellow flowers, and the ANNUAL ROCK-ROSE (*H. guttatum*), with hoary leaves and a red spot at the base of each petal, but they are all very rare.

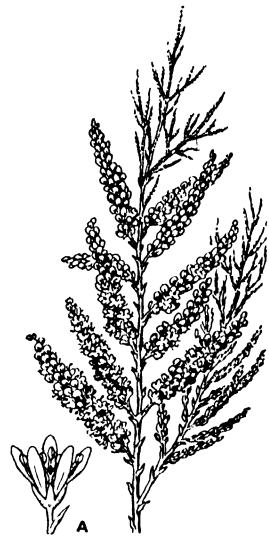
THE TAMARISK FAMILY

TAMARICACEAE

A small family with a wide geographical range, consisting of shrubs or small trees with whip-like branches, minute, scale-like leaves, and spikes of small flowers. Of 90 species in 5 genera belonging to the family more than two-thirds belong to *Tamarix*.

TAMARIX

Distribution of the genus is almost as wide as that of the family. Minute scattered leaves lack stipules. Flowers with parts in fours or fives; one-chambered ovary may consist of 2 to 5 carpels. Two species of this genus are introduced.



TAMARISK
Tamarix gallica
(A) Flower

TAMARISK *Tamarix gallica*

Shrub, commonly naturalized on coasts of S. and E. England. Usually 3–10 feet in height; flowers July to September. Branches hairless but bear scars of fallen leaves and numerous cork-warts. They change with age from red to purple and brown. Leaves small, smooth but slightly glaucous, evergreen. Flowers tiny ($\frac{1}{8}$ inch across), crowded in terminal and lateral spikes, 1 inch long, rising from axils of minute bracts. Sepals and petals 4 or 5; ovary topped with 3 styles. Fruit: flask-shaped capsule containing seeds with tufts of hair. A native of the western coasts of Europe, its tolerance of cutting sea breezes, colourful contrasts in bright green, red and pink, make it a valuable acquisition. *Tamarisk*, from Hebrew *tamarik*, cleansing, from its use either as blood purifier or in making brooms, or from river Tamaris, now the Tambro, in Pyrenees, where tree abounds; *gallica*, French.

FRANKENIACEAE

Small heath-like shrubs of salt marshes, comprising about four genera with about 60 species.

FRANKENIA

SEA HEATH *Frankenia laevis*

The only British species of the family Frankeniaceae. A procumbent, wiry perennial of southern and eastern coastal salt marshes; flowers in July and August. Stem up to about 6 inches long, crowded with short,

very narrow, heath-like leaves. Flowers at the ends or in the forks of the branches, rose-coloured. Fruit a 3-angled capsule hidden by the calyx. Named *Frankenia* after J. Franken, a Swedish botanist; *laevis*, smooth.

WATERWORTS

ELATINACEAE

WATERWORTS — *Elatine hexandra* and *E. hydropiper*

Small, very local, submerged annuals, a few inches long, flowering July and August in ponds. Stems slender, rooting at the nodes. Leaves opposite, entire, spatula-shaped, the stalk shorter than the blade in *E. hexandra*, and longer in *E. hydropiper*. The pinkish-white axillary flowers of the former have 6 stamens and are stalked, and of the latter have 8 stamens and are sessile. Fruits more or less globose. *Elatine*, a classical name; *hexandra*, with 6 stamens; *hydropiper*, from *hyder*, water, *piper*, pepper (fruits somewhat resemble peppercorns).

THE PINK FAMILY

CARYOPHYLLACEAE

Widespread family of graceful herbs including some 1,500 species, 30 or 40 being common natives in this country. Leaves generally narrow, undivided, in opposite pairs on rounded, jointed stems. Flowers have 4 or 5 petals and sepals. Fruit a capsule.

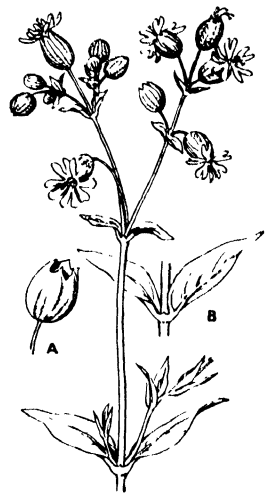
SILENE

Silene is a large genus, comprising several hundred species of which nearly 140 are European and 8 British. Annual or perennial herbs, with 5-toothed, 10-ribbed calyx more or less inflated, and no bracts immediately below flowers as in *Dianthus*.

BLADDER CAMPION — *Silene cucubalus*

Fleshy herb of roadsides, waste land and cornfield edges. Grows up to 3 feet high; flowers June to September. From stout, branching root rises erect, fleshy, generally smooth stem, branching unequally from base. Leaves lance-shaped, sessile, opposite; stem and leaves covered with grey waxy bloom. Flowers white, numerous, generally drooping, in loose terminal clusters. Calyx globular, much inflated, with narrow 5-toothed mouth, veined with purplish network. Petals 5, white, deeply cloven; stamens 10; styles 3. Fruit capsule on short stalk, with 6-toothed opening at top through which are released many kidney-shaped seeds. Also

called White Bottle. Belongs to Catchfly genus, so named because viscid hairs on some species entangle tiny insects. Cross-pollinated by butterflies, moths and long-tongued humble-bees, nectar being concealed at some depth. *Silene*—the origin of this name is obscure ; *cucubalus* is the classical name of a plant in Pliny.



BLADDER CAMPION
Silene cucubalus
(A) Seed capsule
(B) Stem node

SEA CAMPION [Pl. 5] *Silene maritima*

Attractive little perennial, fairly common in shingle by the sea, closely resembling Bladder Campion. Grows 1 foot high ; flowers May to September. Tap-root long, branching necessary for firm anchorage in shingle. Habit rather spreading, leafy stems forming cushion from which rise short, little-branched flower stems. Growth matted, foliage distinctly glaucous and fleshy. Flowers solitary, terminal, larger than in Bladder Campion. Anthers violet-blue, contrasting conspicuously with dead white of petals. Fruit : bell-shaped capsule containing numerous flattened, kidney-shaped seeds. *maritima*, maritime.

STRIATED CATCHFLY *Silene conica*

A local annual, 6–12 inches, of sandy places, flowering May and June. Mainly distinguished from other species by its conical fruiting calyx which is swollen below but not bladdery and has thirty veins or furrows. *conica*, conical.

SMALL-FLOWERED CATCHFLY *Silene anglica*

Uncommon annual of sandy and stony soils. Flowers June to October. Also exudes certain stickiness on stem and calyx. Flowers solitary, axillary, similar to those of Nottingham Catchfly. *anglica*, English.

MOSS CAMPION *Silene acaulis*

Very small perennial, abundant only on mountains, especially in Scotland ; flowers June to August. Covers ground in moss-like patches ; tiny pretty pink (occasionally white) flowers on very short smooth stems. *acaulis*, stemless.

SPANISH CATCHFLY *Silene otites*

A perennial of East Anglian heaths, 1 foot high, flowering in June. Distinguished by the long, narrow inflorescence of greenish-yellow flowers in whorl-like clusters. Leaves mostly radical. *otites*, origin obscure.

NOTTINGHAM CATCHFLY *Silene nutans*

Tall, rather rare perennial, of limestone and chalky soils. Grows 3 feet high ; flowers May to July. Stems slightly hairy, with upper parts and calyx sticky, entangling small insects. Flowers pink or white, scented, honeyless, expanding mainly by night. *nutans*, nodding.

VISCARIA

RED ALPINE CATCHFLY *Viscaria alpina*

A rare, alpine, tufted perennial, flowering June and July, allied to the Campions, but with two-sexed, rose-coloured flowers in a crowded head. Stem not viscid. *Viscaria* from *viscum*, bird-lime ; *alpina*, alpine.

RED GERMAN CATCHFLY *Viscaria vulgaris*

A rare perennial of dry rocks in Wales and Scotland, has larger flowers in a spike-like inflorescence and viscid stems. *vulgaris*, common.

MELANDRIUM

Melandrium is separated from *Silene* by slight differences in styles and capsules and by its having 10 veins in calyx (*Silene* has 20). The genus comprises some 60 species, 3 being English.



WHITE CAMPION
Melandrium album
(A) Flower (B) Seed capsule

NIGHT-FLOWERING CATCHFLY
Melandrium noctiflorum

Rather less common annual, most frequent in eastern counties. Flowers erect, largish, with yellow exterior and reddish interior, fragrant at night when petals expand ; flowers hermaphrodite, appear during late summer. Styles of the ovary 3. *Melandrium*, a classical name ; *noctiflorum*, night-flowering.

RED CAMPION [Pl. 5]
Melandrium rubrum

Common, rather striking perennial, widely distributed in moist copses, especially on loam or sand. Grows 3 feet high ; flowers May to August. Stems loosely branched, hairy, sticky higher up. Leaves hairy, sessile, oval, in opposite pairs. Flowers deep pink, on short stalks. Sepals 5, hairy, greenish red, united in calyx tube with short triangular teeth. Petals 5, 2-lobed, with 2 tiny, erect scales just above claw. Flowers

unisexual ; 10 stamens in male ; 5 united carpels in female form ovary with 5 free stigmas and styles. Fruit : globular capsule with 10 recurved teeth, holding numerous kidney-shaped seeds. *rubrum*, red.

WHITE CAMPION *Melandrium album*

Common in hedgerows, waste places and cultivated land. Similar to last, but with pure white flowers, fragrant towards evening to attract moths. It is a sturdier plant, preferring chalky soils and open sunny situations like cornfields. Calyx-teeth long and narrow ; capsule conical with straight teeth. Also called Evening Campion. *album*, white.

LYCHNIS

Lychnis separated from *Silene* and *Melandrium* by the number of capsule teeth being equal to, not twice the number of styles.

RAGGED ROBIN [Pl. 5] *Lychnis flos-cuculi*

Extremely common, erect perennial, of wet, low-lying clay lands, fens, marshes, or spongy, rush-grown margins of streams. Grows 2 feet high ; flowers May to August. Rhizome short, only slightly thickened. Aerial stems slender, repeatedly forking, slightly downy below, viscid higher up, with dark reddish colouring-matter. Root leaves stalked, broadly lance-shaped ; stem leaves narrowly linear, sessile. Flowers red, in loose terminal clusters, with perhaps 6 or 8 flowers expanding simultaneously on one stem. Tubular calyx has 10 ribs and 5 tapering teeth. Each petal deeply divided into 4 linear lobes, giving flowers a ' ragged ' appearance. Stamens 10, in 2 whorls ; carpels 5, united in 1-celled ovary with 5 free styles. Fruit : broadly oval capsule, releasing many warted, kidney-shaped seeds by 5 short teeth at top. Flowers scentless, but honey is secreted at base of stamens. Larger flying insects attracted by striking, strap-shaped petals, but sticky stem discourages small wingless ones which are useless for pollination. *Lychnis*, from Greek *lychnos*, lamp ; *flos-cuculi*, *flos*, flower, and *cuculi*, of cuckoo.

AGROSTEMMA

Agrostemma distinguished by long lobes of calyx, and petals having no scales at base.

CORN-COCKLE [Pl. 5] *Agrostemma githago*

Largest and loveliest of British Campions. Erect annual commonly distributed in and around cornfields. Grows up to 5 feet high ; flowers June to September. Stem long, coarse, slightly branched ; leaves few, long, linear, densely covered with white hairs. Flowers large, rich reddish purple, solitary, terminal, on long leafless stalks. Calyx strongly ribbed, leathery, with 5 long, pointed, leafy lobes projecting well beyond petals ; length of tube restricts honey to long-tongued butterflies and moths. Petals deep rose, fading towards centre into long white claws. Whole flower suffused with wonderful bluish bloom and traversed by finely ruled dark lines as honey-guides. Stamens 10, generally maturing before stigmas. Fruit : large ovoid capsule, bursting by 5 teeth, shaking out large black

seeds. Flowers stay open through bad weather and darkness. Seeds poisonous, and formerly were often included with corn, giving bread unpleasant smell. *Agrostemma*, from Greek *agros*, field, and *stemma*, garland ; *githago* is the classical name.

DIANTHUS

Dianthus estimated to contain more than 200 species, mostly tufted, wiry, perennial, alpine or rupestral herbs with grass-like leaves and conspicuous pink flowers with long-clawed petals. There are 2 or more opposite bracts immediately below tubular calyx. Fruit a many-seeded capsule. Only 3 species truly native.

DEPTFORD PINK — *Dianthus armeria*

Uncommon annual of hedgerows and thickets in S. England. Branches few, erect, 6–12 inches high. Flowers—deep rose stars dotted with white, in small bunches, appearing in late summer. *Dianthus* from Greek *Dios*, Jove, and *anthos*, flower, i.e. Jove's flower ; *armeria*, origin obscure.

CHEDDAR PINK — *Dianthus gratianopolitanus*

Very rare perennial from grand gorge in Mendips, tufted, with long slender woody branches to rootstock. Leaves smooth, linear, up to 2 inches long. Flowers solitary, delicate pale rose, delightfully fragrant, irregularly toothed. Some specimens produce exclusively female flowers. Flowers June and July. *gratianopolitanus*, of Grenoble.

MAIDEN PINK — *Dianthus deltoides*

Beautiful, widely distributed but rather rare perennial of dry soils in fields, on banks and old walls. Stems may be 1 foot high ; flowers June to September. Plants form low spreading tufts, branching from root-stock. Leaves narrow, grass-like, undivided, downy, in opposite pairs with bases united. Flowers pink, solitary, scentless, on long, slender stems, about ¾ inch across ; frequently marked with white spots. Sepals united in smooth, 5-toothed calyx ; petals free, toothed. Nectar secreted at base of 10 stamens ; ovary has 2 long styles. Fruit : cylindrical, many-seeded capsule. Clove Pink and garden varieties of Carnation spring from *Dianthus caryophyllus*, not a native. Pink refers not to colour but to verb meaning to pierce, alluding to toothed petals. *deltoides*, delta-like.

SAPONARIA

SOAPWORT [Pl. 5] — *Saponaria officinalis*

Common perennial of roadsides, in thickets, and banks of streams, especially near human habitations ; possibly truly wild only in S.W. England. Grows up to 2 feet high ; flowers May to August. Stems several, smooth, rather stout and leafy. Leaves in opposite pairs, without stipules, lance-shaped, connected at base round stem by thin rim, conspicuously 3–5 veined. Flowers large, beautiful, rosy or white, in small cymes, with a pair of narrow, conspicuous, leafy bracts just below each

flower. Calyx cylindrical, 5-toothed ; petals 5, free, broad, undivided but notched at apex, long-clawed, with 2 tiny scales on claw ; stamens 10 ; ovary smooth, with 2–3 styles. Fruit : capsule, releasing its many seeds by 4 valves at the top. Root and leaves contain poisonous substance known as saponin ; when bruised and rubbed with water a good lather is produced. Plant formerly used for washing purposes and medicinally. In the evening flowers exude much stronger perfume, and hawk-moths are attracted to nectar. *Saponaria* from Latin *saponis*, soap ; *officinalis*, used medicinally.

KOHLRAUSCHIA

PROLIFEROUS PINK — *Kohlrauschia prolifera*

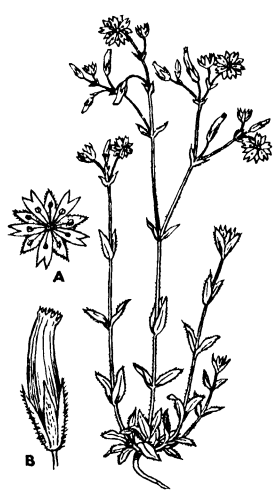
A rare annual, 1–1½ feet, of sandy and gravelly places in the South ; flowering in July. Like a *Dianthus*, except for the membranous bracts enclosing the compact cluster of flowers. Petals rose. Named after a lady botanist, H. Kohlrausch. *prolifera*, proliferous, i.e. reproducing by buds.

CERASTIUM

Cerastium comprises a number of species of variable plants, some common, others local.

MOUSE-EAR CHICKWEED — *Cerastium vulgatum*

Very common, slender, hairy perennial, of waste or cultivated land, wet or dry. Sometimes exceeds more than 1 foot in height ; flowers April to end of autumn. Stems slender, spreading, branching at base, slightly thickened at nodes. Stem leaves bluntly lance-shaped, sessile, somewhat like mouse's ear in shape and texture, being covered with long silky hairs. Flowers white, in loose terminal cymes, with pair of small, leaf-like bracts just below each pair of flowers. Sepals 5, green, hairy on outside with scarious margin and glabrous tips. Petals 5, notched, variable in size ; stamens 10 ; styles 5. Fruit : smooth, shining, cylindrical capsule, splitting into 10 sharp teeth at top, releasing dark, rough-coated seeds. Honey visible at base of stamens. *Cerastium* from Greek *keras*, a horn, with reference to shape of capsule ; *vulgatum*, common.



MOUSE-EAR CHICKWEED
Cerastium vulgatum
(A) Flower (B) Seed capsule

FIELD MOUSE-EAR CHICKWEED
Cerastium arvense

Much-branched, not very hairy perennial herb of chalky or gravelly waste ground ; flowers April to August. Stems

usually prostrate, reaching only few inches above ground. Flowers large, white, petals 2-lobed, twice as long as sepals. One-celled ovary develops into oblique capsule, opening by 10 teeth at top, containing several rounded, pimply seeds. *arvense*, of cultivated fields.

LITTLE MOUSE-EAR CHICKWEED *Cerastium semidecandrum*

Small, rather slender annual, of old walls and dry stony ground ; flowers in spring. Much-branched stem sometimes sticky, with soft hairy leaves. *semidecandrum*, five-stemmed.

DARK-GREEN MOUSE-EAR CHICKWEED *Cerastium tetrandrum*

Annual of sandy soil near coasts ; may grow 1 foot high. Stem much-branched ; flowers insignificant, white, with viscid calyx. *tetrandrum*, having 4 stamens.

STICKY MOUSE-EAR CHICKWEED *Cerastium glomeratum*

Branching, hairy annual of stony and dry ground. Grows over 1 foot high ; flowers spring to late autumn. Resembles large *Cerastium semidecandrum*. Stems sticky ; flowers variable.

Other native British species are :

STARWORT MOUSE-EAR CHICKWEED, *Cerastium cerastoides* ; ALPINE MOUSE-EAR CHICKWEED, *Cerastium edmonstonii* ; CURTIS'S MOUSE-EAR CHICKWEED, *Cerastium pumilum*.

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MYOSOTON

The genus *Myosoton* is closely related to *Stellaria* and differs from the latter in having 5 styles.

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WATER STITCHWORT *Myosoton aquaticum*

Spreading, creeping perennial of stream and river banks in S. England and Wales. Flowers late summer. Stems slender, delicate, rising to 3 feet, with broadly heart-shaped leaves. Flowers white, axillary. *aquaticum*, of water.

STELLARIA

Stellaria comprises some 80 species of which 8 are regarded as British. With the exception of the Common Chickweed, they are known as Stitchworts. Common characteristics are slender, thread-like stems ; narrow pointed leaves, white flowers in loose cymes, and three styles.

COMMON CHICKWEED *Stellaria media*

Common annual weed, especially of gardens and other cultivated land. Flowers almost all year round, and completes its life history within a few weeks. Stems weak, trailing, succulent. Line of comparatively long, reflexed hairs runs down one side of stem and both sides of lower leaf stalks. Line down stem changes sides at each pair of leaves. Leaves

almost oval. Flowers small, white, inconspicuous, petals shorter than sepals. Structure like that of Greater Stichwort, but self-pollinating flowers that never open are produced in winter. At other seasons, stamens, with violet anthers, are reduced to as few as 2, maturing almost simultaneously with stigmas. Fruit : six-toothed capsule with several curved seeds. On Continent used as pot-herb and substitute for spinach. Hairs explained either as serving to draw off rainwater from each successive cup formed by bases of upper leaves, or as absorbing moisture by basal portion of each hair. *Stellaria* flowers from Latin *stella*, a star, referring to star-like flowers ; *media*, intermediate.

GREATER STITCHWORT *Stellaria holostea*

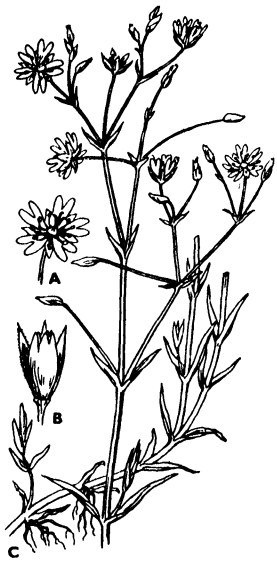
Common, pretty perennial, conspicuous in spring under hedges and in bushy places. Grows 1 foot high ; flowers April to June. Slender creeping rootstock throws up thread-like, delicate, quadrangular, hairless, green stems, leaning for support on surrounding grasses and other plants. Leaves long, narrow, pointed, minutely toothed, sessile. Flowers white, star-like, relatively large, in panicles of only a few flowers. Sepals 5, free, pointed ; petals 5, white, nearly twice as long as sepals, deeply 2-lobed, stamens usually 10, in 2 whorls, outer maturing first ; ovary egg-shaped. Fruit : globose capsule, splitting at top into 6 valves, releasing kidney-shaped seeds. Honey secreted by 5 glands at base of stamens. This species has nearly 60 popular names, including Greater Starwort, Snap-stalks, Tongue-grass, Satin-flower, Lady's-white-petticoat, Breakbones and All Bone. Delicate green shoots are sent out in March from apparently lifeless stalks which do not die down in winter, as is the case with most herbaceous perennials. ' Stitchwort ' refers to infusion made from leaves against pain in the side. *holostea*, from Greek *holos*, whole, and *osteon*, bone ; probably believed to help mending or stitching of broken bones, from resemblance of swollen nodes to extremities of limb bones.



GREATER STITCHWORT
Stellaria holostea
(A) Seed capsule

LESSER STITCHWORT *Stellaria graminea*

Not so common, slender, straggling perennial growing in dry, heathy places. Smaller in habit, but often taller than Greater Stitchwort ; flowers May to July. Stems quadrangular, exceedingly slender, smooth, with lance-shaped, sessile leaves. Flowers numerous, small, white, in loose panicles. Petals deeply 2-lobed, as long as or longer than 3-veined



LESSER STITCHWORT
Stellaria graminea

(A) Flower
(B) Seed capsule
(C) Creeping stem

sepals. Anthers red. After each row of stamens has moved upwards, burst its anthers and bent outwards and downwards, styles elongate and go through same movements, so that flowers can be self-pollinated, although honey is unconcealed and there are numerous insect visitors. Fruit: capsule, containing several circular, warted seeds. Also called Heath Stitchwort. Often confused with Marsh Stitchwort (*S. palustris*), which differs from it in having hairy bracts. *graminea*, grassy.

MARSH STITCHWORT *Stellaria palustris*

Closely resembles Lesser Stitchwort, but grows in marshy places; flowers May to July. Smooth, glaucous perennial with solitary flowers on long stalks. Petals much longer than sepals. *palustris*, of marshes.

BOG STITCHWORT *Stellaria alsine*

Variable perennial of wet ground; flowers May to July. Weak, slender, quadrangular stems have small, lance-shaped leaves with pointed tips. Foliage slightly glaucous. Flowers small, white; petals shorter than sepals. *alsine* from Greek *alsos*, a grove or wood.

WOOD STITCHWORT *Stellaria nemorum*

Uncommon perennial of woody places, chiefly in northern and western counties: flowers May to August. Leaves oval, with fringed edges. Flowers largish, white. *nemorum*, of woods.

MOENCHIA

UPRIGHT CHICKWEED *Moenchia erecta*

An annual, 1–4 inches high, found locally in dry, gravelly, sandy places; flowers May and June. Stem erect, with narrow, opposite, stiff leaves. Petals white, entire, shorter than the broadly white-edged sepals. Fruit a straight capsule, opening by 8 teeth. *Moenchia*, after a German botanist, K. Moench; *erecta*, erect.

SAGINA

COMMON PEARLWORT *Sagina apetala*

Tiny tufted annual similar to Common Pearlwort, flowering May to August. Stems threadlike; leaves sharp-pointed, minutely fringed with hairs, in opposite pairs. Sepals 4, green, free, blunt at apex; petals

lacking, or so small as to be barely visible. Four stamens surround an equal number of short stigmas. *Sagina*, fattening food ; *apetala*, without petals.

SEA PEARLWORT *Sagina maritima*

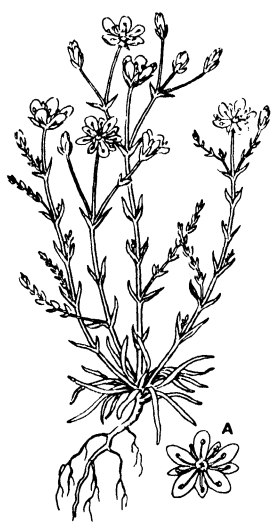
A local, maritime annual, otherwise differing from *Sagina procumbens*, in its non-rooting but flowering main stem. Flowers May to September. It is distinguished from *S. apetala* by its fleshy, sharp-pointed, but not awned, leaves. *maritima*, maritime.

PROCUMBENT PEARLWORT *Sagina procumbens*

Tiny, tufted, grassy perennial, abundant in heaths, gardens, pastures and sandy soils. Grows 2 inches high ; flowers May to September. Stems slender, spreading, trailing, rooting as they go. Leaves needle-like coming to a fine point; lower ones in dense clusters, upper ones in opposite pairs. Flowers many, insignificant, minute, solitary, terminal, greenish on slender stalks. Sepals 4, largish ; petals 4, tiny (sometimes missing) ; stamens 4 ; styles 4, hairy, curving. Fruit : egg-shaped capsule, breaking into 4, releasing numerous, almost microscopic, dark brown seeds. One of the smallest flowering plants, generally regarded as vexatious weed in gardens. Sepals sometimes shaded with red, to attract insects ; flowers closed in bad weather. *procumbens*, trailing.



COMMON PEARLWORT
Sagina apetala
(A) Seed capsule (B) Flower



KNOTTED PEARLWORT
Sagina nodosa
(A) Flower

AWL-LEAVED PEARLWORT *Sagina subulata*

A local perennial of dry, sandy places, forming mats, flowering from June to August. Differs from *Sagina nodosa* in petals not longer than sepals and leaves shortly awned. *subulata*, awl-shaped.

KNOTTED PEARLWORT *Sagina nodosa*

Tufted perennial, similar to previous species, but found in wet places. Grows about 4 inches high ; flowers July and September. Stems few, slender, branching from base of primary flowerless stem, trailing along

ground for a few inches, then turning upwards and growing semi-erect. Lower leaves in needle-like rosettes ; upper (very much smaller) in opposite pairs, with smaller leaves nestling within. Flowers comparatively few, on slender erect stalks. Petals 5, white, longer than 5 broad sepals. Stamens 10 ; styles 5. Fruit : oval capsule splitting into 5, disclosing numerous minute seeds. Also called Knotted Spurrey. *nodosa*, knotted.

MINUARTIA

FINE-LEAVED SANDWORT — *Minuartia tenuifolia*

A slender, uncommon annual, 4–6 inches, of sandy, stony and rocky places and walls, flowering in May and June. Stem erect ; leaves typically very narrow and tapering, crowded below. Petals white, only half length of sepals, on much-branched inflorescences. Fruit an oblong capsule. The other species of *Minuartia* are local tufted perennials. Named after J. Minuart, a Spanish botanist ; *tenuifolia*, fine-leaved.

CHERLERIA

MOSSY CYPHAL — *Cherleria sedoides*

A perennial, local on Scottish mountain slopes, flowering June to August. Distinguished by its mossy, cushion-like habit ; the short stems and very crowded narrow leaves spread over the ground in short, thick clumps. Petals usually absent. Capsule few-seeded. *Cherleria*, after J. H. Cherler ; *sedoides*, sedum-like.

HONKENYA

SEA SANDWORT — *Honkenya peploides*

Widely spread and very common perennial of sandy and shingly shores. Grows 2–8 inches high ; flowers May to September. Rootstock long, slender, creeping, anchoring itself firmly in loose shingle or sand. Much-forked, fleshy, smooth stems at first prostrate, then erect. Leaves thick, fleshy, dark green, shining, in opposite pairs, usually with frilled margin. Flowers few, small, greenish-white, insignificant, in terminal cymes from axils of upper leaves. Sepals 5, oval, fleshy, green ; petals 5, small, spoon-shaped, white ; stamens 10. Ovary globose, topped with 3 to 5 short styles. Fruit large, round, conspicuous capsule opening by 3 to 5 valves, releasing few, large, black, finely pitted seeds. Plant often forms large, dark green matted patches along shore. In some districts it is pickled. *Honkenya*, after German botanist, G. H. Honkeny ; *peploides*, peplis-like.

MOEHRINGIA

THREE-NERVED SANDWORT — *Moehringia trinervia*

Weak, much-forked, spreading woodland annual. Stems 1 foot long ; flowers May to June. Flowers very small, white. Closely resembles Common Chickweed, but 5 white petals are undivided, and shortly stalked, oval, opposite leaves have 3 conspicuous parallel veins. Six-valved capsule contains numerous very small round, brown seeds. Also called Plantain-leaved Sandwort. *Moehringia*, after P. H. Moehring, a German physician and naturalist ; *trinervia*, three-nerved.

ARENARIA

THYME-LEAVED SANDWORT — *Arenaria serpyllifolia*

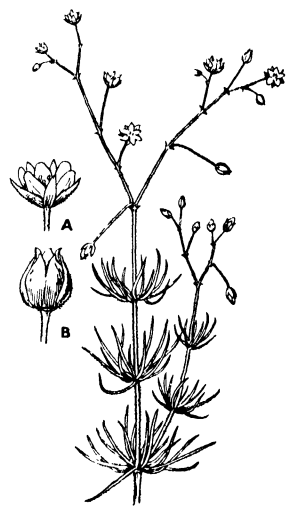
Very small, slender, branching annual, reaching 5 inches in height; flowers throughout summer. On walls and dry, sandy or stony soils. Stems minutely hairy; leaves small, pointed, in sessile, opposite pairs. Flowers white, very small on short stalks. Sepals 5, petals 5, stamens 10, styles 3, twisted. Capsule 6-toothed, containing kidney-shaped seeds. Flowers bisexual or solely female. *Arenaria*, from Latin *arena*, sand; *serpyllifolia*, thyme-leaved.

Three rare and local species of *Arenaria* differ from *A. serpyllifolia* in having the petals longer than the sepals. In *A. ciliata*, of Sligo in Ireland, the leaves are ciliate or fringed with hairs for most of their length and the sepals hairy; in *A. norvegica*, of W. Scotland, the glabrous or basally ciliate leaves are fleshy and somewhat spatula-shaped; in *A. gothica* of Yorkshire, the leaves are slightly ciliate at base and oval; the last two have glabrous sepals. *ciliata*, ciliate; *norvegica*, of Norway, *gothica*, of Gothland (where species in question also occurs).

SPERGULA

CORN SPURREY — *Spergula arvensis*

Common annual weed of dry light soils in cornfields. Grows 18 inches high; flowers June to August. Branches from root into several erect stems with bent joints. Leaves very narrow, needle-like, in clusters at nodes. Stipules small and dry. Flowers numerous, white, very small, in cymes; effect marred by flower stalks wilting when seeds are set. Sepals 5, ovate glandular, downy; petals 5, white, broad, undivided; stamens 5 to 10, with rounded anthers; ovary egg-shaped. Styles 5, short. Fruit: five-valved capsule containing many seeds with a narrow wing. Local name is Pickpurse because of its trouble to farmers. Often fed to stock on Continent. *Spergula* from Latin *spargo*, I scatter, referring to free scattering of seed; *arvensis*, of cultivated fields.



CORN SPURREY
Spergula arvensis
(A) Flower
(B) Seed capsule

SPERGULARIA

SAND SPURREY — *Spergularia rubra*

Very widely distributed, neat, small annual or biennial of sandy or gravelly soils or rocks. Flowers June to September. Many reddish stems branch from base and lie almost prostrate, with tufts of leaves growing from joints. Leaves opposite, narrow, sharply tipped. Conspicuous

stipules silvery white, lance-shaped. Upper part of stems and sepals covered with short hairs. Flowers small, very variable, generally pink to white, in twos and threes. Sepals 5, green, lance-shaped ; petals 5, rosy ; stamens up to 10, as long as petals, with yellow anthers ; styles 3. Fruit : oblong 1-celled ovary develops into 3- to 5-valved capsule, holding many warted seeds. Also called Red Sandwort Spurrey. *Spergularia*, from *Spergula* (see above) ; *rubra*, red.



SAND SPURREY
Spergularia rubra
(A) Seed capsule (B) Flower

SEASIDE SAND-SPURREY
Spergularia marginata

Slender perennial, of muddy shores ; flowers June to September. Aerial stems reddish, compressed from sides, usually glabrous, except in inflorescence. Stipules broadly triangular ; fleshy leaves semi-cylindric, with blunt tips. Flowers pale pink or almost white, on long stalks ; petals and sepals nearly equal in length ; 10 stamens. Fruit : very large capsules, longer than calyx, containing compressed, rounded, reddish seeds with broad wing. Also called Saltmarsh Sand-Spurrey. *marginata* refers to winged seeds.

POLYCARPON

FOUR-LEAVED ALL-SEED
Polycarpon tetraphyllum

A rare, local annual, up to 6 inches, of sandy places in the South-West, flowering June and July. It is much-branched, bearing crowded clusters of small white flowers and opposite leaves with membranous stipules, the lower appearing to be in whorls of four. Capsules many-seeded. *Polycarpon*, many-fruited ; *tetraphyllum*, four-leaved.

CORRIGIOLA

STRAPWORT — *Corrigiola littoralis*

A very local, decumbent annual, up to 10 inches long, of sandy shores in Devon and Cornwall, flowering July and August. The tiny white flowers are crowded in axillary or terminal clusters. Distinguished by the alternate, narrowly oblong, blunt, entire leaves like small straps, with tiny whitish stipules. *Corrigiola*, from *corrigia*, shoe-string ; *littoralis*, of the shore.

HERNIARIA

GLABROUS RUPTURE-WORT — *Herniaria glabra*

A local annual or biennial of sandy places in a few counties, flowering in July. Stems a few inches long with numerous, alternate branchlets

bearing small oval leaves and crowded with axillary clusters of flowers, appearing green as the white petals are so minute. *Herniaria*, from *hernia*, rupture, for which it was used ; *glabra*, hairless. (It may be slightly hairy.)

ILLECEBRUM

ILLECEBRUM *Illecebrum verticillatum*

A local, southern annual, with spreading, decumbent branches up to 9 inches, flowering July to September. Recognized by the silvery white whorls of tiny flowers at the nodes. Leaves small, oval. *Illecebra*, name of a plant (derived from *illicio*, allure or entice) ; *verticillatum*, whorled.

SCLERANTHUS

ANNUAL KNAWEL *Scleranthus annuus*

An annual or biennial, up to 10 inches, of cultivated, sandy fields. Flowers June to August. Stems decumbent or ascending, branched. Leaves small, tapering. Recognized by the rigid, hairless, fruiting calyx, which has sharp teeth, edged with a narrow membrane, the tube deeply furrowed. Flowers small, green, singly in the forks of the stem or in clusters. Fruit a one-seeded nutlet. *Scleranthus*, from *skleros*, hard, and *anthos*, flowers, referring to the hard, persistent, fruiting calyx ; *annuus*, annual.



SEASIDE SAND-SPURREY
Spergularia marginata
(A) Seed (B) Flower
(C) Seed capsule

PERENNIAL KNAWEL *Scleranthus perennis*

A perennial, similar to *S. annuus*, differing mainly in the fruiting calyx, which has blunt, broadly-margined teeth, the tube slightly furrowed and hairy. *perennis*, perennial.

THE PURSLANE FAMILY

PORTULACACEAE

Portulacaceae is represented here by one or two genera with a few species between them. The genus *Claytonia* comes from America and the two species which have become naturalized in this country are both annuals.

MONTIA

BLINKS — *Montia verna*

Annual to perennial, up to 1 foot, growing short and erect in damp terrestrial situations, larger and weaker in the water of streams; flowering from spring to autumn. Leaves long, narrow, opposite and spatula-shaped. Flowers inconspicuous, white, in small terminal inflorescences. Fruit a 3-seeded capsule. Seeds brownish-black, dull, covered with little coarse tubercules. Other species difficult to distinguish except by seed: black, smooth, shining in *Montia lamprosperma*; sharply tuberculed on the keel, smooth, shining on the side in *Montia lusitanica*. Named after G. Monti, an Italian botanist; *verna*, vernal, of springtime.



PERFOLIATE SPRING-BEAUTY
Claytonia perfoliata
(A) Stamens (B) Fruit

CLAYTONIA

PERFOLIATE SPRING-BEAUTY — *Claytonia perfoliata*

Annual, becoming very general on sandy soil away from cultivation; sometimes a troublesome weed in gardens. May be called a 'denizen' because it can reproduce itself freely and spreads away from cultivation. Reaches 1 foot high, and flowers in spring and summer. Leaves surround stem in shape of cup (not literally 'perfoliate'). Flowers white, with 5 free petals and 5 stamens. *Claytonia*, after J. Clayton, an American physician and botanist; *perfoliata*, perfoliate.

THE GOOSEFOOT FAMILY

CHENOPODIACEAE

A family of herbs or shrubs, some of which are found in salty soils. Leaves undivided, fleshy, alternate, without stipules,—not always present. Flowers small, regular, green, inconspicuous, consisting of 3–5 sepals, no petals, 2–5 stamens, one-celled ovary, with 2–3, rarely 1, stigmas. Fruit a small bladder-like nut. There are 5 or 6 genera native to this country.

CHENOPODIUM

GOOD KING HENRY — *Chenopodium bonus-henricus*

Perennial weed of cultivated land, but rather uncommon in a wild state. Grows about 1 foot high, flowers May to August. Rootstock stout and fleshy; aerial stem erect, grooved. Leaves triangular-hastate, toothed, fleshy, dark green. Flowers in spikes, small, greenish, inconspicuous with long stigmas. Fruit: single-seeded, bladder-like nut. Also called All-good, Mercury Goosefoot. Leaves sometimes boiled and eaten like spinach. *Chenopodium* from Greek *chen*, goose, and *pous*, foot, with reference to shape of lower leaves in some species. *bonus-henricus* is a latinized version of Good King Henry.

ALL-SEED — *Chenopodium polyspermum*

An erect or decumbent annual up to 2 feet or more, a common weed of waste or cultivated ground, flowering from July to October. Differs from other species except *C. vulvaria* in having entire leaves. Distinguishable from *C. vulvaria* in being not or scarcely mealy, not fetid, and in having its numerous black, shiny small seeds clearly visible on the crowded inflorescence branches. *polyspermum*, many-seeded.

STINKING GOOSEFOOT — *Chenopodium vulvaria*

A small spreading annual whose greyish, entire leaves are mealy and greasy, and whose chief characteristic is a nauseous smell. *vulvaria*, evil-smelling.

WHITE GOOSEFOOT — *Chenopodium album*

Common erect annual, 1 or 2 feet high, of waste and cultivated land. Leaves broad-oval, pale green but sometimes whitish with a mealy surface, stalked, and sometimes partly toothed. Black polished seeds show minute dots. Also called Fat Hen. *album*, white.

RED GOOSEFOOT [Pl. 12] — *Chenopodium rubrum*

Similar erect annual species, distinguished by stems which are smooth, shiny and frequently red. Leaves extremely variable. *rubrum*, red.

BETA

BEET — *Beta vulgaris*

A common maritime annual to perennial plant, 1–3 feet, flowering July to September. Root swollen at stem-junction; stem erect or decumbent, leafy, branched. Leaves entire, more or less triangular, but



ORACHE
Atriplex patula
(A) Bracts covering fruit
(B) Flower

variable in shape and size, up to several inches long. Inflorescence long, spike-like, with small clusters of green flowers, which are exceeded by narrow, leaf-like bracts. Fruit an achene, adhering in small groups, enclosed in the hardened perianth. *Beta*, the classical name ; *vulgaris*, common.

ATRIPLEX

ORACHE *Atriplex patula*

Spreading annual weed of cultivation, variable in height ; flowers August to October. Stem slender, generally erect, streaked with red ; the many branches spread and trail in all directions. Leaves entire or toothed ; the lower rhomboid-hastate, long-cuneate at base. Flowers minute, reddish green, in terminal spikes and axillary, unisexual. Both sexes are on one plant, and petals are absent. Female flowers have no sepals, but have 2 sepal-like bracts, united below and closing over fruit. Male flowers have 3–5 sepals, 3–5 stamens and undeveloped ovary. Fruit : a roundish, single-seeded nut. Orache has a liking for well-dug and manured soils. *Atriplex* is the classical Latin name ; *patula*, spreading.

FROSTED ORACHE *Atriplex sabulosa*

A less common, nearly white annual of sandy seashores ; flowers July to October. Stem buff-coloured, spreading. Leaves very variable, irregularly toothed. Female flowers axillary ; male flowers in spikes. *sabulosa*, sand-dwelling.

HALIMIONE

SEA PURSLANE *Halimione portulacoides*

Low, spreading shrubby perennial of muddy and sandy seashores, related to *Atriplex*. Grows up to 3 feet high ; flowers July to September. Root-stock branched, woody ; stem woody at first, prostrate, with erect branches. Leaves entire, mostly opposite, thick, erect, spoon-shaped with rounded tips. Flowers yellow, minute, in close clusters at ends of branches. Whole plant coated with mealy substance giving it unmistakable silvery white appearance. *Halimione*, daughter of the sea ; *portulacoides*, like *Portulaca*.

SUAEDA

SEABLITE *Suaeda maritima*

Common branching annual of muddy seashores and salt-marshes. Varies in height from a few inches to over a foot. Flowers July to October.

Stems may be erect, semi-erect, or prostrate. Leaves fleshy, long, pointed. Flowers small, greenish, half hidden by leaves, either solitary or in threes or fives. Fruit : small round nut containing 1 polished black seed. Plant sometimes has a reddish tinge. *Suaeda*, derivation obscure ; *maritima*, of the sea.

SHRUBBY SEABLITE *Suaeda fruticosa*

Uncommon shrubby perennial, found generally on the east coast of England. Grows 2 or 3 feet high ; flowers July to October. Stems thick, woody, much-branched. Leaves numerous, slender, fleshy, with white spots and rounded tips. Flowers and fruit are similar to those of the annual species. *fruticosa*, shrubby.

SALSOLA

SALTWORT *Salsola kali*

A decumbent annual, up to 2 feet, of sandy shores, flowering in August and September. Distinguished by its general rough, prickly appearance ; stems rigid and much-branched ; leaves narrow, sessile, somewhat fleshy and tapering to a spiny point. The inconspicuous flowers are axillary and solitary. Fruit a top-shaped achene with horizontal seed. *Salsola*, old name derived from *sal*, salt ; *kali*, from Arabic as in *alkali*.

SALICORNIA

CREEPING GLASSWORT *Salicornia perennis*

A similar species to the next, found on English coasts ; flowers August to October. Distinguished by a perennial, creeping, woody rootstock which sends up brownish, prostrate cylindrical stems ; and by having bifid stigma. *Salicornia* from Latin *sal*, salt, and *cornu*, a horn, indicating plant's environment and appearance ; *perennis*, perennial.

MARSH SAMPHIRE *Salicornia stricta*

Common but interesting seaside annual, of muddy salt-marshes, sometimes completely submerged by the tide. Grows 6–18 inches high ; flowers July to September. Overall appearance is that of a small slender cactus. Stem round and succulent with numerous close joints ; side branches are similarly formed in pairs. There are no leaves. Flowers insignificant, green, minute, in groups of 3 on each side of node. There are 3 or 4 fleshy segments to the perianth ; stamens 2 ; stigmas much-branched. Fruit ; a small membranous nut. Also called Glasswort. In autumn stems become reddish. *stricta*, upright.



MARSH SAMPHIRE
Salicornia stricta
(A) Flower group
(B) Flowering branch

THE LIME FAMILY

TILIACEAE

Tiliaceae comprises some 40 genera and less than 400 species, largely tropical and mostly woody. Represented in Britain by the genus *Tilia*, or Lime, only. Leaves are scattered and stalked, and flowers are in cymes, and secrete nectar.



COMMON LIME-TREE
Tilia vulgaris
(A) Fruit

TILIA

Tilia consists of tall, straight-stemmed trees, with smooth bark, presenting a grand columnar aspect. The species *vulgaris* is a hybrid between *Tilia cordata* (small-leaved Linden) and *Tilia platyphyllos* (broad-leaved Linden). It may not be absolutely native, but is the most common species in this country. *Tilia cordata* is possibly indigenous.

COMMON LIME-TREE or LINDEN *Tilia vulgaris*

Beautiful large tree sometimes reaching 100 feet in height, and found round meadows, etc. Flowers throughout summer. Stem distinguished by numerous knotted burrs. Young twigs usually glabrous. Leaves alternate, stalked, heart-shaped, toothed, sharply pointed at apex. Flowers inconspicuous, greenish yellow, in pendulous clusters. There is a remarkable, large, buff-tinted bract on the stalk. Sepals 5, petals 5, stamens numerous, each with perfect 2-chambered anther. Hairy ovary has long style with several stigmas. Nectar is abundant and perfume delicious. Fruit: top-shaped, 5-angled, downy nut, containing 1 or 2 seeds, which in this country seldom ripen. The light, strong, elastic wood has many uses, being greatly valued for carving. The fibrous inner bark is extremely tough and is used in rope and mat-making. Linden is derived from the Teuton *Linde* and furnished a cognomen for the great Carl von Linné, better known as Linnaeus. *Tilia*, a classical Latin name; *vulgaris*, common.

All species are very similar. The SMALL-LEAVED LINDEN (*T. cordata*), probably native, has smooth, yellowish brown twigs, and smaller leaves.

The BROAD-LEAVED LINDEN (*T. platyphyllos*) has downy twigs.

THE MALLOW FAMILY

MALVACEAE

The family comprises some 900 species in about 35 genera, natives of Tropical and Temperate regions. They consist of herbs, shrubs and trees ; are all harmless, containing quantities of viscid fluid ; most have showy flowers, scattered and palmately veined and lobed leaves. There are 3 native genera.

MALVA

Malva includes a few herbaceous plants, natives of North Temperate region of Old World. This is the most common of 3 British genera. Three small bracts (epicalyx), free to the base, just below calyx, provide distinctive botanical character of genus.



COMMON MALLOW
Malva sylvestris
(A) Flower (B) Fruit

MUSK MALLOW [Pl. 6] *Malva moschata*

Uncommon perennial of dry meadows and gravelly places. Grows 1–2½ feet high ; flowers July to August. From a short, branched, woody rhizome spring pale green erect stems, rarely branched, covered with spreading hairs, often spotted red. Leaves alternate, on long stalks, deeply 5- to 7-lobed, but lobing is extremely variable. Flowers large, 2 inches across, beautiful pale rose, in bunches at tops of stems. Calyx very pale green, coarsely hairy or bristly. Carpels nearly smooth, their rounded backs densely covered with long silky hairs. Fruit : a ring of united carpels containing kidney-shaped seeds. Stem and leaves exude musky perfume, especially in hot weather or when drawn through the hand. *Malva*, a classical Latin name ; *moschata*, musk.

COMMON MALLOW *Malva sylvestris*

Very common hairy perennial, of waste places and roadsides. Grows 3 feet high ; flowers June to September. Long, slightly branched tap-root secures plant in loose wayside rubbish or sand. Stems robust, erect, branched, widely spreading, prostrate in poor soils. Leaves rounded, broadly heart-shaped, palmately veined, 3- to 7-lobed, toothed at margins, at first dull blue-green, later deeper green, 2–3 inches across, on hairy stalks. Flowers numerous, 1–1½ inches across, in axillary cymes, opening

in succession. Sepals 5, united ; petals 5, free, heart-shaped, generally light rose, with dark crimson nectar guides. Ground colour may be more blue, lilac or white, general effect producing *mauve* which is French name of plant. Nectar pockets, protected by hairs, are at base of petals. Stamens numerous, united in cone over and around undeveloped styles ; ovary comprises about 10 carpels united into flat cake-like structure. Fruit : cushion-shaped ring of smooth, wedge-shaped carpels, netted with wrinkles. Each carpel contains 1 curved seed with slit on one side. Also called Rags-and-Tatters. To ensure cross-pollination stamens ripen and shed pollen soon after flower opens. They then wilt and hang downwards ; styles develop, elongate, spread outwards and occupy original position of stamens. *sylvestris*, of woods.

DWARF MALLOW [Pl. 6] *Malva neglecta*

Common annual, of similar places to last. Grows 1 foot high ; flowers June to September. Stems and foliage similar to *Malva sylvestris*, but smaller. Stems hairy, prostrate ; leaves numerous, small, roundish, on long stalks, slightly lobed, edges toothed. Flowers much smaller ($\frac{3}{4}$ inch across), same colour as *Malva sylvestris*, similar in structure. Owing to smaller size, flowers cannot afford to rely on cross-pollination, so although stamens and styles follow same procedure as in *Malva sylvestris*, if this fails stigmas curl downwards and twist among anthers to ensure self-pollination. Fruit : cushion-like, surrounded by persistent sepals ; contains kidney-shaped seeds. Also called Round-leaved Mallow. *neglecta*, neglected.

LAVATERA

TREE MALLOW [Pl. 6] *Lavatera arborea*

Extremely rare biennial dwarf shrub of rocks on south and west coasts of England. May grow 6 feet high ; flowers July to September. Stems erect, branching, woody ; leaves thick, rounded, variously lobed and toothed, on long stalks, plaited from the stalk, with velvety surface. Flowers large, rosy purple, with shiny petals and large epicalyx united at the base on long axillary shoots. Fruit : like Common Mallow. Generic name derived from that of 2 Swiss doctors, the brothers Lavater ; *arborea*, tree-like.

ALTHAEA

In *Althaea* the epicalyx consists of from 6 to 9 small united bracts. It comprises some 15 herbaceous species, often perennial, sometimes large, all natives of the Old World. Only one species is truly native to Britain.

MARSH MALLOW [Pl. 6] *Althaea officinalis*

Locally distributed perennial of banks and tidal ditches of salt-marshes in England and Ireland. Grows 2 or 3 feet high ; flowers August to September. Little-branched stems and leaves covered in soft velvety hairs. Leaves large, thick, heart-shaped, with short foot-stalks and toothed margin, shallowly lobed. Flowers pale blush-pink, 1–2 inches across, in clusters on end of short stalks from axils of stem leaves. Calyx

proper is 5-lobed. Stamens numerous, united, with deep rose-coloured anthers which mature before stigmas become receptive ; as they wither the circle of slender styles (as many as there are carpels) develop stigmatic surface down inner surfaces. Fruit : ring of 1-seeded carpels, as in *Malva*, surrounded by persistent sepasl. A very beautiful plant, perhaps the only true native species. Closely related to Hollyhock (*A. rosea*). In France root juices extracted by boiling are used in cough lozenges. This soothing property explains origin of generic name *Althaea* from Greek *altho*, I heal. *officinalis*, used medicinally.

HISPID MALLOW *Althaea hirsuta*

Extremely rare and doubtfully native annual or biennial, found only in parts of Somerset and Kent. Whole plant is covered in coarse hairs. Bears solitary lilac flowers in June and August. *hirsuta*, hairy.

THE FLAX FAMILY

LINACEAE

Linaceae forms well-marked group of 9 genera and about 120 species, the Flaxes, *Linum* being the largest and most important genus.

LINUM

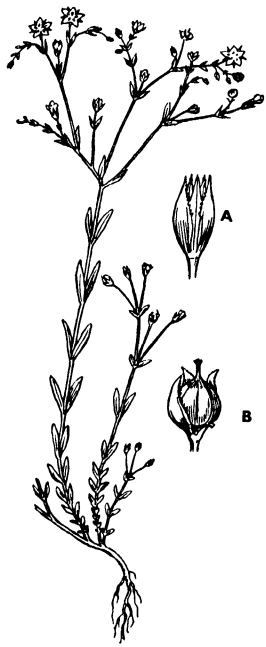
Four species found in Britain in wild or semi-wild state ; distinguished from little FLAX-SEED or ALL-SEED by their flower-parts being in fives, whilst in the latter they are in fours.

PALE FLAX *Linum bienne*

Uncommon annual or perennial, with northern limits in Lancashire. Seems truly wild on dry, sandy or chalky soils, chiefly in S. and W. England. Grows 18 inches high ; flowers May to September. Leaves small, narrow, alternate, fewer than in next. Flowers pale lilac-blue, up to $\frac{3}{4}$ inch across ; sepals elliptical, 3-ribbed. *Linum*, a classical Latin name ; *bienne*, biennial, a misleading name, as the plant is usually perennial.

CULTIVATED FLAX *Linum usitatissimum*

Generally an escape from cultivation, not being known wild with certainty anywhere. Usually unbranched annual, larger than *Linum catharticum*. Grows 18 inches high ; flowers June to August. Leaves narrow, lance-shaped, alternate ; flowers large, rich blue, with parts in fives. Capsules $\frac{3}{8}$ inch across ; they do not burst when ripe, have smooth partitions and contain pointed seeds. Our great linen industry owes its origin to this plant. Oily contents of seed make Linseed valuable for poultices ; oil itself is important commercially, used in paints and varnishes, in linoleum and oil-cloths, and as substitute for indiarubber. Refuse ' cake ' left after oil extraction makes valuable feeding and fattening material for cattle. *usitatissimum*, most used.



PURGING FLAX
Linium catharticum
(A) Calyx
(B) Seed capsule

PERENNIAL or ENGLISH FLAX *Linum anglicum*

A much rarer perennial, with larger, bluer flowers, and almost oval, 5-ribbed sepals. Found occasionally in chalky soils in Midlands. Grows 2 feet high; flowers June to September. Two forms of flower occur: one with long styles and shorter stamens; the other with short styles and longer stamens. In some cases there must be cross-pollination between these 2 types before seed is set. *anglicum*, English.

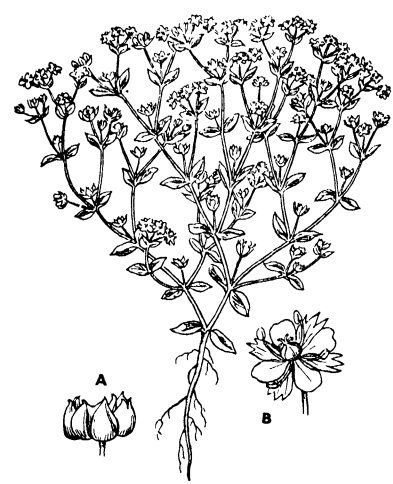
CATHARTIC or PURGING FLAX
Linum catharticum

Slender little annual, familiar in dry pastures or heaths. Grows about 6 inches high; flowers June to September. From a long, thread-like, branching tap-root rise delicate, slender, usually erect, widely forking stems; leaves pale glaucous green, in opposite pairs. Flowers very small, white, in loose cymes. Five sepals, petals, stamens and carpels, with apparently 10-chambered, 10-seeded ovary. Nectar is secreted; self-pollination possible. Fruit: somewhat globose capsule, splitting into 5 valves. *catharticum*, purging.

RADIOLA

ALL-FLAX or ALL-SEED
Radiola linoides

Tiny annual, locally distributed on sandy heaths or in damp places. Grows about 1 inch high; flowers July and August. There are many branches, each forking repeatedly, smooth, threadlike. Leaves minute, oval, sessile, in opposite pairs. Flowers diminutive, white in terminal bunches.



ALL-FLAX or ALL-SEED
Radiola linoides
(A) Fruit (B) Flower

One older flower springs from middle of each branch fork. Parts in fours ; sepals toothed ; petals soon wither and drop. Four-sectioned ovary has 4 free styles. Fruit : capsule composed of 4 carpels, each splitting at top to release 2 pale brown, glossy seeds. One of the smallest of British annuals. *Radiola* from *radiolus*, a ray, from diverging cells of capsule ; *linoides*, flax-like.

THE GERANIUM FAMILY

GERANIACEAE

Florists' 'geraniums' are species of *Pelargonium*, a related genus. *Geraniaceae* comprises 11 genera and over 450 species, mostly herbs, often more or less succulent or hairy, with stalked leaves. Leaves are usually compound or deeply lobed. Sepals and petals 5, stamens 10, carpels 5, united, making a 3–5 celled ovary.

GERANIUM

Geranium comprises some 160 species, of which about a dozen are British.

MEADOW CRANE'S-BILL [Pl. 6] *Geranium pratense*

Beautiful perennial herb, adorning river banks, water meadows, and dry hedgerows in the British isles. Grows up to 3 feet high ; flowers June to September. The short, thick, branched rhizome is firmly anchored in ground by long root fibres. Stems erect, branched, covered with silky hairs. Leaves rounded, up to 5 inches across, deeply and variously lobed, opposite, shortly stalked. Flowers many, large, violet-blue, usually in pairs on long stalks. Sepals beaked, hairy ; petals free ; ovary 5-celled. Nectar is protected by fringe of hairs on petal claws. The pale purple anthers burst before the stigmas become receptive, making plant entirely dependent on cross-pollination by insects. Fruit : the 5 carpels unite to form a long-beaked fruit. When fruit bursts, strips of tissue forming the awns of the ripe carpels separate themselves elastically, jerking seed to a distance. Surface of seed is ridged which may anchor it where it falls. Also called Crowfoot Crane's-bill (because its divided leaves look like those of the Buttercup) and Meadow Geranium. ' Crane's-bill ' is derived from the long beak on the fruit. *Geranium*, from Greek *geranos*, a crane ; *pratense*, of meadows.

WOOD CRANE'S-BILL [Pl. 6] *Geranium sylvaticum*

A tall perennial, of fields and copses north of Midlands. Sometimes exceeds 3 feet ; flowers June and July. Stem erect, with large, rounded leaves, deeply 5- to 7-lobed, 5 inches across. Flowers of medium size, bluish purple or pink, 2 on a stalk. *sylvaticum*, of woods.

PENCILLED CRANE'S-BILL *Geranium versicolor*

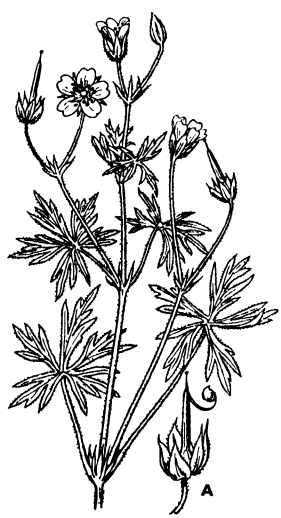
Uncommon, weak and rather straggling perennial not truly native but established in many places. Stems hairy, springing from an ascending rootstock ; leaves large, deeply 5-lobed, on opposite stalks ; flowers few, blooming separately, with lance-shaped, hairy sepals and deeply notched petals. *versicolor*, many-hued.

BLOODY CRANE'S-BILL [Pl. 6] *Geranium sanguineum*

Uncommon perennial, growing in shade, of dry, stony places, preferring limestone soils. Grows 2 feet high ; flowers July and August. The rootstock is short and blunt. Aerial stems slender, scaly at base, bent and thickened at joints, hairy. Leaves opposite, on short stalks, rounded, deeply divided and subdivided. Large, conspicuous, crimson flowers, singly on long, slender, axillary stalks. Each stalk has a pair of small bracts. Sepals green, ribbed, ending in a fine point ; petals crimson, with hairy claws ; stamens with violet anthers ; ovary 5-lobed with red style. Fruit : the 5 carpels spring upwards from the base and scatter seed. Resembles other species in its essential characters, but the showy, blood-red flowers make it unmistakable. *sanguineum*, bloody.

MOUNTAIN CRANE'S-BILL [Pl. 6] *Geranium pyrenaicum*

Fairly common perennial of roadsides, probably a naturalized introduction. Lower leaves on long stalks, roundish, with 7 blunt lobes, upper ones smaller and on shorter stalks. Flowers : reddish purple, $\frac{1}{2}$–$\frac{3}{4}$ inch across, petals notched. Whole plant covered with short hairs. *pyrenaicum*, of the Pyrenees.



LONG-STALKED CRANE'S-BILL
Geranium columbinum
(A) Fruit

LONG-STALKED CRANE'S-BILL
Geranium columbinum

Rather uncommon, small, slender annual, of hedgerows and pastures in dry gravelly or limestone soil. Grows up to 2 feet high ; flowers June to August. Stems very slender, slightly hairy. Leaves long-stalked, opposite, divided almost to the base of their blades into from 5 to 7 segments. Flowers rose-purple, rarely white, drooping gracefully at the end of long, slender stalks, not exceeding $\frac{3}{4}$ inch across. Sepals large, tapering, green, extending slender points between petals. Petals shot with bluish bloom, slightly notched. Stamens and stigmas mature simultaneously. Fruit : resembles *G. pratense*, with similar method of seed dispersal. Seeds minutely pitted. *columbinum*, from *columba*, a dove, applied to this species in error.

CUT-LEAVED CRANE'S-BILL
Geranium dissectum

Annual, closely resembling *G. columbinum*, of dry meadows and waste land; flowers May to August. Leaves large, narrowly divided and sub-divided; petals scarlet, distinctly notched. *dissectum*, cut up.

ROUND-LEAVED CRANE'S-BILL
Geranium rotundifolium

Resembles *G. molle* but petals are entire, with smooth claw. Found south of Midlands. Flowers rosy, appearing in June and July. *rotundifolium*, round-leaved.

DOVE'S FOOT CRANE'S-BILL
Geranium molle

A fairly common annual or biennial of cornfields and waste land. May grow 1 foot high (more if climbing on a support); flowers May to September. Stems weak, hairy, swollen at joints, spreading in habit. Radical leaves large, on long stalks, nearly round, deeply lobed and toothed, turning red in autumn. Stem leaves more scattered, smaller. Flowers small, rosy, in pairs on short stalks, with pointed sepals. The notched petals have slightly hairy claws. Fruit: carpels are glabrous, keeled, and when ripe break away from their awns, and are jerked to a distance with their seed inside them. May be easily confused with less common *G. rotundifolium* and *G. dissectum*. *molle*, soft.



DOVE'S FOOT CRANE'S-BILL
Geranium molle
(A) Fruit (B) Seed

SMALL-FLOWERED CRANE'S-BILL *Geranium pusillum*

Resembles *G. molle*, with more deeply divided leaves, notched petals with slightly bearded claw, and sepals as long as petals; 5 of stamens without anthers. Flowers very small, pale pink, appearing in June to September. Carpels pubescent. *pusillum*, very little.

SHINING CRANE'S-BILL [Pl. 6] *Geranium lucidum*

Not so common annual, shining with a reddish tinge in summer. Flowers rosy, appearing in May to August. Leaves have 5–7 bluntly lobed divisions each. Each sepal in calyx is awned; petals, with smooth claw, are longer than sepals and undivided. *lucidum*, shining.

HERB ROBERT [Pl. 6] *Geranium robertianum*

Small, branching annual, of roadsides and stony and waste places. Grows over a foot high; flowers May to September. No rhizome is



COMMON or HEMLOCK STORK'S-BILL
Erodium cicutarium
(A) Fruit

formed. Stems spreading, much-branched, thinly covered with hairs, often turning reddish. Leaves on long stalks, in opposite pairs, palmate, deeply divided and subdivided. Flowers very small, pretty, reddish purple or pink in pairs. Sepals hairy, angular, narrow, coming to very fine point; petals free, spoon-shaped, entire, with hairless claws; stamens surrounding grooved ovary with erect, hairy style. Fruit: seed is released as in previous species. Sometimes called Stinking Crane's-Bill, from unpleasant smell emitted when stem and leaves are rubbed. Nectar is secreted at base of stamens, and self-pollination is possible when flower droops and half closes during bad weather and at night. *robertianum*, after Robert (identity in this case uncertain).

ERODIUM

Erodium comprises some 50 species, 4 of which are natives. Although closely allied to *Geranium*, it possesses a number of distinctive features. Leaves in *Erodium* are generally pinnately veined and lobed instead of with the palmate arrangement found in *Geranium*.

COMMON or HEMLOCK STORK'S-BILL *Erodium cicutarium*

Attractive little annual, common in waste ground, especially in light, sandy, gravelly or chalky soil inland, and more particularly in sand hills near the sea. Grows 3–12 inches high; flowers June to September. A massive tap-root gives firm anchorage in loose soil. Stems prostrate, tinged red, forming spreading rosettes. Whole plant covered with scattered hairs, making it viscid. Leaves pinnate, finely cut, in irregular pairs, suggesting a comparison with those of Hemlock. Flowers small, bright, pinkish blue, erect, in many-flowered axillary umbels, on rather long stalks, with bracts at base of cluster. There are 5 each of sepals, petals and stigmas, and 10 stamens, 5 being sterile. Only perfect stamens have nectaries at their bases. Petals have 3 nectar-guides and a red or green spot at their base. Fruit: hairy carpels do not burst but contract over the single seed they each mature. Beaks elongate and become spirally twisted, and when separated from main axis of fruit, they take seed with them. According to prevailing humidity, the beak-like appendage twists and untwists, helping to bury seed in soil. Has a pungent, unpleasant smell, especially when bruised. *Erodium* from Greek *erodios*, heron, referring to relatively longer beak, in fruit, than the Crane's-bills; *cicutarium* from *cicuta*, hemlock.

There are 2 less common native species.

MUSKY STORK'S-BILL *Erodium moschatum*

Much larger species, found mostly on south coast. Leaflets less deeply lobed, with musky scent. Flowers rose-purple, fewer than *E. cicutarium*, appearing in June and July. *moschatum*, musky.

SEA STORK'S-BILL *Erodium maritimum*

Small, maritime annual, rather rarer than last two. Leaves small, simple, lobed, hairy ; flowers small, reddish purple, appearing in May to September. *maritimum*, maritime.

THE WOOD SORREL FAMILY

OXALIDACEAE

Oxalidaceae comprises some 900 species in 8 genera, two-thirds of them belonging to the genus *Oxalis*. Most are perennial herbs with scattered, compound leaves, and rather large, perfect flowers, with parts arranged in fives.

OXALIS

Oxalis, sometimes included in *Geraniaceae*, is the only British genus, represented in this country by 1 native species. However, in *Geraniaceae* the ovary is composed of 5 single-seeded carpels, whereas *Oxalis* has a 5-chambered ovary, each chamber containing numerous seeds.

WOOD SORREL *Oxalis acetosella*

Beautiful little perennial herb, of damp woods, often flourishing in humus derived from decaying wood, bark and leaves of old stumps. Grows a few inches high ; flowers April and May. The short, knotted, pink underground stems throw out bunches of fine roots at intervals. Leaves of 3 leaflets all radical, rising from underground stem in early spring on translucent, red-tinged, hairy stalks. Leaflets delicate, heart-shaped, at first vivid green, with scattered, soft hairs. Under surface often reddened or purpled ; at night and in bad weather they droop close to stem. Flowers large, pretty, white, streaked rose or pale violet, solitary, on reddish stalks (longer than leaf-stalks) from a rhizome. There are 2 bracts half-way up stalk. In dull or



WOOD SORREL
Oxalis acetosella
(A) Arrangement of stamens and stigmas

cold weather flowers close, and cleistogamous flowers are later produced. Flowers have 5 sepals, petals and stigmas, and 10 stamens. Anthers and stigmas mature nearly simultaneously, so self-pollination is probably frequent. After fertilization flower-stalk droops, but straightens when fruit is ripe. Fruit a 5-sided, 5-chambered, irritable capsule, with 2 or 3 seeds in each chamber. When ripe, capsule splits down midrib of each carpel, aril of each seed turns inside out, and black, polished seeds are catapulted. Possesses various local names: Hearts (shape of leaflet), Alleluis, Stubwort (place of growth), Sleeping Beauty, Cuckoo's-meat. Also believed to be original Irish Shamrock. Generic name *Oxalis* from Greek *oxys*, acid, and specific *acetosella* from Latin *acetum*, vinegar, refer to abundance of oxalic acid present, especially in leaves.

THE BALSAM FAMILY

BALSAMINACEAE

The family comprises only 2 genera with some 250 species.



ORANGE BALSAM
Impatiens capensis
(A) Enlargement of flower

IMPATIENS

There is only 1 genus in this country, of which only 1 species is truly native, although the Orange Balsam is thoroughly naturalized.

YELLOW BALSAM or TOUCH-ME-NOT
Impatiens noli-tangere

Somewhat tender perennial herb, uncommon in wild state, found in N.W. England and Wales. Grows 1 to 2 feet high; flowers in summer. Stem erect, succulent; leaves simple without stipules. Flowers large, conspicuous, yellow spotted with orange, on long stalks. Sepals 3, petals 5, irregular, all similarly coloured, making distinction difficult. Two small outer sepals are lateral and opposite; 3rd hangs lowest, with wide pouch or spur containing nectar. Lateral petals are in 2 pairs, with odd 1 in between. Stamens 5, with short, broad filaments, and anthers united in cap over ovary; anthers are ripe when flower first opens. Carpels 5, united, with

many ovules, the thin partition walls soon disappearing, leaving persistent central axis with seeds attached. Growth of young ovary breaks stamens away at base. Fruit, capsule, the outer skin of which remains fleshy and sometimes green. As seeds ripen within, unequal tensions are set up, so that when touched or warmed by sun the 5 valves coil inwards from the bottom up and shoot seeds out with great force. Generic and specific names are derived from this characteristic. Cleistogamous flowers are produced. Normal flowers have powerful aromatic scent. *Impatiens*, impatient; *noli-tangere*, do not touch.

ORANGE BALSAM *Impatiens capensis*

A native of eastern N. America, completely naturalized in many places on river banks. Flowers orange, spotted red, with a sharply upturned spur. *capensis*, relating to the Cape of Good Hope; here a misapplied epithet!



SMALL BALSAM
Impatiens parviflora
(A) Seed pod (B) Flower (C) Root

SMALL BALSAM *Impatiens parviflora*

A native of Siberia, naturalized in many places on waste and cultivated ground. Grows up to 2 feet high. Leaves oval, pointed, slightly toothed, with a short stalk. Flowers small, yellowish, with a short sput. Fruit similar to that of other species. Whole plant rather succulent and quite glabrous. *parviflora*, small-flowered.

THE MAPLE FAMILY

ACERACEAE

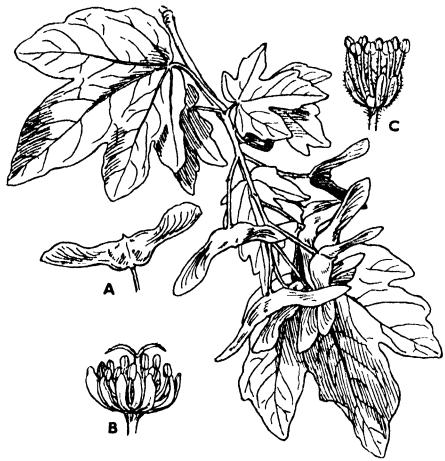
Aceraceae comprises 2 genera and about 100 species, largely belonging to the genus *Acer*.

ACER

Maples are trees or shrubs, bearing opposite leaves without stipules, inconspicuous flowers and winged fruits.

COMMON or ENGLISH MAPLE *Acer campestre*

Small, round-headed, deciduous tree with dense, dark green foliage. Common in hedges, sometimes assuming bushy or shrubby habit, found wild as far as Northern England. The only indigenous representative of the



MAPLE
Acer campestre
(A) Winged fruit (B) Flower (C) Stamens

genus and family in our islands. Flowers in spring. Bark smooth at first, soon becoming brown and rough, splitting into longitudinal corky wings. Branches almost horizontal; young shoots yield white, milky latex containing sugar. Leaves opposite, 5-lobed, with 3 principal veins radiating palmately. Flowers inconspicuous, greenish, half hidden in foliage, terminating young shoots of the year, arranged in erect, corymbose panicle; lower ones in cluster being male, with rudimentary ovary; terminal ones may be female (with sterile anthers) or perfectly bisexual. Sepals 5, narrow, closely resembling the 5 petals; stamens about 8. Female flower has generally 2-celled, hairy ovary, with 1 or 2 seeds in each cell. All flower parts are downy. Fruit: ovary spreads and develops into large, thin wing on each side of the 2 carpels. This is called a 'key' and helps to scatter the 2–4 seeds it contains. Pollination usually by wind, occasionally by flies, for in spite of nectar insect visits are few. Timber is beautifully marked, and sometimes used for furniture. *Acer* is old Latin name for Maple; *campestre*, of the plains.

SYCAMORE [Pl. 7] *Acer pseudoplatanus*

A very common species, but introduced a few centuries ago. Reaches 100 feet in height, is extremely hardy and prolific, and leaf segments are much toothed. Flowers in pendulous panicles. Sometimes mistakenly referred to as a Plane-tree. *pseudoplatanus*, false *Platanus* (Plane).

THE HOLLY FAMILY

AQUIFOLIACEAE

Aquifoliaceae comprises 5 genera and 180 species of shrubs and trees, spread all over the world.

ILEX

Ilex is the largest genus, including 170 species, widely spread in tropical and temperate regions. Only 1 species native in Britain.

HOLLY [Pl. 7] *Ilex aquifolium*

Extremely familiar, widely spread shrub or small tree. Has been known to reach 50 or 60 feet; flowers May to August. The stout root sends out a profusion of fine rootlets. Smooth, matt-silver bark of stem covers hard-grained, ivory-white wood. Twigs and young leaves light green in spring, dark and glossy later. Leaves leathery, simple, scattered, generally edged and tipped with strong spines, although these may be lacking in upper leaves. Flowers small, wax-like, white or pink-tinged, in clusters; frequently unisexual, but female flowers are often mistaken for perfect ones due to presence of large (but sterile) stamens. Sepals 4, petals 4, stamens 4, white, and 4–6 carpels form ovary. Male and female flowers usually on separate trees. Nectar easily accessible; peculiarly attractive to bees. Fruit a polished, blood-red, occasionally yellow, black or white berry. Each of the 4 little stones inside contains 1 seed, scattered by birds which eat the berries. Rich in folk-lore and tradition, famous in connection with Christmas. Berries poisonous to man; leaves formerly used medicinally. Hard wood valued for turnery, inlaying and staining. *Ilex*, a classical Latin name; *aquifolium*, needle-leaved. A South American species, *I. paraguensis*, produces the well-known drink *Mate* or Paraguayan Tea.

THE SPINDLE-TREE FAMILY

CELASTRACEAE

Celastraceae comprises a small group of trees and shrubs related to the Hollies, mainly in the Northern Hemisphere. Only 1 genus with 1 species in Britain.

EUONYMUS

SPINDLE-TREE [Pl. 7] *Euonymus europaeus*

A fairly common tree, sole British representative of family, usually seen as hedgerow shrub. Grows 8–20 feet high; flowers May to June. Shoots smooth, vivid matt-green, retaining greenness for years, as distinct from most woody plants. Leaves simple, glossy, undivided, in opposite pairs, drawn out in graceful points. Buds and shoots 4-angled. Flowers pale, inconspicuous, in stalked clusters generally of 3 together, individually less than ½ inch across. All parts in fours; 4 sepals and petals, 4 stamens with bases sunk into margin of large fleshy disc; 4 carpels united to form ovary with 2 ovules in each of its chambers. There are male, female and bisexual



SPINDLE-TREE
Euonymus europaeus
(A) Flower (B) Fruit

flowers ; cross-pollination is by flies attracted to nectar poured on to fleshy disc. Fruit : pale crimson capsule with orange seeds. Close-grained wood formerly used for turnery, staves, meat-skewers, spindles, knitting needles, etc. Produces fine-grained charcoal for artists' crayons. Twigs and leaves bitter, with irritant poison called euonym ; smell unpleasant when bruised. English name derived from one of wood's many uses. *Euonymus*, well-named or lucky, from the Greek—a euphemistic title intended to placate gods responsible for poisonous character of plant ; *europaeus*, European.

THE BOX FAMILY

BUXACEAE

A small family which was formerly treated merely as a sub-division of the *Euphorbiaceae*, with which it is closely allied. Distinguished chiefly by presence of watery instead of milky juice. Evergreen shrubs or trees with leathery leaves without stipules.

BUXUS

Buxus includes fewer than 20 species with unisexual flowers on same plant, which secrete some nectar, but are largely pollinated by wind. Flowers small, clustered together in cymes.

Box — *Buxus sempervirens*

A small, evergreen, very slow-growing tree, usually wider than its height ; appears wild in a very few places in S. England ; grows 12–15 feet high in this country ; flowers April and May. Shoots seldom exceed 6–8 inches of annual length, and diameter increases only 1 inch in 10 years. Its grey stems are never more than 8 inches through. Twigs 4-angled ; leaves in opposite pairs, though often twisted into a single plane or spray. When young they are a bright grass-green ; when mature, leathery and dark, with highly polished surface. Little pale yellow clusters of flowers in axils of leaves—central flower in each cluster being female. In addition to minute bracts each flower has a calyx, consisting in male flowers of 2 alternating pairs of sepals, and in female of 6, 9 or 12, in alternating whorls of 3. Male flowers have 4 stamens with long filaments ; female flowers have 3 carpels united below in 3-chambered ovary, but with 3 distinct spreading styles. Dry capsule, ½ inch long, splitting explosively into 3 valves. The 2 black seeds in each chamber are hurled some distance. Cultivated species often used for clipped garden hedges and similar 'topiary' work. The yellow wood is hard, compact, and even-grained (only European wood that will not float) and used extensively for wood engraving and for handles of tools. *Buxus*, the classical name ; *sempervirens*, evergreen.

THE BUCKTHORN FAMILY

RHAMNACEAE

Rhamnaceae comprises shrubs or small trees, some twining and climbing, others with spiny branches. They are a large family, but represented in Britain only by the two Buckthorns.



COMMON BUCKTHORN
Rhamnus cathartica
(A) Flower (B) Fruit

FRANGULA

ALDER BUCKTHORN [Pl. 7] *Frangula alnus*

A hedgerow shrub or small tree, with loose habit, flourishing on clay or wet alluvial soils. Often found with Alder, which it resembles in leaf. Flowers in summer. Wood soft, spongy, yellowish ; branches alternate, thornless, slender ; twigs slightly angular, tinged violet, marked with leaf-scars, bearing small grey hairy buds without bud-scales. Leaves stipulate, simple, entire, alternate, oval, pointed. Flowers small, inconspicuous, greenish white, in clusters, on hairy stalks from axils of leaves ; bisexual, with 5 sepals, petals, stamens. Each stamen opposite 1 small narrow petal. Nectar secreted from base of 3-celled ovary. Fruit : small round berry containing 2 stones (each with 1 seed) ; at first a polished vivid green, becoming bright red and ultimately black. Also called Black Alder or Black Berry-bearing Alder. Colour from berries was used in dyeing. Plant contains bitter, astringent and purgative substances formerly used medicinally. Charcoal from the wood is still used in gunpowder. Buckthorn is an early mistranslation of German *Buxdorn*, thorn-bearing box. *Frangula*, from Latin *frango*, I break, with reference to brittle twigs ; *lanus*, alder.

RHAMNUS

COMMON BUCKTHORN *Rhamnus cathartica*

A stiff, much-branched, spreading, spinous shrub, of chalky soils. Flowers most of summer. Branches spreading, often thorn-tipped ; leaves deciduous, finely toothed, similar in shape to last. Flowers greenish, inconspicuous, unisexual, with their parts in fours ; male and female on separate trees. Male flowers have 4 stamens, longer than petals, and a rudimentary ovary ; female flowers have 3 or 4 stigmas and rudimentary stamens. Fruit : small, poisonous, pea-like berries containing 4 stones ; they pass at once from green to black. Similar uses to last. *cathartica*, purgative.

THE PEA FAMILY

PAPILIONACEAE

The family *Papilionaceae* is closely related to the *Rosaceae*. It contains more than 5,500 species in some 300 genera, and is represented by herbs, shrubs and trees all over the world. British representatives comprise some 80 species in 19 genera.

Nodules on the roots extract and store nitrogenous food from the earth. Farmers use this peculiarity to enrich arable land by growing leguminous crops and ploughing them in.

Leaves are nearly always scattered, compound and stipulate. The *Papilionaceae* family has a distinctive flower arrangement. The 5 sepals are united below, but sometimes so unevenly as to appear 2-lipped. Petals 5, free, in 2 dissimilar pairs, odd one generally the largest and known as the 'standard', at the back. This is flanked by 2 side petals, the 'wings'; finally the lower pair, more or less united by their lower edges, are known as the 'keel'. Here lie stamens and pistil. Stamens 10, all united in tube, or nine only are joined (two-thirds of their length) and upper one is free. One-chambered ovary has single curved style, and ripened pod or legume splits variously to release 1 or 2 rows of seeds.

GENISTA

DYER'S GREENWOOD OR WOADWAXEN — *Genista tinctoria*

A small, stiff-branched, spineless shrub, fairly common in thickets and poor soil. Flowers July to September. Leaves stipulate, scattered, lance-shaped, slightly hairy. Flowers pale yellow, in slender racemes—each flower borne in the axil of a bract. Pods thin, hairless. Green dye known as Kendal Green was formerly made from mixture of Woad (*Isatis tinctoria*) and yellow colouring matter yielded by Dyer's Greenwood. Also called Dyer's Greenwood. *Genista*, name, in Virgil, of a broomlike plant; *tinctoria*, used for dyeing.

NEEDLE OR PETTY WHIN — *Genista anglica*

Deciduous, prickly shrub, common throughout Britain (not in Ireland), on heaths and moors. Grows 2 feet high; flowers May and June and occasionally again in autumn. Stems woody, slender, branched from base, inclined to straggle. Spines long, sharp, in great numbers; leaves very small, lance-shaped, glabrous. Flowers bright yellow, ½ inch long, in dense racemes at end of stems. Calyx 2-lobed, toothed, bell-shaped; 10 united stamens, with anthers alternately long and short; ovary smooth with long style. No nectar. Fruit: short, broad, inflated pod, pointed at each end, holding a number of dark brown, rounded, shiny seeds. Also called Needle Furze or Needle Greenwood. Pollen discharged as in Gorse. *anglica*, English.

HAIRY GREENWOOD — *Genista pilosa*

A rare and local procumbent shrub of dry sandy heaths of South England and Wales, flowering May and June. It is not spiny and differs mainly

from *G. tinctoria* in rougher branches, hairier leaves and hairy flowers and fruit. *pilosa*, hairy.

ULEX

Ulex comprises some 20 species, all densely spinous. Three species British.

GORSE, WHIN or FURZE [Pl. 7] *Ulex europaeus*

Widely distributed deciduous shrub, of moors, commons and sandy places. Grows up to 6 feet high ; flowers February to June, and August to September, although fruit is mainly product of first flowering. Tap-root long, yellowish, giving firm anchorage in sandy soil. Small trefoil leaves produced by young seedlings are later replaced by spines ; intricate arrangement of larger spines replaces branches. Flowers beautiful, golden, in large trusses, on ends of large spikes ; 2 bracts just below. Calyx 2-lobed, pale yellow, minutely toothed, shaggy with spreading black hairs. Petals deep golden yellow, with delicious apricot scent, attracting numerous bees. Stamens all united, but anthers alternately long and short. Fruit : thick black pods, $\frac{3}{4}$ inch long, covered with brown hairs ; may be heard popping on warm days, throwing brown shiny seeds 20 feet. No nectar. When bee alights on wing petals and pistil jerks forward, keel petals fall down and back into vertical position, showering bee with pollen. Spines generally presumed to form protection against browsing animals, although assumed rather late in life. Often suffers from frost. *Ulex*, name, in Pliny, of a shrub ; *europaeus*, European.

IRISH GORSE or DWARF FURZE *Ulex gallii*

The most frequent dwarf form in W. England and the only one in Ireland ; sometimes nearly as large as Common Gorse. Spines stiffer than in Dwarf Gorse, often bent abruptly downwards. Branches more erect ; flowers orange, opening in autumn, with minute bracts ; wings longer than keel. Calyx similar to Dwarf Gorse, but pods burst in spring. Specific name from French botanist Le Gall.

DWARF FURZE [Pl. 7] *Ulex minor*

A similar plant to last but smaller in every way. A striking feature of sandy upland commons in W. counties. Grows 3 feet high ; flowers July to November. More decumbent than *Ulex europaeus*, and foliage is a deeper green. Flowers smaller and paler ; bracts rounded, very minute ; calyx finely downy, with distinct spreading teeth ; standard narrower, wings shorter than keel. Pods take a year to ripen. Often called *Ulex nanus*. Those who assert that Gorse blooms at all seasons are sometimes unaware that most of the plants seen between July and November belong to this much smaller and distinct species. *minor*, small.

SAROTHAMNUS

BROOM [Pl. 7] *Sarothamnus scoparius*

Attractive, quick-growing shrub, thriving in warm, dry soil, especially pure sand ; common all over Great Britain, especially on heaths and commons, ascending to 2,000 feet in Scottish Highlands. Grows 6 feet high ; flowers April to July. Stems tough, woody, surmounted by dense

mass of long, erect, flexible, angular twigs, tough, furrowed, bright green (becoming bluer with age), and clothed with fine, silky hairs. Lower leaves stalked, mostly divided into 3 leaflets ; upper ones usually single leaflet. Stipules minute ; young leaves silky ; sometimes leaves are almost absent. Flowers gay, golden yellow, in leafy racemes, like Gorse but larger. Calyx 2-lipped ; stamens 10 (5 long, 5 short), united in tube ; ovary hairy, topped by long, spirally coiled style. Fruit : dark brown, flat pod, 1–2 inches long, fringed with stiff hairs. When ripe it bursts open elastically, the 2 valves curling up spirally to jerk out 15 or 16 seeds. No nectar, but pollen attracts numerous insects. Pollination mechanism explosive, similar to *Ulex* and *Genista*, with differences in detail. *Sarothamnus*, from *saros*, a broom, and *thamnos*, a bush ; *scoparius*, a broom made of twigs.

ONONIS

Ononis comprises some 80 species, natives mainly of the Mediterranean ; represented in Britain by 3 species.

RESTHARROW [Pl. 7] *Ononis repens*

Prostrate woody perennial, with marked fetid smell, of poorly cultivated land, neglected fields, roadside wastes, sandy links by the sea, etc. Grows 1 foot high ; flowers June to September. Rootstock strongly developed, creeping underground and sending off long, tough, branching suckers. Roots taste sweet ; sometimes called Wild Liquorice. Branches leafy, of fleshy texture, covered with sticky hairs. Leaves have large, leafy, toothed stipules united to stalks. Flowers solitary, shortly stalked. Calyx 5-lobed, deeply but evenly divided. Petals pink, colourful, with standard having deeper shade of red. Stamens 10, joined in tube ; no nectar, but insects are abundantly showered with pollen when alighting on keel. Fruit : small, inflated, erect pod, shorter than calyx, containing 2 or 3 seeds. Also called Wrest-Harrow, or Cammock. Former name is derived from its tendency to obstruct cultivation by its tough underground stems. Latter is from old English *cam*, meaning crooked, with reference to long, branching suckers. *Ononis*, from name of a plant in Dioscorides ; *repens*, creeping.

SPINY RESTHARROW *Ononis spinosa*

A second so-called species—possibly merely a variety of first. Differs in that it does not produce suckers, is erect and usually spinous, has 2 rows of hairs along its branches, and produces a pod longer than its calyx. Plant is rather more woody, and flowers are smaller. Intermediate forms also occur. *spinosa*, spinous.

SMALL RESTHARROW *Ononis reclinata*

Very much smaller and without spines, annual, grows by the sea in sandy soil, in Devon and the Channel Islands.

TRIGONELLA

BIRD'S-FOOT FENUGREEK *Trigonella ornithopodioides*

An annual, up to 10 inches long, of dry, gravelly and sandy places, usually near the coast ; flowering June and July. Stem prostrate, slender.

Leaves trifoliate. Flowers small, white and pink, in stalked heads, among the leaves. Characterized by the pods, which are compressed, blunt, transversely furrowed, curved and slightly hairy. Name from *trigonos*, triangular, referring to appearance of corolla; *ornithopodioides*, like *Ornithopus*, bird's foot.

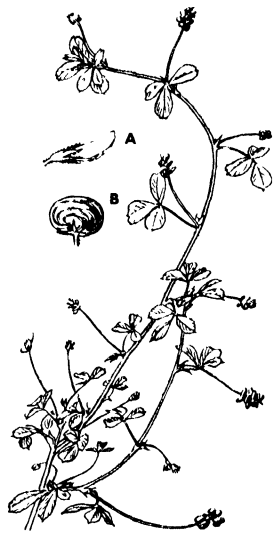
MEDICAGO

SICKLE MEDICK *Medicago falcata*

A small perennial, is found prostrate on the ground or sometimes erect in grassy places on gravel soil, as in Norfolk, Suffolk and Cambridge. *Medicago*, from Greek *medike*, because the Medes introduced the genus into Greece; *falcata*, sickle-shaped.

LUCERNE or ALFALFA [Pl. 7] *Medicago sativa*

A perennial fodder plant which puts forth deep purple flowers from May to July. Origin uncertain, but if found apparently wild will be an escape from cultivation. *sativa*, cultivated.



BLACK MEDICK
Medicago lupulina
(A) A single flower
(B) Pod

BLACK MEDICK or NONSUCH *Medicago lupulina*

A common fodder crop growing wild in fields and waste places; annual. Grows 2 feet high; flowers May to August. Rootstock spreading; stems slender, spreading, branched from base; leaves few, divided into 3 leaflets with projecting midrib, on short, common stalk; leaflets toothed, as are large, prominent stipules. Flowers small, yellow, crowded in rounded heads on long stalks from leaf-axils. Calyx deeply 5-lobed, hairy; one of 10 stamens free; ovary has smooth style. Fruit: black, kidney-shaped, explosive pods, conspicuously veined, unenclosed by calyx, each containing 1 smooth, kidney-shaped, yellowish seed. Often misnamed Hop Trefoil (*Trifolium campestre*) because of very close resemblance. Can be distinguished by bare black pods and small point in apex of leaflet. Nectar secreted sparingly. *lupulina*, hop-like.

SMALL MEDICK *Medicago minima*

A local annual, up to 9 inches, of sandy fields in the South-East, flowering May to July. The prickly, roundish fruit resembles that of *M. arabica*, but the leaflets are much smaller, narrower, not blotched and the whole plant more downy. *minima*, very small, smallest.

HAIRY MEDICK *Medicago hispida*

A creeping annual, found locally in S. and S.E. England and Ireland. Closely resembles previous species, umbels of small yellow flowers appearing



TALL MELILOT
Melilotus altissima
(A) Pod (B) Flower

during same period. Spines on pod are straighter, and reticulations more prominent. *hispida*, shaggy.

SPOTTED MEDICK *Medicago arabica*

Annual of gravelly soil by roadsides, chiefly in England. Leaflets spotted, toothed, heart-shaped ; flowers small, yellow, appearing from May to August ; pods intricately veined, coiled like a shell, edged with double row of long, curved spines. *arabica*, Arabian.

MELILOTUS

Melilotus comprises some 20 species, natives of warm and temperate regions of the Old World, 1 of which is indigenous to Britain, 3 others occurring frequently as introductions.

TALL MELILOT *Melilotus altissima*

A tall, much-branched annual herb, apt to form wood in its stem during first season and survive into second year. Common in field corners, by roadsides, in hedgerows, etc. ; grows 4 feet high ; flowers June to August. Stems hairless, slender, ribbed ; leaves few, rather scattered, on long stalks, divided into 3 narrow, toothed, oval leaflets, with a pair of stipules at base of stalk. Flowers attractive, yellow, small, Furze-like, on long stalks out of axils of leaf stalks, in long, slender racemes, all pendulous on one side of axis. Calyx has 5 nearly equal teeth ; petals, nearly equal in length, fall immediately after fertilization. Nectar copious, flowers pleasantly fragrant. Insects depress wing and keel petals, and both stamens and stigma emerge. Fruit : black, pointed, compressed, reticulated, hairy pods holding 1 smooth seed each. *Melilotus* from Greek *meli*, honey, and *lotos*, applied to many plants, referring to copious nectar ; *altissima*, tallest.

COMMON MELILOT [Pl. 8]

TRIFOLIUM

Trifolium comprises some 290 species, mostly low-growing herbs. There are 20 British species, 15 annual, 5 perennial, characterized by palmately veined trefoil leaves.

RED or PURPLE CLOVER [Pl. 8] *Trifolium pratense*

Perennial herb of meadows and cultivated fields, often grown for fodder. Flowers May to September. Stems 2 feet long, spreading, hairy. Leaflets large, oval, often with light crescentic mark, minutely toothed. Stipules broad, conspicuous, protecting young head of flowers. Flowers reddish purple, in dense terminal clusters, remaining erect after fertilization. Calyx has 5 slender, hairy lobes ; ovary elliptical, with very long slender style. Nectar can only be reached by humble-bees. Fruit : a

small pod. Chiefly distinguished from previous species by colour of flowers and nature of stipules. *Trifolium*, from Latin *ter*, thrice, and *folium*, leaf; *pratense*, of meadows.

MEADOW or ZIGZAG CLOVER *Trifolium medium*

Branched perennial, similar to Red Clover, of dry fields. Branching stems follow zigzag pattern, leaflets are more pointed and unmarked. Flowers purplish red, in large depressed, globose heads, appearing in June to September; they are more purple than those of *T. pratense*. *medium*, intermediate.

SEA CLOVER *Trifolium squamosum*

An annual, up to 1 foot, of Southern saltmarshes, flowering June and July. Stem erect or spreading. Flowers small, pink, in larger heads than those of *T. striatum* or *T. scabrum*, and all terminal, becoming scaly. *squamosum*, scaly.

HARE'S-FOOT TREFOIL *Trifolium arvense*

Annual, erect, branching, slender herb, with wiry, rather downy stems, growing 1 foot high in dry fields. Very many small white to pinkish flowers, crowded together in cylindrical, brush-like heads, appearing in July to September. Five-lobed calyx is longer than the petals giving flower-heads a feathery look. *arvense*, of cultivated fields.

SOFT-KNOTTED TREFOIL *Trifolium striatum*

Decumbent annual with downy stems, of dry fields. Flowers small, rosy-red, in egg-shaped heads, appearing in June and July. These may be axillary or terminal. *striatum*, striated.

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ROUGH RIGID TREFOIL *Trifolium scabrum*

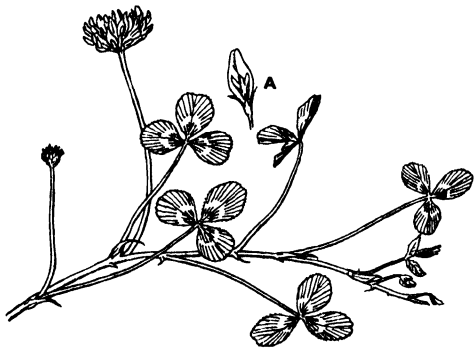
Rather local annual of sandy or chalky soils near coast. The rough, rigid, prostrate stems bear stiff leaflets. Flowers small, whitish, with purple calyx, appearing in May to July. *scabrum*, rough.

SUBTERRANEAN TREFOIL *Trifolium subterraneum*

A local, prostrate annual of sandy or gravelly places, flowering May and June, readily distinguished by its many, slender, 5-lobed flowerless calyces and compressed, orbicular pods which burrow in the earth. *subterraneum*, underground.

ALSIKE CLOVER [Pl. 8] *Trifolium hybridum*

Weak, branched perennial, with flexuous stems 9–24 inches high, of fields and roadsides. Introduced as a fodder crop and never truly native. Lower leaves on long stalks, upper ones much shorter; leaflets ¾–1¼ inches long. Flower heads ¾–1 inch across, whitish tinged with pink. Whole plant bright green, almost glabrous. *hybridum*, hybrid.



WHITE CLOVER
Trifolium repens
(A) Single flower

WHITE CLOVER
Trifolium repens

Common, creeping perennial herb of meadows and cultivated fields. Stem up to 2 feet long; flowers May to October. Rhizome creeping, wiry, with solid stem, branching freely on or below surface, rooting at intervals. Leaves rise on long stalks with pair of lance-shaped stipules at base of each. Leaflets almost rounded, on short, equal stalks, finely toothed, generally with pale stripe across leaf, less commonly with dark purple or blackish stains or reddish under surface. Leaf slightly hairy, rather waxy below. Flowers erect on angular stalks above leaves, white or tinged pink. After fertilization they wither and droop. Standard marked with fine honey-guides leading to abundant nectar. Calyx hairless, unequally 5-lobed; wing and keel petals adhere slightly to each other; upper stamen of the 10 is free. Fruit a small, smooth, oval 2- to 4-seeded pod enclosed by persistent withered corolla. Pollination mechanism practically identical with that of Melilot. An improved cultivated variety, *Dutch Clover*, may have been introduced at some time from Holland. *Trifolium*, three-leaved; *repens*, creeping.

STRAWBERRY-HEADED CLOVER. *Trifolium fragiferum*

Creeping perennial similar to White Clover, found in similar situations. Flowers purple-red, in small spherical heads, appearing in July and August. Each calyx increases after flowering and turns reddish, thus enlarging size of flowers and giving them strawberry-like appearance. *fragiferum*, bearing strawberries.

HOP TREFOIL *Trifolium campestre*

Much-branched downy annual of dry soils, or gravelly or sandy places. Some stems erect, others creeping, but all wiry and hairy. The 3 leaflets of each leaf wedge-shaped and toothed, and large leafy stipules are prominent. Flowers small, yellowish, crowded together in dense, rounded, hop-like heads. After fertilization the standard curves over the straight pod and turns brown. This distinguishes it from the Black Medick (*Medicago lupulina*) which has bare pods. Pods contain 1 or 2 yellowish shining seeds. *campestre*, of the plains.

LESSER YELLOW TREFOIL *Trifolium dubium*

Very common small annual of roadsides and waste places, similar to *T. campestre* but smaller in all its parts. Flower heads usually with less

than 20 flowers, which are a darker yellow and not so tightly packed. *dubium*, doubtful.



HOP TREFOIL
Trifolium campestre
(A) Flower

ANTHYLLIS

Anthyllis comprises some 20 species, natives of north temperate regions of the Old World. There is only 1 British species.

KIDNEY VETCH or LADIES' FINGERS [Pl. 8] *Anthyllis vulneraria*

Very common hairy but variable perennial of dry banks and sunny pastures throughout the country. Seldom exceeds 1 foot, and usually flowers June to August. Herbaceous, silky, aerial stems often prostrate, putting out numerous long leaf-stalks, carrying from 3 to 13 narrow, distant leaflets, in pairs, with a terminal one. Radical leaves frequently in large tufts of one long terminal leaflet and 2 much shorter lateral ones. Leaves bluish. Flowers usually yellow or reddish on the end of long flower-stalks, generally in pair of dense heads, with involucre of finger-like bracts immediately below (hence popular name Ladies' Fingers). Calyx pale, inflated, membranous, hairy with 5 teeth, longer than petals, as a whole. Fruit : very small, pointed, smooth 1-seeded pod. Nectar lies at bottom of long tube, and thus restricted to long-tongued bees. *Anthyllis* from Greek *anthos*, a flower, and *ioulos*, down, referring to hairy nature of flowers ; *vulneraria*, from Latin *vulnerare*, to wound, an allusion to plant's supposed astringent properties.

LOTUS

Lotus comprises some 70 species, natives of temperate climates. Two very common forms occur throughout the British Isles, as well as 2 or 3 uncommon species.

BIRDSFOOT TREFOIL [Pl. 8] *Lotus corniculatus*

Semi-erect or trailing perennial herb, up to 1 foot high, chiefly of dry pastures. Common on chalky and sandy soils and extending into Scottish Highlands, to altitudes of 2,800 feet. Also abundant on sand-dunes and sandy heaths by the sea. Flowers June to October. Slender, trailing, branching stems bear oval, slightly hairy, trefoil leaflets, with a pair of large, leafy stipules at the base. Flowers : bright little flower-heads on short stalks, usually 1 or 2 inches from the ground, forming umbellate clusters of from 3 to 10. Petals golden yellow, often beautifully varied with scarlet and orange. Calyx has 5 pointed, equal, hairy teeth. Fruit : slender, cylindrical pods are outspread like bird's toes, and contain a



BIRDSFOOT TREFOIL
Lotus corniculatus

(A) Seed pods (B) Flower
(C) Stem and stipules

number of grey, mottled, globular seeds. The charming petals have earned the plant numerous nicknames—Butter-and-eggs, Eggs-and-bacon, Fingers-and-toes, Shoes-and-stockings. Pollination mechanism consists of a pumping arrangement whereby the 5 outer stamens form a piston and push pollen (already shed on keel petals) through opening in keel to cover stigma. Visiting insects depress wings and keel and carry some pollen away. Self-pollination usually ineffective, for the stigma is not receptive until rubbed. *Lotus* is ancient Greek name for similar plant ; *corniculatus*, horned.

SLENDER BIRDSFOOT TREFOIL *Lotus tenuis*

A local perennial, allied to *L. corniculatus*, but often taller, more slender, with narrow leaflets and with fewer flowers in the heads. *tenuis*, slender.

LARGE BIRDSFOOT TREFOIL *Lotus uliginosus*

The second common species, resembling the first. Perennial herb, rather more erect, reaching 2 feet in height. May straggle among rushes or other waterside vegetation, and has elongated, branched and sucker-bearing rhizome. Stems and leaflets present little difference. Flowers, 5–12, orange-yellow, on long stalks, have calyx teeth spreading and divergent from bud stage. Flowers appear in July and August, and the thin pointed pods are arranged in form of a star. *uliginosus*, of swamps.

HAIRY and SLENDER BIRDSFOOT TREFOILS
Lotus hispidus and *Lotus angustissimus*

Two annuals of maritime grassy places in the South, flowering July and August, with flowers smaller and fewer in each head than in other species. *L. hispidus* is distinguished by its shagginess and by the flower-stalks exceeding the leaves ; *L. angustissimus* by its long, narrow pods (about six times the length of calyx), procumbent habit and flower-stalks shorter than leaves. *hispidus*, shaggy ; *angustissimus*, very narrow.

GALEGA

GOATS' RUE, FRENCH LILAC *Galega officinalis*

An introduced perennial, 2–3 feet, well naturalized in waste places ; flowers June to July. Leaves pinnate, with oblong leaflets. Flowers in attractive white or lilac, spike-like clusters. Pods long, narrow, cylindrical,

sharp pointed. Derivation of name obscure. *officinalis*, officinal, from *officina*, druggist's shop, i.e. used medicinally.

COLUTEA

BLADDER SENNA — *Colutea arborescens*

An introduced shrub, up to 10 feet, naturalized on waste ground and railway banks, flowering May to July. Leaves pinnate, with oval silky leaflets; flowers yellow with red markings; distinguished by the much swollen, membranous pods. *Colutea*, old name of a tree; *arborescens*, shrubby.

ASTRAGALUS

The genus *Astragalus* is one of the largest in the vegetable kingdom, containing some 1,600 species. Has spread over greater part of the globe, with 120 species in Europe, of which 3 only are found in this country.

PURPLE MILK VETCH — *Astragalus danicus*

Uncommon little perennial of dry pastures mainly in the East. Grows 2–8 inches high. Leaves pinnate with 7–15 pairs of leaflets, hairy above. Flowers bluish purple in dense globular heads. Pods clothed with white woolly hairs. *Astragalus*, from Greek *astragalos*, ancient name of a leguminous plant, as also of the ankle-bone; *danicus*, Danish.

SWEET MILK VETCH [Pl. 8] — *Astragalus glycyphyllos*

Perennial low-growing plant, rather rare though widely distributed throughout Great Britain; entirely absent from Ireland. Grows among grass and other vegetation in thickets, or on edges of fields, on sloping banks, on chalky and gravelly soils; flowers June to September. Root massive, branching, woody. Habit straggling and prostrate; thick stem bears branches of large compound leaves consisting of 5 or 6 pairs of leaflets and a terminal one. Stipules are free. Flowers borne in shortly stalked, dense racemes, from axils of leaf-stalks. Bracts, though small, are longer than stalks of individual flowers. Calyx has 5 nearly equal teeth; sepals are about half length of petals. Petals are pale greenish sulphur-yellow. Fruit: bunches of smooth erect pods, tipped with remains of styles, elongating considerably after fertilization, are almost as conspicuous as flowers. Each contains many pale flattened seeds, and are divided internally by partition down middle. Sometimes called Wild Liquorice from its resemblance to the closely related true Liquorice (*Glycyrrhiza glabra*). *glycyphyllos* from Greek *glukus*, sweet, and *phyllon*, a leaf, referring to first taste of leaves, which soon, however, turns to nauseous bitterness. Called Milk Vetch because it was supposed to increase milk yield in cows.

ALPINE MILK VETCH — *Astragalus alpinus*

A rare, Scottish alpine perennial, flowering in July, with more spreading flowers than *A. danicus* and its stipules not joined at the base; the flower-stalk is much longer than its subtending leaf. *alpinus*, alpine.

OXYTROPIS

PURPLE OXYTROPIS — *Oxytropis halleri*

A locally hairy perennial, with stout, branched rootstock, flowering June and July, in Scottish hill-pastures. Similar to an *Astragalus* but with a small projection to the keel of the pale purple flower. Rootstock, stout, branched. The rare Scottish alpine *O. campestris* is larger, has yellow flowers tinged with purple. *Oxytropis*, sharp-keeled ; *halleri*, after A. von Haller, a Swiss botanist ; *campestris*, of plains.

ORNITHOPUS

BIRDSFOOT — *Ornithopus perpusillus*

A slender prostrate annual of sandy and gravelly places, up to 18 inches long, flowering from May to July. Leaves pinnate, with small elliptic downy leaflets. Flowers white with red veins, small, in 3–6 inch stalked heads. Pods curved and constricted between the seeds to resemble a bird's claw. *Ornithopus*, from *ornithos*, bird, and *pous*, foot ; *perpusillus*, very small.

Another species, *Ornithopus pinnatus*, with yellow flowers, is native to the Scilly and Channel Islands.

CORONILLA

CROWN VETCH — *Coronilla varia*

An introduced perennial, 1–2 feet, well naturalized in waste places, on roadsides and hedgebanks ; flowering in June. Flowers in axillary, crowded heads on long stalks, yellow, purple or white. Pods slender, flexuous, in 1-seeded joints. *Coronilla* is diminutive of *corona*, crown ; *varia*, varied.



HORSESHOE VETCH
Hippocrepis comosa
(A) Flower

HIPPOCREPIS

Hippocrepis comprises 12 species of low-growing, herbaceous plants, mostly Mediterranean natives, with only 1 British species.

HORSESHOE VETCH — *Hippocrepis comosa*

Much branched perennial herb, of chalky and stony ground in England, growing abundantly on Sussex Downs, extending into Southern Scotland, absent from Ireland. Grows 6–12 inches high ; flowers May to August. Stems branch freely from the base and bear smooth pinnate leaves of several pairs of leaflets with a terminal one, all the same size. Small, undivided stipules are generally present. Flowers resemble those of Birdsfoot Trefoil ; yellow, on top of long stalks in axillary umbels. Petals

are long-clawed ; nectar abundant. Fruit : rough flattened pods, breaking up into horseshoe-shaped, 1-seeded joints. Seeds are crescent-shaped. ' Horseshoe ', from shape of pod. *Hippocrepis* from Greek *hippos*, a horse, and *krepis*, a shoe ; *comosa*, hairy, but in the case of this hairless species it is taken to mean tufted.

ONOBRYCHIS

SAINFOIN [Pl. 8] *Onobrychis viciifolia*

Handsome perennial herb much used and cultivated as fodder plant, sometimes found wild in suitable districts. Favours chalky or limestone soil ; grows 2 feet high ; flowers June to August. Erect downy stems bear pinnate leaves, 12 pairs of leaflets with a terminal one. Flowers rosy pink, sometimes tinted deeper red, in dense spike. Standard petal notably broad, wings smaller than standard and keel. Fruit : crescent-shaped, pointed, spiny, 1-seeded pods. ' Sainfoin ', borrowed from French, means healthy hay. *Onobrychis*, classical name of a leguminous plant, presumably from *onos*, ass, and *brycho*, eat greedily ; *viciifolia*, vetch-leaved.

VICIA

Vicia comprises numerous herbaceous species, mainly of the north temperate zone, long cultivated as fodder for cattle, or as food for man.

HAIRY VETCH or TARE *Vicia hirsuta*

Weak-stemmed, slender annual of hedges and cornfields. Stipules deeply divided ; sessile stalks bear several pairs of narrow leaflets. Whole plant is more or less hairy. Flowers very small, rather few, pale blue, with plentiful nectar. Pods short, hairy, with 2 slightly flattened, mottled seeds. *Vicia*, classical Latin name ; *hirsuta*, hairy.

SLENDER VETCH or SMOOTH TARE *Vicia tetrasperma*

Annual, similar to last, but almost hairless. Slender stems grow 2 feet long, and somewhat larger, pale blue flowers are borne singly or in pairs from May to August. Pods hold 3 to 5 (usually 4) seeds each, and the plant is common in similar places to the last. *tetrasperma*, 4-seeded.

TUFTED VETCH [Pl. 8] *Vicia cracca*

Common annual herb with perennial rootstock, widely distributed throughout the country chiefly in hedgerows. May reach 6 feet or more ; flowers June to September. From a creeping rhizome, bearing those remarkable nodules which help to nourish the plant, climb slender, weak, angular stems, often to tops of hedges by means of tendrils. Graceful leaves, 3 or 4 inches long, consist of some 20 pinnately arranged leaflets, seldom in opposite pairs, each narrow and pointed. At the base are 2 slender stipules, each like half an arrowhead. Terminal and some lateral leaflets are replaced by delicate tendrils, aiding plant's clambering mode of growth. Stem and leaves are downy. Flowers are in long racemes on main stalks from axils of leaves, but individual stalks are very short.

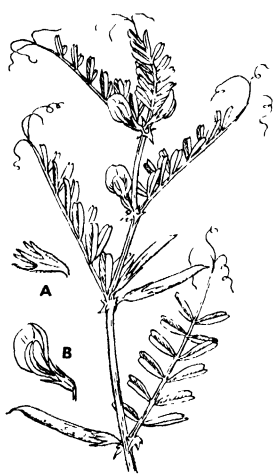
Ten to thirty hanging little pea-shaped flowers crowd together in one-sided cluster, each half an inch long, pink at first, becoming blue to violet later. There is nectar at base of ovary, and slender style has upper brush of hairs. Fruit: smooth straight pod, 1 inch long, beaked with persistent style, holding about 6 dark brown seeds. When ripe, sides of pod coil violently apart and catapult contained seeds. *cracca* is the Latin name for a vetch.

WOOD VETCH *Vicia sylvatica*

Beautiful perennial herb, found only locally in high wooded districts. Rhizome creeping, sending up 6-foot climbing stems. Common stalk has many pairs of leaflets, and ends in branched tendrils. Stipules extremely toothed. Flowers white with blue veins, in lax raceme, faintly resembling Common Vetch; appearing in June to September. *sylvatica*, of woods.

BUSH VETCH [Pl. 8] *Vicia sepium*

Commonly distributed perennial herb of bushy situations by wayside, growing 3 feet high; flowers April to September. From tangled mass of runners climb weak straggling stems, with several pairs of slightly hairy, oval leaflets, terminal ones becoming tendrils. Stipules similar to those of previous species. Flowers pale purple, in small clusters, rising on short stalks from leaf axils. Style less hairy than in previous species. Fruit: beaked, smooth, dark brown pod, 1 inch long, containing several seeds. *sepium*, of hedges.



COMMON VETCH
or TARE
Vicia sativa
(A) Calyx (B) Flower

COMMON VETCH *Vicia sativa*

Annual or biennial herb, widely cultivated as fodder plant, common in fields and roadsides but not truly wild. Grows 2 feet high; flowers May and June. Ribbed weak stems may be trailing or climbing, with leaves composed of several pairs of reversedly heart-shaped leaflets, each with long point growing out of middle of terminal V-shaped notch. Common stalk ends in climbing tendril. Leafy stipules have dark mark in centre. Flowers reddish purple, on very short axillary stalks, singly or in pairs. Calyx deeply 5-lobed; stigma has usual tuft of hairs near top. Fruit: 2-inch, smooth pod contains a number of dark brown, rounded seeds. *sativa*, sown.

NARROW-LEAVED VETCH [Pl. 8]
Vicia angustifolia

A similar annual with short, trailing stem, of similar situations, but thought to be wild. Flowers May to July. Differs mainly in much narrower, slender leaflets,

and is generally smaller in parts. Pale flowers are produced singly or in pairs. *angustifolia*, narrow-leaved.

SPRING VETCH *Vicia lathyroides*

Tiny prostrate annual, closely resembling small edition of Common Vetch; of dry fields and roadsides. Stems only a few inches long with 2 or 3 pairs of narrow, oval leaflets. Flowers very small, sessile, solitary, lilac, appearing in May and June. Pods contain granular seeds. *lathyroides*, pea-like.

BITHYNIAN VETCH *Vicia bithynica*

A trailing perennial which grows on bushy cliffs and in hedges.

All other species are very local.



MEADOW VETCHLING
Lathyrus pratensis
(A) Seed pod

LATHYRUS

YELLOW VETCHLING *Lathyrus aphaca*

Rare annual cornfield weed south of Midlands, flowering June to July. The 3-foot trailing stems climb about the corn. Although lacking true leaves or leaflets, the sometimes very large leafy, spear-shaped stipules may be mistaken for leaflets. Ends of leaf-stalks develop into forked tendrils. This and Meadow Pea (*L. pratensis*) are the only yellow-flowered species of *Lathyrus* in Britain, but *L. pratensis* is far more common and bears unmistakable leaflets. Yellow Vetchling has pale yellow flowers borne singly on long stalks. Ovary develops into long curved pod. *Lathyrus*, from Greek *lathyros*, ancient name of the plant; *aphaca*, Greek name of plant.

MEADOW VETCHLING *Lathyrus pratensis*

Much-branched, straggling perennial herb of meadows, hedges and copses, common throughout the country. Stems may reach 2 feet; flowers June to September. Rootstock forms creeping underground stems. Several weak, sharply angled aerial stems rise direct from rootstock with leaves consisting of 1 pair of lance-shaped leaflets with a terminal, usually branched, tendril sprouting in between. There is a pair of large, leafy arrowhead stipules at base of stalk. Flowers bright yellow, on common axillary stalk, in racemes of 6 to 10. Calyx tubular, with 5 equal teeth; standard notched at top and possibly thinly streaked with purple; 10 stamens all joined in a sheath; stigma hairy on upper side. Fruit: long, slightly flattened, hairless pods, containing several globose, blackish, scarred seeds. Also called Meadow Pea, Meadow Vetch, Yellow Pea. *pratensis*, of meadows.



GRASS VETCHLING
Lathyrus nissolia
(A) Calyx

GRASS VETCHLING *Lathyrus nissolia*

Rather locally distributed, slender, annual, grass-like herb, found growing with grass. Grows 3 feet high; flowers in June. Erect, slender, green stems are ribbed and smooth and lack true leaves; their place is taken by leaf-stalk, flattened and tapered to resemble blade of grass. Flowers: long flower-stalks spring from axils of leaf-stalks and bear 1 or 2 small crimson flowers. Calyx bell-shaped, unequally 5-lobed; stamens 10, united in a sheath; style flattened, shortly bearded at top. Nectar is secreted and flowers may sometimes be self-pollinated. Fruit: long, very narrow, straight pods, flat at first, filling out later with ripening of dark quadrangular seeds. Also called Grass-leaved Pea or Grass Vetch. Very difficult to discover when not in flower or fruit, because of its close resemblance to grass. Displays a high grade of evolution by having dispensed with leaves, leaflets and tendrils. *nissolia*, in honour of French botanist, M. G. Nissole.

WOOD OR NARROW-LEAVED PEA *Lathyrus sylvestris*

Local perennial, up to 6 feet high, of hedges, woods and thickets. Flowers June to August. Has a creeping rootstock and green winged stems, climbing by tendrils. There is a single pair of lance-shaped, very long, pointed leaflets with common stalk developing into forked tendril in between. There is also a pair of narrow, crescentic stipules. Flowers few, small, rosy-purple, in racemes. Flattened pods are nearly 2½ inches long, containing several rounded, blackish seeds. Whole plant has a glaucous hue. *sylvestris*, of woods.

MARSH PEA *Lathyrus palustris*

Tall perennial, of marshland, somewhat local south of Yorkshire, flowering June to August. Stems angular, 4 or more feet long, with leaves composed of 2 or 3 pairs of lance-shaped leaflets, with a pair of half-arrowhead stipules at base of each stalk. Flowers bluish purple, 2 to 6 in raceme. Whole plant has glaucous hue. *palustris*, of marshes.

BITTER VETCH [Pl. 8] *Lathyrus montanus*

Erect perennial herb of heaths, commons and open woods, especially in mountainous districts. Grows 1 foot high; flowers April to July. Creeping rootstock bears small tubers. Stems angular, winged, hairless,

generally unbranched. Leaves few, consisting of 2 to 4 pairs of opposite lance-shaped leaflets, with stalk ending in sharp point. There is a pair of large, green, pointed stipules at the base of each leaf-stalk. Flowers reddish purple to crimson, few, in long-stalked racemes. Calyx unequally 5-lobed ; 10 stamens united in sheath ; vertical style shortly bearded on inner side. Fruit : reticulate pods, 2 inches long, with curved beak, holding several brown rounded seeds. Also called Tuberous Pea, or Tuberous Bitter Vetch. *montanus*, of mountains.

SEA or SEASIDE PEA — *Lathyrus maritimus*

Very local, pale glaucous green perennial of pebbly shores in S. and E. England (as far west as Dorset), with narrow-leaved form in Shetlands ; flowering June to August. Rhizome long, stout and black, anchoring securely in shifting shingle. Stems 3 feet long, prostrate, clinging to pebbles by means of tendrils. Leaflets (5 or 6 on each side) alternate, oblong, are smooth and almost sessile. Common stalk ends in forked tendril. Flowers few, purplish blue, in long-stalked racemes. Flattened, beaked pods contain several rounded, blackish, bitter seeds. *maritimus*, of the sea.

THE ROSE FAMILY

ROSACEAE

Rosaceae is a very large family of trees, shrubs and herbs, distributed all over the world. Flowers are similar in structure, with 4 or 5 sepals and petals, numerous stamens, and carpels variable in number ; fruits are more varied than in any other family, and leaves usually alternate, with stipules.

FILIPENDULA

DROPWORT — *Filipendula vulgaris*

An abundant but local perennial, thriving in dry, chalky, upland pastures. Flowers June and July. Rhizome short, brownish, bearing blackish tuberous swelling sometimes in palmate masses, and sometimes united several together, end to end, like a necklace. Leaves almost entirely radical, in rosette, close to the earth, or ascending ; dark green, smooth, divided into numerous stalkless leaflets, deeply cut and toothed. Radical leaves have pair of narrow uncut stipules, but stipules of the few stem leaves are toothed. Aerial stem round, smooth, erect, often deeply tinged with crimson. Flowers clustered, scentless and nectarless, similar to Meadow-sweet, but larger. Sepals and petals usually 6. Outer surface of petals tinged with crimson, but inside they are creamy white.



MEADOW-SWEET
Filipendula ulmaria
(A) Leaf (B) Flower

Fruit : carpels more numerous than in Meadow-sweet, varying from 6–12 ; straight, downy, each holding 2 seeds. Whole plant decidedly astringent, and formerly had many tonic qualities ascribed to it. The name Dropwort is taken from swollen tubers in roots. *Filipendula*, hanging by a thread, from form of roots ; *vulgaris*, common.

MEADOW-SWEET *Filipendula ulmaria*

Attractive perennial of stream banks, reed swamps and ditches. Grows 2–4 feet high ; flowers June to August. From short creeping rhizome rise erect, branched, angular, reddish aerial stems. Root-leaves large, divided into a few large toothed leaflets and small intermediate ones in pairs ; terminal leaflets large, acutely palmately lobed into 3, 4 or 5 lobes ; whole leaf usually white and downy below. Stem-leaves smaller, usually 3-lobed, with leafy ear-shaped stipules. Flowers very small, creamy white, numerous in characteristic dense cymes at tops of stems. Sepals and petals usually 5. Fruit : carpels 5–9, smooth, twisted, each containing 2 brown flattened seeds. Though lacking nectar the flowers attract many insects by sweet fragrance and abundant pollen. Also called Queen of the Meadows. *ulmaria*, elm-like, because of resemblance of its leaflets to those of the Elm (*Ulmus*).

RUBUS

The genus *Rubus* is widely distributed, and its species are extremely variable.

CLOUDBERRY *Rubus chamaemorus*

Herbaceous perennial, confined to high moors north of Midlands. Grows 8–10 inches high ; flowers June and July. Stem erect, single-flowered, without prickles. Leaves few, large, entire, kidney-shaped, lobed. Single flower large, white, with male and female flowers on separate plants. Fruit, a few large orange-red drupes, formerly greatly valued for making preserves. *Rubus*, from Latin *ruber*, red ; *chamaeomrus*, from Greek *chamae*, on the ground, and *morus*, a mulberry.

STONE BRAMBLE *Rubus saxatilis*

Local species of high ground in north and west of the country; rootstock creeping. Has prostrate and erect stems, 2 or 3 feet long—former produces only spines and leaves; latter bears few small white flowers, appearing in June and July. Leaves toothed, slightly hairy, trifoliate. Fruit: 3 or 4 scarlet drupes. *saxatilis*, dwelling among rocks.

WILD RASPBERRY *Rubus idaeus*

Woody shrub, not very particular as to soil, of dry and damp situations, on sand, loam and limestone. Grows about 5 feet high; flowers June to August. Short creeping rhizome sends up suckers to a height of about 5 feet. Aerial stems biennial, round, erect, nodding at the top, glaucous or mealy, with few straight, bristle-like prickles, pointing slightly downwards. Leaves pinnate, with 1 or 2 pairs of leaflets and a terminal one, white beneath, with irregularly toothed edge. Flowers drooping, a few together, with curved prickles on stalks, lasting 2 days. Stamens and stigmas mature simultaneously, but nectar is copiously secreted and attracts many insects. Sepals greenish, white-felted, spreading outwards as petals fall, then bending backwards, whilst narrow white petals stand erect, squeezing stamens together to shut out short-tongued insects from nectary. Fruit: 'drupels' covered with white down when young; numerous, forming globular group, turning red or amber as they ripen, then dropping off as a whole. Swallowed by birds or animals their little pitted stones resist digestion, and the plant is undoubtedly largely dispersed in this manner. *idaeus*, from Mt. Ida in Asia Minor, where the plant is abundant.



WILD RASPBERRY
Rubus idaeus
(A) Fruit

DEWBERRY *Rubus caesius*

Variable, easily recognized species of calcarious and clayey soils in damp places, often in dense shade. Stem prostrate, round, low-arching, very glaucous. Leaves almost always in threes, with thin, irregular-lobed, toothed leaflets. Flowers large, white, with felted, long-pointed sepals, few in each cluster. Fruit: a few glaucous, acid drupes. *caesius*, blue-grey.

BLACKBERRY BRAMBLE [Pl. 8] *Rubus fruticosus*

Extremely common perennial deciduous shrub, widely distributed throughout the country, in hedgerows, commons, copses, etc. Climbs 5 to 10 feet high or more; flowers June to September. Rootstock woody,



MARSH CINQUEFOIL
Potentilla palustris

flowers, with an epicalyx (a series of bracts close to and resembling calyx).

MARSH CINQUEFOIL *Potentilla palustris*

Uncommon perennial herb, found in bogs, swamps and other damp places; grows about 1 foot high; flowers June and July. Rhizome long, woody, giving off fibrous roots. Aerial stem reddish brown, upper portion slightly hairy and branched. Lower leaves stalked, with from 5 to 7 serrated leaflets, downy and whitish or glaucous beneath. Large membranous stipules are attached to the leaf-stalk, often with cut margins. Upper stem leaves are almost stalkless, composed of 3 leaflets. Flowers: scentless, a few together in a loose cluster, on downy stalks of a dark purplish hue, suggesting clotted blood, over an inch across. Sepals long, pointed, with a small epicalyx; petals lance-shaped, still smaller. Anthers mature before stigmas. Fruit: like branching; some forms have stems which root at their tips when they touch the ground. Thick, fleshy stems are long, quick-growing, prickly. Leaves compound consisting of several oval, pinnately arranged leaflets, irregularly toothed. Petals white or pink, varying in size. The blackberry is a group of many very small drupes, black or purple, each stalkless, containing one seed, firmly attached to receptacle. Whole plant is astringent, the green shoots yielding a black dye. This species has been split into numerous microspecies.

POTENTILLA

Potentilla is closely allied to *Fragaria* and comprises about 200 species, mainly perennial herbaceous plants, all natives of the north temperate region. Eleven species are native in this country. They have compound leaves with stipules, and conspicuous



BARREN STRAWBERRY
Potentilla sterilis
(A) Flower



SILVERWEED
Potentilla anserina
(A) Flower

a strawberry, with enlarged, conical spongy receptacle, but fruit is dry and achenes do not fall off. Rhizome extremely astringent and used in tanning; dull yellow or red extract also used in dyeing. *palustris*, of marshes.

BARREN STRAWBERRY *Potentilla sterilis*

Common on hedge banks throughout the country; grows a few inches high; flowers early April. Rootstock branching, without runners. Stalks short, weak, hairy; radical leaves in a tuft, grey with silky hairs, trefoil, smooth on upper surface. Flowers small, yellow, with notched petals. Fruit: cluster of small dry carpels on a dry, flattish receptacle. Often confused with Wild Strawberry, but absence of runners, smaller, weaker habit and flowers, and dry inedible fruit provide sufficient distinction. *Potentilla* from Latin *potens*, powerful, meaning 'powerful little plant', with reference to its dubious medicinal properties; *sterilis*, barren.

SILVERWEED *Potentilla anserina*

Common and beautiful perennial herb, of damp places and roadside verges, usually growing in dense clusters. Reaches a few inches in height; flowers June to August. Rhizome slender, branching, with copious pink runners, enabling plant to spread vegetatively. Leaves pinnate, with alternate leaflets so much serrated as to appear almost fern-like, silvery with long, soft, silky hairs on one or both surfaces. Flowers solitary, large, yellow, on long axillary stalks. Calyx 5-lobed, with an epicalyx; petals 5; carpels and stamens numerous. Fruit: dry achenes on flat, dry receptacle. Roots are sometimes eaten roasted or boiled, as parsnips. *anserina* from Latin *anser*, goose, as geese are said to be fond of the plant.



TORMENTIL
Potentilla erecta
(A) Calyx (B) Flower
(C) Rootstock

HOARY CINQUEFOIL *Potentilla argentea*

A local perennial of sandy grassland, 6–18 inches, flowering June to August, distinguished by its palmate leaves, silvery-white beneath. The ascending stems bear terminal clusters of small yellow flowers. *argentea*, silvery.

TORMENTIL *Potentilla erecta*

Perennial herb, commonly found in warm, sunny, open spaces on sandy heaths, in shady woods and dense pasture grasses. Grows a few inches high; flowers June to September. Rootstock stout, woody, almost tuberous, red internally, astringent. Aerial stems annual, slender, erect, branched, seldom rooting at nodes, clothed with curly hairs. Radical leaves long-stalked, composed of 5 leaflets, toothed at the top; stem leaves made up of 3 leaflets, not stalked. Flowers yellow, in loose inflorescences; petals generally 4; often self-pollinated. Fruit: oval, netted. Roots formerly used extensively in drugging and tanning. The 4 petals are an exception in the family. *erecta*, erect.

CREEPING CINQUEFOIL *Potentilla reptans*

Common perennial herb of meadows and waysides, resembling Silverweed in flower and fruit. Grows a few inches high; flowers June to September. Rootstock long, woody, red within, black without. Plant reproduces vegetatively by means of long, creeping stems. Leaves composed of 5 toothed leaflets, arranged like fingers. Flowers golden, solitary on long, slender, axillary stalks; stamens and pistils mature at the same time; achenes numerous. *reptans*, creeping.



WILD STRAWBERRY
Fragaria vesca
(A) Flower

SHRUBBY CINQUEFOIL [Pl. 9]
Potentilla fruticosa

The only British shrubby species, growing 4 feet high and flowering in June and July. Very rare. Stems much-branched, leaves silky, pinnate; flowers large, golden, growing in profusion. *fruticosa*, shrubby.

Native, but less common, species are: SPRING CINQUEFOIL (*P. tabernaemontani*); ALPINE CINQUEFOIL (*P. crantzii*); TRAILING TORMENTIL (*P. anglica*).

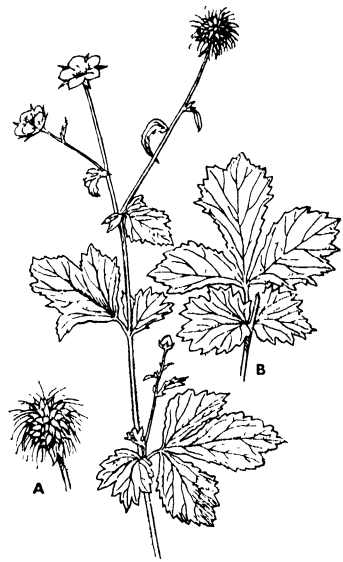
FRAGARIA

Fragaria comprises about 8 species, mostly natives of the north temperate zone. There is only 1 wild representative in

Britain. Mainly distinguished from several allied genera by remarkable large fleshy outgrowth from floral receptacle which forms after fertilization below carpels.

WILD STRAWBERRY *Fragaria vesca*

Small perennial herb, commonly distributed throughout the country, of moist banks and woodland glades. Grows a few inches high; flowers April and May. Rootstock woody, downy. Plant is reproduced vegetatively by means of runners which elongate and root at nodes. Erect shoots spring from axillary buds at nodes, forming new plants at some distance from parent. Leaves are radical and cauline; they are ternate, the leaflets oblong and coarsely toothed. Flowers large, white. Sepals 5, uniting in calyx cup; immediately below are 5 bracts forming epicalyx; petals 5, white, shortly clawed; stamens and carpels numerous. Fruit: after fertilization receptacle swells and becomes juicy, bearing on its surface many small hard achenes, turning red. Strawberry 'fruit', therefore, is collection of fruits. *Fragaria* from Latin *fragrans*, fragrant, referring to fragrant fruit; *vesca*, edible.



WOOD AVENS or HERB BENNET
Geum urbanum
(A) Fruit (B) Leaf

GEUM

Geum comprises some 36 species, natives of temperate and cold regions in both hemispheres. They are distinguished by their astringent and aromatic rhizomes. Two species are native in this country.

HERB BENNET, WOOD AVENS *Geum urbanum*

Abundant perennial of hedges, copses and roadsides. Grows 3 feet high; flowers June to August. Rhizome short, creeping, aromatic, astringent; acrial stems round, softly hairy, branching slightly above; radical leaves long-stalked, interruptedly pinnate, each leaflet lobed and toothed, the terminal one being large and reversedly heart-shaped, with prominent veins in under surface; stem leaves shortly stalked, often broken into 3 leaflets, variously lobed; stipules large, leaf-like, lobed, toothed. Flowers erect, on slender stalks, half an inch across; epicalyx and calyx green; petals bright yellow, spreading, as long as sepals; stamens and stigmas crowded, maturing at about the same time. Some

flowers entirely staminate. Little nectar is secreted. Fruit: carpels develop into several one-seeded achenes, forming a chestnut brown bur, each achene tipped with a strong hooked awn to aid its dispersal. Rhizome was used as preserve and flavouring to beer and wine, and as preventative against dysentery and poison. Legend has it that when a monk handed St. Benedict a cup of poisoned wine, and he blessed it, the cup broke in pieces; hence Bennet is taken to be a corruption of Benedict. *Avens* is the Latin version of our 'awn' probably from *avena*, an oat. *Geum*, from Greek *geuo*, I relish, with reference to clove-like taste of roots; *urbanum*, of the town.

WATER AVENS [Pl. 8] *Geum rivale*

A similar perennial to the above, less common but more attractive. Frequents marshes, ditches and margins of streams, especially in the North. It is shorter, stouter, hairier, and has larger flowers than *Geum urbanum*, growing 1 foot high, and flowering from May to July. Rhizome larger, blackish, woody, deep-growing, also astringent and aromatic. Aerial stem little-branched, lower portion having soft, reflexed hairs, upper portion densely covered with shorter hairs. Leaves similar to those of *Geum urbanum*, but softer and thinner in texture. Stipules often tinged with red. Flower bud bends gracefully downwards as it expands, but as fruit forms, stalk becomes erect again. Sepals richly coloured, long-pointed, brownish red, downy, widely spread in broad, flat, basal cup, then growing upwards to extreme level of tops of petals—later embracing fruit. Petals broad, reversedly heart-shaped; opening pale green, they flush with pink, then become tanned with tawny yellow-brown, with strongly marked darker reddish veins. Nectar restricted to rather long-tongued insects. Fruit: similar to *Geum urbanum*. Head of achenes is raised on axis almost as long as sepals; achenes and bases of styles are hairy. Many showy species of *Geum* are cultivated. *rivale*, of the brook.

DRYAS

Dryas is a small genus with but 2 or 3 species, well distinguished from *Geum* by its simple leaves, solitary flowers, absence of epicalyx, and non-jointed styles growing out into long feathery awns. One species British.

MOUNTAIN AVENS [Pl. 9] *Dryas octopetala*

Perennial, shrubby, prostrate, alpine plant, found north of Staffordshire, in varying soils and altitudes. Grows a few inches high; flowers May to July. Stout woody rhizome produces prostrate, reddish brown aerial stems. Leaves have oak-like outline—very crinkled edges—with under surface of a hoary whiteness, on long, hairy leaf-stalks; stipules slender, hairy. Flowers large, delicate, white, nestling among leaves, with numerous golden anthers. After flowering, flower-stalk lengthens considerably, and a dense head of feathery awns, 1–2 inches long, develops. *Dryas*, from Greek *Dryas*, a Dryad or nymph of the oak-woods; *octopetala*, eight-petalled.

AGRIMONIA

Agrimonia comprises some 10 species, all herbaceous and perennial, natives of north temperate regions, of which 2 are British.

COMMON AGRIMONY [Pl. 9] *Agrimonia eupatoria*

Common perennial herb, found by the wayside, on commons, by hedgerows, etc., in almost all districts. It grows 1–3 feet high ; flowers June to September. Rhizome short, woody, astringent, yielding yellow dye. Leaves all pinnate, lower one 3–7 inches long, made up of 3–10 pairs of deeply toothed leaflets, larger ones 1–3 inches long, alternating with smaller ones less than ½ inch long. They are shaggy with soft silky hairs on under surfaces. Whole plant above ground is hairy. Flowers numerous, golden yellow, in a stiff terminal spike, remaining open for 3 days. Stamens 5–20, inserted with 5 petals round ring-shaped disk. Fruit : calyx-tube becomes hardened, closing over carpels in fruiting stage, and is surrounded with spines. After fertilization flower-spike lengthens, and stalks droop. Calyx-tube shrinks in deep furrows throughout its length, and the little hooked spines form a bur to catch in fur of passing animals. Anciently used as a remedy for wide variety of disorders. *Agrimonia*, a corruption of Greek *argemone* (cataract in the eye), a plant mentioned by Pliny ; *eupatoria*, named after its traditional discoverer, Mithradates Eupator, otherwise Mithridates the Great, King of Pontus.

FRAGRANT AGRIMONY *Agrimonia odorata*

Closely related to *A. eupatoria* but taller and more branched ; its flowers are closer together and larger ; minute glands on under surface of leaves give off resinous, lemon-like perfume.

ALCHEMILLA

LADY'S MANTLE *Alchemilla vulgaris*

Perennial, usually slightly hairy herb, of moist lowland and sub-alpine pastures ; grows 6–12 inches high ; flowers June to August. Rootstock short and thick, astringent, moist and soft. Stems slender, prostrate at first, later erect. Radical leaves large (3–6 inches across), conspicuous, always green, rounded or kidney-shaped, toothed and lobed. Stipules of the smaller, sessile stem-leaves unite by both edges to form leafy sheath round stem. Flowers tiny, yellow-green, in numerous clusters, without petals. Sepals 4, with alternate bracts. Fruit : 1 to 5 carpels ripen in a small cup-like floral receptacle, with slender style springing from base. Roots are relished by pigs, and taste of parsnip. Lady's Mantle takes its popular name from shape of leaves,

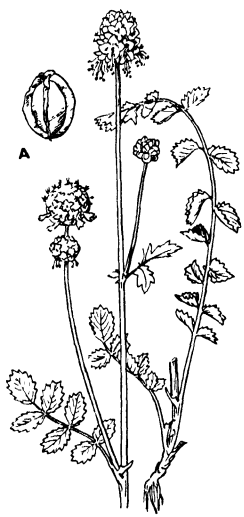


LADY'S MANTLE
Alchemilla vulgaris
(A) Flower

resembling an old-time lady's mantle. *A. vulgaris* is split into many microspecies. *Alchemilla*, from the Arabic, denoting use of these plants in alchemy or medicine ; *vulgaris*, common.

ALPINE LADY'S MANTLE *Alchemilla alpina*

A smaller perennial, similar to *A. vulgaris*, generally abundant at altitudes of 3,000 feet or more. Grows about 6 inches high ; flowers June to August. Leaves deeply cut into several oblong leaflets, with silvery under surfaces. Flowers and fruit are smaller editions of *A. vulgaris*. *alpina*, of high mountains.



SALAD BURNET
Poterium sanguisorba
(A) Fruit

APHANES

PARSLEY PIERT *Aphanes arvensis*

Common, inconspicuous, low-growing, softly hairy annual of fields and waste gravelly places. Grows a few inches high. Pale green stems, branching from the base and spreading, forming extensive carpets in some localities. Leaves small, on very short stalks, fan-shaped, deeply lobed into three sections, toothed. Flowers minute, greenish, leaf-opposed, in dense clusters in the leaf axils. *Aphanes*, unnoticed ; *arvensis*, of cultivated fields.

SANGUISORBA

GREAT BURNET [Pl. 9] *Sanguisorba officinalis*

Herbaceous perennial up to 3 feet high, in damp meadows ; flowers June to August. Leaves longer and fewer pinnate, with 3–7 pairs of leaflets ; flowers all bisexual, with 4 dull brown sepals, 4 short, rigid stamens, in oblong heads. *Sanguisorba*, from *sanguis*, blood, and *sorbere*, to absorb ; *officinalis*, used medicinally.

POTERIUM

Poterium comprises some 30 species of perennials, mostly herbaceous, but some are shrubby. Only one of these species is native.

SALAD BURNET *Poterium sanguisorba*

Common herbaceous perennial in dry pastures, usually in thinnest soil on chalk downs. Grows up to 1 foot high ; flowers June to August. Rootstock stout, long ; aerial stems slender, branching ; leaves pinnate, with smooth cut-edged leaflets, marked with radiating veins, whitish below, fern-like. Flowers small, crowded together in dense purplish heads on red, angular flower-stalks. There are no petals, but calyx is 4-lobed. Flowers at top of head are commonly female, and first expand their crimson

stigmas ; the lateral ones are bisexual and open next ; and the lowest are generally male and open last. Stamens about 30, carpels 2 or 3 ; no nectar. Anthers hang in tassels of red, silk-like filaments. Calyx becomes hardened and 4-angled in fruiting stage. Sometimes used in salads (hence popular name) and drinks, for leaves have refreshing, cucumber-like flavour. Burnet probably derived from Italian brown cloth called *brunetta*, originally applied to *Sanguisorba officinalis* with its rich brown sepals. *Poterium* from Greek *poterion*, a cup referring to use of leaves in drinks ; *sanguisorba* from Latin *songuis*, blood, and *sorbere*, I absorb, perhaps with reference to blood-red colour with which plants are diffused, or to medicinal use in staunching wounds.

ROSA

The genus *Rosa* is extremely variable ; total number of species between 230 and 250. About 13 species are native. Most easily characterized by fruit or ' hip '—a fleshy, urn-shaped receptacle enclosing indefinite number of distinct, dry, 1-ovuled carpels, and surmounted by withered remains of calyx.

BURNET ROSE [Pl. 9] *Rosa spinosissima*

Much-branched, prickly, scrambling, perennial shrub, of warm, dry soils, chalk or limestone hills, or shifting sand dunes. Grows up to 4 feet high ; flowers May to June. Woody branches densely covered with straight prickles mingled with stiff, bristle-like or glandular hairs. Leaves pinnate, generally with 9 roundish, toothed leaflets. Stipules green, joined to stalk. Flowers large, white or pink, solitary (1½ inches across) at end of short shoots. Sepals not lobed ; petals white or pink, widespread ; carpels and stamens numerous. Fruit : globular ' hip ' ripening to dark purple or black in September, enclosing true fruitlets or achenes. Ancestor of cultivated Scotch Rose. Called Burnet Rose because of resemblance of its leaflets to those of genus *Poterium*. *Rosa*, old Latin name ; *spinosissima*, most spiny.

DOG ROSE [Pl. 9] *Rosa canina*

Largest of British roses, forming strong, perennial, suckering bush or shrub, abundant in hedges and copses. Grows up to 12 feet high ; flowers June to August. Stems long, arching, covered with even, hooked prickles, unmixed with bristles. Leaves compound, divided into 5–7 sharply toothed leaflets. Stipules present at base of leaf-stalk. Flowers solitary, large, pink, scented. Sepals 5, pinnate, curving backwards ; petals 5, pink, notched, heart-shaped. Stamens and styles many, partly sunk in hollow receptacle. No nectar. Fruit : calyx hardens, swells and reddens, becoming a ' hip ', enclosing small dry carpels or achenes. One of our loveliest hedgerow plants, making excellent stock on which to bud garden roses. *canina*, of dogs (i.e. common).

SWEET BRIAR *Rosa rubiginosa*

Small shrubby perennial, common in bushy districts in S. England. Grows 1 or 2 feet high ; flowers June and July. Rootstock woody ;

branches erect or arching, succulent, studded with straight and hooked prickles, and mingled with bristles. Foliage sweetly scented; leaves hairy below. Flowers small, solitary, pink; fruit pitcher-shaped. This is the old Eglantine. *rubiginosa*, rusty.

FIELD or AYRSHIRE ROSE [Pl. 1] *Rosa arvensis*

Similar perennial shrub to *Rosa canina*, flowering June and July. Distinguished by extremely thin, trailing stems and clusters of white flowers with sepals which fall off, and styles united in a column. Also called Trailing Rose. In spite of its name is least common in Scotland. *arvensis*, of cultivated fields.

PRUNUS

BLACKTHORN, SLOE [Pl. 9] *Prunus spinosa*

Commonly distributed deciduous shrub of hedges and thickets; flowers April. Bark dark grey or black, branches spread in all directions and every twiglet ends in a thorn. Leaves are small, elliptic, finely-toothed, and smooth beneath. Cold, dead-white flowers appear in advance of leaves, flower buds forming in August and September of previous year. Flowers borne on smooth stalks, with 5-lobed calyx tube, 5 white petals, 10 to 15 stamens with golden anthers, and 1 free carpel in sunken receptacle. Fruit: after fertilization receptacle withers away and carpel ripens into globular, purple-black 'drupe' or stone-fruit, consisting of fleshy outer part, and hard stony inner part containing one seed. It is not more than half an inch in diameter and harsh in flavour. Called Blackthorn when in flower or leaf, and Sloe when in fruit. A number of garden plums and damsons are derived from the Sloe. Fruits are barely edible, though acceptable to birds. They make a pleasant jam, have been used in the manufacture of spurious port wine, but make an excellent, legitimate liqueur. *Prunus*, the ancient Latin name of the plum; *spinosa*, spiny.

BULLACE *Prunus insititia*

Deciduous tree, resembling the last, of similar situations. It is taller, with brown bark and straight, downy branches. Thorns are few and leaves are larger, broader, more coarsely toothed and downy below. Flowers resemble those of *P. spinosa*, but they expand at the same time as leaves and their stalks are downy. Globular fruit is larger, nearly an inch in diameter, purple or yellow, less harsh to the taste. Damson and some orchard plums have been cultivated from Bullace. The third related type, Wilk Plum (*Prunus domestica*), is not truly native to this country, and when found growing apparently wild is merely an escape from cultivation. *insititia*, budded or grafted.

WILD CHERRY or GEAN [Pl. 9] *Prunus avium*

Small deciduous tree, of dry soil in woods. Sometimes reaches 50 feet; flowers in spring. Commonest of our 3 species of Cherry. Trunk, which may be branchless for some distance from ground, is covered with thin grey bark which readily peels. Spreading branches bear drooping, long-stalked leaves, of a glistening brown-green hue, coated with film of gum

as they open in early spring. In autumn they present wonderful combinations of blood-red and clearest yellow. Flowers white, separately stalked, about 3 or 4 in a cluster, appearing at same time as leaves, from April onwards, having 5 soft, limp, deeply notched petals. There are about 25 stamens and 1 style about same length. Fruit : globose, reddish, firm and bitter, yielding little juice, which, however, stains the hands. There is one seed. Sometimes called Mazzard, and probably the origin of our Morello Cherries. Wood is valued for its even grain. *avium*, of birds.



BULLACE
Prunus insititia
(A) Flowers

SOUR CHERRY or DWARF CHERRY *Prunus cerasus*

Usually merely a bushy shrub, with copious suckers to the roots. Much-branched stems bear short-stalked, erect leaves, quite smooth, broader and with more wavy veins than *Prunus avium*. Petals firm, slightly notched ; round, red fruit has an acid juice that does not stain the hands. Our sweet garden varieties of cherry are probably derived from this species. *cerasus*, an ancient name of this plant.

BIRD CHERRY *Prunus padus*

Small deciduous tree or shrub found occasionally in woods especially in the North. In spring it puts forth pretty pendulous racemes of small white fragrant flowers. Extremely bitter, firm fruit rarely exceeds a quarter of an inch in diameter. *padus*, a Greek name for a tree.

CRATAEGUS

Crataegus comprises well over 50 species of shrubs and small trees, belonging to the north temperate zone, 2 of which are native. Generally spinous, the spines being modified branches.

HAWTHORN [Pl. 10] *Crataegus oxyacantha*

Common deciduous shrub or small tree, 20–30 feet high ; flowers May. Our chief hedge-making bush. Branches numerous and very spinous. Bark light-coloured, brown shading to red. Leaves simple, stalked, wedge-shaped at base, varying considerably in outline and margin. Flowers small, numerous, hiding young green leaves. Sepals 5, petals 5, white, stamens numerous, carpels 1 or 2. Delicate pink anthers become brown as they burst and discharge pollen, and air becomes laden with honey fragrance. Fruit : stony seed surrounded by swollen receptacle forms deep red mealy berry, edible but unpalatable. Usually treated as two species, *C. monogyna* with downy flower stalks and calyx, and single carpel,

usually in hedges ; and *C. oxyacanthoides*, flowering a fortnight earlier, with leathery glossy leaves, smooth flower-stalks and calyx, fewer but larger flowers, and 2 or 3 styles, mainly found in woods. Less common forms have yellow or white fruits. The var. *praecox*, reputed to have sprung from staff of St. Joseph of Arimathaea planted at Glastonbury, blossoms at Christmas, as well as at usual season. Anciently regarded as symbol of hope ; later superstition attached curses to it. Wood was regarded as best substitute for Box in wood-engraving. Name ' haw ' means ' hedge ' with reference to its use in hedge-making. Also called May, from season of blooming. *Crataegus* from Greek *kratos*, strength, referring to toughness



ROWAN or MOUNTAIN ASH
Sorbus aucuparia
(A) Fruit

of wood. *oxyacantha* from Greek oxus, sharp, and *akantha*, a thorn. *monogyna*, single carpel and style. The pink and double-flowered forms of hawthorn are escapes or cultivated varieties of the native species.

SORBUS

ROWAN or MOUNTAIN ASH [Pl. 1] *Sorbus aucuparia*

Common, deciduous, erect tree, of woods and hedges, particularly in the North. Up to 30 feet high ; flowers May to July. Numerous branches form spreading habit ; bark smooth, brownish grey ; branches redder. Leaves compound, divided into 6–8 pairs of oblong, toothed leaflets with one terminal. Flowers small, creamy white, slightly scented, in conspicuous dense, flattened clusters. Sepals 5, pointed ; petals 5, white, rounded ; stamens numerous, with tawny anthers ; styles 3, partly hairy. Fruit : showy clusters of scarlet berries, relished by birds. A fine elegant tree, once regarded as a protection against witchcraft. Berries anciently used in marmalade. *Sorbus*, the Latin name ; *aucuparia*, bird catching.

WHITE BEAM [Pl. 10] *Sorbus aria*

Deciduous, erect shrub or tree, common on chalk or limestone in S. and W. England and on hills in N.W. England. May reach 40 feet ; flowers in spring. Older bark smooth and red-brown ; young shoots have white, mealy surface with conspicuous, paler cork-warts. Dwarf-shoots, given off at 45°, are also downy and bear leaves clustered in tufts, preceded by downy buds with leathery scales exuding sticky secretion. Leaves simple, downy, with white under surfaces. Flowers white, scented, in broad, flat clusters, covered with white hairs ; petals 5, white ; stamens numerous in 2 rows ; styles 2–4, downy at base. Fruit sub-globose, ½ inch across, ripening to bright scarlet, dotted with numerous little brown points. Orange-coloured flesh mealy, at first acid and astringent ; later, after a touch of frost, it becomes palatable. Beam is old English for tree ; *aria* possibly refers to Khorassan, which anciently was known as Aria.

WILD SERVICE TREE *Sorbus torminalis*

Uncommon native, found chiefly in S. England. Small tree, with simple, lobed leaves, and white flowers in loose inflorescences. Fruit oval, yellowish brown, spotted, mellowing in storage. Dried, it is used medicinally in treatment of colic. Tough, yellowish-white wood, streaked with brown, is highly valued. *torminalis*, relieving colic.

MALUS

CRAB-APPLE *Malus sylvestris*

Beautiful low tree with rounded head and gnarled and crooked trunk, of woods and hedgerows, southwards from Forth and Clyde. Grows up to 40 or 50 feet high ; flowers May. Bark scaly ; habit spreading and irregular. Leaves simple, scattered, sharply toothed, unfolding with brownish tinge in April. Flowers beautiful rose-white, in few-flowered clusters ; sepals 5, pointed, woolly inside ; petals 5, free, heart-shaped, white inside, pink outside. Stamens numerous ; carpels 5. Nectar is secreted. Fruit : the 5 fertilized carpels join to form apple core, and receptacle swells and becomes fleshy, forming edible part of apple. Fruit is 1 inch across, drooping with yellow or red skin. Crab-apples are very acid but make excellent jellies. *Malus* is Greek name for the apple ; *sylvestris* wild.

THE STONECROP FAMILY

CRASSULACEAE

A considerable family of herbs and shrubs, numbering nearly 500 species in 15 genera ; cosmopolitan but especially abundant and varied in S. Africa. Most of them grow in very dry situations, naked rocks, old walls, or hot sandy plains, and this accounts for their succulent stems and leaves which are thick and contain a reserve store of water. Three genera are native to this country.

SEDUM

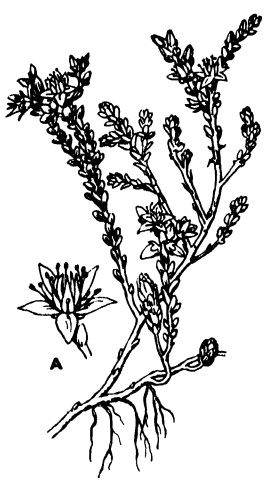
Sedum comprises about 140 species, about 7 of which are considered British.

ROSE-ROOT or MIDSUMMER-MEN *Sedum rosea*

Uncommon perennial in mountains of Wales and the North. Grows about 1 foot high ; flowers May to August. Notable for woody rootstock which smells of roses. Leaves scattered, glaucous, lance-shaped ; flowers small, star-like, golden sometimes tinged purple, unisexual, male and female generally on separate plants ; petals 4. *Sedum*, from Latin *sedere*, to sit, with reference to prostrate mode of growth ; *rosea*, rosy.

ORPINE or LIVELONG [Pl. 10] *Sedum telephium*

Often an escape from gardens, and less commonly wild, growing in shady spots in fields and woods or on sandy banks. Grows 6–24 inches high ; flowers July and August. Rhizome short, thick, perennial, with numerous long, tuberlike, descending adventitious roots. From this arise several erect, fleshy, brittle annual stems, often tinged with red. Leaves close-set, ascending, stalkless, round, fleshy, flat or slightly concave on their upper surfaces, slightly toothed. Flowers rose or deep purple-coloured, in crowded terminal cymes. Floral organs in whorls of 5; stamens maturing well in advance of stigmas ; carpels furrowed at back. Fruit : five-clustered follicle, with many seeds. Tallest of our British species of *Sedum*. Used anciently in many superstitions ; will live for a long time after being uprooted, hence popular name. Orpine, a yellow colour, and misapplied to this species. *telephium*, identified with Greek *telephion*, said to be a plant used by Achilles to heal wounds, he himself had inflicted on *Telephus*, son of Hercules.



BITING STONECROP or WALL-PEPPER
Sedum acre
(A) Flower

BITING STONECROP or WALL-PEPPER *Sedum acre*

Procumbent perennial herb, growing in abundant tufts and mats on bare walls, rocks and stones in hot, dry places. Grows a few inches high ; flowers June and July. Stems spread outwards and upwards and consist of flowerless and flowering stems, both crowded with leaves. Leaves small, scattered, occasionally opposite, stalkless, fleshy, biting to the taste. Flowers bright yellow, star-like, in short, dense cymes at end of shoots. Sepals 5, small, fleshy, united at base ; petals 5, bright yellow, pointed, free. Stamens 10, in 2 whorls ; carpels 5, free, joined at base. Fruit : carpels develop into follicular fruit, splitting down inner side, releasing numerous minute seeds. Also called Golden Stonecrop and Poor Man's Pepper. All English names

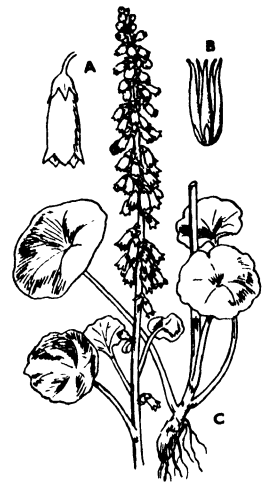
derived from acrid taste of leaves. *acre*, bitter or sharp.

REFLEXED-LEAVED or
CROOKED YELLOW STONECROP *Sedum reflexum*

Uncommon perennial herb, naturalized on old walls, etc., widely distributed but not truly native. Grows to about 18 inches high; flowers July and August. Leaves large, fleshy, up to 1 inch long, usually reflexed, i.e. the points turned down; flowers golden yellow, in cymes, generally 6-petalled. *reflexum*, turned back, with reference to leaves.

ENGLISH STONECROP *Sedum anglicum*

Locally abundant perennial, somewhat resembling *S. acre*, forming dense mats an inch high, on rocks by the coast. Leaves tiny, fleshy, reddish or glaucous. From May to August produces white or rosy little star-like flowers; anthers purple, carpels scarlet. *anglicum*, English.



NAVELWORT or
PENNYWORT
Umbilicus rupestris
(A) Flower (B) Seed pods
(C) Rootstock

TILLAEA

MOSSY TILLAEA *Tillaea muscosa*

A very local annual of sandy heaths in the South and East, flowering June and July. It is recognized by its small, branched stem, not more than two inches long, densely crowded with tiny, fleshy, oblong leaves and whitish inconspicuous flowers; plant reddish. Named after M. Tilli, an Italian botanist. *muscosa*, moss-like.

UMBILICUS

The genus comprises a few species of succulent herbs with almost penny-shaped leaves, flowers in cymes, and clusters of follicles for fruit. Only one species native to this country.

NAVELWORT or PENNYWORT *Umbilicus rupestris*

Succulent perennial herb, rather uncommon on dry stone walls in eastern counties, but abundant on wet rocks and banks in the South-West. Stems up to 1 foot long; flowers May to August. Underground stem solid and tuberous sending out a few fibrous roots thickly covered with root hairs. Leaves thick, fleshy, circular, with rounded hollow in centre, springing from rootstock on long stalks. Flower-stalks often long and branched; flowers greenish yellow, hanging in racemes by short foot-stalks. Sepals 5, united at base; petals 4 or 5, joined in greenish white, scentless tube. Stamens 10, in 2 whorls; stigmas 5, on thread-like styles. Nectar is secreted by large, reddish yellow scales at base of carpels. Fruit: carpels develop into clusters of 5 follicles in each, splitting to discharge

abundant seed. Also called Penny-Pies, Hipwort, Kidneywort, all from shape of leaves. *Umbilicus*, navel, with reference to depression in leaves ; *rupestris*, growing on rocks.

THE SAXIFRAGE FAMILY

SAXIFRAGACEAE

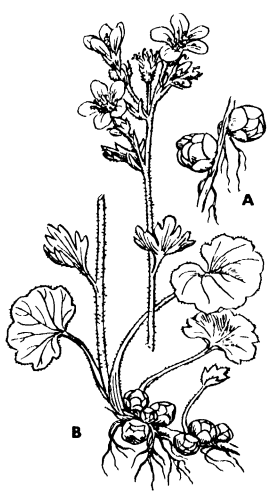
A large family comprising over 600 species in some 70 genera, natives mostly of temperate or cold mountainous zones. Three genera are represented in Britain. They comprise herbs or shrubs with opposite or scattered leaves, an ovary composed of 2 carpels and a capsule or berry for fruit.

SAXIFRAGA

A genus of some 200 species, some succulent, all herbaceous, many growing on bare rock surfaces. In Britain there are from 12 to 20 species, mostly uncommon, variously adapted to dry conditions.

RUE-LEAVED or THREE-FINGERED SAXIFRAGE *Saxifraga tridactylites*

Pretty, small, erect annual herb of dry upland fields, rocks, old walls and stony places. Grows 3 or 4 inches high ; flowers April to June. Whole plant covered with sticky hairs. Stem branching ; leaves scattered, rarely opposite, wedge-shaped, 3–4 lobed, becoming entire higher up stem. Flowers tiny, pure white. Calyx 5-lobed ; ovary inferior ; stamens 10 with rounded anthers ; styles 2. Capsule contains many very small brown seeds. *Saxifrage*, from Latin *saxum*, a stone, and *frango*, I break, or Stonebreak, because some species insert tufts of short, slender rootlets into rocky crevices and aid slightly the penetration of melted snow, rain and frost ; *tridactylites*, three-fingered.



MEADOW SAXIFRAGE
Saxifraga granulata
(A) Bulbils (B) Rootstock

MEADOW SAXIFRAGE *Saxifraga granulata*

Perennial herb of gravelly banks and meadows. Grows 1 foot high ; flowers April and May. Produces at base of stem several small, brown, downy, pea-like bulbils. Aerial stem erect, viscid with scattered glandular hairs. Leaves mostly radical, kidney-shaped, coarsely toothed or palmately lobed ; stem leaves becoming sessile. Leaves richly tinted with red and brown in times of drought. Flowers white, expanding to an

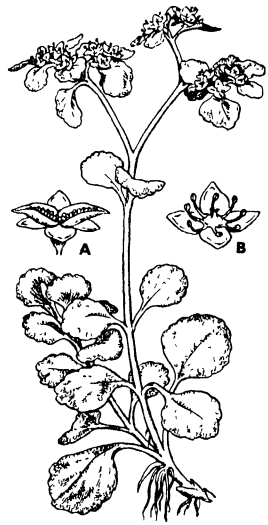
inch in diameter ; sepals 5, hairy, united in calyx above ovary ; petals 5, obovate, dead white above, becoming greenish yellow below ; stamens 10 ; carpels 2, united below but with divergent styles above. Fruit : many-seeded capsule. *granulata*, with knotted root.

MOSSY SAXIFRAGE
or DOVEDALE MOSS *Saxifraga hypnoides*

Uncommon pretty little herbaceous perennial, growing on mountains. It appears in tufted, mossy, yellow-green cushions on rocks. Flowers very similar to those of *S. granulata*, produced from May to July. *hypnoides*, moss-like.

CHRYSOSPLENIUM

The genus comprises some 40 species of small, succulent, herbaceous plants, of which 2 are British.



GOLDEN SAXIFRAGE
Chrysosplenium oppositifolium
(A) Seed capsules (B) Flower

OPPOSITE-LEAVED GOLDEN SAXIFRAGE
Chrysosplenium oppositifolium

Common, handsome, procumbent perennial herb of moist shady situations. Grows up to 5 inches high ; flowers April to June. Stems creeping, quadrangular, rooting from below nodes, branching from base. Leaves opposite, stalked, simple, kidney-shaped, both radical and stem, the latter higher up spreading out in same plane as flowers, and golden yellow in colour, thus helping to draw attention to inconspicuous flowers. Flowers golden or greenish yellow, in small cymes ; calyx yellow, 4-lobed ; petals absent ; nectar secreted by disk on edge of which are inserted 8 stamens ; carpels 2, united below into one-celled ovary. Two curving styles have stigmas that mature almost simultaneously with anthers. Fruit : two-lobed capsules, splitting to disclose very many small, light brown seeds. *Chrysosplenium*, from Greek *chrysos*, gold, and *splenion*, spleenwort, or literally Golden Spleenwort ; *oppositifolium*, opposite-leaved.

ALTERNATE-LEAVED GOLDEN SAXIFRAGE *Chrysosplenium alternifolium*

Very similar perennial, less common than previous species, but often found growing with it. Habit more tufted and erect, with stems branching only at top. Main difference is in leaves which are few and scattered. Flowers bright yellow, appearing a little before those of *C. oppositifolium*. *alternifolium*, alternate-leaved.

GRASS OF PARNASSUS

PARNASSIACEAE

PARNASSIA

GRASS OF PARNASSUS — *Parnassia palustris*

Slender, smooth, beautiful perennial of marshes, bogs and other waterlogged ground. Grows up to 1 foot high; flowers July to October. Short, thick rhizome bears tufts of unbranched roots and withered remains of former leaves. Radical leaves glossy green, thick, heart-shaped, untoothed, on long stalks; 1 sessile stem leaf on each flower-stalk, less than halfway up. Stems long, angular, singularly erect. Flowers large, terminal, solitary, creamy white. Sepals 5, green, spreading in flower stage, persistent in fruit; petals 5, creamy white outside, purer white inside, pencilled with greenish veins. Stamens 5 normally developed, and 5 modified; ovary large—4 carpels united into single chamber, topped with 4 sessile, rayed stigmas. Fruit: capsule splitting down 5 midribs of carpels and releasing numerous very minute seeds. Cross-pollination is ensured by interesting mechanism. The 5 stamens are fully formed when flower first expands, and stand with their backs pressed against top of immature ovary. Maturing in succession each filament lengthens and anther discharges pollen outwards away from ovary. When last stamen has fallen, the 4 sessile stigmas become receptive. Whorl of 5 modified stamens or nectaries alternate with perfect stamens. These are largish scales, secreting nectar from 2 glands on inner surface of each, but fringed with a cone of from 8–17 filaments, ending in glistening but dry yellow knobs, deceptively resembling drops of honey. Insects attracted by these receive discharged pollen and carry it to another flower. On bright sunny days flower has honey-like perfume. *Parnassia*, from Parnassus, a mountain sacred to the Muses; *palustris*, of marshes.



GRASS OF PARNASSUS
Parnassia palustris
(A) Flower

THE CURRANT FAMILY

GROSSULARIACEAE

RIBES

The only genus in the family *Grossulariaceae*, familiar in cultivation as the currants and gooseberries.

RED CURRANT — *Ribes rubrum*

A shrub, 3–6 feet, of woods and hedges, flowering April and May. Leaves broadly 3–5 lobed, softly hairy, lighter green below, glandless and inodorous. Flowers greenish, many on an ascending to drooping inflorescence. Recognized by the red, globose berries. *Ribes* is derived from the Persian name of an acid-juiced plant ; *rubrum*, red.

BLACK CURRANT — *Ribes nigrum*

Differs from *R. rubrum*, mainly in its glandular, odorous leaves and black berries ; the inflorescence droops. *nigrum*, black.

MOUNTAIN CURRANT — *Ribes alpinum*

A local, northern species, growing taller than and differing from the others in having erect inflorescences of dioecious flowers, the female smaller than the male. The berry is red and insipid. *alpinum*, alpine.

GOOSEBERRY — *Ribes uva-crispa*

Differs from the other *Ribes* in having spiny stems, one or few flowered inflorescences, and in its well-known ovoid, green, yellowish or reddish, smooth or bristly fruit. *uva*, grape, and *crispa*, curled.

THE SUNDEW FAMILY

DROSERACEAE

A family of insectivorous bog herbs, widely spread throughout the world under suitable conditions, comprising rather more than 100 species in 6 genera. There is 1 British genus.

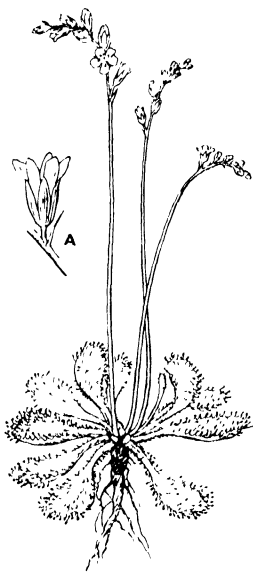
DROSERA

Drosera includes some 90 species, 3 of which are British. They are mainly boggy perennials with leaves specially adapted for trapping small insects.

ROUND-LEAVED SUNDEW — *Drosera rotundifolia*

Small perennial herb, common in peat bogs and sandy swamps throughout Great Britain, generally making a patch of colour where it grows in clusters. Grows up to 6 inches high ; flowers July and August. Roots very small and slightly developed. Flower-stalks long, erect, leafless.

Leaves all radical, roundish, green splashed with red, lying flat on ground in long-stalked rosette. Upper surface near edge of each blade has numerous, long, red glands or tentacles tipped with a viscid swelling resembling a drop of dew. Insect alighting on leaf blade irritates these glands, and the other tentacles curl over, pressing insect against leaf. Digestive juices are secreted from glands which absorb nitrogenous content of insect. Flowers white, lowest opening first in long inflorescences on smooth, erect stalks. Sepals 5, joined, smooth ; petals 5, free, white, regular ; stamens 5, free ; ovary single-celled, with 6 to 8 styles. Flowers generally self-pollinating, seldom open (cleistogamous). Fruit : a capsule containing numerous seeds, pointed at both sides. Sundew probably derived from Teutonic *sindau*, ever-dewy. *Drosera*, from Greek *drosos*, dew ; *rotundifolia*, round-leaved.



ROUND-LEAVED SUNDEW
Drosera rotundifolia
(A) Flower

LONG-LEAVED SUNDEW *Drosera intermedia*

Very similar perennial, often growing with *Drosera rotundifolia*. Differs in having shorter flower-stems, and leaf-blades are spoon-shaped. Leaves are borne semi-erect. *intermedia*, intermediate.

NARROW-LEAVED or GREAT SUNDEW *Drosera anglica*

Another less common perennial, closely resembling the above and growing in similar situations. Leaves erect, and resemble those of *D. intermedia* but are twice as long and narrower. *anglica*, English.

THE LOOSESTRIFE FAMILY

LYTHRACEAE

This family is represented in Britain by 3 species in 2 genera, all herbs. Leaves generally opposite with minute stipules ; flowers in racemes or spikes ; petals crumpled in bud ; and fruit capsular.

LYTHRUM

This genus comprises some 20 species of shrubs and herbs, with square branches, axillary flowers secreting nectar, red petals, long slender style, and 2-chambered ovary. There are 2 British species.

PURPLE LOOSESTRIFE [Pl. 10] *Lythrum salicaria*

Tall-growing, erect, perennial herb, of water-logged ground on stream banks, etc., common and widespread. Grows 3–5 feet high; flowers July to September. Rootstock creeping; stem angled, erect, branched, leafy. Leaves opposite, sometimes whorled, lance-shaped, with heart-shaped base clasping stem, hairy beneath. Flowers large, purple, in conspicuous spikes of stalkless cymes. Sepals united in calyx-tube with 8–12 teeth, alternate ones larger and outspreading; petals 4–6 oblong, free; ovary 2–6-celled; stamens 12, in 2 whorls of 6, each of different length. Species is *trimorphic*, i.e. 3 distinct forms occur, often growing side by side and in equal numbers. One is a large, coarse, downy plant with dull flowers, and has a style shorter than either whorl of stamens. A second has style intermediate in length between 2 whorls of stamens. The third, a slender, glabrous plant with narrow leaves and bright flowers, has style longer than all stamens. Long stamens in first 2 forms have green anthers, the others being yellow; the longer the stamens, the larger the pollen grains. Thus there are 18 ways of cross-pollination here, but only 6 assure perfect fertility, in which pollen is transferred from anthers to stigma at the corresponding level. Mainly cross-pollinated by a bee, *Cilissa melanura*, which just suits the flower in size, the head, thorax and abdomen corresponding to position of 2 rows of stamens and stigma in either form. Fruit: a many-seeded capsule. A bright feature of English stream-sides, now naturalized in Australia and America. *Lythrum*, from Greek *lythron*, gore, alluding to colour of flowers; *salicaria*, from *Salix*, a willow, from a fancied resemblance of leaves to those of some Willows.

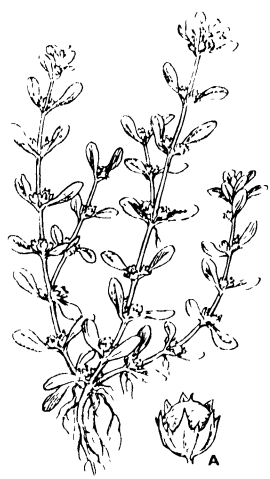
HYSSOP-LEAVED LOOSESTRIFE
or GRASS POLY *Lythrum hyssopifolia*

Rare, half-erect annual of wet places in eastern and a few southern counties; flowers June to September. Stem smooth, prostrate, 6–18 inches long; leaves scattered, narrow, lance-shaped; flowers rosy, small, solitary, axillary, all similar, with only 6 stamens. *hyssopifolia*, Hyssop-leaved.

PEPLIS

WATER PURSLANE *Peplis portula*

Common, much-branched, prostrate annual of ditches and other moist places. Stems creeping, quadrangular, reddish, sometimes rooting from under side. Leaves oval or spoon-shaped, in opposite pairs, shortly stalked. Flowers very small, solitary, purplish, inconspicuous; produced from axils of leaves on extremely short stalks. Calyx bell-shaped with 12 teeth, 6 inner, narrow, pointed, and 5 alternate, outer, awl-shaped. Petals 6, sometimes imperfect or missing altogether (especially when submerged) or



WATER PURSLANE
Peplis portula
(A) Fruit

in any case soon falling. Stamens 6 or 12 ; style very short, with 2-lobed stigma. Fruit : flattened, roundish capsule surrounded by calyx, containing numerous seeds. Submerged flowers remained closed and are automatically self-pollinated. In the open, self-pollination is ensured by stamens bending towards stigma. *Peplis*, from Greek, a purple garment, from the colour of the flowers ; *portula*, from *portulaca*, name given by Greeks to cultivated Purslane.

THE DAPHNE FAMILY

THYMELAEACEAE

The family belongs mainly to southern parts of the Old World, and consists mostly of shrubs or undershrubs remarkable for their tough stems.

DAPHNE

The genus comprises some 50 species of low-growing shrubs, of which 2 are British natives.



SPURGE LAUREL
Daphne laureola

(A) Fruit
(B) Longitudinal section of flower

MEZEREON *Daphne mezereum*

Similar to *D. laureola*, but, in a wild state, very rare perennial of chalky soils. Grows 3–5 feet high ; flowers February or March before leaves appear. Branches erect, with terminal tufts of deciduous leaves. Flowers fragrant, pink, along stems in axils of fallen leaves of previous year. Berries red, highly poisonous. *Daphne* is a classical name taken from Greek myth of Daphne and Apollo ; *mezereum*, deadly.

SPURGE LAUREL *Daphne laureola*

Erect, evergreen, low-growing shrub of copses and woods, especially in S. England. Grows 2–4 feet high ; flowers January to April. Stem erect, tough, slightly branched ; leaves bright, evergreen, tough leathery, lance-shaped, almost stalkless, generally confined to top of stem. Flowers yellowish green, hang-

ing in racemes, below terminal rosettes of glossy leaves ; calyx 4-lobed, tubular ; petals absent ; stamens 8 ; style 1 short. Sweetly scented. Fruit : the single carpel ripens into a highly poisonous, black, fleshy berry. Leaves and berries formerly used as laxatives. *laureola*, a diminutive of *Laurus*, the Laurel tree.

SEA BUCKTHORN FAMILY

ELAEAGNACEAE

A small family of 3 genera and about 15 species. Only one genus with one species is British.

HIPPOPHAË

SEA BUCKTHORN [Pl. 14] *Hippophae rhamnoides*

Shrub up to 3 feet high of sandhills by the sea at a few places on the south and east coasts. Flowers March to May. Rigid, much-branched and spiny shrub with grey bark. Leaves lance-shaped, about 2 inches long, very shortly stalked. Male and female flowers separate on the same plant. Male flowers small, greenish, with 4 stamens. Female flowers with a tubular perianth and long stigma. Fruit : the perianth becomes fleshy and enlarges to cover the achene so as to resemble a smooth orange berry, about ⅓ inch long. *Hippophae* from Greek *hippos*, a horse, and *phao*, I shine ; *rhamnoides*, like *rhamnus*, the buckthorn.

THE WILLOW-HERB FAMILY

ONAGRACEAE

A large family, mainly herbaceous, generally of northern temperate regions. Leaves opposite or alternate, toothed and without stipules. Flowers usually regular, in twos and fours ; ovary inferior. Fruit a capsule, berry or drupe.

EPILOBIUM

This genus includes over 150 species, 11 British, besides many natural hybrid forms. Most are herbaceous perennials, with slender underground stems, making them difficult weeds to eradicate. Seeds with a tuft of long hairs.

GREAT HAIRY WILLOW-HERB or CODLINS-AND-CREAM [Pl. 10] *Epilobium hirsutum*

Tall, handsome, herbaceous perennial of stagnant waters and banks of slowly running streams. Grows 3–6 feet high ; flowers July and August. Rootstock has thick, fleshy, underground suckers, bearing a few leaf-scales

or rosettes of leaves. Sub-aerial stems slightly branched, downy; stem branched, sturdy. Leaves 3–5 inches long, lance-shaped, stalkless, clasping stem, finely toothed, most hairy along their veins. Whole plant is hairy, some hairs long and spreading, others glandular. Flowers erect, sharply-pointed flower-buds expand into handsome, deep rose-pink flowers, sometimes over 1 inch across. Sepals lance-shaped; petals broad, notched; stigma conspicuously 4-lobed, white. Although exclusively female flowers do occur, perfect flowers are generally the rule, with anthers and stigmas maturing very nearly simultaneously. Fruit: capsule, 2–3 inches long. Has several popular names such as Gooseberry Pie, Gooseberry Pudding, Cherry-pie, Plum-pudding, Codlins-and-Cream. *Epilobium*, from Greek *epi*, upon, and *lobon*, a capsule, with reference to the perianth surmounting the capsule; *hirsutum*, hairy.

HOARY OR SMALL-FLOWERED HAIRY WILLOW-HERB *Epilobium parviflorum*

Similar perennial to *E. hirsutum*, of river banks and wet places; grows 1½ feet high; flowers July and August. Stem rosy, branched in upper part; whole plant covered in white down. Leaves lance-shaped or slightly stalked, opposite becoming alternate, finely toothed. Flowers reddish purple, small, regular, with deeply notched petals and 4-lobed stigma. *parviflorum*, small-flowered.

MOUNTAIN OR BROAD-LEAVED WILLOW-HERB *Epilobium montanum*

Erect perennial of woods, banks and walls, or a garden weed; grows 1–2 feet high; flowers June and July. Stem downy, but leaves practically smooth, broadly lance-shaped, shortly stalked, opposite or alternate. Flowers nodding in bud, ⅓ inch across, rosy-purple, with 4-lobed stigma. Capsule sometimes exceeds 3 inches in length. *montanum*, of mountains.

MARSH OR NARROW-LEAVED WILLOW-HERB *Epilobium palustre*

Locally common perennial, of boggy and marshy places; 18 inches tall; flowers July and August. Has subterranean runners which form bulbils in autumn and detach to form new plants. Stem rounded, erect, downy; leaves lance-shaped, slightly hairy, soft, sessile, opposite, becoming alternate; flowers very small, few, rose-lilac, at end of stems. Capsule 3 inches long. *palustre*, of marshes.

SQUARE-STALKED WILLOW-HERB *Epilobium adnatum*

Common semi-aquatic perennial of ditches and moist places. Grows 1–2 feet high; flowers July and August. Stems erect, branched, sharply angled; leaves small, sessile, lance-shaped. Flowers small, rosy, with club-shaped undivided stigma. *adnatum*, closely attached, referring to the somewhat decurrent leaves.

CHAMAENERION

ROSEBAY WILLOW-HERB, FIREWEED [Pl. 10] *Chamaenerion angustifolium*

Extremely common herbaceous perennial of woodlands, waste land and burnt and bombed areas in towns, etc. Grows 2–4 feet high; flowers July and August. Rootstock creeping, sending out slender underground

stems or 'stolons'. Stems erect, tall, smooth, unbranched often deeply tinged with red. Leaves alternate, lance-shaped, with crinkled edges, often glaucous beneath. Flowers large, rose-pink, slightly irregular, in handsome, loosely arranged, tapering racemes. Sepals 4, long, narrow, purple; petals 4, rosy-pink, one pair larger than the other, leaving a gap through which the 8 stamens and 1 style protrude. Carpels 4, united, with 1 common 4-lobed style. When flowers open, anthers are ripe and style bends downwards among bases of stamens until pollen is shed. Visiting insects clasp stamens and lower petals and thrust tongue between filaments. Stamens afterwards turn down and style straightens up with its 4 stigmatic lobes spreading apart to positions previously occupied by anthers. Nectar is secreted. Fruit: four-chambered capsule splitting by 4 valves which coil downwards leaving many seeds attached to central axis. Seeds are small, oblong, brown, each with tuft of long, silky, white hairs, aiding their dispersal by wind. A Northern Irish name is 'Blooming Sally' from its resemblance in some respects to Sallow. *Chamaenerion*, from Greek *chamae*, ground, and *nerium*, the oleander; *angustifolium*, narrow-leaved.

OENOTHERA

EVENING PRIMROSE [Pl. 10] *Oenothera biennis*

Annual or biennial, frequently an escape from cultivation found in waste places and on sandy seashores. Grows 2–3 feet high; flowers June to October. Stem erect, often unbranched. Leaves shortly stalked, oval to lance-shaped, 3–6 inches long, slightly toothed. Flowers in terminal leafy spikes, 2–3 inches, pale yellow. Calyx 2 inches long, divided into 4 reflexed segments. Petals 4, stamens 8, stigma divided into 4 lobes. Fruit: cylindrical, slightly 4-angled capsule, hairy, many-seeded. Flowers open as sun sets, closing an hour or two after sunrise, when they wither, to be replaced by others in the evening. *Oenothera*, from Greek *oinos*, wine, and *thera*, imbued with, from roots which have a vinous scent; *biennis*, biennial.

CIRCAEA

Genus *Circaea* comprises 6 or 7 north temperate herbs, of which 2 or 3 are natives in this country.

ENCHANTER'S NIGHTSHADE
Circaea lutetiana

Perennial herb, locally abundant in wooded glens and other shady



ENCHANTER'S NIGHTSHADE
Circaea lutetiana
(A) Flowers (B) Flowers

places. Grows about 1½ feet high ; flowers June to August. Rootstock slender, creeping ; stem erect, square, slightly swollen at nodes, shortly hairy. Leaves opposite, shortly stalked, broadly pointed, elongatedly heart-shaped, slightly toothed ; generally displaying transparent dots if held to the light. Flowers tiny (⅛ inch across), pinkish white, in loose terminal racemes. Sepals 2, crimson ; petals 2, white, alternating with sepals, deeply divided into 2 broad lobes ; stamens 2, pink, at first curving away from slender central style. Slender flower-stalks at first spread out horizontally, but after fertilization bend downwards. Fruit : ovary is covered with hooked hairs which become stiff and bristle-like in fruit, making it a small bur. This is 2-chambered, each chamber containing 1 seed. *Circaea*, named after Circe, the Enchantress ; *lutetiana*, from *Lutetia*, Paris, where it was perhaps common.

ALPINE ENCHANTER'S NIGHTSHADE *Circaea alpina*

Rare perennial, found in Scotland and hilly districts ; grows 6 inches high ; flowers July and August. Stem much shorter ; leaves glossy, more deeply toothed. Hairs on ovary less stiff and less hooked at the end ; fruit 1-seeded. *alpina*, alpine.

THE WATER-MILFOIL FAMILY

HALORAGACEAE

A small family of less than 100 aquatic plants, with 1 genus in Europe. Leaves opposite or whorled ; flowers unisexual, with an inferior ovary ; fruit a drupe or capsule.

MYRIOPHYLLUM

SPIKED WATER-MILFOIL *Myriophyllum spicatum*

Somewhat uncommon aquatic perennial herb of ditches, ponds and slow running streams ; somewhat resembles Mare's-tail. Flowers June to August. Rhizome creeps and roots under water. Usually only flower spikes visible above water. Leaves submerged, feathery, very finely divided, generally in whorls of 4. Flowers minute, inconspicuous, greenish, usually unisexual, with both sexes on same plant, each flower in the axil of a small toothed or entire bract, not longer than the flower. When complete and perfect there are 4 petals, 4 sepals, 4, 6 or 8 stamens, and 4 carpels. Males generally at top of spike, females lower down. Flowers wind-pollinated. Fruit : globose nutlets. *Myriophyllum*, from Greek *myrios*, innumerable, and *phyllon*, a leaf, on account of finely divided submerged leaves ; *spicatum*, spiked.

WHORLED WATER-MILFOIL *Myriophyllum verticillatum*

Rarer aquatic perennial herb very similar to the above, of similar situations. Differs in having its flowers often submerged. Bracts longer than flowers, which are whitish. *verticillatum*, whorled.

THE MARE'S-TAIL FAMILY

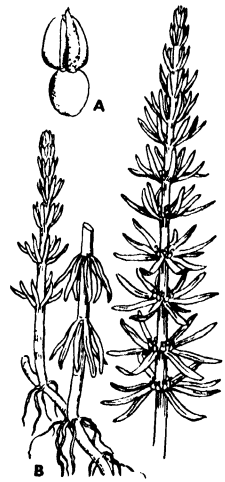
HIPPURIDACEAE

HIPPURIS

Genus includes only 1 species, widespread all over the world.

MARE'S-TAIL *Hippuris vulgaris*

Glabrous aquatic herb, fairly common in ponds and ditches throughout the country. Grows up to nearly 1 foot above water; flowers June and July. Rhizome, buried in mud, is creeping; erect, unbranched, jointed, tapering shoots rise above water. Sometimes occurs in running water when it is wholly submerged and flowerless. Leaves in whorls of from 6–12, entire, narrow, usually ending in stiff hard tip; but in deep or running water they elongate sometimes to nearly a foot in length, becoming flaccid and translucent, with no hard tip. Stems have numerous air spaces internally. Flowers minute, greenish, sessile, one in axil of each of upper leaves. Calyx rudimentary; no petals; 1 stamen with red anther, and 1 tapering pointed style; ovary inferior. Fruit: single carpel develops into oblong capsule. *Hippuris*, from Greek *hippos*, a horse, and *oura*, a tail; *vulgaris*, common.



MARE'S-TAIL
Hippuris vulgaris
(A) Flower
(B) Rhizome

THE WATER STARWORT FAMILY

CALLITRICHACEAE

CALLITRICHE

WATER STARWORT *Callitriche stagnalis*

The commonest species of the only genus in *Callitrichaceae*, a family of aquatic or mud-inhabiting annual or perennial plants, characterized by very slender stems, extremely narrow under-water leaves, often with two incurved teeth at the apex, and narrow spatula-shaped floating leaves, the latter not always present. *C. stagnalis*, growing up to 3 feet under water, and up to 8 inches on mud, flowering through the summer, has floating or upper leaves in well-marked rosettes. The axillary flowers are inconspicuous, lacking petals and sepals; ovary inferior. The fruits are small, round, with 4 winged lobes, separating eventually into 4 drupelets.

Other species, difficult sometimes to distinguish, vary in leaf and fruit, but the group is readily recognizable. *Callitriche*, from *kallos*, beauty, and *thrix*, hair ; *stagnalis*, of swampy places.

THE MISTLETOE FAMILY

LORANTHACEAE

The *Loranthaceae* comprise upwards of 500 species in more than 200 genera, all semi-parasitic ; but the great majority of them are tropical. Only 1 British species.

VISCUM

MISTLETOE — *Viscum album*

Evergreen semi-parasitic shrub, native in S. England ; most frequently found on Poplar and Apple trees, rarely on Oak, its traditional host. Flowers March to May. Stem short, round in section ; it forms no cork, but outer skin of stem persists and grows so as to accommodate itself to increasing girth ; thus stem remains smooth and green. Tip of each branch sends forth 2 more branches in Y-shaped fork, and so on. At each forking there is usually a pair of yellowish-green leaves, opposite, leathery, narrow, blunt-edged ; each pair represents a year's growth. Flowers small, green, inconspicuous, generally grouped in clusters of 3 in forks of branches ; unisexual, with sexes on separate plants. Sepals 4, small, thick, greenish ; petals (in male) none ; 4 anthers adhere to sepals (there being no filaments) ; each anther has numerous pollen-sacs, opening by separate minute pores to discharge pollen so that surface of anther resembles honeycomb. Female flower has 1-celled ovary below calyx, and simple stigma without a style. Flowers contain some honey. Fruit : berries, ripening in October. Seed fills entire cavity of ovary and adheres to its inner walls. These pearly white fruits are eaten by many birds, especially Missel-Thrush, Fieldfare and Redwing. Extremely viscid coat which surrounds seed prevents them from swallowing it, and they accordingly scrape it off their bills on a branch where it may stick and sprout. Mistletoe most commonly grows downwards, the seed in germination sending its taproot upwards. This sucker penetrates the wood of the host and reaches the tissue where it feeds on sap. Mistletoe is rich in legend and superstition. It was sacred to Druids, believed to be a source of fertility and a remedy against all poisons. Special properties were attached to it because it grows 'between heaven and earth'. *Mistletoe* probably derived from mist, different, and tau, twig, being so unlike the tree on which it grows. *Viscum*, from Greek *biskos*, tenacious, alluding to sticky fruits ; *album*, white, from colour of fruits.

THE SANDALWOOD FAMILY

SANTALACEAE

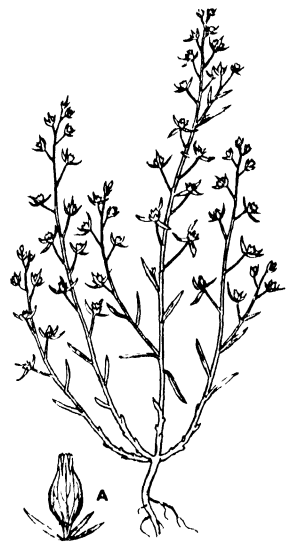
A small but widespread family of semi-parasitic trees, shrubs or herbs.

THESIUM

The genus constitutes more than half the family. All slender, perennial root-parasites, mostly of north temperate regions of Old World. There is 1 British species.

BASTARD TOAD-FLAX *Thesium humifusum*

Perennial, semi-parasitic herb of hilly pastures on chalk or limestone, in dry sunny spots, no further north than Cambridgeshire and Norfolk. Flowers May and June. Rhizome yellow, woody, with fibrous root which sends out little white knob-like suckers, by means of which it attaches itself to various plants. Aerial stems numerous, prostrate, spreading out in a circle, 6–18 inches long; leaves numerous, 1-veined, 1 inch long, with edges minutely toothed. Flowers green externally, white within, $\frac{1}{6}$ inch in diameter, often solitary but sometimes in cymes in groups of 3. A bract below each flower, attached to flower-stalk, is flanked by 2 bracteoles. Perianth funnel-shaped spreading at mouth into 5 triangular lobes; stamens 5, short; ovary inferior; style short, with lobed stigma. Anthers after bursting remain open for some time, except in wet weather. Nectar is secreted. Fruit: green, egg-shaped, 1-seeded nut, ribbed externally; longer than persistent calyx-tube which surrounds it. First recorded as a British plant in 1633.

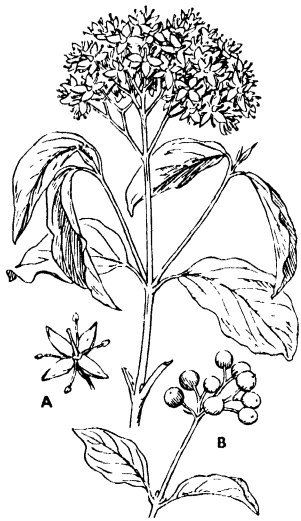


BASTARD TOAD-FLAX
Thesium humifusum
(A) Fruit

Bastard Toad-Flax is a literal translation of *Linaria adulterina*, which was its earlier name among botanists. *Thesium* is derived from Athenian hero Theseus; games were held in his memory and Victor's crown was made up of leaves of a plant with a similar name; *humifusum*, prostrate.

THE CORNEL OR DOGWOOD FAMILY

CORNACEAE



DOGWOOD
Cornus sanguinea
(A) Flower (B) Fruit

Mostly trees or shrubs, with a few herbs, mainly of the north temperate zone. Leaves generally opposite, simple ; flowers crowded, perfect ; fruits berry-like.

CORNUS

The genus includes nearly 30 species, some herbaceous, but the majority shrubby. Only 1 species is British.

DOGWOOD *Cornus sanguinea*

Deciduous shrub most abundant on chalky and limestone soil in our south-eastern counties, rare further north. Grows 4–10 feet high ; flowers June and July. Branches round, straight, spreading horizontally or ascending in opposite pairs, their downy surface changing in autumn and other seasons when affected by frost from vivid green to blood-red. Leaves opposite, short-stalked, oval, entire, 2–6 inches long, with prominent tough veins, under surface sparsely clothed with hairs ; in spring and autumn beautifully tinted with red. Bark and leaves have strong fetid odour when bruised. Flowers small, cream-coloured, in terminal clusters. Sepals 4, minute, superior ; petals 4, not overlapping in bud ; stamens 4, alternate with petals ; ovary inferior, 2-celled, with single style. Flowers are rich in nectar and visited by numerous insects, but self-pollination is not prevented. There is a heavy, unpleasant perfume. Fruit : fleshy, bitter hard berries, ripening from green to black in September. Seed is contained in hard inner stone. Berries eaten by Thrushes, but astringent to human palate. Anciently used medicinally ; shoots sometimes employed in basket-making. *Dogwood* is corruption of *Dagwood, dag* being old name for a meat skewer, the hard wood of this species being useful in this connection. *Cornus*, probably derived from Latin *cornu*, a horn, from horny texture of wood ; *sanguinea*, blood-red, from seasonal colour of twigs.

CHAMAEPERICLYMENUM

DWARF CORNEL *Chamaepericlymenum suecicum*

Widely distributed creeping perennial of high moors in Scotland and Northern England. Sends up annual stems about 6 inches high bearing opposite, stalkless, oval leaves. Flowers produced in June and July, appear in little terminal umbels ; individual flowers purple, minute, but

there are 4 large white bracts which may be mistaken for petals. *Chamaepericlymenum*, from Greek *chamai*, on the ground ; *periclymenum*, resembling *Lonicera periclymenum* in appearance of leaves. *suecicum*, Swedish.

THE IVY FAMILY

ARALIACEAE

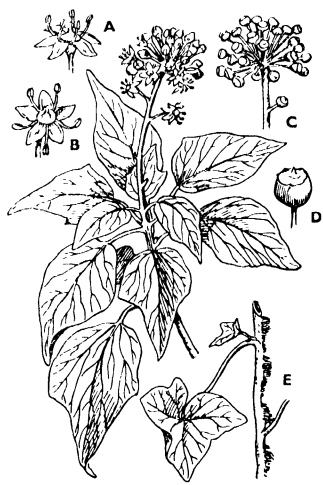
Contains over 50 genera and 400 woody species, mostly tropical. They are trees or shrubs, with scattered leaves, inconspicuous, greenish flowers and berry-like fruits.

HEDERA

Hedera contains few distinct species, only 1 European.

IVY *Hedera helix*

Very common, evergreen, perennial, climbing shrub, found practically everywhere in town and country, clinging to walls, trees, or running about hedge bottoms. Climbs to almost any height ; one of the latest flowering British plants, flowering during September and October. Stem and foliage extremely variable. It may trail with long, slender stems along the ground, rooting at nodes but never flowering. Unable to stand alone, it may send out crowded double row of unbranched roots along internodes by which it climbs to summit of some support and there at length produces flowers and fruit. In this way stem may reach 1 foot in diameter. Leaves on trailing and climbing parts of plant are 3- or 5-angled, and lie so as to form a leaf-mosaic, capturing maximum amount of sunlight. At top of tree or wall plant branches freely in a radial manner and bears oval, single-pointed leaves which hang nearly vertically. Angular leaves of lower stem exhibit considerable variety in colouring, being often tinged with red, and with their veins prominently white or pale green. There are no stipules to leaves. Umbels of flowers produced exclusively from upper, free-branching region often arranged racemosely and forming a terminal panicle. Flower-stalks hairy ; each individual flower is yellowish green, with 5 united sepals, marked by



IVY
Hedera helix

(A) & (B) Flowers
(C) Berries
(D) Single berry
(E) Roots from stem

triangular teeth; 5 yellowish petals bending backwards; 5 carpels joined in many-celled inferior ovary; and 5 joined styles with separate stigmas. Nectar, freely secreted on top of ovary, is very attractive to all types of insects, butterflies, and moths at night. Flowers will not apparently set seed with their own pollen. Fruit: greenish black berries, containing 2–5 seeds. They ripen in March or April and are unaffected even by severe frost. Eaten by birds but poisonous to man. Ivy is not a parasite, and does little harm to supports, whether trees or buildings. Leaves eaten by stock. Anciently became an emblem of constancy. Widely used in art design, on account of beautiful leaf patterns. *Hedera* is classical Latin name for Ivy; *helix*, a spiral, from its twining habit.

THE MARSH PENNYWORT FAMILY

HYDROCOTYLACEAE

HYDROCOTYLE

Only one genus in this family which was formerly included in *Umbelliferae*.

MARSH PENNYWORT *Hydrocotyle vulgaris*

Common aquatic perennial herb of marshy ground, throughout the country, often massed together in broad patches. Flowers June to August. Stems long, slender, trailing, creeping in mud or floating in water, rooting at nodes. One or more leaves on long, erect, slightly hairy stalks spring from each node; blades smooth, rather fleshy, nearly circular, attached to stalk in the middle, 1–2 inches across. Flowers minute, greenish white, in little axillary umbels on short leafless stalks springing from nodes. There are 3–6 almost sessile flowers in each very imperfect umbel, which is sometimes elongated to form a second cluster. Fruit: tiny, consisting of 2 much flattened, keeled, nearly circular carpels, with a ridge down each surface. In these inconspicuous flowers self-pollination is at least possible, for although anthers mature in succession, stigmas mature before last of 5 anthers bursts. Also called White-rot. Pennywort comes from shape of leaves. *Hydrocotyle*, from Greek *hydor*, water, and *kotyle*, a dish with reference to leaves; *vulgaris*, common.



MARSH PENNYWORT
Hydrocotyle vulgaris
(A) Flower (B) Fruit

THE CARROT OR PARSLEY FAMILY

UMBELLIFERAE

This family comprises some 1,400 species in about 180 genera, cosmopolitan in distribution. Of these, 35 genera and about 60 species are British.

Although generically and specifically difficult to distinguish, as a family the plants are usually easily recognizable. Stems stout, often fluted, usually hollow between the nodes. Leaves usually divided, scattered, without stipules, sheathing at base. Flowers usually small, white or yellow, with parts in fives (sepals, petals and stamens 5), perfect, grouped in umbels, on long stalks, like ribs of umbrella. That is, 7–12 flowers, arranged at about the same level, each have a foot-stalk which converges on a common point on the main stem. These large stems may be arranged in a similar manner to the smaller foot-stalks, thus creating a compound umbel. Frequently a whorl of bracts is produced at the base of each umbel. Ovary inferior, 2-chambered with 2 erect or curving styles. Fruit dry, consisting of 2 united 1-seeded carpels, 1 at back of flower and 1 at front, crowned by fleshy disk. When ripe it splits in 2 parts which hang from central stalk, each known as a 'mericarp'. Surface of mericarps is ridged and ducted, often holding aromatic or poisonous oils.



WOOD SANICLE
Sanicula europaea
(A) Rootstock (B) Fruit

SANICULA

WOOD SANICLE *Sanicula europaea*

Common, not unattractive, perennial herb, growing in patches in dense shade, in woods on clay or sand, and under Beech trees on chalk. Grows about 1½ feet high; flowers May to July. Rhizome, short, stout, creeping, woody; leaves mostly radical, on long, slender, erect stalks, purplish at base; blades rounded, glossy, 1–3 inches across, deeply palmately 3- to 5-lobed, lobes being wedge-shaped, divided into 3 lobes themselves, and unequally toothed. Flower-stalks almost leafless, but with leafy bracts just below flower-heads. Flowers very small, few, in irregular compound umbels. Outer flowers in each head are male, slightly stalked; inner flowers female, sub-sessile. Sepals leaf-like, as long as petals; petals white,

tinged with pink, with long incurved point, appearing to be deeply notched ; stamens longer than petals. Chiefly pollinated by small flies and beetles. Fruit : flattened, oval nutlet, nearly circular in transverse section, with hardly a trace of ridges, but with numerous oil cavities ; densely covered with hooked prickles to ensure transport by passing animals. Only European species of the genus. *Sanicula* supposed to be derived from Latin *sanare*, to heal ; *europaea*, European.

ERYNGIUM

SEA HOLLY or ERYNGO — *Eryngium maritimum*

Rigid, much-branched, thistle-like perennial of sandy seashores. May grow a foot or two high ; flowers July and August. Rhizome creeping, sending off fleshy rooting branches down to depth of 6 feet or more. Aerial stems often prostrate, but may rise 1 or 2 feet. Radical leaves stalked, nearly round, 3-lobed, with wavy, spinous margins, 2–5 inches across. Stem leaves embrace stem or have basal sheath ; 3 leaves reduced in size, stalkless, form the involucre. Whole plant has glaucous hue. Individual flowers minute, pale blue, almost stalkless, in dense heads which need a close scrutiny to be recognized as umbels. Between bases of petals and stamens is 10-pointed nectar-secreting disk, which is arched over and protected by incurved tips of petals and filaments of stamens. Tip of each narrow petal is folded in to a distance nearly half its length. Fruit : globose, hooked exteriorly, topped by persistent, pointed sepals. Also called Sea Holme, Sea Hulver. The only blue-flowered genus in the family. Roots were formerly candied and eaten. Several beautiful exotic species are cultivated in gardens. *Eryngium*, from Greek *eryngion*, to belch, from its supposed efficacy in flatulent disorders ; *maritimum*, maritime.

FIELD ERYNGO — *Eryngium campestre*

Inland, thistle-like perennial herb, somewhat similar to above, of waste places and roadsides in certain districts. It is much less glaucous, almost pale green, more slender, more erect, more branched and less succulent. Radical leaves pinnate. Flowers white or pale blue. Doubtfully truly wild. Also called Watling-Street Thistle, Hundred-headed Thistle, Daneweed. *campestre*, of the plains.

CHAEROPHYLLUM

ROUGH CHERVIL — *Chaerophyllum temulum*

Common erect biennial of waysides and shady banks. Grows up to 3 feet high ; flowers May and June. Stems purple-spotted, hairy. Leaves alternate, twice pinnate, with basal sheaths to stalks ; leaflets coarsely toothed, downy. Flowers very small, white, in compound umbels, with bracts to secondary umbels. Fruits long. Very poisonous. *Chaerophyllum*, from Greek *chairo*, I rejoice, and *phyllon*, a leaf ; *temulum*, nodding.

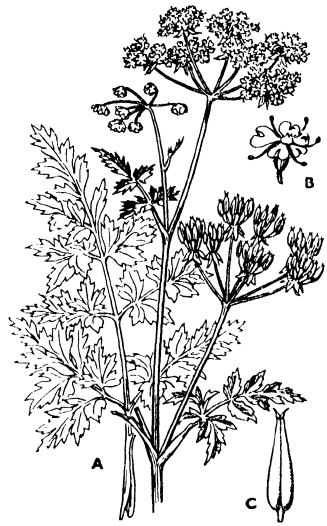
ANTHRISCUS

BUR-BEAKED PARSLEY
or CHERVIL *Anthriscus neglecta*

Annual resembling *A. sylvestris*, but smaller. Plant less hairy, leaves much smaller and finely cut, and fruits rough with short hooked bristles, shortly beaked. *Anthriscus*, from Greek *antheros*, being a diminutive of that word, with reference to the small flower; *neglecta*, overlooked.

WILD CHERVIL, COW PARSLEY
Anthriscus sylvestris

One of our commonest weeds in meadows, orchards and hedgerows; biennial, grows up to 3 feet high, flowers April and May. Stem erect, furrowed, hairy below but smooth above, branched, leafy and hollow, with slightly swollen nodes. Leaves 3 times pinnate, downy, wedge-shaped, with coarsely toothed leaflets. Flowers very small, white, in terminal, stalked, compound umbels which droop in bud stage. There are bracts to the secondary umbels, green often tinged with pink. Central flowers of umbel are often exclusively male. Nectar exposed in centre of flower. Outer flowers of umbels are irregular. Fruit: smooth, shining, compressed laterally, narrower at upper end, without ribs or resin channels. Eaten eagerly by animals, the plant is also called Cow Parsley, Cow Weed, Rabbit Meat, etc. Also by a series of names indicating that it is not fit for human consumption: Devil's Parsley, Devil's Oatmeal, etc. *sylvestris*, of woods.



WILD CHERVIL
Anthriscus sylvestris
(A) Leaf (B) Flower (C) Fruit

GARDEN CHERVIL *Anthriscus cerefolium*

Long used as a salad plant and when apparently wild is only an escape from cultivation. Generally regarded as native of S.E. Europe and perhaps the plant to which Dioscorides' name *Chaerophyllum* was originally applied; *cerefolium* is the Latin name, apparently referring to the ornamental foliage.

SCANDIX

The genus contains about a dozen annual species, natives of the temperate zone of the Old World. There is 1 British species, which might well be a colonist, introduced with seed corn.



SHEPHERD'S NEEDLE
or VENUS'S COMB
Scandix pecten-veneris

(A) Flower (B) Root

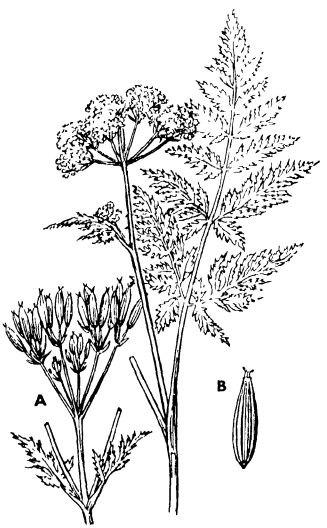
SHEPHERD'S NEEDLE or VENUS'S COMB *Scandix pecten-veneris*

Small annual cornfield weed, seldom exceeding 1 foot in height; flowers May and June. Stem branches freely but shortly from tap-root; whole plant slightly downy with spreading hairs. Leaves bright green, on slender stalks, sheathing at base. Flowers small, white, few in each umbel; umbels terminal and lateral so that they often appear in pairs, leaf-opposed. Before pollination of flowers the bract has its leaves undivided, but immediately one flower is pollinated these leaves enlarge considerably and become notched. Fruit: after fertilization the whole ovary of each flower enlarges and its upper portion or 'beak' lengthens rapidly to 2 or 3 inches. When ripe, fruit splits in half with violent jerk. Owing to its peculiar fruits this inconspicuous weed has earned more than 50 popular names. *Scandix* is an old Greek name for some edible plant; *pecten-veneris*, Venus's comb.

MYRRHIS

SWEET CICELY *Myrrhis odorata*

Perennial, uncommon in wild state; native to the North but not found wild in S. England or in Ireland; of pastures and stream sides. Grows 2 or 3 feet high; flowers May and June. Root large, and fleshy, sweet and aromatic, like rest of plant. Stem hollow, furrowed, slightly downy, with soft hairs. Leaves large, hairy, three times pinnate, with sheathing bases, whitish underneath, generally of a pleasingly bright shade of green. Flowers small, white, fragrant, open in light, compound umbels, borne aloft above foliage in graceful heads. Generally no bracts at base of primary umbel, but small, whitish, membranous bracts are found below secondary umbels. Only outer flowers are perfect, with all stamens in same umbel maturing



SWEET CICELY
Myrrhis odorata

(A) Fruiting umbel
(B) Single fruit

simultaneously before stigmas. Later inner flowers are male. Calyx inconspicuous ; petals heart-shaped, with turned-in point. Fruit : an inch in length, its carpels separate from a Y-shaped floral axis and having 5 very prominent equal primary ridges which are hollow and often rough externally. Aromatic properties most concentrated in seeds. Leaves still used in salads in Italy ; originally known in S. England only as a pot-herb. Like Coriander, Dill, Anise, Cumin and Caraway, has some value as stimulant. Cicely, from Greek *seseli*, used by Dioscorides for various *Umbelliferae*. *Myrrhis*, from Greek *myrra*, myrrh, alluding to its sweet smell ; *odorata*, scented.



HEDGE PARSLEY
Torilis japonica
(A) Leaf (B) Fruit

TORILIS

There are less than 20 species of *Torilis*, natives of temperate Asia, Europe and N. Africa, all hairy annuals with pinnate leaves and few-rayed umbels ; 3 of them are British.

Upright Hedge Parsley — *Torilis japonica*

Hairy, erect annual very commonly distributed throughout the country in hedgerows and at borders of fields. Grows 2 or 3 feet high ; flowers July to September. Stem stiff, erect, solid, grooved, branched, covered with reflexed bristles ; branches spring from leaf-axils, rising nearly vertically. Leaves hairy, soft to touch, divided into lance-shaped, toothed leaflets ; lower leaves on long, channelled foot-stalks. Flowers minute, white or tinted pink, in compound, long-peduncled, umbels, both lateral and terminal, with short, rough, 4–12 bracts and 4–12 rays. Outer flowers are slightly irregular, and central ones frequently male. Sepals short, broad, pointed, persistent ; petals heart-shaped, with turned-in points ; styles spreading, persistent, lengthening and diverging after fertilization. Fruit : oval, often reddish, with thick covering of erect, rigid prickles concealing ridges. Classified by some botanists under genus *Caucalis* because of slight differences in fruits. *Torilis*, origin obscure ; *japonica*, of Japan.

Spreading Hedge Parsley — *Torilis arvensis*

Less common annual of English fields and meadows, getting rarer towards the North. Grows up to 1 foot high ; flowers July to September. More erect than previous species, with solid, leafy, freely branching, bristly stem, and narrow oblong finely toothed leaflets. Flowers irregular, white or tinted pink, in compound, long-peduncled, usually 3–5-rayed umbels.



HEMLOCK
Conium maculatum
(A) Fruit

Bracts 1–0. Fruits densely clothed with hooked bristles. *arvensis*, of cultivated fields.

KNOTTED HEDGE PARSLEY
Torilis nodosa

Widely distributed in S. England, of sunny banks and wayside wastes ; grows up to 18 inches high ; flowers May to July. Stems slender, wavy, less erect than in previous species. Leaves more finely cut, leaflets small. Flowers pink, very small, perfect ; one of the few Umbellifers with simple nearly sessile umbels. Bracts 0. Fruits oval with barbs on spines. *nodosa*, knotted.

SMYRNIUM

ALEXANDERS [Pl. 11]
Smyrnium olusatrum

Widely distributed biennial of waste places, old ruins, and especially abundant on the coast. Introduced and naturalized. Grows 2–4 feet high ; flowers April to June. Stem strong, solid, grooved, cylindrical. Radical leaves large, smooth, glossy, with long stalks broadly sheathed at base ; twice pinnate, leaflets lobed and toothed. Stem leaves smaller, less divided. Flowers very small, greenish yellow, in large, dense, compound umbels. Bracts and bracteoles are often lacking. Calyx tiny, inconspicuous ; petals notched, with tip turned in towards centre. Fruit : two carpels joined in oval, brownish fruit, with 3 conspicuous ridges and resin channels in between. Strong, pungent, aromatic taste of plant becomes bland when bleached ; formerly cultivated and eaten as celery. *Smyrnium*, from *Smyrna*, myrrh ; *olusatrum*, black pot-herb, from fruit being quite black when ripe.

DANAA

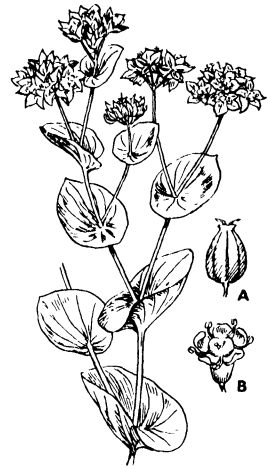
BLADDER-SEED *Danaa cornubiensis*

A very local perennial of the S.W., 1–3 feet, flowering July and August. Stem erect, round, ribbed, smooth. Lower leaves on long stalks, three times sub-divided with stalked narrow laciniate segments which are short, hairy on margins and nerves on both sides. Distinguished by its roundish, inflated, inconspicuously ridged fruits. *Danaa*, after Italian botanist, J. P. M. Dana ; *cornubiensis*, of Cornwall.

CONIUM

HEMLOCK *Conium maculatum*

Common biennial or perennial, of hedgerows, banks, along streams and in piles of rubbish, generally distributed throughout the country. Grows 2–6 feet high ; flowers June and July. Tap-root resembles small parsnip. Aerial stem smooth, round, branched, hollow, bright green, generally spotted with dark purple. Leaves large, 3 times pinnate, dark shining green, alternate and wedge-shaped. Leaflets very much divided, lance-shaped, opposite. Whole plant lacks aromatic scent of other Umbellifers, but emits nauseous, mousy odour when bruised. Flowers very small, white, in small many-rayed umbels gathered into larger ones. Bracts at bases of primary umbels consist of several leaflets ; secondary bracts or bracteoles have merely 3–5 small leaflets, all on one side. Fruit : almost globose, with 5 prominent crinkled edges and no resin channels. All parts of this plant are extremely poisonous, but when dried in hay are harmless. Formerly used medicinally, and by ancient Greeks was official form of execution for condemned criminals, as witness death of Socrates. *Conium*, from Greek *konos*, a cone or top, with reference to shape of umbels ; *maculatum*, spotted.



HARE'S EAR
Bupleurum rotundifolium
(A) Fruit (B) Flower

BUPLEURUM

This genus comprises some 90 northern species, erect glabrous plants with yellow flowers. There are 4 British species, all rare.

HARE'S EAR *Bupleurum rotundifolium*

Rare, erect, smooth annual cornfield weed of chalky soil in fields and downs in the South and East. Grows about 1 foot high ; flowers June and July. Stem erect, smooth, round, slender, freely branching. Leaves simple, undivided, large, oval, glaucous, distant, with lower portion encircling stem, strongly ribbed. Flowers minute, yellow, in compound umbels. The secondary umbels are surrounded by large leafy bracts, greenish yellow and 3 times as long as flowers, and these may be mistaken for petals. However, each flower is perfect, with 5 petals with in-turned tips ; stamens 5 and styles 2. Fruit : tiny, oval, consisting of 2 oblong, 5-sided carpels. Also called Thorow-Wax. Locally called Buplevers. Hare's ear is derived from shape of leaves. Thorow-wax comes from Turner's description in his *Names of Herbes* (1548) : '. . . the stalke waxeth thorowe the leaues.' *Bupleurum*, from Greek *bous*, an ox, and *pleura*, rib ; *rotundifolium*, round-leaved.

SMALLEST HARE'S EAR *Bupleurum tenuissimum*

A slender annual, 6–18 inches, growing locally in England, usually near the coast, flowering July to September. Distinguished from *B. rotundifolium* by its narrow, not perfoliate leaves and very small close umbels, overtopped by bracts. *tenuissimum*, very slender.

TRINIA

HONEYWORT *Trinia glauca*

A very local, glaucous perennial of limestone in the S.W. up to 8 inches, flowering May and June. The grooved stem is much branched, rising from a thick root crowned with remnants of dead leaf-stalks. Leaves much divided into very narrow segments. Flowers white, very small, male and female on different umbels. Fruit small, oval, with prominent ridges. Named after K. B. Trinius, Russian botanist ; *glauca*, glaucous, bluish green.

APIUM

WILD CELERY *Apium graveolens*

Rare perennial herb of marshes, mainly near sea. Grows about 2 feet high ; flowers June to August. From a tap-root rises the stout, grooved stem, bearing large smooth leaves cut into 3–7 wedge-shaped leaflets. Flowers greenish white in compound umbels. Whole plant is coarser than our cultivated variety of which it is the parent. Tastes bitter and is probably poisonous. *Apium*, Latin name used for several umbelliferous plants ; *graveolens*, strong-smelling.

MARSHWORT or FOOL'S WATERCRESS *Apium nodiflorum*

Creeping procumbent perennial, fairly common in marshy places near the sea ; stems 1–3 feet long ; flowers July and August. Stems slender ; leaves sheathed at base, pinnately divided into several pairs of opposite, toothed, stalkless leaflets. Flowering stems root at base. Flowers minute, white, almost sessile, in short-stalked umbels ; apparently axillary but actually leaf-opposed. Bracts infrequent. Fruit : small flattened oval, with 5 thin ribs and resin channels on each carpel. Also called Fool's Watercress, having sometimes been mistaken for that plant in summer. However, Marshwort has a nauseous taste, although not considered poisonous. *nodiflorum*, flowering from the nodes.

LEAST or LESSER MARSHWORT *Apium inundatum*

Much smaller and rarer perennial of waterlogged ground or pools, with stems up to 1 foot long, stout, creeping or floating. Most leaves submerged, finely divided, and a few aerial ones. Flowers minute, white. *inundatum*, submerged.

PETROSELINUM

CORN CARAWAY *Petroselinum segetum*

A slender biennial, 1–3 feet, of hedgerows and fields, flowering in August and September. Tap-root slender; stem erect, round, wiry, with many spreading branches. Leaves pinnate, with narrow, toothed leaflets. Umbels irregular, with few whitish flowers, and few, very narrow, basal bracts. Carpels with 5 slender ridges. Smelling of parsley. *Petroselinum*, from *petros*, a stone, and *selinon*, Greek name for a plant, perhaps celery; *segetum*, of cornfields.

SISON

STONE PARSLEY *Sison amomum*

Annual or biennial herb, growing in damp places on chalky soil chiefly in S. England. Reaches 2–3 feet in height; flowers June to August. Branches slender, rigid, divergent. Leaves simply pinnate into 5–9 leaflets. Flowers minute, cream-coloured in compound umbels, with few primary rays of irregular length, and from 2–4 thread-like bracts and as many bracteoles. Petals deeply 2-lobed. Fruit: ribbed, globular, with short, club-shaped oil channels, solitary in each furrow. Fruits are pungent and aromatic when ripe. Whole plant when green has peculiarly nauseous smell, especially if bruised. Fruits formerly used medicinally. Also called Hedge Sison, Hedge Stonewort, Bastard Stone Parsley. *Sison* originally used by Dioscorides for this and other plants; *amomum* was originally applied to some plant which was not this species.

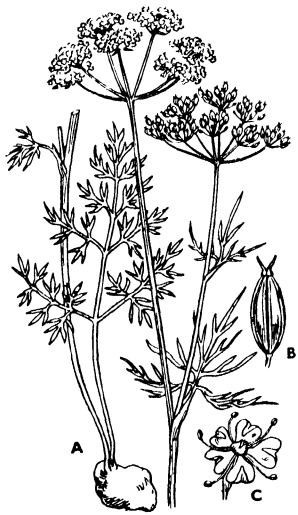


MARSHWORT
Apium nodiflorum
(A) Fruit (B) Flower

CICUTA

COWBANE *Cicuta virosa*

An erect perennial, 1–4 feet, local in ditches, marshes and ponds, flowering in July and August. Stem very stout, slightly ridged and hollow. Rootstock tuberous with transverse cavities. Leaves characteristic, lowest up to a foot, pyramidal in outline, 2–3 times pinnate, the toothed segments long and narrow. Umbels large, flat-topped, crowded with whitish flowers: many narrow bracts at base of ultimate umbels only. Fruit roundish, the carpels with 5 broad ridges. Poisonous. *Cicuta* is the Latin name for Hemlock; *virosa*, poisonous.



EARTH-NUT or PIG-NUT
Conopodum majus

(A) Tuberous rootstock
(B) Fruit
(C) Flower

CARUM

WHORLED CARAWAY *Carum verticillatum*

An erect perennial, 1–2 feet, of grassy places of chalk in the West (and Surrey), flowering July and August. Stem erect, little branched. Leaves mostly basal, and of a distinctive whorled appearance, the segments very finely dissected. Umbels of small white or pink flowers; fruits small with 5-ridged carpels. Name possibly from *karon*, an umbelliferous plant; *verticillatum*, whorled.

CONOPODIUM

EARTH-NUT or PIG-NUT *Conopodium majus*

Common perennial of hedge bottoms, woods and fields. Grows up to 2 feet high; flowers throughout summer. Rootstock tuberous, forming a 'nut' about the size of a chestnut, brown and rounded, edible. Aerial stems annual, slender, erect, tough, pliant, smooth, finely furrowed, slightly branched. Radical leaves few, short-lived, twice pinnately divided into narrow lobed leaflets. Stem leaves few, stalkless with broad basal sheath, finely divided. Flowers minute, white, in compound umbels without bracts. Rays slender; petals heart-shaped, with turned-in tips, shorter than stamens. Fruit: elliptic, short, faintly 5-ribbed, with resin channels in between. Also called Kipper-nut, Earth Chestnut, Ar-nut, Jur-nut, Yur-nut and Pig-nut. The 'nut' is much appreciated by country children and pigs, eaten raw or boiled. *Conopodium*, from Greek *konos*, a cone, and *podion*, a little foot; *majus*, greater.

PIMPINELLA

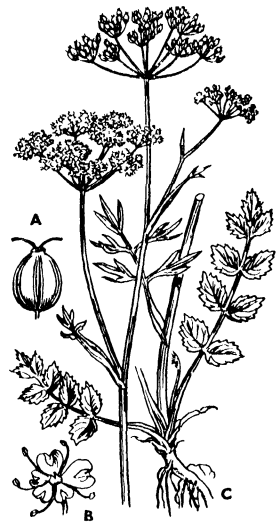
BURNET SAXIFRAGE *Pimpinella saxifraga*

Fairly common perennial herb of dry upland pastures and roadside banks. Grows 1–3 feet high; flowers June to October. Rootstock stout, creeping. Stems slender, wiry, round, furrowed, branching, slightly hairy. Radical leaves pinnately divided into about 6 pairs of irregularly and coarsely toothed or lobed leaflets. Stem leaves twice pinnate, with narrow pointed leaf segments. Flowers white, sometimes pink, very small, usually in 2 closely placed flat-topped umbels, with numerous very slender rays. Petals white, deeply notched, tip turned inwards; no bracts. Fruit: smooth ovoid, topped by 2 persistent stigmas, each carpel having 5 ribs, and oil channels in furrows. Also called Pimpinel. Aniseed is fruit of related species *P. anisum*, not a British plant. English name derived from faint

resemblance of leaves to those of Salad Burnet. *Pimpinella* a Latin name, origin obscure ; *saxifraga*, stone-breaker.

GREATER BURNET SAXIFRAGE *Pimpinella major*

A larger species closely resembling the above. Grows up to 4 feet high ; flowers July and August. Stem angular, smooth ; leaves pinnate, radical ones rather heart-shaped. Inner flowers of umbel have stamens but no ovary. *major*, greater.

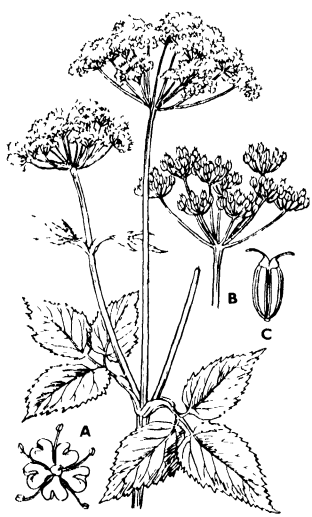


BURNET SAXIFRAGE
Pimpinella saxifraga
(A) Fruit (B) Flower
(C) Rootstock

AEGOPODIUM

GOUTWEED or BISHOP'S WEED *Aegopodium podagraria*

A herbaceous perennial weed, common and prolific throughout the country in waste places, especially near houses. Grows up to 3 feet high ; flowers June to August. Rootstock white, creeping, very long, scented, with a pungent flavour. Stem erect, hollow, grooved, branching above. Radical leaves on long stalks, large, coarse, triangular, often carpeting ground, divided into 3 leaflets which are again divided into three. Some leaflets are unequally-sided at the base ; all coarsely toothed. Stem leaves divided into 3 small narrow leaflets, becoming sessile. Flowers minute, white, usually in 3 compound umbels on each main stem, the 2 lateral umbels generally on longer stalks than central one. Bracts generally absent. Sepals very small, without teeth ; petals broad, deeply notched, with points turned over and inwards. Fruit : flattened oval carpels are ridged but lack usual oil channels. Also called Ground Elder, Ashweed, and Herb Gerard. Supposed to have been introduced and cultivated for medicinal purposes in Middle Ages, and is probably not a true native. *Aegopodium*, from Greek



GOUTWEED or BISHOP'S WEED
Aegopodium podagraria
(A) Flower (B) Fruit umbel
(C) Fruit

aix, a goat, and *podion*, a little foot, or goat's foot ; *podagraria*, from *Podagra*, gout, for which it was formerly said to be a cure.

SIUM

BROAD-LEAVED WATER-PARSNIP *Sium latifolium*

A less common species, broadly resembling the following and found in the same spots. Grows much higher (up to 4 feet), with a short creeping root-stock, is less branched and has simply pinnate leaves, with 4–6 pairs, sessile, regularly serrate segments. Carpels with prominent ribs. Also poisonous. *Sium*, from Greek *sion*, a name for a water plant ; *latifolium*, broad-leaved.

BERULA

LESSER or NARROW-LEAVED WATER-PARSNIP *Berula erecta*

Aquatic perennial herb of ditches and waterlogged ground, widespread in the South, but getting rarer towards the North. Grows about 3 feet high ; flowers June and July. Stems freely branching, strong, furrowed, bent at first but later erect. Radical leaves about 1 foot long, pinnately divided into 5–10 pairs of stalkless leaflets, each lance-shaped, coarsely and irregularly toothed. Stem leaves similar but smaller, main stem embraced by basal sheaths. Flowers minute, white, in crowded compound umbels with several rays. Toothed, leafy bracts are subtended at base of umbels. Fruit : rounded carpels without prominent ribs. Poisonous. Also called Lesser Sium. *Berula*, plant-name in Marcellus Eiupiricus ; *erecta*, upright.



SAMPHIRE
Crithmum maritimum
(A) Flower (B) Fruit

CRITHMUM

The genus contains but one species which ranges from the Crimea to the south-west coast of Scotland.

SAMPHIRE *Crithmum maritimum*

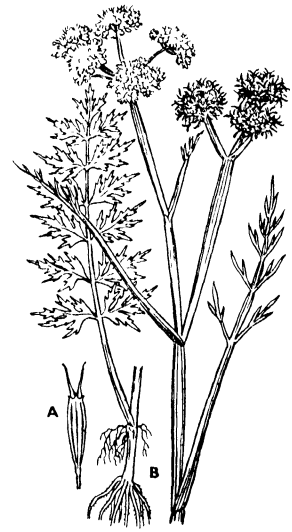
A glaucous, fleshy perennial, of coasts and rocky cliffs, but not north of Kent on the east coast. Grows 1 foot high ; flowers June to September. Rhizome creeping, perennial, somewhat woody, tightly wedged in rocky crevices. Aerial stem ascending, pliant, grooved, solid, seldom branched. Leaves very much divided into thick, pointed, awl-shaped leaflets. Stem and leaves thick and fleshy. Flowers minute, in compound umbels ; dominant colour is yellowish

green of unripe ovaries, although petals are white. Anthers yellowish, disk white; styles recurved. Fruit: globose, oblong, becoming deep purple, with sharp and slightly winged primary ridges and numerous resin channels. Used in flavouring and spices. No relation to Marsh Samphire (*Salicornia*) or Golden Samphire (*Inula crithmoides*). Samphire is derived from old French name, being a corruption of *Saint Pierre*. *Crithmum* from Greek *krithe*, barley, from resemblance of Samphire's fruit to a barleycorn; *maritimum*, of the sea.

SESEL

MOUNTAIN MEADOW-SAXIFRAGE *Seseli libanotis*

A very local perennial of calcareous hills in the S.E. 1–2 feet, flowering July and August. Rootstock crowned with dead leaf-stalks. Leaves much sub-divided. The dense, hairy, long-rayed umbels are subtended by many thread-like bracts and bear small white flowers and small, oblong, prominently-ridged hairy fruits. The long, pointed calyx teeth are characteristic. *Seseli*, a classical name; *libanotis*, a strongly scented plant from *libanotos*, incense.



WATER DROPWORT
Oenanthe fistulosa
(A) Fruit
(B) Rootstock

OENANTHE

A common genus, with 7 British species. They are all aquatic or semi-aquatic plants whose long fruits are topped with persistent styles.

WATER DROPWORT *Oenanthe fistulosa*

Perennial, most common British species, frequent everywhere except in extreme North, of ditches, marshes, and water-logged soil generally. Grows 3 feet high; flowers July to September. Root fibres often thickened and fleshy, lower part of stem sending off runners into mud; aerial stems swollen, rounded, hollow. Leaves radical and stem, pinnately divided, swollen and hollow; stem leaves smaller. Flowers minute, white, in compound umbels, those on main stem fertile, but those terminating the branches have a number of sterile flowers. Fruit: narrow, oblong, $\frac{1}{4}$ inch long, with 2 spiny persistent styles. Has no connection with Dropwort, a species of *Filipendula* (*Rosaceae*). *Oenanthe*, from Greek *oinos*, wine, and *anthos*, a flower, with reference to wine-like scent of flowers; *fistulosa*, hollow.

PARSLEY WATER DROPWORT *Oenanthe lachenalii*

Perennial up to 3 feet high, of fresh and salt marshes. Flowers July to September. Root fibres cylindrical, not tuberous. Leaves finely divided, radical ones short-lived. Fruit broader and blunter than in the next species, with very short styles. *lachenalii* in honour of W. Lachenal, eighteenth-century botanist.

HEMLOCK WATER DROPWORT or HEMLOCK-WORT *Oenanthe crocata*

Locally plentiful perennial of ditches and stream-sides ; grows 5 feet high ; flowers July. Root made up of tubers like a bunch of parsnips, each 1 inch across. Stem hollow, grooved, containing juice which turns yellow when exposed to air. Leaves broad, smooth, twice pinnate, segments being coarsely toothed or pinnately lobed. Flowers minute, white, on long rays in many umbels. Bracts few, leafy. In each umbel outer flowers are usually stalked and male, and inner ones are usually sessile and fertile. Fruits are long, nearly cylindrical, with 2 persistent stiff styles and one resin channel. Plant is extremely poisonous, especially the roots. *crocata*, saffron-coloured.

FINE-LEAVED WATER DROPWORT *Oenanthe aquatica*

Perennial of ponds and streams, with stout erect stem up to 4 feet high ; flowers July to September. Leaves finely divided, especially lower ones when submerged. Flowers in compound umbels, bisexual, but outer ones may be slightly imperfect. Plant is poisonous. *aquatica*, aquatic, i.e. growing in water.

AETHUSA

FOOL'S PARSLEY *Aethusa cynapium*

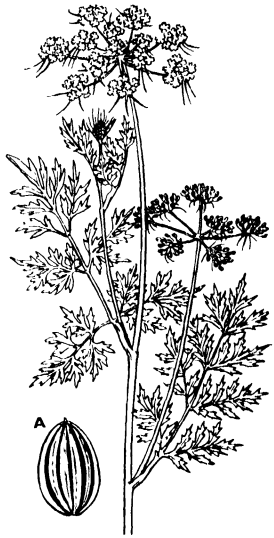
Erect annual weed of cultivation, common also in waste ground. Grows up to 2 feet high ; flowers July and August. Stems round, branched, ribbed and hollow. Leaves numerous, smooth, glaucous-green, finely divided, two or three times pinnate, with lance-shaped lobes. Each leaf stalk has long basal sheath. Flowers small, white irregular, in compound umbels opposite the leaves. The secondary umbels have 3 long, pendulous bracts—an unmistakable recognition feature. Rays 8–12. Calyx minute, petals white, notched. Fruit : oval, compressed, with 5 conspicuous ribs and 5 black resin channels. Also called locally Snake's Food. Stem and foliage emit disagreeable smell when rubbed. Whole plant considered poisonous. *Aethusa*, from Greek *aitho*, I burn, from its acrid taste ; *cynapium*, from Greek *kynos*, a dog, and *apion*, a Greek name for several umbelliferous plants.

FOENICULUM

The genus consists of tall, smooth, biennial or perennial herbs, mostly natives of the warmer temperate zone of the Old World, although our common species is apparently truly wild on our southern coasts, and as far north as Norfolk and North Wales, and perhaps in Ireland.

COMMON FENNEL [Pl. 11] *Foeniculum vulgare*

Perennial herb of rocks and sea cliffs. When found in other waste places, especially near dwellings, is probably an escape, for it has long been cultivated. Grows 3 or 4 feet high ; flowers August and September. Rootstock stout, woody. Stems branched, tapering, polished, round, grooved, almost filled with pith. Leaves on short stalks, finely divided into numerous green, thread-like segments, grooved along upper surfaces. Flowers minute, yellow, in large compound umbels, with numerous glaucous rays, outer ones longer than inner ones. Fruit : short, slightly flattened, semi-cylindrical, with 5 prominent ridges. Whole plant is aromatic, with properties most concentrated in the seed. Has been used as sauce, eye-wash and medicine. *Foeniculum*, from Greek *foenum*, hay, possibly from a comparison of the smell to that of new mown hay ; *vulgare*, common.



FOOL'S PARSLEY
Aethusa cynapium
(A) Fruit

SILAUM

PEPPER SAXIFRAGE *Silaum silaus*

A rather local, tall perennial, 1–3 feet, of damp meadows, flowering June to August. Characterized by the minute teeth on the segments of the much-divided leaves, the lower of which are large and pyramidal in outline, the upper few and small. Flowers small, yellowish ; fruit small, oblong with slender ridges ; umbels long-stalked. *Silaum* and *silaus* are forms of a classical name.

MEUM

BALDMONEY *Meum athamanticum*

An aromatic perennial, 1–2 feet, of mountain pastures, flowering in June and July. Characterized by the thread-like segments of the much-divided leaves. The rootstock is crowned by the fibre-like remains of leaf-stalks. Flowers small, yellowish ; fruit oval with slender ridges. *Meum*, a classical name ; *athamanticum*, after King or Mount Athamas.

LIGUSTICUM

LOVAGE *Ligusticum scoticum*

A perennial, 1–2½ feet, of northern rocky coasts, flowering in July. Stem stout, ridged, reddish tinged. Leaves with 2 broad, 3-lobed toothed segments. Umbels of greenish-white flowers, with very narrow basal bracts ; fruit an oblong cylinder, prominently ridged. Habitat and leaf-



WILD ANGELICA
Angelica sylvestris
(A) Fruit (B) Leaf

shape help to distinguish this plant. *Ligusticum*, from a place where it grows, Liguria ; *scoticum*, Scottish.

ANGELICA

WILD ANGELICA [Pl. 11] *Angelica sylvestris*

Handsome perennial of damp copses, stream-sides and other moist situations. Grows up to 6 feet or even higher ; flowers July to September. Stem smooth, stout, hollow, tinged purple. Leaves very large and long, triangular, divided into several pairs of wedge-shaped, toothed leaflets, with an odd terminal one. Petioles deeply channelled on upper side, dilated and forming a sheath at base ; the upper leaves reduced to sheathing petioles. Flowers minute, white or pale purple, in large compound umbels with convex top. Petals small, entire, very regular, but stamens soon become more conspicuous. Fruit : the 2 compressed carpels have slightly winged ridges, with 3 conspicuous resin channels. Related to the garden Angelica (*A. archangelica*) which is used in confectionery. *Angelica*, from *Angelus*, an angel, with reference to its supposed angelic properties ; *sylvestris*, of woods.

PEUCEDANUM

SULPHUR-WEED *Peucedanum officinale*

A tall, 1–3 foot, rare perennial, near the sea in Kent and Essex, flowering July to September. Stem solid ; leaf-segments longer and narrower than in *P. palustre*, not minutely toothed. Umbels of many yellow flowers, fruit long-oval. *Peucedanum*, from *peukedanon*, its classical name ; *officinale*, from *officina*, druggist's shop (i.e. used medicinally).

HOG'S FENNEL, MILK PARSLEY *Peucedanum palustre*

A biennial, 1½–5 feet, of fens and marshy places, not common, flowering July to September. Stems erect, hollow, ridged. Leaves pyramidal in outline, repeatedly divided into narrow-lobed segments. Umbels of many white flowers with deflexed basal bracts. Fruit oval, winged. Food of the Swallow-tail butterfly. The young plant yields a milky juice. *palustre*, of swampy places.

PASTINACA

WILD PARSNIP — *Pastinaca sativa*

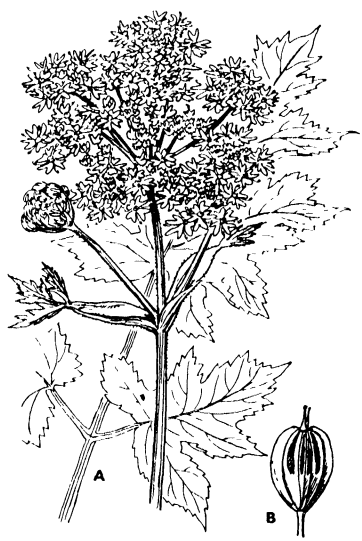
Common annual or biennial, of waste land and meadows. Grows over 2 feet high ; flowers July and August. Tap-root white, aromatic, juicy, sweet and rather wiry. Stem stout, angular, furrowed, hollow. Leaves large, dull green, pinnately divided into oval, prominently toothed leaflets. Flowers very small, yellowish, in compound umbels subtended on curving branches. Calyx-teeth suppressed. Petals roundish, sharp-pointed, with tip turned inwards. Fruit : compressed and flat with fine ridges and broad margins ; each furrow has a resin channel. Parent of well-known cultivated Parsnip, whose root has been enlarged and sweetened to edible proportions by careful selection and cultivation. *Pastinaca* is the Roman name, from Latin *pastum*, food, with reference to its nutritional value ; *sativa*, sown, cultivated.

HERACLEUM

The genus comprises some 70 species belonging to the north temperate zone and some mountains further south. There is 1 British species.

COW-PARSNIP or HOG-WEED — *Heracleum sphondylium*

Coarse, strong, striking perennial, of hedges, open woods and waste land. Grows up to 6 feet high ; flowers June to September. Tap-root stout, occasionally branched, rich in sugar, resembling that of Parsnip. Aerial stem stout, angular, furrowed, hollow, rough with short hairs. Leaves large, coarse, slightly hairy, pinnately divided into lobed and toothed leaflets ; stem leaves have broad sheathing bases. Individual flowers white, larger than usual, in large, many-rayed compound umbels, terminal umbels having very narrow bracts. Outermost flowers are irregular, having their outer petals larger than inner ones. Nectar is exposed on small central disk. Stamens longer than petals ; ovary downy. Much compressed, with lateral ridges flattened and broadened into a wing, and other ridges reduced to slender threads. A single resin channel is found between each ridge, none being as long as fruit. *Heracleum*, derived from Hercules, referring to its robust growth ; *sphondylium*, a classical name for this plant.



COW-PARSNIP or HOG-WEED
Heracleum sphondylium
(A) Leaf (B) Fruit

DAUCUS

WILD CARROT — *Daucus carota*

Erect, branching annual or biennial of pastures and hedgerows, widely distributed throughout the country. Grows 1–3 feet high; flowers June to August. Tap-root carrot-like, but thinner. Aerial stem branched, tough, hairy, closely ribbed and grooved. Leaves on long stalks with broad basal sheath, twice pinnate, much divided into fern-like pattern, downy underneath; leaf-stalks shorter and leaflets less divided higher up stem. Flowers very small, white, in terminal, leaf-opposed, compound umbels. Conspicuous bracts 3- to 7-lobed. Calyx minute; petals notched, with turned-in tip; stamens longer than petals; ovary clothed with bristly hairs. Fruit: carpels form oblong fruit, with prominent ribs, covered with sharp bristles. Also called Bird's nest, because after flowering the common stalks of umbels fold inwards and form a nest-like structure. Taken to be wild form of our cultivated carrots. *Daucus*, the classical name; *carota*, carrot.



WILD CARROT
Daucus carota
(A) Fruit
(B) Rootstock

THE CUCUMBER FAMILY

CUCURBITACEAE

A widely distributed family, abundant in the tropics, comprising some 87 genera and 650 species, mostly juicy, rapidly growing, herbaceous plants, climbing by means of tendrils, with generally unisexual flowers and a gourd as fruit. Although melons, vegetable marrow and cucumbers have long been cultivated here, there is only 1 wild genus represented in this country.

BRYONIA

WHITE BRYONY [Pl. 10] — *Bryonia dioica*

Climbing perennial herb, widespread, especially in the South, generally clambering over hedges; flowers May to September. Rootstock turnip-

like, yellowish, transversely wrinkled, often forked, with soft, white flesh containing nauseous, poisonous, milky juice. Each spring long, rough, angled, trailing, annual stems shoot up and climb over and around surrounding vegetation by means of spirally coiled tendrils. Leaves scattered, without stipules, palmately veined and lobed, toothed, stalked, 4 or 5 inches across, covered, as is the whole plant, with dense white hairs. Flowers of 2 kinds : male and female, generally borne on separate plants. Corolla and calyx are similar in both, consisting of 5 small, narrow sepals united in bell-shaped tube ; and 5 creamy-white, green-veined petals, hairy. In male flower there are 5 stamens, but filaments and anthers are twisted together to look like 3. Female distinguished by swollen ovary below sepals ; style slender, 3-lobed. Fruit : female flowers develop into globular scarlet berries, containing several seeds, making a colourful and familiar hedgerow sight in autumn. Only British species of the genus. Root and berries poisonous. Uncommon north of Midlands and absent from Scotland and Eire. No relation to Black Bryony (*Tamus communis*) which is a Monocotyledon. Bryony or *Bryonia*, from Greek *bryo*, I sprout, with reference to its rapid growth ; *dioica*, dioecious (unisexual flowers on separate plants).

THE SPURGE FAMILY

EUPHORBIACEAE

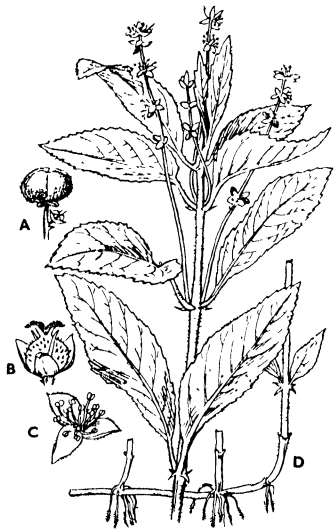
A large family among flowering plants, comprising some 8,000 species in over 280 genera. Cosmopolitan, except for Arctic regions, its most distinctive feature is the presence in most species of latex, white, milky and acrid. In the tropics, largely represented by trees ; in Britain 2 genera with about 15 species ; all herbs.

MERCURIALIS

A small genus, belonging mainly to the Mediterranean region, comprises 7 species, all herbs, 2 of which occur in Britain.

DOG'S MERCURY *Mercurialis perennis*

Common creeping, hairy perennial weed, abundant in woods on chalky soil, often forming an extensive green carpet early in spring. Grows about 1 foot high ; flowers March to May. Rhizomes slender, creeping, branching. Stems erect, simple, with shortly-stalked leaves in opposite pairs. These leaves are lance-shaped and delicate in texture. Flowers unisexual, minute, green, sexes usually on separate plants, flowering before leaves are fully open. Male flowers borne in racemes on long stalks, each consisting of 3 minute sepals and from 8–15 stamens with slender but erect filaments. Female flowers are borne singly, or 2–3 together, on long stalks, much concealed by leaves, consisting of 3 sepals and 2 carpels united below, with 2 long recurved styles. Fruit : hairy externally, with valves of 2 carpels



DOG'S MERCURY
Mercurialis perennis

(A) Single fruit
(B) Female flower
(C) Male flower
(D) Rhizome

opening outwards and discharging seeds of which there is only 1 in each carpel. No milky juice present, but plant is highly poisonous. Has disagreeable smell and was once used as a medicine. Name derived from god Mercury who is supposed to have discovered its medicinal properties. *perennis*, perennial.

ANNUAL MERCURY *Mercurialis annua*

Glabrescent annual, doubtful native, occurring generally as a weed in gardens. Flowers July to October. Stem branched; leaves very delicate, smooth, bright. Occasional male flowers present in clusters of female flowers. *annua*, annual.

EUPHORBIA

A large genus of some 600 species, of which 12 are British. The small inflorescences are often rendered more conspicuous by leafy bracts; in Britain these are yellowish green. The inflorescence of *Euphorbia* is a distinguishing feature. There are neither sepals nor petals; all flowers are unisexual. A number of male flowers surrounding a single female flower in the centre are enclosed in a little 5-toothed cup-like structure formed of 5 united bracteoles. Between each 2 adjacent teeth of the involucre is a crescent-shaped yellow gland secreting nectar. Each male flower consists of single stamen on separate flower stalk. Single female flower in each inflorescence hangs over edge of cup on long, curved stalk; it consists of 3 carpels, united in ovary, with styles branching above. This flower structure, with slight variations, is common to all British species.

CAPER SPURGE *Euphorbia lathyrus.*

Glabrous biennial of copses and woods, probably native in a few situations in England and Wales. Grows 3 or 4 feet high; flowers June and July. Stems short, stout. Leaves narrow, opposite in 4 rows. Fruit used in kitchens for sauces, etc. Contains poisonous milky juice. *Euphorbia*, ancient Greek name; *lathyrus*, pea-like.

SUN SPURGE *Euphorbia helioscopia*

Erect, glabrous annual herb of waste and cultivated land. Grows 6–12 inches high; flowers May to October. Distinguished by its oval yellowish-green leaves which are toothed along edges of upper half. Con-

ains poisonous milky juice. Ants are partial to fruit and thus distribute eed. *helioscopia*, turning towards the sun.

ETTY SPURGE *Euphorbia peplus*

Much-branched glabrous annual of waste land and gardens. Grows 6–12 inches high ; flowers July to November. Leaves shortly stalked, broad-oval, thin, entire. Involucral glands have long points. Milky juice, poisonous. *peplus*, origin obscure.

WOOD SPURGE [Pl. 14] *Euphorbia amygdaloides*

Common hairy perennial of woods and copses ; flowers March to May ; grows about 1–2 feet high. Rhizome perennial, woody, sending up stout, erect, biennial shoots. In March these shoots may be seen as crimson stalks, surmounted by tuft of blue-green, lance-shaped leaves. They do not flower until their second season. They then hang downwards in a paler green shoot. By April, new shoot stands erect and branches into a group of 5–10 slender branches, bearing many pairs of pale green bracts, united at their bases to form an almost circular disk. Uppermost of these generally forms shallow cup in centre of which are 3 inflorescences. Fruit : a 3-celled ovary with 1 or 2 seeds in each. Handsomest of our British species. In autumn leaves and stems may be a brilliant crimson. Contains poisonous, milky juice. *amygdaloides*, sap almond-like.

THE DOCK OR BUCKWHEAT FAMILY

POLYGONACEAE

An extensive group of herbs belonging to the north temperate zone. It includes 3 or 4 well-known genera : *Rumex*, Docks and Sorrels ; *Polygonum*, Knot-grasses ; *Fagopyrum*, Buckwheats ; and *Rheum*, Rhubarbs.

Leaves scattered, simple, with 2 generally membranous stipules united to form sheath round stem. Flowers generally small but massed to form handsome inflorescences. Stamens 6–9. Styles 2 or 3. Fruit, a 1-celled, triangular nut.

POLYGONUM

The genus comprises about 800 species distributed all over the world, mainly in temperate regions ; 14 species are British.

COMMON KNOT-GRASS *Polygonum aviculare*

Slender, straggling annual, generally regarded as a garden weed, of cultivated and waste land ; flowers May to October. Stems up to 3 feet long, prostrate, branching, spreading, wiry. Leaves variable, with silvery stipules, alternate. Flowers pink, or sometimes white, small, in axils of leaves. Fruit : brown nutlet, closely dotted. Also called Knotweed. *Polygonum*, from Greek *poly*, many, and *gonu*, knee, to the many knees or bent and swollen nodes in stems ; *aviculare*, pertaining to birds.

ALPINE BISTORT *Polygonum viviparum*

A slender perennial, 6–12 inches, of mountain pastures, flowering June to August. It differs from *Polygonum bistorta* in narrow leaves tapering at the base, slender lax inflorescence bearing fewer whitish flowers and reddish-purple bulbils in the lower part. *viviparum*, viviparous.

BISTORT *Polygonum bistorta*

Uncommon perennial of moist meadows. Grows up to 2 feet high; flowers June to September. Rootstock stout, twisted like a snake. Root leaves long, oval, with partly winged stalks; stem leaves nearly sessile. Flowers pink or white, nectar-producing. Also called Snake-root and Easter ledges; *bistorta*, twice twisted.

AMPHIBIOUS BISTORT [Pl. 9] *Polygonum amphibium*

Striking perennial of watersides, ponds and damp meadows. Aquatic stems may grow up to 3 feet long; terrestrial about 1 foot; flowers July and August. Rhizome slender, creeping, woody, branched, with numerous whorls of white or red rootlets. When floating, stems are supported by floating, oval-lance-shaped, pointed leaves on 1–3 inch stalks; whole plant glabrous. When on land, stems are erect, leaves narrower, with short stalks; whole plant hairy; flowers only sparingly produced. Flowers rose-coloured, borne above water in handsome oval or oblong dense spikes on stout stalks. Stamens 5 exserted, alternating with sepals—or they may be entirely absent, such flowers being female. Styles 2, with globular rose-red stigmas. Nectar secreted by 5 orange-yellow glands around base of ovary. Fruit: globular nut, containing mealy, brown, polished seeds. A highly specialized type of flower. Seeds said to be favourite food for waterfowl, but they are seldom ripened. Also called Amphibious Persicary, Amphibious Buckwheat, Amphibious Knotgrass, Water Bistort. *amphibium*, amphibious.

SPOTTED PERSICARY *Polygonum persicaria*

A variable, branching annual, of moist cultivated and waste land. Grows up to 2 feet high; flowers July to October. Stem erect; leaves long, lance-shaped, often reddish, usually marked with a dark patch; stipules slightly fringed. Flowers usually pinkish or flesh-coloured, but may be white or greenish. There are 6 stamens and 2 styles. Also called Spotted Knotweed. *persicaria*, peach-leaved.

PALE PERSICARY [Pl. 12] *Polygonum lapathifolium*

Very similar annual of waste land and gardens. Flowers July and August. Stem several feet long, reddish, semi-prostrate, rooting at lower nodes. Leaves pale green, unspotted, oval, with long points; stipules unfringed. Flowers greenish, in stout, erect racemes. Peduncles sparsely glandular. Also called Pale-flowered Persicaria, Pink Persicaria. *lapathifolium*, dock-leaved.

WATER PEPPER *Polygonum hydropiper*

A slender annual, closely resembling *P. persicaria*. Grows 2 feet high in ditches and similar wet places. Flowers July to October. Stems generally

erect, but sometimes inclined to creep, branched. Leaves lance-shaped, nearly sessile, often with a black spot. They have a biting taste when chewed. Flowers pink or white, in slender, nodding racemes. Peduncles eglandular. Also called Biting Persicaria; *hydropiper* is the latinized version of Water Pepper.

BLACK BINDWEED *Polygonum convolvulus*

Straggling annual, of fields and cultivated land. Flowers July to September. Stems twining, up to 3 feet long. Leaves resemble those of *Convolvulus*, with short stipules. Sepals green, with pale edges. Also called Climbing Buckwheat. *convolvulus*, convolvulus-like.

RUMEX

There are about 150 species throughout the world in temperate zones, of which 10–15 are native British species. Identification is often difficult.



SHEEP'S SORREL
Rumex acetosella
(A) Inflorescence
(B) Single flower
(C) Rootstock

SHEEP'S SORREL *Rumex acetosella*

Common slender perennial of sandy and gravelly soils, especially on dry heath. Grows 6–18 inches high; flowers May to September. Rootstock branched, spreading by underground shoots. Stems several, slender, leafy. Radical leaves spear-shaped with spreading or forward-pointing lobes with silvery stipules, forming rosette on ground. Whole plant often tinged, especially in autumn, with a deep red. Leaves acid. Flowers small, inconspicuous, in whorls; some perfect, others unisexual—the latter always segregated on different plants. Fruit: 3-angled nutlet. Sorrel is a Teutonic equivalent of sour or acid. The prefix 'Sheep's' was doubtless suggested by abundance of this plant on sandy uplands where sheep are pastured. *Rumex*, a classical name; *acetosella*, diminutive of *acetosa*, acid.

COMMON SORREL *Rumex acetosa*

A much larger perennial, similar to previous species, but found in most meadows and moist grassland generally. Grows about 2 feet high; flowers May to August. Rootstock slender, tufted. Stem slender, with clasping leaves. Radical leaves fleshy, stalked, arrow-shaped, forming rosette. Flowers reddish, or sometimes green; unisexual, either male, female or hermaphrodite. Fruiting perianth segments usually turn red after fertilization. *acetosa*, acid.

GREAT WATER DOCK *Rumex hydrolapathum*

A tall graceful perennial of riversides and other wet places. Grows up to 6 feet high ; flowers July and August. Stem stately, branched, leafy. Leaves 1 or 2 feet long, broad, lance-shaped, usually tapering at each end. Inner perianth segments triangular, each with a tubercle. *hydrolapathum*, water-dock.

CURLED DOCK *Rumex crispus*

Large, very common perennial of ditches, waste land and roadsides. Grows 1-3 feet high ; flowers June to October. Stem leafy, branching erect. Leaves very long, lance-shaped, with wavy, crisp edges. Flowers green, sometimes reddish, in erect sprays, with smooth tubercle on upper inner perianth segment. *crispus*, curled.

BROAD-LEAVED DOCK *Rumex obtusifolius*

Very common, widespread perennial of waste land and waysides ; grows 2–3 feet high ; flowers July to September. Stem stout, springing from thick rootstock. Leaves 6–12 inches long, extremely broad ; lower leaves heart-shaped, with blunt tips ; upper leaves more lance-shaped ; midrib thick, reddish. Flowers green or brownish, in long inflorescences ; perianth segments 6, in 2 whorls of 3. Inner ones larger, deeply toothed, embracing fruit. Sometimes there is a large oval reddish tubercle on one or more of the perianth segments. Stamens 6 ; carpels 3, with 3 styles. Fruit : triangular nut which does not split. Flowers wind-pollinated. A nuisance to farmers. *obtusifolius*, blunt-leaved.

RED-VEINED DOCK *Rumex sanguineus*

A similarly widespread perennial of hedges and roadsides. Grows up to 4 feet high ; flowers July and August. Stem slender, almost branchless. Leaves oval-lance-shaped, faintly wavy, sometimes red-veined. Flower spikes almost leafless, with no bracts on inflorescence. Inner perianth segments entire, oblong, with large tubercle on upper one. Also called Blood-Veined Dock, Wood Dock. *sanguineus*, bloody.

FIDDLE DOCK *Rumex pulcher*

A perennial, up to 18 inches, found locally, in dry habitats, flowering June and July. Branches straggling and tangled. The perianth segments are toothed and tubercled. Recognized by its fiddle-shaped leaves. *pulcher*, beautiful.

MARSH AND GOLDEN DOCKS *Rumex palustris* and *Rumex maritimus*

Somewhat local plants of marshy ground, flowering June to September, belonging to the group of Docks with tubercled, distinctly-toothed perianth segments, but differing from *R. pulcher* in more upright, untangled branches. Inflorescences of crowded whorls, more so in *maritimus*, which also has golden perianth segments, those of *R. palustris* being yellow. *palustris*, of swampy places ; *maritimus*, of the sea.

SHARP DOCK *Rumex conglomeratus*

Common perennial of wet meadows. Grows 1–3 feet high; flowers June to October. Leaves resemble those of *R. crispus*, but with heart-shaped base; lack sheathing stipules. Flowers in long leafy spikes; inner perianth segments narrow, entire, each with a large tubercle. *conglomeratus*, crowded.

OXYRIA

MOUNTAIN SORREL *Oxyria digyna*

A tufted perennial, 6–12 inches, with stout rootstock, growing on damp rocks on mountains. Flowers July and August. The erect stem is almost leafless. Allied to *Rumex*, but with long-stalked, somewhat fleshy, kidney-shaped leaves, shorter inflorescence branches, the flowers with four non-tubercled segments. Fruit broadly winged. *Oxyria*, from *oxys*, sharp, acid; *digyna*, digynous, with two styles.

THE NETTLE FAMILY

URTICACEAE

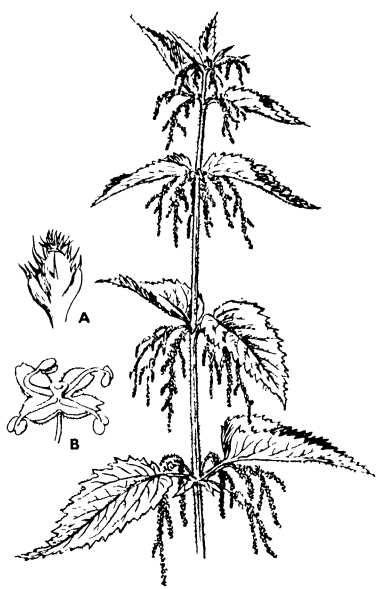
The family comprises some 41 genera and over 500 species, the majority being tropical.

PARIETARIA

Genus consists of about 10 species, mainly in temperate regions.

WALL-PELLITORY *Parietaria diffusa*

Uncommon, spreading perennial, growing in tufts on old walls, covered with dust of old mortar or of nearby roads. Grows about 1 foot high; flowers June to October. Roots long, slender, tough, worming deeply into mortar. Rhizome short, woody, sending up annual, reddish, quadrangular stems, variously branched, tufted, erect, or prostrate. Leaves numerous, scattered, slender-stalked, lance-shaped, entire, without stipules, more or less pointed, from ½ to 4 inches long. Stem covered in silky, stingless hairs. Flowers greenish, hermaphrodite,



STINGING NETTLE
Urtica dioica
(A) Female flower (B) Flower

in dense clusters, enclosed by bracts. Perianth of 4 segments, uniting below in tubular, red, hairy, persistent calyx; carpel 1, with single protuberant style which ripens first; stamens 4, similar to those of Nettle, springing up and discharging pollen when ripe. No perfume or nectar. Fruit: non-splitting nut, enclosed in enlarged, persistent calyx, and containing 1 seed. *Parietaria*, literally 'Wallwort' from Latin *paries*, a wall; *diffusa*, spreading.

URTICA

Urtica is mostly herbaceous, and there are only 3 English species.

STINGING NETTLE — *Urtica dioica*

Perennial weed, preferring manured soil near human habitations. Grows up to 4 feet high; flowers June to September. Rootstock vigorous, creeping, sending up erect, ridged stems. Leaves heart-shaped, pointed in opposite pairs. Leaves and stems thickly covered with stinging hairs. These hairs are single-celled with bulbous base filled with unknown acid, and their tips are brittle, breaking off readily if even brushed lightly. Resulting sharp point punctures skin and ejects its poison. When a nettle is grasped firmly, hairs are bent right over without being able to penetrate skin. Flowers unisexual, with sexes on different plants, hanging in insignificant but dense greenish inflorescences. Perianth segments 4, equal in male but paired in female flowers. Stamens 4, with filaments bent over when unripe, but when mature they spring upwards and outwards, with anthers turning inside out and puffs of fine-grained pollen floating away on breeze. Female flowers have single carpel with a brush-like stigma. Fruit: one-seeded nutlet. Nettle-tops boiled in milk are still sometimes used as a blood-purifier. Lace has been made from Nettle fibre. *Urtica* from *uro*, I burn, with reference to stinging hairs; *dioica*, having stamens and carpels on distinct individual plants.

SMALL NETTLE — *Urtica urens*

A common annual form of similar haunts. Grows up to 18 inches high; flowers June to September. Distinguished by prominent longitudinal veins in oval-oblong, coarsely toothed, bright green leaves, with male and female flowers mixed in clusters, and these clusters or spikes being shorter than flower stalks. *urens*, stinging.

THE HEMP AND HOP FAMILY

CANNABINACEAE

HUMULUS

HOP [Pl. 14] — *Humulus lupulus*

Herbaceous perennial, wild in copse and hedgerow in S. England; always an escape from cultivation further north. Flowers July to August.

Rhizome stout, branching, sending up several aerial stems annually, rapidly growing 15 or 20 feet long. Stems hollow, but abundantly supplied with tough fibre ; angular, and clothed with small hooked prickles which give them a good grip of trees or shrubs which support them. They twine spirally from left to right, averaging one turn every 2 hours 8 minutes. Leaves opposite, stalked, heart-shaped, coarsely toothed, palmately 3–5 lobed, rough, especially on under surface, somewhat resembling those of Grape Vine. Flowers small, greenish, sexes in separate inflorescences. Male flowers in much-branched, drooping, axillary panicles ; each flower has 5 small, concave, oblong, free perianth segments, with same number of short stamens. Female flowers in egg-shaped, cone-like catkins on slightly branched axillary shoots ; cone made up of broad, thin scales, enclosing single ovary surmounted by 2 long spreading, purple, downy, stigmas. Whole structure eventually changes from green to yellow and becomes thickly studded with yellow glands containing waxy and bitter substance called *lupulin*. Fruit : small, non-splitting nut enclosed in the persistent perianth. ' Hops ' are ready for picking in September or October, serving 3 distinct purposes in brewing ; they give a bitter flavour to sweet malt liquor ; check fermentation, enabling beer to be kept ; clarify liquid by precipitating albuminous matter of malt. The only British species. *Humulus*, a classical name ; *lupulus*, a little wolf, alluding to tenacity with which plant clings to any support.

THE ELM FAMILY

ULMACEAE

A considerable group of trees and shrubs, mostly of northern temperate regions.

ULMUS

The genus comprises some 16 species, with only 2 main groups recognized in England.

Frequent hybridization and variation in habit and leaf-shape make the Elms difficult to identify except by the expert. General characters of these tall trees are the presence of suckers, the basal assymetry of the broadly oval to narrowly elliptical leaves, the clusters of small, bell-shaped flowers with lobed rims, appearing before the leaves. The fruit is a flat capsule surrounded by a broad wing.

WYCH or SCOTCH ELM *Ulmus glabra*

Large, spreading, deciduous tree, with short, stout trunk, and large open habit of growth ; more frequent in the North. This tree has no suckers ; branches ascending, often drooping ; bark bitter, astringent ; twigs at first thick, downy, becoming smooth second year. Leaves large,

markedly oblique, short-stalked, rough but free from hairs. Flowers crimson, in small, dense, stalkless clusters on sides of twigs ; they appear before leaves, and each is solitary in axil of one of clustered bracts. Fruit : flat, oval, with 1 centrally-placed seed. Wood is useful for boxes, coffins, etc. *Wych* is probably a corruption of an early English word meaning a chest. *Ulmus* is the classical Latin name for an Elm ; *glabra*, smooth.

COMMON, ENGLISH or HEDGEROW ELM *Ulmus procera*

Produces abundant suckers ; has long horizontal limbs, with a rounded head—often of great height ; leaves and flowers similar to those of previous species. Fruit is orbicular, with off-centre seed. Found mainly in hedgerows in S. England. *procera*, tall.

THE BOG-MYRTLE FAMILY

MYRICACEAE

A small family, of which the genus *Myrica* constitutes almost the whole.

MYRICA

Myrica consists of about 60 existing species of world-wide distribution and great antiquity, most being shrubs, but some growing into small trees. There is but 1 English representative.

BOG MYRTLE, SWEET GALE *Myrica gale*

Deciduous shrub characteristic of stagnant water in boggy ground ; in upland moors, wet heaths, reed-swamps, and margins of fens it is often a dominant species. Grows about 3 feet high ; flowers April and May, before leaves appear. Stem woody, whose astringent bark contains resin and tannin ; spreads by suckers. Leaves scattered, simple, toothed, leathery, without stipules, fragrant when bruised or when sun is hot, from resinous glands which dot them. Flowers in spikes, sexes separate, usually on separate plants. Male flower consists of 4 stamens in axils of a bract ; anthers red. Female flower consists of spherical ovary covered with resinous projections, surmounted by 2 red, thread-like styles. There is neither calyx nor corolla. Catkins reach full size by March, their scales being a shining red-brown. Fruit : small, 2-winged drupe, fleshy outside, stony inside, secreting a considerable quantity of wax. Also called Sweet Willow, Dutch Myrtle, Candleberry-Myrtle. Good burning wood ; perfumed leaves formerly used as moth-balls. Bitter principle in leaves sometimes used as substitute for Hops in brewing. *Myrica*, Greek name for Tamarisk, but is probably connected with *myron*, perfume ; *gale*, derivation obscure.

THE BIRCH FAMILY

BETULACEAE

Small family of deciduous trees and shrubs. Leaves simple, with deciduous stipules. Flowers unisexual, in catkins. Buds are scaly. 3 species are British.

BETULA

Betula includes 40 species, mainly confined to north temperate and Arctic regions.

SILVER BIRCH — *Betula verrucosa*

A woodland or scrub tree, flowering in April and May, fruiting July and August, often recognizable by its smooth silvery bark, dark and rough at the base. Twigs hairless and covered with warts. Leaves more or less triangular, sharply toothed, long-pointed. Inflorescences appearing before the leaves, of long, drooping male catkins, and shorter, erect female catkins. Fruit a winged, flattened achene. At an early period the waterproof bark made the wood useful for canoes of our British ancestors. Also used for roofing, jars, boxes, or for tanning on account of fragrant oil distilled from it. Fibre furnishes cordage ; twigs make brooms ; wood also employed in carriage-building, furniture, turnery and as fuel. Bark contains starch for bread-stuff, leaves are made into tea, and copious sugar in spring sap is fermented into wine. *Betula*, a classical name ; *verrucosa*, warty.

WHITE BIRCH — *Betula pubescens*

Not always easy to distinguish from *B. verrucosa*, and intermediates may often be found. In general it has less sharply-toothed leaves, the twigs are hairy and typically without warts. The bark is greyish brown and smooth to the base. The wings of the achene are narrower. *pubescens*, softly hairy.

DWARF BIRCH — *Betula nana*

A very local shrub of northern hills and moors, not more than 3 feet, usually procumbent, flowering in May, fruiting in July. Readily distinguished from the other Birches by its smaller, roundish leaves, broader than long. *nana*, dwarf.

ALNUS

There are 14 species of Alder, of which 1 is British.

ALDER — *Alnus glutinosa*

A medium-sized, pyramidal, deciduous tree, common on river and canal banks ; very tolerant of stagnant water. Grows about 35 feet high with a girth of $4\frac{1}{2}$ feet ; flowers early spring. Trunk frequently gnarled and crooked. Leaves roundish, with wedge-shaped base, wavy, toothed edges, and short stalks—becoming glossily dark green on both surfaces ; when



ALDER
Alnus glutinosa

(A) Female catkins
(B) Female catkin, with scales open

young the surface is sticky and hairy—hence specific name. Male flowers, each consisting of 4 perianth segments and 4 stamens, 3 together, with 4 bracteoles, in the axil of each scale of long, cylindrical male catkin. Female flowers of 1 pistil, in short, egg-shaped catkins, 2 in the axil of each catkin-scale ; bracteoles also 4 to each group of flowers. Catkins appear before leaves. In February or March male catkins lengthen, turn dark red, shed pollen, and turn rust colour. Female catkins lengthen but remain green until after pollination, when they become brown and woody. Fruit : small, light brown, winged, 1-seeded, held in a persistent, woody-scaled fruit-cone formed of united bracteoles and catkin scales. In spring these scales gape asunder to enable winged fruits to be dispersed by wind. The fine, curled grain and light weight of the timber make it useful for rollers, clogs, artificial limbs, etc. *Alnus*, classical name ; *glutinosa*, sticky.

THE HAZEL FAMILY

CORYLACEAE

A small family of deciduous trees and shrubs, with scattered, simple leaves with deciduous stipules, and unisexual flowers in catkins, on same plant. In some works included under *Betulaceae.*

CARPINUS

Over 25 species of trees, rarely shrubs. Only 1 species is native.

HORNBEAM *Carpinus betulus*

A common, though not generally observed deciduous tree, abundant in S.E. counties, preferring a stiff, moist clay, though also growing on gravel or limestone. It has a rounded head, and unlopped may reach a height of 70 feet with a trunk 9 feet in girth. Flowers April to June. Stem generally



HORNBEAM
Carpinus betulus

(A) Male catkins (B) Fruit
(C) Shoot, with terminal female catkin
(D) Female catkin in fruiting stage

fluted, expanding below into buttress-like ridges ; when pollarded becomes flattened or dividing and reuniting in a series of loops, gnarled and distorted. Wood white, dense, hard and very tough, due to slow growth ; crossed by very wide rays, and annual rings between them taking irregular wavy direction. Bark thin, grey shading to black. Leaves hazel green or slightly yellowish, with tapering point, toothed margin and strongly marked plaits along veins. Buds resemble those of Beech, but shorter, and do not make same angle with stem. Leaves unfold in April, shedding bud-scales ; but when tree has been clipped wither but do not fall in autumn, thus making tree valuable as windscreen for hedges in nursery gardens. Flowers in catkins ; shorter female catkins terminate the shoots and enlarge considerably soon after pollination; male ones hang from axils of leaves of previous year. Stamens 4–12, deeply-forked. Female catkin has prominent, large, green 3-lobed bracts, hanging in hop-like clusters, and persisting in fruiting stage. Ovary 2-celled, surmounted by 2 long red stigmas. Fruit : little 3-sided, 1-seeded nut. Very hard wood employed in cog-wheels, printers' rollers, etc. 'Hornbeam' refers to this toughness (from German *baum*, a tree). Etymology of *Carpinus* is doubtful ; *betulus*, Birch.



HAZEL
Corylus avellana

(A) Nuts
(B) Catkins, male and female

CORYLUS

About 15 species, mainly shrubs. Only 1 species is British.

HAZEL *Corylus avellana*

A very common, large, bushy shrub or small tree, of copses and hedgerows. Grows up to 12 feet high ; flowers December to April. Rootstock sends up numerous suckers ; stems branch freely from base. Young twigs rusty brown, with soft down and blunt rounded buds ; bark on older stems becomes smooth, marked with cork-warts. Leaves 3–4 inches long, broadly oval, heart-shaped, somewhat one-sided at base, with irregularly toothed margins, a long point and downy under surface. Male and female catkins borne on same tree. Male are long, dull brown, hanging (Cats' tails), lengthening and becoming greenish yellow, 4 or 5 together ; clouds of yellow pollen are shaken out by March gales. Female catkins are little egg-shaped, bud-like catkins, each holding 8–21 minute flowers, each with 2 conspicuous crimson stigmas rising beyond catkin scales. Fruit : the well-known 'cobnut' protruding from a leafy husk with lobed edges. Only a few flowers from each female catkin ultimately form nuts, and in each nut, as a rule, only 1 of 2 ovules becomes a seed or kernel. Distinguished from the Filbert (*C. maxima*) which is an alien, parent of

cultivated Filberts, by narrower nut of latter which is completely enclosed by leafy husk. Timber used for cheap fishing rods and excellent walking sticks, the latter sometimes distorted by twining honeysuckle. The 'dowsing-rod' of water diviners is usually a forked Hazel twig. *Corylus*, from Classical Greek, origin obscure; *avellana* from ancient Abella, now Avellino, in Neapolitan Campania, where nuts are still much grown.

THE BEECH FAMILY

FAGACEAE

A group of great geological antiquity, perhaps much reduced in floral structure; consists of some 6 genera and 800 species, 1 of which is British. Leaves alternate, deciduous or evergreen. Stipules scaly. Sexes separate, on same tree. Fruit, a nut surrounded by a cup.

FAGUS

BEECH [Pl. 14] *Fagus sylvatica*

Tall, deciduous tree, dominant on warm light soils in S.E. counties. May reach 70 feet; flowers April and May. Roots massed, spreading, just below surface, and this combined with its dense shade kills most undergrowth. Buttresses at base of tree do not extend far up stem. Stem may be branchless for most of its length, cylindrical, 18 feet or more in girth, covered with smooth grey bark. Huge branches may tower up vertically from main horizontal limbs and more slender branchlets and twigs may sweep downwards. Leaves deciduous, appearing with flowers, short-stalked, oval, pellucid, emerald-green, silk-fringed. Buds long, pointed, polished, brown, spindle-shaped, diverging at an angle from dark grey twigs. Male flowers in globular heads, with 4–7 united perianth segments; stamens 8–16; they hang on long weak stalks among leaves. Female flowers on shorter, stouter stalks, with 4, 6 or 9 united perianth segments. Ovary 3-celled, 3-styled. Fruit: 3-sided nut, splitting when ripe. Nut extremely attractive to squirrels, dormice, pigeons, and pigs. Timber widely used for furniture and turned articles. *Fagus*, the classical name; *sylvatica*, of woods.

QUERCUS

There are some 500 species of Oak, but only 2 are British natives.

COMMON OAK [Pl. 14] *Quercus robur*

Tall, rugged, spreading tree, abundantly and generally distributed, but preferring a wettish soil. Grows 100 feet high; flowers April and May. Trunk massive, gnarled, with huge limbs, spreading out 50 or 60 feet at right angles to stem. Shoots short, slow-grown. Leaves mostly crowded together in tufts of 3 or more near apex of shoot, twigs smooth. Catkins appear shortly after leaves, male catkins pendulous, few-flowered female ones erect; former 2 or 3 inches long, bearing at intervals sessile clusters of inconspicuous flowers each consisting of 6- or 7-lobed, hairy perianth

segments and 10 stamens with slender filaments. Female flowers solitary or in spikes, each surrounded by many overlapping scales, later conspicuous on outside of acorn cup; ovary 3-celled, with 3-lobed style. Fruit: familiar acorn, with cup much shorter than ripe acorn itself, and minute scales triangular, obtuse. Acorns make good swine food. Bark rich in tannin; timber is one of most useful and adaptable in the world. Longest-lived and largest tree in British Isles. *Quercus*, the classical name; *robur*, strong.

DURMAST OAK — *Quercus petraea*

The only other British species. Is a more erect tree, with downy twigs, leaf stalk ½–1 inch long, leaves more or less downy beneath, with nearly triangular lobes; acorns close together on very short stalk. *petraea*, of stony ground.

HOLM or EVERGREEN OAK — *Quercus ilex*

A Mediterranean species long cultivated in this country. Evergreen tree, with entire or toothed leaves, with spiny teeth. *ilex*, a Latin name for this tree.

TURKEY OAK — *Quercus cerris*

Although not originally native, the Turkey Oak has become naturalized in many places, especially in the South of England. The acorn is long and not so round as in some of the other species and a particular characteristic is the acorn cup, with long spreading scales, which give it a 'furry' appearance. *cerris*, from *cerrus*, a Latin name for this tree.

THE WILLOW FAMILY

SALICACEAE

A widely distributed family of trees, shrubs and herbaceous plants, comprising only 2 genera—the Willows and the Poplars. Leaves alternate, entire. Sexes on separate plants. Fruit, a capsule.

POPULUS

Trees with pendulous catkins, about 30 species in north temperate zone. Only 1 species is truly native.

WHITE POPLAR — *Populus alba*

A rare tree of S. England. Introduced. Grows up to 40 feet high; flowers March and April. Bark smooth, grey; branches spreading horizontally. Leaves broadly heart-shaped, palmately lobed, cottony and snowy white beneath. There are numerous suckers produced from roots, bearing very large triangular leaves. Catkins cylindrical, male ones having 6–10 stamens with purple anthers; female ones shorter, with 2 yellow stigmas. Ovaries ripen into slender egg-shaped capsules. Also called Abele. *Populus*, the classical name; *alba*, white.

GREY POPLAR *Populus canescens*

A tall tree, probably native only in S.E. England. Grows 80 or 90 feet high, with circumference of between 10 and 24 feet, and lives for about 100 years. Bark yellowish grey, stem furrowed. Leaves heart-shaped, sparsely toothed, often downy beneath. Female flowers have 4 wedge-shaped, purple stigmas. The tree suckers freely. *canescens*, greyish.

ASPEN [Pl. 14] *Populus tremula*

A fine erect tree of woods and copses, especially in the Highlands, where it is abundant. Grows up to 80 feet high ; flowers early spring. Older branchlets rough and knobby, with shiny bark. Leaves grey-green, woolly when young, with 2-edged, very slender, compressed stalks, which causes them to 'tremble' at the slightest breath of air. Flowers unisexual, sexes on separate trees. Male catkins enclosed in bud by shining sticky scales ; female catkins grey, with purple stigmas. Fruit : hairy capsule. A short-lived tree whose attractive red and yellow tints make it one of the most beautiful in northern latitudes. Timber is soft and used for matches and wood-pulp in manufacture of paper. *tremula*, quaking.

BLACK OR LOMBARDY POPLAR [Pl. 14] *Populus nigra*

Doubtfully native ; more probably introduced from the Mediterranean region. *nigra*, black.

SALIX

WHITE WILLOW *Salix alba*

Large deciduous tree of stream-sides and similar places. Grows up to 90 feet high, with trunk 20 feet in circumference. Branches weep at ends ; twigs green purplish or bright yellow, branching off at narrow angle. Leaves pale green, covered below with dense silky down, giving tree a silvery appearance ; shortly stalked, narrowly lance-shaped. Male catkins stalked ; female slender, loosely flowered ; capsule hairless. Wood tough and valuable, although used for cheaper cricket bats. *Salix*, the classical name ; *alba*, white.

Wood for best cricket bats comes from BLUE WILLOW (*S. coerulea*), a hybrid between *S. fragilis* and *S. alba*.

WEEPING WILLOW *Salix babylonica*

The beautiful Weeping Willow (*S. babylonica*), common on our river banks, is a native of China.

CRACK WILLOW *Salix fragilis*

Large bushy tree, up to 70 feet high, of river banks and similar moist places ; flowers in spring. Bark rough, strongly corrugated. Twigs brown or purplish, branching off at wide angle, snapping readily at a joint when bent. Leaves green, smooth, on long stalks, coarsely toothed. Flowers develop with leaves on short leafy shoots. Female catkins very slender and loosely flowered ; capsules smooth-stalked. Timber used for cheap cricket bats. *fragilis*, brittle.

OSIER *Salix viminalis*

Erect deciduous shrub or small tree growing up to 30 feet high, by stream-sides and other moist places; flowers early spring. Branches long, straight, slender, minutely hairy. Leaves long, slender, narrow, pointed, softly silky below, appearing after flowers. Male catkins sessile, with anthers on long filaments; female flowers stalked within bract. Capsule silky, hairy; sessile or subsessile. Tree is usually pollarded near ground level and the long pliant shoots are used extensively in basket-making. *viminalis*, having long flexible shoots.

GOAT WILLOW *Salix caprea*

Tall, deciduous shrub or small bushy tree of comparatively dry hedgerows and woodlands. Grows about 12 feet high; flowers at Easter. Winter buds with brown leathery scales. Branches short, turning to dull grey-brown. Leaves wrinkled, glabrous or nearly glabrous when mature, persistently downy beneath. Stipules broad, leafy, soon falling. Catkins generally stalkless with young leaves at base. Male catkins longer and thicker than female; stamens 2. In female catkins there are 2 carpels united in single-celled ovary, with a hairy style. Fruit: dry downy capsule, opening by 2 valves to release numerous seeds, each covered by tuft of cottony hairs springing from its base. Also called Sallow, and Palm. Grey foliage makes tree conspicuous when not in flower. The only Willow which commonly grows from seed; can also be propagated from cuttings. Makes good fences and sheep hurdles. Hybrids with other species are common. *caprea* from Latin *capra*, goat, referring to reputed fondness of goats for catkins.



GOAT WILLOW
Salix caprea

(A) Male catkins
(B) Female catkins
(C) Leaves

GREY WILLOW *Salix atrocinerea*

A similar shrub or small tree, much branched; found in moist soils. Distinguished principally from previous species by smaller leaves and catkins. Leaves thinly hairy beneath, with at least some of the hairs rust-coloured. Charcoal was formerly made from wood in manufacture of gunpowder. Often called Sallow. *atrocinerea*, black-grey.

CREEPING WILLOW *Salix repens*

Low, straggling, deciduous shrub of heaths, moors and sandy places. Smallest lowland British species of Willow, growing about 12 inches high, and creeping extensively underground. Flowers in spring. Leaves smooth above, silky beneath. Male catkins longer than female, with

flask-shaped scale at base. Capsule downy. Also called Dwarf Willow. *repens*, creeping.

ROUND-EARED WILLOW *Salix aurita*

A bushy shrub of moist woods and bushy places on damp heaths. Grows smaller than *S. caprea* and flowers early in spring. Conspicuous for its short, knotted, twiggy branchlets and very wrinkled leaves with large, persistent, toothed stipules; these are densely hairy below. Catkins appear before leaves, each with a few silky hairy bracts at base. Capsule hairy. *aurita*, with ears.

THE HEATH FAMILY

ERICACEAE

Ericaceae comprises some 80 genera, with 1,500 species. Most of them are perennial, evergreen, wiry undershrubs, shrubs, or trees, with leathery, entire leaves; urn- or bell-shaped corollas; and berries or capsules for fruits. Thirteen genera are native.

LOISELEURIA

LOISELEURIA, TRAILING AZALEA *Loiseleuria procumbens*

A creeping, evergreen shrub of high alpine situations, flowering May to July. Leaves small, oval, opposite, crowded; flowers small, bell-shaped, pink, in small clusters; fruit a small oval capsule. Named after Loiseleur-Deslongchamps, French botanist. *procumbens*, procumbent.

DABOECIA

ST. DABEOC'S HEATH *Daboecia cantabrica*

A straggling, evergreen shrub, 1–2 feet, local in West Ireland, flowering July to September. Plant grandular. Leaves elliptic, white, hairy below. Flowers purplish, much larger than in *Loisleuria*. Capsule oblong. Named after St. Dabeoc; *cantabrica*, of Cantabria in Spain.

ANDROMEDA

MARSH ANDROMEDA *Andromeda polifolia*

Rather late, branching evergreen shrub, of peat bogs from the Midlands northwards. Grows up to 1 foot high; flowers May to August. Stem slender, woody, creeping, rooting, with smooth, brown bracts, and twiggy branches. Leaves alternate, slender, lance-shaped, with polished dark blue-green surfaces, inrolled margins, and glaucous under surfaces. Flowers: nodding, delicately bluish bells, in small, terminal clusters, on

slender, red stalks. Calyx has 5 sepals, persisting in fruit stage; urn-shaped corolla, minutely 5-toothed; 10 stamens with hairy filaments, and chocolate-brown, awned anthers. Fruit: dry, globose capsule, with 5 chambers, bursting by 5 valves to release numerous hard, smooth seeds. Also called Wild or Bog Rosemary. Contains acrid narcotic, sometimes fatal to sheep. *Andromeda* is a name from Greek mythology; *polifolia*, having leaves resembling those of *Teucrium polium*.



MARSH ANDROMEDA
Andromeda polifolia
(A) Fruit

ARBUTUS

STRAWBERRY TREE *Arbutus unedo*

An evergreen tree of W. Ireland, locally abundant, flowering late in the year. Recognized by its clusters of creamy-white, pendulous, somewhat globular flowers and warty, red, globose berries. Leaves oblong, toothed, shining above. *Arbutus*, the classical Latin name; *unedo*, classical name of the fruit.

ARCTOSTAPHYLOS

BEARBERRY *Arctostaphylos uva-ursi*

A procumbent, evergreen shrub with long rooting branches, of northern moors and rocks, flowering from May to July. Leaves narrow, oval, broader above the middle, leathery and shiny, paler green beneath, with an obvious network of veins. Flowers pinkish, pitcher-shaped, in short clusters. Fruit a shiny, red, flavourless berry with 5 1-seeded cells. *Arctostaphylos*, from *arktos*, bear, and *staphyle*, bunch of grapes; *uva*, grape, *ursi*, 'of a bear'.

ARCTOUS

BLACK BEARBERRY *Arctous alpina*

A very local northern shrub, with trailing branches, differing from *Arctostaphylos* in thinner leaves, white flowers and black berries. *Arctous*, of a bear; *alpina*, alpine.

CALLUNA

HEATHER or LING [Pl. 13] *Calluna vulgaris*

Low, evergreen shrub, covering moorlands all over Great Britain. It seldom occurs on chalky soil, and is dominant in the Scottish Highlands. Grows 1–3 feet high; flowers July to September. Stem tough, wiry, branching freely from base, with leafy shoots extending beyond raceme of flowers which hang mainly to one side of shoot. Leaves sessile, tiny, pointed, triangular, variously hairless or downy, in opposite, overlapping pairs. A bright green at first, they soon become dark and wither to a

dark or rusty brown. Flowers small, short-stalked bells, with 2 leafy and 2 more membranous bracts below the rose, lilac, or rarely white calyx. Sepals 4, deeply divided and pointed ; corolla shorter, bell-shaped, 4-cleft, within calyx. Stamens 8, united by anthers in ring round style. Hairy awns from anthers project almost at right angles. Distinguished from heaths by presence of bracts and shorter corolla within. Fruit : small, 4-chambered capsule, opening by 4 valves. Very valuable honey plant, and bee-hives are taken up on to moors to secure its fragrant nectar. Ling is derived from Scandinavian. *Calluna* from Greek *calluno*, to sweep, twigs being used in besoms ; or from Greek *kallino*, to beautify or adorn ; *vulgaris*, common.

ERICA

Erica numbers upwards of 400 species, with 12 species in Europe, of which 6 are wild in the British Isles. Four of these occur only in the extreme South-West.

CROSS-LEAVED HEATH or BOG HEATHER *Erica tetralix*

Low evergreen shrub, characteristic of boggy and damp situations throughout the country. Grows 6–18 inches high ; flowers July to September. Stem branched, erect, downy. Leaves minute, narrow, inrolled, rigid, in whorls of 4 equally spaced along stem (from which comes its popular name), fringed with long and often glandular hairs. Foliage generally very downy. Flowers large, delicately blushing bells, collected in drooping, terminal umbels. Each stalk has a leafy bract. Sepals 4, oblong, slightly hairy, much shorter than corolla, which is tubular, minutely 4-lobed ; stamens 8 ; stigma protruding from mouth of corolla. Dead corolla, fading to blue, then grey, then drab, persists into winter. Fruit : thin-shelled capsule, bursting by 4 valves. White forms occasionally occur. Pollination is by bees. Often seen growing with common Heather (*Calluna vulgaris*) but far less abundant. *Erica*, the classical name ; *tetralix*, Greek name of a plant in Theophrastus.

FRINGED or DORSET HEATH [Pl. 13] *Erica ciliaris*

Downy, much branched under shrub, confined to parts of Dorset and Cornwall. Grows about 2 feet high ; flowers June to September. Leaves small, oval, in whorls of 3 or 4. Sepals downy, with fringed margins. Flowers beautiful, large, crimson, with narrow mouths and no awns to anthers. *ciliaris*, fringed.

FINE-LEAVED HEATH [Pl. 13] *Erica cinerea*

Low, woody, evergreen undershrub, often covering large areas of moorlands and commons. Grows up to 18 inches high ; flowers July to September. Stems smooth, branching from base. Leaves also smooth, very narrow, shortly stalked, with curled-under edges, in whorls of three, usually with short, leafy, axillary shoots. Flowers crimson, egg-shaped, in a long, dense raceme of whorls, either horizontal or drooping. Corolla usually crimson-purple, minutely 4-lobed, gaping at mouth, with 8 stamens, hairless ovary, and protruding stigma. Capsule embraced by corolla-tube, holding

many small seeds. Also called Bell Heather, and Ball, Purple, Grey or Scotch Heath. Rich in nectar. *cinerea*, grey.

CORNISH HEATH *Erica vagans*

A beautiful smooth plant restricted to Western Cornwall, especially on downs and heaths near the Lizard. Grows up to 3 feet high ; flowers July and August. Branches very leafy. Flowers in conspicuous spikes of gaping, pink bells. *vagans*, wandering.

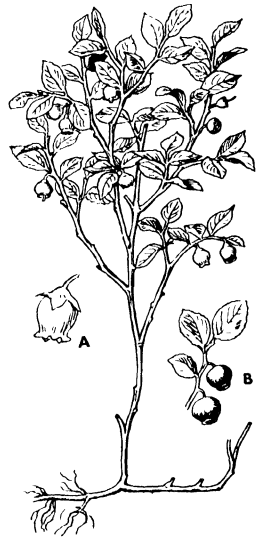
VACCINIUM

Vaccinium comprises about 130 species, all natives of the Northern Hemisphere, especially of mountainous and marshy areas. There are 3 British species.

COWBERRY *Vaccinium vitis-idaea*

Evergreen creeping shrub, of moors, heaths and mountainous districts ; absent from S.E. England. Grows about 9 inches high ; flowers June and July. Stems round, wiry, downy. Leaves rather oval, with edges curled back, dotted beneath. Flowers in crowded clusters, with bell-shaped corolla and no awns to stamens. Berry red, acid, but edible. Also called Red Whortleberry. *Vaccinium*, the classical name ; *vitis-idaea*, vine of Mount Ida.

WHORTLEBERRY *Vaccinium myrtillus*



WHORTLEBERRY
Vaccinium myrtillus
(A) Flower (B) Fruit

A small, erect, deciduous shrub, preferring peat and acid soils. Found at altitudes up to 4,000 feet in Scotland, but dwarfed when above 3,000. Found on heaths, sometimes pale and stunted under Ling ; growing but not flowering under Beech ; a dominant species in dry Oak woods ; with Bracken under Pines ; on exposed peat-moors ; or on bare, rocky, granite mountain-sides. Grows about 1 foot high ; flowers April to June. Rootstock creeping ; branches angular, green, smooth, polished. Leaves small, thin, erect, polished, entire, toothed. When young, leaves are rosy, and in autumn they often turn to a vivid scarlet. Flowers wax-like, solitary, varying from pale greenish white to deep red. Sepals 5, scarcely discernible at summit of top-shaped, inferior ovary. Corolla has very narrow entrance at mouth of its bell. Stamens 10, with stout filaments curving inwards, forcibly pressing anthers against style. Stigma projects at mouth of corolla ready to receive any pollen on head of visiting insect. Nectar plentifully secreted by ridge round summit of ovary, attracting many humble-bees and wasps. Fruit : dark blue, or very rarely white, glaucous berry, forming important article of food for game birds of moor and woodland, by which means seeds are widely dispersed. Also called Bilberry,

Blaeberry and Huckleberry. Berries edible and referred to by Bean as 'one of the most valuable wild fruits in Britain'. Species was described by early botanists as a Myrtle, from which are derived common and specific names. *myrtillus*, a diminutive of *myrtus*, myrtle.

BOG WHORTLEBERRY *Vaccinium uliginosum*

Deciduous shrub, related to common Whortleberry, of heaths and bogs in N. England and Scotland. Grows about 1 foot high; flowers May and June. Distinguished by cylindrical, woody stems; entire leaves, glaucous beneath; globose, pale pink corolla; awns to the anthers; and a smaller, blue berry. Also called Bog Bilberry. *uliginosum*, of marshes.

OXYCOCCUS

CRANBERRY *Oxycoccus palustris*

Prostrate, trailing, evergreen shrub, of mountain peat-bogs. Grows a few inches high; flowers June to August. Leaves glaucous beneath, with edges curled back. Corolla wheel-shaped, 4-cleft, bright red; anthers yellow, lacking awns, but protruding. Berries dark red; pleasantly flavoured. *Oxycoccus*, sharp berry, referring to their acid taste; *palustris*, of swampy places.

Also SMALL CRANBERRY (*O. microcarpus*), a native of Scotland.

THE WINTERGREEN FAMILY

PYROLACEAE

The *Pyrolaceae* are very closely related to the *Ericaceae*, and formerly were generally included in the latter family. They are now, however, regarded as distinct. They comprise some 10 genera with 30 species; 2 genera with 5 species occurring in Great Britain. Biennial or perennial evergreen plants with slender creeping rhizomes, and mostly radical, simple leaves.

PYROLA

Pyrola is largest genus of family. Comprises some 15 species, of which 4, very closely related, are British.

COMMON OR SMALL-FLOWERED WINTERGREEN [Pl. 13] *Pyrola minor*

Small, partially evergreen, perennial herb of woodland or heaths, not very common but fairly frequent in Pine forest and Pine heaths of the North. Grows up to 7 or 8 inches high; flowers July and August. Root-stock creeping, with long, narrow scales among leaf-stalks. Stem short, unbranched, firm, almost woody, an inch or two long. Leaves thick, smooth, leathery, mostly radical, very broadly oval, with broad stalks, forming rosette, from centre of which rises solitary flower scape. Flowers small, globose, white tinged with rose, in a pendulous raceme, hanging to one side of peduncle with bracts as long as individual pedicels. Parts

all in fives ; globose corolla made up of almost free petals. Stamens 10, at first curved outwards towards petals, with large anthers each opening by 2 pores at their base ; when insects push back petals, stamens curve inwards, anthers become reversed, and pollen falls downwards on insect. Pollen grains united in groups of 4. Single style divided into 5 short lobes ; ovary 5-chambered. No nectar, but a sticky fluid is exuded. Fruit : globular capsule, with persistent calyx below it, splitting into 5 valves from below ; margins of valves connected by web of hairs. Seeds minute, elongated at both ends, light enough to be dispersed by wind. Medicinal vegetable oil 'Wintergreen' is obtained from American plant of same family. Wintergreen refers to plant's evergreen character. *Pyrola* is diminutive of *Pyrus*, a pear, with reference to pear-like shape of leaves ; *minor*, smaller.

INTERMEDIATE WINTERGREEN — *Pyrola media*

Very similar to previous species, but larger, found from Midlands northwards. Leaves little bigger and thicker. Flowers white, larger. Sepals shorter than stamens ; style straight, twice as long as stamens, projecting considerably from corolla. Style expanded into a ring below the stigma, which has 5 minute lobes. *media*, intermediate.

ROUND-LEAVED WINTERGREEN — *Pyrola rotundifolia*

Again similar to Lesser Wintergreen, and occurring roughly in the same localities. Leaves almost round, on longer finer stalks. Flowers pure white, as large as those of Intermediate Wintergreen, the petals more spreading, fragrant. Styles strongly curved, with a ring. *rotundifolia*, round-leaved.

MONESES

ONE-FLOWERED WINTERGREEN — *Moneses uniflora*

A local and rare perennial of Scottish woods, differing from *Pyrola* mainly in its opposite leaves and solitary flowers. *Moneses* from *monos*, single, and *hesis*, tendency ; *uniflora*, one-flowered.

THE BIRD'S NEST FAMILY

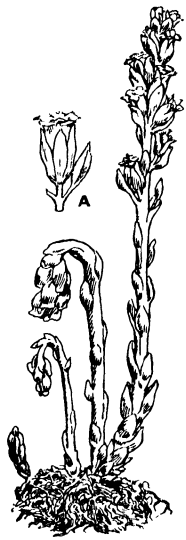
MONOTROPACEAE

Small family, with only one British genus. Almost colourless herbs with leaves reduced to scales.

MONOTROPA

YELLOW BIRD'S NEST — *Monotropa hypopithys*

Perennial, saprophyte, lives on dead organic matter occasionally found in dense shade of Fir, Birch or Beech woods. Grows about 3–9 inches high ; flowers July. Roots short, fleshy, covered with fungus which enables them to extract food from decaying leaves in which they grow. Stem



YELLOW BIRD'S NEST
Monotropa hypopithys
(A) Flower

annual, stout, fleshy, yellowish. Leaves reduced to overlapping, yellowish scales. Flowers brownish yellow, in terminal spike at top of stem, which is at first bent round and downwards, but becomes erect later. Individual flowers are large, fragrant, and during July they stand out horizontally, becoming erect after fertilization. Lateral flowers have 4 sepals, 4 petals, 8 stamens, 4-lobed ovary, with 2 nectaries to each lobe; but top flowers have parts in fives. Fruit: 5-valved capsule, containing many small seeds. *Monotropa* from Greek *monos*, single, and *tropos*, to turn, with reference to flowers all turning one way; *hypopithys*, under pines.

THE CROWBERRY FAMILY

EMPETRACEAE

A small family of heath-like shrubs, mainly from the Northern Hemisphere and the Andes. There are only 2 British species.

EMPETRUM

CROWBERRY — *Empetrum nigrum*

Small, spreading evergreen moorland shrub, of peat-bogs, especially in Scotland and N. Ireland. Flowers April and May. Stem short, lying along ground, rooting from under surface. Branches trailing, slender, leafy, 6–18 inches long. Leaves evergreen, turning red when older, their edges rolled back, and inside of leaves filled with hairs. Flowers minute, purplish red, sessile, male and female on separate plants. Perianth segments 6, stamens 3 with red anthers; short style with 6–9 lobes. Fruit: black, edible berries, containing 1–9 seeds. Also called Crakeberry and Black-berried Heath. *Empetrum* from Greek *em*, on, and *petra*, rock, referring to stony ground on which plant often grows; *nigrum*, black.

THE THRIFT FAMILY

PLUMBAGINACEAE

A small family of 10 or 11 genera with less than 300 species of perennial herbs or shrubby plants, cosmopolitan in distribution, but especially characteristic of the sea-coast. There are 2 British genera.

LIMONIUM

Comprises some 130 species distributed over most parts of the world. They are perennial herbs with all their leaves radical. There are 8 British species, all coast plants.

SEA LAVENDER [Pl. 12] *Limonium vulgare*

Often grows side by side with thrift, on sand-dunes, muddy shores, and flat, wide-stretching salt-marshes. Grows up to 18 inches high; flowers July to November. Rootstock woody, branching, creeping. Flowering stems angular, much branched. Leaves all radical, large, lance-shaped, pointed, stalked, with prominent midrib. Flowers small, purple, numerous in branched panicles. Parts in fives. There are teeth between the 5 calyx lobes. Outer bracts rounded at the back. Fruit: single-seeded nut. Many varieties are cultivated in gardens. Formerly classified as *Statice limonium*. *Limonium*, growing in a meadow; *vulgare*, common.

DWARF OR LAX-FLOWERED SEA LAVENDER *Limonium humile*

Perennial, very similar to the last, and found in the same situations, but smaller. Differs chiefly in that its flowering branches do not rise to one level (as they do in *L. vulgare*); its cymes are lax and erect or incurved, rather than recurved, and other bracts are keeled. First recognized as a British plant by Samuel Dale in 1700. *humile*, dwarf.

UPRIGHT OR ROCK SEA LAVENDER *Limonium binervosum*

Perennial, more frequent on rocky shores than others, preferring west and south to the east coast. Flowers July and August. From branched rootstock rise short upright stems. Leaves show 3 nerves instead of 1 rib. Flowers bluish purple, with white calyx. *binervosum*, 2-nerved.

ARMERIA

The genus comprises some 50 species, of which only 1 is a British native.

THRIFT OR SEA PINK [Pl. 12] *Armeria maritima*

Common perennial of cliffs and rocks by the sea; also sometimes on mountains inland. Grows up to 9 inches high; flowers April to October. Primary root perennial, and short shoot made each year dies down almost entirely, next year's shoot rising as an axillary branch on remnant. Leaves all radical, undivided, very narrow, somewhat fleshy. Flowers small, rose-coloured in close clusters at the end of leafless stems. Calyx funnel-shaped, 5-lobed, persistent; corolla formed of 5 deeply separated, clawed petals, with bases lined by hairs to protect nectar. Stamens 5; carpels 5, forming 1-chambered ovary with 5 styles, which are hairy below. Each flower-head is surrounded by an involucre of pinkish brown bracts; these form a membranous sheath. Fruit: a dry, non-splitting nut attached to persistent calyx which helps to transport it on the wind. Many forms are favourites in old-world gardens. Also called Cushion Pink, Scawfell Pink and Sea Grass. Sweetly scented. *Armeria*, origin obscure; *maritima*, of the sea.

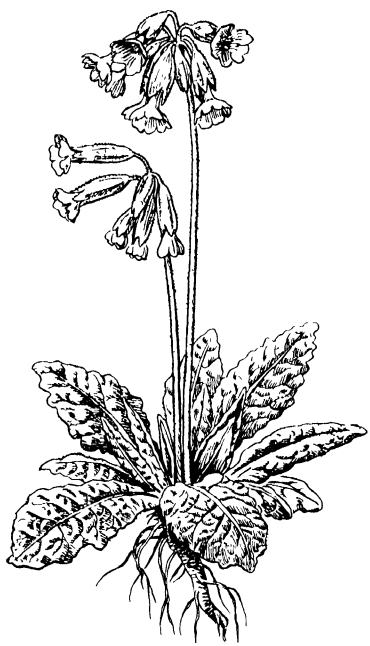
THE PRIMROSE FAMILY

PRIMULACEAE

Primulaceae is a large, practically cosmopolitan family, consisting mainly of perennial, or sometimes annual herbs, with simple leaves without stipules, relatively large, bisexual flowers on scapes, and 1-celled capsules for fruits. They comprise nearly 30 genera and 400 species, 9 genera and 16 species being British.

PRIMULA

Primula is a very widely dispersed genus, distinguished by a tubular calyx, salver-shaped corolla, and 5 valves, each splitting into 2 teeth in ripe capsule. There are 5 British species. In *Primula*, as in some other genera, there are two forms of flower, found on separate plants, to aid cross-pollination. One flower has a long style, so that the stigma stands at mouth of corolla tube, and anthers are inserted halfway down it; the other has a short style, so that the stigma is halfway down tube, and anthers are at its mouth. These two forms are known as 'pin-eyed' and 'thrum-eyed' respectively.



COWSLIP
Primula veris

BIRD'S-EYE PRIMROSE
Primula farinosa

Lovely, small, perennial plant of damp meadows in Northern England. Grows about 6 inches high; flowers June and July. Differs from others in that leaves are smooth and mealy beneath, and calyx-tube is not pleated into angular folds. Whole plant is of a more delicate habit, and bears pale purple-lilac flowers with a yellow eye, in a tight umbel. *Primula*, from Latin *primus*, first, referring to its early flowering; *farinosa*, mealy.

SCOTTISH BIRD'S-EYE PRIMROSE
Primula scotica

A locally abundant perennial of North Scotland not so tall as and flowering later than *P. farinosa*. Leaves not crenulate; flowers purple; calyx-teeth blunt. The fruit only slightly exceeds the calyx. *scotica*, Scottish.

COWSLIP *Primula veris*

Abundant perennial of meadows and pastures in England ; rare in Scotland. Grows about 9 inches high ; flowers April and May. Roots numerous, slender, in dense tuft. Leaves all radical, oblong-lance-shaped, finely toothed, minutely hairy, soft, pale green, much wrinkled, strongly veined beneath, abruptly contracted into the stalks. Scape long, finely hairy, with short pedicels of the flowers. Flowers smaller than those of Primrose, in terminal, drooping, simple umbels ; petals rather less spreading, more deeply yellow. Calyx bell-shaped, toothed ; ovary globose, at bottom of corolla tube, crowned with pin-like style and spreading stigma. Fruit : bell-shaped capsule, enclosed by persistent calyx, and opening at top by 5 valves. Flowers scented, and in 2 forms ; pin-eyed and thrum-eyed. Nectar secreted round base of ovary. Hybrids which occur between Primrose and Cowslip are often mistaken for Oxlip. Umbel of Cowslip was formerly compared to a bunch of keys and produced many pretty, local names. *veris*, of spring.

OXLIP *Primula elatior*

Rare perennial, similar to the above, found only in certain woods in East Anglia. Grows up to 1 foot high ; flowers April and May. Differs chiefly from previous forms in having a less inflated calyx, a thinner corolla with mouth not contracted, shorter pedicels of the flowers, and main stout stem, elongated like that of Cowslip. *elatior*, tall.

PRIMROSE [Pl. 13] *Primula vulgaris*

Abundant and beloved perennial spring flower, generally distributed in hedges and the rich humus of woods throughout Britain. Grows 6 inches high ; flowers April and May. Leaves all radical, wrinkled, toothed, softly hairy but not mealy. Scape stout, short, hidden among bases of leaves, surmounted by an involucre of narrow, pallid bracts. From this grow long, slender, pinkish pedicels of the flowers, almost as long as leaves, each bearing a delicate pale yellow flower with orange honey guides at base of petals. Calyx-tube strongly folded into 5 pleats, presenting a 5-pointed star-like outline if cut across. Corolla funnel-shaped, with salver-like lobes. Fruit : capsule, opening at the top by 5 teeth. There are pin-eyed and thrum-eyed flowers. Copious nectar is secreted, and there is a faint woodland scent. Seed is seldom set, because bees, on which it relies for cross-pollination, are rarely about so early in year ; compensation is provided in vegetative reproduction by rootstock. Common name is derived from Prime Rose, or first Rose of the year. *vulgaris*, common.

HOTTONIA

Hottonia is a small genus, containing only 2 species, one of which is native in this country.

WATER VIOLET *Hottonia palustris*

Pale green, perennial, aquatic herb of ponds and ditches, occurring locally throughout England and Ireland, but absent from Scotland.



WATER VIOLET
Hottonia palustris
(A) Flower

Grows a foot or more above water ; flowers May and June. Roots long, creeping, sending out from base of scape radiating, floating, succulent branches, 6–12 inches long, about as stout as a goose-quill. These branches send down at intervals long silvery roots into the water ; their terminal buds, crowded with thickened leaves, form winter-buds. Leaves in dense tufts, submerged, finely divided and comb-like, 1–4 inches long. Flowers in whorls on long, slender, cylindrical stems a foot or more above water. Each whorl has 4–8 flowers on individual pedicels, standing in axil of a linear bract. Pedicels are ascending during flowering, but droop after fertilization. Calyx with 5 teeth, green, slender, about as long as tube of corolla. Corolla tubular at base, opening out like a salver into 5 white or lilac, long, spreading, rounded, notched petals, with a yellow eye. Stamens 5, inserted on inside of tubular part of corolla. Ovary globose, and persistent style and stigma are undivided. Nectar is secreted. Originally this pretty plant was combined with several other aquatic species under the general name of Water Milfoil ; later some likeness in the flower to Cruciferous Stocks was recognized ; and as the name Violet was also applied to Stocks, it eventually came by its present common name. Generic name given in honour of Peter Hotton, seventeenth-century Professor of Botany at Leyden. *palustris*, of swampy places.

LYSIMACHIA

Lysimachia comprises some 60 species, natives of temperate and subtropical regions. There are 3 British species.

WOOD LOOSESTRIFE or YELLOW PIMPERNEL *Lysimachia nemorum*

Small, prostrate, graceful perennial of moist and dark or shady woods. Stems up to 1 foot long ; flowers May to August. Stems smooth, square, sinuous, trailing, rooting at intervals, coloured a beautiful pellucid red. Leaves in opposite pairs, almost sessile, oval and running to a point, slightly fleshy, bright shining green. Flowers solitary, on slender, gracefully curving axillary stalks, yellow, small ($\frac{1}{2}$–$\frac{3}{4}$ inch across). Calyx with 5 narrow, persistent, spreading, pointed teeth ; corolla 5-lobed, wheel-shaped ; stamens in single whorl, opposite petals, with slender, smooth filaments ; style persistent on fruit. Fruit : small, globular capsule, splitting in various ways to release numerous angular seeds. Gracefulness of form and brightness of colouring have recommended this plant for cultivation. *Lysimachia*, after Lysimachos, King of Thrace ; *nemorum* from Latin *nemus*, a dark wood.

MONEYWORT or CREEPING JENNY [Pl. 13]
Lysimachia nummularia

A very similar and favourite ally, but larger in all respects than the Wood Loosestrife. It grows in the same places, with stems about 2 feet in length ; flowers June and July. Stems prostrate, rooting at joints. Leaves smaller, opposite, short-stalked, roundish, dotted. Flowers larger, solitary, from axils of leaves, golden yellow, funnel-shaped. Filaments of stamens all united at their bases. Moneywort is derived from coin-like leaves ; *nummularia*, from *nummulus*, money.

YELLOW LOOSESTRIFE [Pl. 13]
Lysimachia vulgaris

Handsome perennial of river banks and damp places, especially in England. Grows 2–4 feet high ; flowers June to August. Rootstock creeping ; flower stems erect, downy. Leaves opposite or in whorls of 3 or 4, lance-shaped, pointed at tips and broad at bases, stalkless, entire, dark green, smooth or downy beneath, dotted with black glands above. Numerous, very attractive, bright yellow flowers on thin stalks, either singly in axils of upper leaves, or in smaller axillary cymes at top of shoot. Bracts slender. Calyx with 5 teeth, hairy and red at margins. Corolla, united in bell-shaped tube, with 5 broadly lance-shaped lobes spreading fully, deep yellow. Stamens united in glandular tube. Ovary nearly globose, topped by slender style. Fruit : globular capsule opening at top with 5 valves. Though found in similar places this is no relation to the Purple Loosestrife (*Lythrum salicaria*). Sprays were formerly put under yoke of horses to keep away flies, hence strife was lost among them. *vulgaris*, common.



WOOD LOOSESTRIFE or YELLOW PIMPERNEL
Lysimachia nemorum

(A) Flower

NAUMBURGIA

TUFTED LOOSESTRIFE *Naumburgia thyrsiflora*

Rare perennial of marshy ground in N. England and Scotland. Grows up to 3 feet high ; flowers June and July. Stem erect ; leaves in opposite pairs, covered with black glandular dots, occasionally whorled. Flowers yellow, numerous, in dense clusters in axils of leaves ; corolla much smaller, with small tooth between each of the 5 or 6 lobes. *Naumburgia*, after J. S. Naumburg, Professor of Botany in Erfurt ; *thyrsiflora*, with flowers in a contracted panicle.

TRIENTALIS

CHICKWEED WINTERGREEN *Trientalis europaea*

Very attractive but rather local annual, confined to woodlands in our northern counties and Scotland. Grows 4–8 inches high ; flowers June

and July. Rootstock slender. Stem erect, thin and wiry, unbranched, and almost leafless up to the summit, where there is a whorl of about 6 oval, stiff, glossy leaves, rather variable in size. Flowers white, ½ inch across, solitary on long slender stalks, springing from whorl of leaves. There are 2–4 per plant, with parts generally in sevens. Calyx with 7 long, slender teeth. Corolla with 7 white (sometimes pink) lobes, embedded in fleshy, yellow ring, from which spring 7 stamens. Ovary globose, surmounted by thread-like style and blunt stigma. Fruit : globose capsule, splitting by 5 valves. *Trientalis,* herb the third of a foot high ; *europaea,* European.

ANAGALLIS

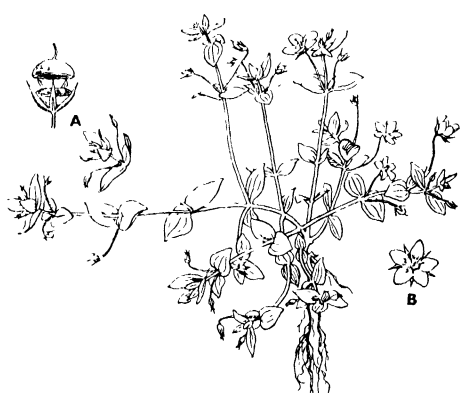
Anagallis has spread to all parts of the world and includes 24 species in all ; 8 of these are European and 3 are British.

BOG PIMPERNEL — *Anagallis tenella*

Beautiful, small, slender, creeping perennial, widely distributed in bogs and marshes ; flowers July and August. Stems thread-like, 4-sided, prostrate ; leaves minute, broad-oval, in opposite pairs, lying in one plane ; flowers relatively enormous. Corolla delicate, funnel-shaped, about ½ inch across, palest pink but traversed with darker veins, much longer than the calyx and almost filled with woolly hairs on the stamens. *Anagallis,* the classical name ; *tenella,* delicate.

SCARLET PIMPERNEL — *Anagallis arvensis*

Small, generally prostrate annual weed of cultivation, in waste places, arable land and gardens. Grows up to 1 foot high ; flowers May to



SCARLET PIMPERNEL
Anagallis arvensis
(A) Fruit capsule (B) Flower

November. Stem 4-angled, branching freely from base. Leaves sessile, oval, dotted with black glands beneath, usually in opposite pairs. Flowers

small, nectarless and scentless, on long slender stalks from leaf axils, thus appearing to be in pairs. Calyx with 5 narrow lance-shaped, pointed teeth, appearing between lobes of the corolla which they nearly equal in length. Corolla generally bright scarlet with a violet eye ; but it may be pink, white with a red eye, pure white, or blue. Corolla lobes bordered by row of short stalked glands. Stamens 5, with hairy filaments, opposite corolla lobes. Ovary globose. Fruit : globose capsule, splitting across middle ; upper half falls off and releases numerous, triangular, winged seeds. Also called Poor-man's-weather-glass because flowers close temporarily for cloud or rain. Other names are Wink-a-peep, Shepherd's Clock, Shepherd's Sundial, Shepherd's Watch, and Shepherd's Glass. *arvensis*, of cultivated fields.



SEA MILKWORT
Glaux maritima
(A) Flower

BLUE PIMPERNEL *Anagallis foemina*

A sturdy, small, erect annual plant, with black dots on the lower surface of its close-set, broad-oval leaves, with no glandular hairs on the margins of its intensely blue petals. Found on sunny chalk slopes facing south ; comes true to seed. Said to be incapable of crossing with *A. arvensis*, and also held by some to be merely a variety. Probable explanation is that there are 2 plants : one a distinct species, and the other a colour variation of *A. arvensis*. *foemina*, female.

CENTUNCULUS

CHAFFWEED *Centunculus minimus*

A small annual, up to 3 inches long, usually prostrate, of damp, sandy places, flowering June to July. Leaves small, oval, entire. Petals minute, pale pink, shorter than the calyx teeth. Fruit a tiny, globose capsule, opening transversely. Its small size helps to identify it. *Centunculus*, a diminutive meaning a small patch ; *minimus*, very small.

GLAUX

SEA MILKWORT *Glaux maritima*

Small, branching perennial, often abundant on muddy sea-shores, wedged in rocks, in estuaries and inland salt areas. Grows up to 6 inches high ; flowers May to August. Rootstock creeping, tough, rooting at nodes. Stems short, branching, slightly fleshy. Leaves dark blue-green above, much paler beneath ; lower opposite, upper alternate, small, fleshy, oval, minutely pitted. Flowers rose-coloured, in leafy spike-like racemes, stalkless, from axils of leaves. Calyx bell-shaped, with 5 rosy, petal-like lobes, minutely dotted with red ; corolla is lacking ; stamens 5, about as long as sepals and alternating with them. Ovary round and smooth.

Fruit : globose capsule, opening by valves. Also called Black Saltwort. Distinguished from remainder of *Primulaceae* by lack of petals. *Glaux*, the classical name ; *maritima*, of the sea.

SAMOLUS

BROOKWEED — *Samolus valerandi*

Small perennial, widely distributed on sand, gravel or cliffs in wet places, especially on the west coast. Grows 4–12 inches high ; flowers June to September. Several stems, round, smooth, rise from tuft of radical leaves, which are oval, glossy, fleshy, smooth, yellowish green, entire. Stem leaves smaller, few, alternate, on short stalks becoming sessile, turning into small, leafy bracts on flowering branchlets. Flowers small, white, in terminal racemes on upper branches. Calyx rounded, gland-dotted, with 5 green, triangular lobes ; corolla 5, short blunt lobes. Stamens 10, 5 fertile, with short filaments, connected to inside of corolla tube opposite lobes of the corolla, and 5 small sterile stamens in between lobes of the corolla. Ovary roundish, with flat top and short, slender style. No nectar is secreted, the flowers are seldom visited by insects, and automatic self-pollination is usual. Fruit : globular capsule surrounded by persistent calyx and opening by 5 valves to release numerous rough seeds. *Samolus*, perhaps derived from Samos, a Greek island in which it abounds ; *valerandi*, in honour of D. Valerand, sixteenth-century botanist.

THE OLIVE FAMILY

OLEACEAE

This family contains some 20 genera with 400 species, shrubs and trees, belonging mostly to tropical latitudes. Leaves may be simple or compound ; flowers generally consist of 4 united sepals, 4 united petals, 2 stamens, and 2 carpels, united into a superior ovary. Fruit differs in almost every genus of this family. *Oleaceae* is represented in this country only by Ash and Privet.

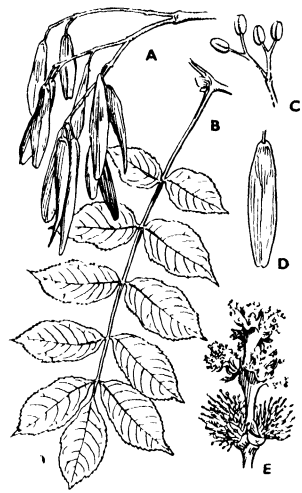
FRAXINUS

Fraxinus includes some 40 species, natives of the Northern Hemisphere. There is but 1 British species.

ASH — *Fraxinus excelsior*

Common deciduous tree, and one of our largest natives. Although capable of growing in almost any soil and at altitudes of 1,350 feet in Yorkshire (and 4,000 feet in the Alps), it prefers shelter and a deep, well-drained, rich loam for perfect development. Grows up to 80 or 90 feet ; flowers April and May. Bole covered with smooth, ashen-grey bark. Twigs opposite, slightly greener, noticeably flattened below each node whence spring prominent bases that support the heavy leaves ; afterwards marked by large leaf-scars. Leaves do not unfold until June or July, after flowering ;

opposite, pinnately divided into 3–5 pairs of opposite leaflets, oblong-lanceolate, toothed, with terminal leaflet rather larger than others ; no stipules. In leaf-axils are short, oval, wedge-shaped black buds which burst into rich clusters of flowers before leaves unfold. Buds owe their original blackness to their clothing of thickly-set, flattened hairs, filled with a dark resin ; they become greener later. Flowers may be unisexual or bisexual, but in each case there are no sepals or petals. Ovary simple, flask-shaped, with short, thick style and 2-lobed stigma. Stamens 2, with black, elliptic anthers. Short flower-stalks elongate in fruit ; fleshy stigmas mature a few days before anthers. Fruit : capsule flattened and elongated into a wing, containing a single seed. One of our most handsome trees, whose timber is tougher and more flexible than any other European wood, and therefore used for frames in coachwork, agricultural implements and sports goods. Unpopular with farmers because its long roots, just below the surface, rob corn of its water supply. *Fraxinus*, the classical name ; *excelsior*, very lofty.



ASH
Fraxinus excelsior
(A) Fruit
(B) Leaf
(C) Male flowers
(D) Single fruit
(E) Inflorescense

LIGUSTRUM

PRIVET [Pl. 13] *Ligustrum vulgare*

More or less evergreen shrub, wild in certain parts of Southern England and Lowlands of Scotland. Grows 6–10 feet high ; flowers June and July. Branches straight, slender, in opposite pairs. Leaves opposite, entire, oval-lance-shaped, dark green, glossy, leathery, on short stalks, of varying duration, being often nearly or completely evergreen. Flowers small, white, in pyramidal cymes, with a copious supply of nectar and a powerful perfume. Calyx short, tubular, 4-lobed, deciduous ; corolla 4-lobed, funnel-shaped, with spreading rim ; stamens 2 ; carpels 2, united, forming superior, 2-chambered ovary. Flowers later fade to a rusty brown. Fruit : spherical berries, ripening from olive-green to true black, though filled with purplish juice. Often seen in tall hedgerows on a chalky soil. Berries are not eaten by birds until almost every other kind of hedgerow fruit has disappeared ; have been used in dyeing pink and green, for extraction of oils, and for colouring port wine. Young twigs, dried and powdered, have been used in tanning. Being tolerant of drip from other trees, Privet is useful for undergrowth in shrubberies or game-preserves ; whilst being also fairly proof against smoke it is useful in town gardens. *Ligustrum*, the classical name ; *vulgaris*, common.

THE PERIWINKLE FAMILY

APOCYNACEAE

Apocynaceae is a large, mainly tropical family, including few trees or herbs but made up mostly of twining and trailing shrubby plants. They have a milky latex which is generally an acrid poison.

VINCA

Vinca comprises some 5 species of slender, evergreen perennial herbs, of which but one is truly native to this country. The larger *V. major*, though naturalized, has no claim to be considered a native.

LESSER PERIWINKLE [Pl. 13] *Vinca minor*

Trailing and climbing evergreen perennial herb, of woods in a warm, sandy soil, especially in S. England. Flower stems about 1 foot high; flowers April and May. Rootstock creeping. Stems tough, round, trailing, 1 or 2 feet long, rooting at nodes. Leaves in opposite pairs, simple, entire, oval-lance-shaped, smooth, shining. Flowers light violet, solitary, on short, erect branches. Calyx deeply 5-lobed, persistent; corolla salver-shaped, formed of 5 petals joined halfway as a tube then branching into 5 free, obliquely set lobes. Nectar secreted by 2 yellow glands at base of ovary, and protected by hairs lining throat of corolla-tube. Stamens 5, attached halfway up tube by very short filaments bending inwards below stigmatic disk; anthers with hairy tips extend above this disk. Carpels 2, very small in flower stage, separate in ovary, but united above into remarkable small style and stigma which resemble a shaving brush. Flowers scentless, but freely visited by bees and long-tongued flies for nectar. Fruit seldom ripens in England, but when it does, it consists of 2 elongated, curved parts, each containing a number of black seeds. Normally reproduces vegetatively. Anthers discharge their pollen inwards on to collecting hairs above stigma which it is prevented from reaching by expanded disk and bent filaments blocking corolla-tube. Because of its pretty flowers Periwinkle is a favourite of gardens. *Vinca* from Latin, *vincio*, I bind, from use of stems; *minor*, lesser.

THE GENTIAN FAMILY

GENTIANACEAE

Gentianaceae is a considerable family, numbering some 750 species in more than 60 genera. Distributed throughout all climates they are mainly northern and sub-alpine. All species are intensely bitter and many furnish valuable tonic medicines.

They are all annual or perennial herbs, with usually opposite, entire leaves without stipules; flowers regular with 4–10 sepals, tubular corolla

with a similar number of petals, and 4–8 stamens attached to corolla-tube. Fruit a 2-valved capsule.

CICENDIA

CICENDIA *Cicendia filiformis*

Attractive, rather local, small annual of sandy shores and moist heaths in South and South-west England. Grows a few inches high ; flowers July to October. Stem slender, ribbed, erect, simple or branched above. Radical leaves narrow, lance-shaped ; stem leaves, sessile, in opposite pairs, pointed. Flowers solitary, tiny, yellow, each on a long stalk. Calyx bell-shaped, consisting of 4 united, pointed sepals ; corolla tubular, with 4 lobes spreading out like a salver ; stamens 4, included in corolla-tube ; style slender, with stout, stigmatic lobe. Fruit very small, oval, containing numerous tiny seeds. *Cicendia*, origin obscure.

CENTAURIUM

Centaurium is a beautiful genus, comprising some 30 species of annual or perennial plants, of which 6 are British.

DWARF-BRANCHED CENTAURY *Centaurium pulchellum*

Flowers July to October, has a short stem, freely branching from base, broad, oval leaves, and stalked flowers, with calyx as long as the tube of corolla. *Centaurium* commemorates the centaur Chiron of Greek mythology ; *pulchellum*, diminutive of *pulcher*, beautiful.

CENTAURY [Pl. 13] *Centaurium minus*

Erect, neat, annual herb, generally distributed in woods and dry and sandy pastures, especially in S. England. Grows 4–12 inches high ; flowers June to September. Stems square, erect, ribbed, hairless, branched from base. Leaves spoon-shaped, forming spreading tuft at base ; stem leaves narrow, oval or lance-shaped, sessile. Flowers small, bright pink, numerous in dense tufts. Calyx with 5 lobes. Corolla pink, funnel-shaped. Stamens 5, projecting beyond throat of corolla-tube. Style short, slender, 2-lobed, surmounting long, narrow ovary. No free nectar. Flowers open between 5 and 7 a.m. and begin to close about noon or if sky becomes overcast. Fruit : two-valved capsule, splitting to release numerous seeds. In N. Scotland an infusion of this plant is still drunk medicinally under the name of *Gentian*. *minus*, lesser.

DWARF CENTAURY *Centaurium capitatum*

Very local, in dry grassland, near the sea. Flowers July and August. Stem short, simple, with broad-oval leaves and sessile flowers in a dense bead-like cyme. Stamens inserted at the base of the corolla tube. *capitatum*, arranged in a head.

DWARF-TUFTED CENTAURY *Centaurium littorale*

Flowers June and August by the seashore, has a short stem with a basal rosette of leaves, narrow and obtuse stem leaves, and sessile flowers in a dense terminal cluster ; calyx and corolla-tube are about equal in length. *littorale*, belonging to the sea-shore.

BLACKSTONIA

Blackstonia comprises a few European species, but only 1 British.

PERFOLIATE YELLOW-WORT [Pl. 15] *Blackstonia perfoliata*

Smooth annual, somewhat resembling Common Centaury but less widely distributed. Found mainly on sunny banks of chalk in Central and Southern England. Grows up to 18 inches high; flowers June to September. Several slightly branched stems, circular in section, may proceed from one root. Radical leaves spoon-shaped, with rounded points, forming basal rosettes, often withering; stem leaves pointed, in opposite pairs with bases joined to encircle stem. Whole plant is smooth and glaucous. Flowers beautiful, star-like, bright yellow. Sepals, petals and stamens all usually number 8, each in one whorl, calyx-lobes being deeply divided. Corolla is wheel-shaped (rotate) with short, broad tube, expanding into 8 yellow lobes; ovary flask-shaped, with slender style and 3-lobed stigma. Fruit: long tapering capsule which when ripe bursts through corolla-tube. Flowers have neither scent nor nectar. They open between 9 and 10 a.m. and close about 4 p.m. Often called Yellow Centaury; abundant in certain areas. *Blackstonia*, named after John Blackstone, eighteenth-century apothecary; *perfoliata*, perfoliate, a misleading reference to the way leaves encircle stem.

GENTIANA

Perennial, very seldom annual, herbs. Over 200 species, of which 3 are British.

MARSH GENTIAN [Pl. 15] *Gentiana pneumonanthe*

Uncommon but magnificent perennial, of some boggy heaths. Grows 1–2 feet high; flowers August and September. Stems slender, erect, little branched. Leaves linear. Calyx equally 5-lobed, with 2 bracts below. Flowers large, trumpet-shaped, deep blue inside and a lighter shade outside, striped with green. Tube is long and wide, without hairs, and pollinated chiefly by bumble bees. Pliny called this 'the gift of Autumn'. *Gentiana*, after Gentius, an Illyrian King (in Pliny); *pneumonanthe*, lungflower, from having been used to cure pulmonary disorders.

SPRING GENTIAN *Gentiana verna*

One of the most beautiful species, of very limited distribution, being confined to Teesdale and a few localities in W. Ireland, on wet limestone rocks, often abundant. It is a perennial growing 2 inches high and flowering from March to June. Stems very short, tufted, surrounded by rosette of spoon-shaped, radical leaves. Flowers solitary, large, deep blue, with long, narrow corolla-tube, opening out like a salver, and with 2 scales on the pleat between each lobe. Pollinated chiefly by butterflies. *verna*, of spring.

SMALL GENTIAN *Gentiana nivalis*

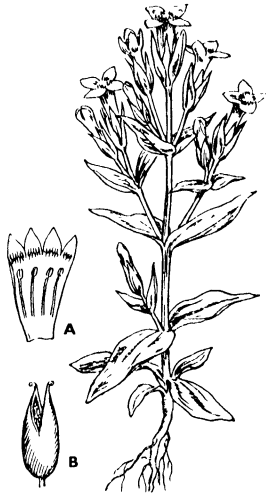
A rare Scottish alpine annual, up to 6 inches, flowering July to September. Stem slender, erect. Otherwise differing from *G. verna* in smaller flowers. *nivalis*, growing in or near snow.

GENTIANELLA

Comprises some 120 species, of which only 6 or 7 are British. All plants are herbaceous, and the majority are alpine, with perennial tufted habit, and relatively large, attractively coloured flowers.

FIELD GENTIAN *Gentianella campestris*

Erect annual, frequently found on commons and in upland pastures, generally on limestone soil and in the North. Grows up to 9 inches high; flowers July to October. Stem slender, glabrous. Leaves in sessile, opposite pairs, smooth, strongly ribbed, broadly lance-shaped, increasing in size further up stem. Flowers pale blue, solitary, on short, axillary branches. Parts in fours, with 2 outer calyx-lobes much larger than the inner. Corolla formed of 4 petals joined in funnel-shaped tube, 1 inch long, twice as long as calyx, with conspicuous fringe of long blue hairs at mouth. Stamens alternate with corolla lobes. Ovary long with single style, surmounted by bi-lobed persistent stigma. Fruit: 2-valved, 1-chambered capsule, with numerous rounded seeds. Nectar can only be reached by humble bees and butterflies. Medicinal virtues of plant depend upon a pure bitter principle resembling tannin. *Gentianella*, diminutive of *Gentiana*; *campestris*, of the plains.



FIELD GENTIAN
Gentianella campestris
(A) Longitudinal section of flower
(B) Seed capsule



AUTUMN GENTIAN or FELWORT
Gentianella amarella
(A) Longitudinal section of flower
(B) Rootstock

AUTUMN GENTIAN or FELWORT *Gentianella amarella*

Erect, simple or branched annual, resembling previous species, widely distributed on dry heaths and chalk downs; much more common in the North. Grows about 6 inches high; flowers August to October. Stem erect, with stiff, slender crimson or purple-tinged, smooth branches. Radical leaves spoon-shaped; stem leaves lance-shaped, sessile in opposite pairs, rounded and clasping stem at their bases. Flowers pale purple, numerous, tightly crowded into leafy

panicles. Calyx 5-lobed, with lobes nearly equal ; corolla formed of 5 united petals, twice as long as calyx, with dense fringe of stiff hairs at mouth of tube. Stamens 5. Fruit : capsule topped by persistent stigma, holding many minutely pitted seeds. Although more abundant locally, this species is not so widely distributed as *G. campestris* ; *amarella*, diminutive of *amara*, bitter.

THE BUCKBEAN FAMILY

MENYANTHACEAE

This family is in some works included in *Gentianaceae*, from which it differs in many respects. It is essentially an aquatic or marsh family.

MENYANTHES

BUCKBEAN [Pl. 15] *Menyanthes trifoliata*

Perennial, aquatic herb of marshes, shallow water and bogs. Stems up to 1 foot long ; flowers May and July. Rhizome stout, dark-coloured, creeping in mud and sending out thick, adventitious roots without root-hairs ; rhizome is filled with starch. Branches ascending, fleshy, with numerous short internodes, rising little above water or mud in which plant grows. Stems often so matted together as to form a raft over large areas of marsh or bog. Leaves alternate, divided into 3 smooth, shining, oval leaflets, with thick midrib and wavy margin ; leaf-stalks thick, round, with sheathing membranous bases. Flowers numerous, beautiful, in crowded spike on thick stem opposite a leaf. Calyx with 5 short lobes. Corolla funnel-shaped, with 5 long, recurved, fleshy lobes, delicately tinged with pink externally but pure white within, and fringed with long, lace-like, white hairs. Nectar glands 5, at base of corolla-tube. Stamens 5, with reddish anthers. Ovary globose, surmounted by single style, with slightly lobed stigma. As in some *Primulaceae*, there are ' thrum-eyed ' (short-styled) and ' pin-eyed ' (long-styled) flowers. In former, anthers project beyond corolla and produce large oval pollen grains, stigma is larger, bi-lobed, and relatively coarsely hairy. In latter, stigma, although projecting beyond corolla, is smaller and finely hairy, and oval pollen grains are about half size of those of other form. Fruit : capsule splitting into 2 parts, releasing a few, light brown, rounded seeds. Also called Bogbean, Begbean and Marsh Trefoil. Fringe of petals has been explained as rendering flower more conspicuous, and as protection against rain, but seems more concerned with exclusion of unwelcome insect visitors, for small crawling insects are frequently seen entangled in this fringe. *Menyanthes* from Greek *men*, a month, and *anthos*, a flower, referring to duration of individual flowers, but was probably first used for some other plant ; *trifoliata*, three-leaved.

NYMPHOIDES

FRINGED WATER-LILY [Pl. 15] *Nymphoides peltatum*

Beautiful aquatic perennial herb, fairly common in sluggish or stagnant waters of S.E. England, from Cambridgeshire fens to Sussex, especially abundant in Thames below Oxford, or more particularly between Windsor and Hampton, but rare elsewhere. Flowers July and August. Rhizome creeping, rooted in mud. Leaves large, roundish, broadly heart-shaped, floating on surface of water ; lower with long, slender stalks, others supporting flowers on short thick stalks. Flowers bright buttercup-yellow, in sessile umbels. Calyx with 5 ascending lobes ; corolla funnel-shaped, expanding to an inch or more across, its segments having an irregularly cut margin, while tube is closed by fringed scales. Fruit : flagon-shaped capsule, whose winged seeds rise to the surface. Nectar secreted by 5 purplish glands between bases of stamens. There are short and long-styled flowers. After fertilization flower-stalk bends so as to withdraw ovary beneath water until fruit is ripe. Also called Round-leaved Buck-bean, Water Villarsia. *Nymphoides*, like a water-lily ; *peltatum*, like a shield, i.e. with stalk attached to surface, not margin, of leaf.

THE JACOB'S LADDER FAMILY

POLEMONIACEAE

Polemoniaceae includes genera and about 270 species, mostly in America. Only one genus with one species is British.

POLEMONIUM

JACOB'S LADDER [Pl. 15] *Polemonium caeruleum*

Rare perennial of limestone screes in North England. Grows up to 3 feet high ; flowers June and July. Rootstock short, creeping. Stem erect, leafy. Leaves pinnate, with oblong leaflets. Flowers deep blue, with corolla divided into 5 lobes, about 1 inch across. Stamens 5, with yellow anthers on long filaments. Style 1, stigma 3-cleft. Fruit : small 3-celled capsule with numerous seeds. Frequently grown in gardens, from which it sometimes escapes and establishes itself, but only truly wild in a few places in N. England. *Polemonium*, origin obscure ; *caeruleum*, blue.

THE BORAGE FAMILY

BORAGINACEAE

Boraginaceae includes some 1,200 species in 85 genera, mostly perennial herbs, especially abundant in the Mediterranean area. Leaves alternate, entire, without stipules. Flowers in cymes. Sepals 5, united in toothed



HOUND'S-TONGUE
Cynoglossum officinale
(A) Fruits

tube ; petals 5, joined in tube with spreading lobes ; fruit, 4 nutlets. Some flowers change colour during life of individual plant.

Of 27 European genera with nearly 200 species, 11 genera with about 24 species occur in Britain.

CYNOGLOSSUM

HOUND'S-TONGUE *Cynoglossum officinale*

Hairy biennial of roadsides, waste places and chalky dunes. Grows 2 or 3 feet high ; flowers June and July. Rootstock thick, fleshy, tapering. Stem pale green, branching, erect, softly hairy, fleshy. Radical leaves very long, stalked, broad, oval or lance-shaped, in tuft at base ; stem leaves narrower, lance-shaped, pointed, alternate, softly hairy, bright green above, lighter below. Flowers dull crimson or purplish red, in nodding, loose, forked inflorescences. Calyx lobes 5, oblong or ovate, obtuse, densely downy ; corolla funnel-shaped, 5-lobed, with throat almost closed by 5 prominent scales. Style stiff, triangular. Fruit : four small flattened nuts, with raised and thickened edge, covered with short hooks to aid in dispersal by animals. Nectar secreted and concealed in base of corolla tube. When bruised, foliage and flowers have disagreeable mousy odour. Anciently used as a cure for stuttering. *Cynoglossum* from Greek *kion*, a dog, and *glossa*, a tongue, from shape and texture of leaves ; *officinale*, from *officina*, druggist's shop, i.e. used medicinally.

GREEN HOUND'S TONGUE *Cynoglossum germanicum*

Much rarer species of hilly districts. Flowers May to July. Similar to previous species but smaller and weaker. Leaves rounder, less hairy, greener. Flowers originally reddish eventually become blue. Nutlets lack thickened raised edge. *germanicum*, German.

SYMPHYTUM

Symphytum is a group of 15 species belonging mostly to the Mediterranean region. They are rough coarse perennials, with stalked radical and stalkless stem leaves. Flowers drooping, tubular. There are 2 British species.

COMFREY [Pl. 15] *Symphytum officinale*

Perennial of river banks, moist meadows and other wet places. Grows 2 or 3 feet high ; flowers May and June. Rhizome fleshy, tough, thick,

black externally, but containing much tasteless mucilage ; it gives off fleshy, fibrous roots. Stems stout, branched, angular, winged in their upper parts by stalks of leaves. Leaves alternate, broadly lance-shaped, pointed, upper ones with winged stalks running down stem. Foliage covered with bristly, brittle hairs. Flowers purple, pink, or ochreous, forming drooping tubular bells, dilated above middle. Calyx deeply divided into 5 narrow teeth ; corolla shortly and broadly 5-lobed ; there are 5 triangular scales at throat, converging to conceal 5 anthers. Nectar is stored at base of corolla. Fruit : four small smooth nuts, each with a single seed, and embraced by persistent calyx. Is included in British Pharmaceutical Codex because of medicinal properties, and earlier known on this account as Bone-set and Bruisewort. Leaves sometimes cooked in young state, and eaten as greens. Dried rootstock forms basis of drug. *Symphytum* from Greek *symphyo*, I cohere, or ' make grow together ' with reference to its wound-healing properties, *fiton*, a plant ; *officinale*, from *officina*, druggist's shop, i.e. used medicinally.

TUBEROUS COMFREY — *Symphytum tuberosum*

Smaller and rarer perennial of wet places in woods and thickets, but mostly from Midlands northwards. Grows up to 2 feet high ; flowers June and July. Rootstock swollen tuberous ; radical leaves on longer stalks, shorter than middle leaves. Stems slender, scarcely winged. Whole plant softly hairy. Flowers smaller, yellowish white. *tuberosum*, tuberous.

BORAGO

BORAGE — *Borago officinalis*

Annual or biennial. Cultivated through the centuries, commonly found as an escape near human habitations. Plant grows about 1 foot high ; flowers June and July. Stem stout, leafy, hairy, spreading. Lower leaves ovate-lance-shaped, stalked ; upper ones sessile, narrower ; all covered with bristly hairs. Flowers large, conspicuous, beautiful pure blue, drooping gracefully in loose cymose clusters. Calyx and corolla deeply 5-lobed. Nectar abundant, secreted below ovary which is concealed in short corolla. Five notched scales at base of corolla-tube throat. Stamens have forking filaments and long dark purple anthers forming cone round style, shedding their pollen in this cone. Fruit : 4 separate nutlets. Formerly used as a cordial. Smells of cucumber. Medicinal properties were attributed to it. *Borago* is probably latinized form of



BORAGE
Borago officinalis

some oriental name; *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.

PENTAGLOTTIS

EVERGREEN ALKANET — *Pentaglottis sempervirens*

Erect, leafy perennial, in hedgerows, probably native in a few places in S.W. England. Rare elsewhere. Grows up to 2 feet high; flowers May and June. Stem erect, branched, leafy all year, covered with stiff hairs. Root leaves on long stalks; stem leaves almost sessile, half clasping stem, alternate, broad oval, bright green, pointed, stiffly hairy. Flowers small, bright blue with white eye, in one-sided clusters, on short branches from axils of leaves. Calyx deeply 5-lobed, fringed with hairs; corolla-tube straight, lobes $\frac{2}{3}$ inch across with white scales. Fruit: 4 separate nutlets, covered with fine criss-cross markings. *Pentaglottis*, name in Greek, from *penta*, five, and *glotta*, a tongue (5-tongued); *sempervirens*, evergreen.



EVERGREEN ALKANET
Pentaglottis sempervirens
(A) Longitudinal section of flower
(B) Calyx

ANCHUSA

COMMON ALKANET — *Anchusa officinalis*

Similar to *P. sempervirens* but rarer biennial, with stout root and softer hairs; flowering April to June. Flowers deep bluish purple, with straight corolla-tube and white scales; diameter $\frac{1}{3}$ inch. *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.

LYCOPSIS

Lycopsis is a very small genus confined to Europe and W. Asia consisting of 3 species, 1 being British.

COMMON BUGLOSS — *Lycopsis arvensis*

Not uncommon bristly annual of dry light soils, on sand, gravel or chalk, in cultivated fields. Grows $1\frac{1}{2}$ feet high; flowers June and July. Erect, branched, extremely prickly, each of its stiff hairs rising from a scaly tubercle. Root small, tapering, whitish. Leaves oblong, wavy, stalkless, although those from root are stalked and lance-shaped. Flowers small, $\frac{1}{4}$ inch across, in short, terminal cymes. Calyx 5-toothed, linear-lance-shaped, hairy. Corolla lobes 5, often irregular and oblique; corolla-tube, with white scales, but limb a bright true blue. Stamens 5, with anthers included in uppermost bend of tube. Fruit: 4 closely pitted nutlets. Nectar is secreted. Also called Small Bugloss. Once common

around Piccadilly. *Lycopsis* from Greek *lykos*, a wolf, and *opsis*, aspect, the plant's roughness resembling that of a wolf ; *arvensis*, of cultivated fields.



COMMON BUGLOSS
Lycopsis arvensis
(A) Rootstock
(B) Single flower

PULMONARIA

LUNGWORT *Pulmonaria longifolia*

This species is similar to the common cultivated *P. officinalis* which is quite frequently found as an escape, apparently native in Hampshire. It differs from *P. officinalis* in narrower leaves.

Erect perennial of sunny banks, in the Isle of Wight and the New Forest. Grows 18 inches high ; flowers in spring. Rootstock thick, fleshy, sending out runners. Stem erect, brownish, coarsely hairy. Leaves alternate, rough, deep green, lance-shaped. Flowers funnel-shaped, with tube opening out into 5-lobed salver, in crowded terminal clusters. Calyx sharply 5-toothed, hairy ; corolla changes colour from pink to violet, and 3 shades of colour may be exhibited simultaneously. There are no scales in corolla-tube, their place being taken by 5 tufts of hair between stamens. There are short and long-styled forms, and copious nectar is accessible to long-tongued insects. Fruit : 4 slender tapering nutlets. Also called Snakeflower and Blue Cowslip. Common name derived from its former reputation as a chest medicine, and also from spotted leaves. *Pulmonaria* from Latin *pulmo*, the lung ; *longifolia*, long-leaved.



FORGET-ME-NOT
Myosotis palustris
(A) Creeping stem

MYOSOTIS

Myosotis comprises about 30 species of which 8 are British. Most are terrestrial plants and their alternate, entire stem leaves are commonly oblong and densely downy.

FORGET-ME-NOT *Myosotis palustris*

Attractive, small semi-aquatic perennial of wet ditches, stream-sides and other wet places, often in great patches. Grows up to 2 feet

high; flowers May to July. Rhizome creeping, branching, sending out tufts of stout rootlets. Aerial stems ascending, weak, rather fleshy and round or slightly angular in section. Leaves alternate, narrowly oblong, blunt, with shining surfaces; stem leaves stalkless, root leaves on long stalks. Stem and leaves have inconspicuous, scanty spreading hairs. Flowers beautiful turquoise-blue, in 2-forked, 1-sided curving cyme, resembling scorpion's tail. Calyx bell-shaped, closely hairy, with 5 short teeth; corolla moderately long, straight tube, with throat nearly closed by 5 short, blunt, notched scales (forming yellow 'eye'), while limb spreads in 5 flat rounded lobes. Stamens 5, with short filaments, and short style included in corolla-tube. Fruit: nutlets smooth, rounded, highly polished, becoming black when ripe. Also known as Water Forget-me-not, Water Mouse-ear, Scorpion-grass, and long used as symbol of affection and constancy, the symbolism probably originating in Germany. The yellow 'eye' acts as a nectar-guide to insect visitors. *Myosotis* from Greek *mys*, a mouse, and *ous*, an ear, referring to shape and texture of leaves; *palustris*, of swampy places.

CREEPING or WATER FORGET-ME-NOT [Pl. 15] *Myosotis secunda*

Perennial herb closely resembling previous species, of similar situations. Stems about as long, but almost prostrate at first, later ascending. Leaves stalkless, hairy, narrowly lance-shaped. Flowers bright blue with yellow eye, rather smaller. Calyx cut halfway down into narrow lobes. *secunda*, arranged on one side only.

TUFTED or WATER FORGET-ME-NOT *Myosotis caespitosa*

Similar annual or biennial to Water Forget-me-not, of similar situations. Grows up to 18 inches high; flowers May to August. Rootstock has no runners, and stem branches from base. Leaves bright green, shining. Flowers very small, with sky-blue corolla and yellow 'eye'. Calyx-teeth triangular, $\frac{1}{2}$–$\frac{3}{4}$ length of calyx; corolla-lobes rounded. *caespitosa*, tufted.

ALPINE FORGET-ME-NOT *Myosotis alpestris*

Rare little perennial, only found on Teesdale, at 2,400 feet, and on Ben Lawers at almost 4,000 feet, on moist rocks. Grows 3 inches high; flowers July to September. Bears an intensely blue flower as large as that of Water Forget-me-not; sweet-scented at evening. Pedicels of fruits about as long as the calyx, or the lower somewhat longer. *alpestris*, of high mountains.

WOOD FORGET-ME-NOT *Myosotis sylvatica*

An erect perennial, 6–18 inches; locally abundant in damp woods, flowering in May and June. Differs from *M. arvensis*, in larger flowers, the tube of the corolla being as long as or longer than the calyx, and in its longer style. Pedicels of fruits spreading, 1$\frac{1}{2}$–2 lengths of calyx. *sylvatica*, of woods.

FIELD or COMMON FORGET-ME-NOT *Myosotis arvensis*

Annual or biennial herb of dry situations in fields and woods. Grows up to about 1 foot high ; flowers May to August. Stem branching from base, hairy. Lower leaves oblong, narrowing to stalks ; stem leaves smaller, narrower. All foliage rather darker than in previous species. Calyx covered with hook-tipped hairs ; each flower-stalk in inflorescence longer than one above. *arvensis*, of cultivated fields.

YELLOW-AND-BLUE FORGET-ME-NOT *Myosotis discolor*

Pretty, small annual of banks, old walls and waste land. Grows 1 foot high ; flowers May and June. Stem simple, erect, hairy, rising from tuft of leaves. Flowers small, easily recognizable by being at first pale yellow or white and later becoming blue. Pedicels of fruits ascending, shorter than the calyx. *discolor*, of changing colour.

EARLY FIELD FORGET-ME-NOT *Myosotis hispida*

Tiny spring annual of dry banks, sand-dunes, old walls and similar situations. Grows a few inches high ; flowers April and May. Flowers bright blue, $\frac{1}{8}$ inch in diameter ; sometimes with a solitary flower some little distance below rest of racemes. Pedicels of fruits ascending, nearly as long as the calyx. *hispida*, hispid.

LITHOSPERMUM

PURPLE GROMWELL *Lithospermum purpurocaeruleum*

Rare perennial restricted to chalk and limestone soils in about half a dozen English southern counties. Stems 1 foot long, creeping. Differs mainly from other species in having purplish-blue flowers (appearing in June and July), and one or two hard, white, globular nutlets for fruit. *Lithospermum*, from Greek *lithos*, a stone, and *sperma*, seed, with reference to hard fruit ; *purpurocaeruleum*, purplish blue.

COMMON GROMWELL *Lithospermum officinale*

Perennial similar to *L. arvense*, but larger, stronger and taller. Grows 2 or 3 feet high ; flowers June and July. Found in copses, hedgerows and thickets, in S. Scotland, England and Ireland. From stout, whitish, woody rootstock rise several branching rough stems. Leaves pointed, lance-shaped, sessile, half clasping stem, bristly beneath, softly hairy above. Flowers smaller, greenish yellow, dull and inconspicuous, with scales in throat of corolla. Fruit, of 2 or 3 greyish nutlets. *officinale*, from officina, druggist's shop, i.e. used medicinally.

CORN GROMWELL *Lithospermum arvense*

Strong-growing annual weed of cornfields and waste places, grows 1 foot high ; flowers May and June. Erect, solitary, hairy, branching, slightly angular, becoming woody at base. Radical leaves broadly lance-shaped,



CORN GROMWELL
Lithospermum arvense
(A) Fruit

entire, stalked, hairy all over; stem leaves much narrower, pointed, stalkless, half clasping stem. Flowers small, creamy white, on short stalks in leafy terminal cymes. Calyx 5-toothed, united at base, almost as long as corolla; corolla 5-lobed, without scales in throat, but with hairy folds in tube. Fruit: 4 separate closely pitted, polished, light brown nutlets. Also called Bastard Alkanet. Mostly self-pollinated, as insect visitors are few. *arvense*, of cultivated fields.

MERTENSIA

NORTHERN SHORE-WORT
Mertensia maritima

A local, mainly northern decumbent perennial, up to 2 feet, of maritime shingle, flowering June to August. Distinguished by its glaucous, fleshy appearance. Leaves oval, dotted on upper surface; lower leaves narrowing into a stalk. Flowers pinkish or purplish. Nutlets flattened, fleshy, with a membranous outer covering. Named after K. H. Mertens, German botanist. *maritima*, of the sea.

ECHIUM

Although *Echium* includes many Mediterranean species, there are only 2 British—both herbaceous.

VIPER'S BUGLOSS [Pl. 1] *Echium vulgare*

Large, handsome, stately annual or biennial herb of waste places on sandy seashores, on gravel, or on bare sunny slopes of chalk. Grows 3 feet high; flowers June to August. Roots long, tapering, descending far into soil. Stem erect, stout, covered with stiff, bristly hairs with swollen bases, or with silky hairs, or with wart-like projections. Root leaves long, stalked, strap-shaped, spreading out in strong rosette, each with prominent midrib. Flowers in dense, more or less branched, spike of unilateral cymes. Corolla large, handsome, funnel-shaped, with no scales in tube, but dilated upwards into 5 unequal lobes, which may be white, pale blue, or a deep vinous red-purple; most frequently opens rose-pink from bud, and rapidly becomes beautiful pure blue. Stamens 5, alternate with lobes of corolla and projecting considerably from mouth, with reddish filaments which modify general hue of inflorescence. Style slender, forking, sometimes hairy, longer than stamens and lying with them along

lower side of corolla-tube. Anthers burst as corolla expands, their conspicuous colouring attracting a great variety of bees and other insects, including butterflies and hawk-moths to abundant nectar. Fruit: 4 wrinkled, rough nutlets. Common name derived from the use of the plant as a cure for the bite of a viper. Bugloss from Greek *bous*, an ox, and *glossa*, a tongue, alluding to shape and texture of leaves; *Echium*, the classical name; *vulgare*, common.

PURPLE VIPER'S BUGLOSS *Echium plantagineum*

Rare biennial, found in Jersey and Cornwall. It has a branched inflorescence of purple flowers. Stamens very unequal, posterior one being shortest, two of anterior ones being shorter than the other two, and the longest two protruding only slightly from corolla-tube. Also called Plantain-leaved Viper's Bugloss. *plantagineum*, plantain-like.

THE BINDWEED FAMILY

CONVOLVULACEAE

Convolvulaceae includes about 1,000 species in about 40 genera. Mostly annual or perennial herbs with scattered, stalked leaves without stipules. Flower parts mostly in fives. Fruit a 2- to 4-valved capsule. Three genera with 5 species British.

CONVOLVULUS

The genus comprises some 170 species, mainly of temperate regions. One species native.

SMALL or FIELD BINDWEED *Convolvulus arvensis*

Graceful twining perennial herb, widely distributed throughout England and Wales in warm, light soils of fields and banks. Stems up to 3 feet long; flowers June to September. Rhizome slender, penetrating deeply and branching extensively underground. Stems numerous, slender, trailing or twining in an anti-clockwise direction, making a revolution in about 2 hours, often



SMALL or FIELD BINDWEED
Convolvulus arvensis
(A) Young fruit showing style

strangling their supports. Leaves alternate, stalked, arrow-shaped. Flowers funnel-shaped, in axillary cymes, from 1 to 4 flowers in each. Calyx 5, deeply-lobed ; corolla delicate, varying from pure white to deep rose, an inch across, with 5 shallow, wavy-margined lobes. Fruit : small, 2-celled capsule, with minutely pitted seeds. Corollas unfold about 7 a.m. and close about 10 p.m. or in bad weather. There is usually a pair of tiny bracts well down flower-stalk. Due to its twining habits, it has acquired many local names such as Bearbind, Wheatwind, Withwind, etc. *Convolvulus* from Latin *con-volvo*, I wind about ; *arvensis*, of cultivated fields.

CALYSTEGIA

BELLBINE OR LARGER BINDWEED [Pl. 15] *Calystegia sepium*

Strong, handsome perennial, resembling *C. arvensis* but much larger, common in hedges and on banks of streams ; also a mischievous weed in gardens. Grows 6 or 7 feet high ; flowers June to August. Rootstock creeping, forming massive underground growth which starves neighbouring plants. Aerial stems complete the work by strangling them, twining spirally over any handy support. Leaves alternate, arrow-shaped, pointed, with somewhat wavy margins. Flowers beautiful, large, white, or occasionally pink trumpets, closing at dusk, and opening again by moonlight. Calyx 5-lobed, overlapping, concealed by pair of large, conspicuous, heart-shaped bracts—the ' hood '. Stamens 5, alternating with lobes of corolla-tube. Ovary 2-celled, with slender style and forked, warted stigma. Nectar is secreted for benefit of moths, but flowers are scentless. Fruit : globose capsule holding 4 seeds, enclosed by persistent bracts and calyx. Also called White Bindweed. Originally classified under *Convolvulus*, but later separated on account of 2 large leafy bracts enclosing real calyx. *Calystegia* from Greek *kalyx*, the calyx, and *stego*, cover ; *sepium*, of hedges.

SEA BINDWEED [Pl. 1] *Calystegia soldanella*

Widely distributed perennial, on sandy shores. Rhizome long, slender, creeping, binding together our shifting sands. Rarely if ever twines. Stems prostrate, slender, tough, pinkish. Leaves smooth, succulent, kidney-shaped, fleshy, rising on long stalks, in thick patches of dark green. Flowers few, large, pink, trumpet-shaped, on long stems. Calyx 5-lobed, unequal, with 2 smaller, heart-shaped bracts immediately below. Flowers June to August. *soldanella*, origin obscure.

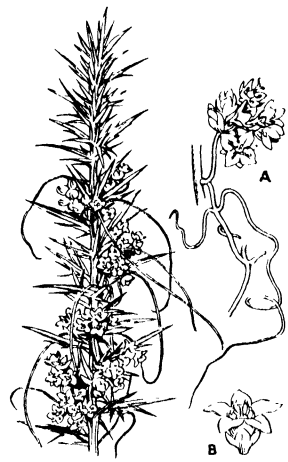
CUSCUTA

Cuscuta comprises some 90 species, widely distributed in temperate and tropical regions. About 12 species occur in Europe, and 5 or 6 in England, but 3 or 4 of these are imported aliens.

COMMON DODDER *Cuscuta epithymum*

Slender, parasitic annual herb, common on our southern heaths upon Furze, Heather, Wild Thyme and other plants with woody stems. Flowers July to September. Stems slender, thread-like, crimson, tangled, twining

tightly round host plant. They not only twine but send out suckers at intervals into stem of host plant, robbing their tissues of food. There are no green leaves, these being reduced to tiny colourless scales. Flowers tiny, wax-like, thickly set in crowded heads. Calyx 5-lobed, reddish; corolla 5-lobed, persistent, pitcher-shaped; stamens 5; styles 2, protruding from mouth of corolla. Nectar concealed by 5 relatively large fringed scales which spring from inside corolla-tube, each at base of a stamen. These scales afford chief means of discrimination between different species. Fruit a tiny, globular capsule, containing 4 relatively large angular seeds. Also called Heath Dodder. Some flowers are cleistogamous, that is, setting seed without opening, and others are self-pollinating. Large quantities of seed have to be set to ensure survival. Host plant is often killed by this parasite. *Cuscuta* is an Arabic name; *epithymum*, on thyme.



COMMON DODDER
Cuscuta epithymum
(A) A flower head
(B) Single flower

GREATER OR LARGE DODDER *Cuscuta europaea*

A much rarer annual parasitic on Nettles, Vetches and other herbaceous plants, not found north of Yorkshire. Flowers August and September. This has coarse branching stems, with pinkish flowers, and non-protruding stamens. *europaea*, European.

THE NIGHTSHADE FAMILY

SOLANACEAE

Solanaceae includes some 1,700 species in upwards of 70 genera, occurring mainly in Central and South America. There are 10 European genera with about 35 species, including 3 British genera with 4 species between them.

The family comprises herbs, shrubs and trees with alternate or opposite simple leaves without stipules; regular, solitary or cymose flowers; and a berry or capsule for fruit. It contains valuable commercial plants such as potato, tobacco and tomato. All British natives are poisonous.

ATROPA

Atropa contains only 2 species—both European—though only 1 is British.

DEADLY NIGHTSHADE [Pl. 16] *Atropa belladonna*

Highly poisonous, uncommon, stout, freely branching, herbaceous perennial of chalk and other soils, especially in S.E. England. Grows 3 or 4 feet high ; flowers June to August. Rhizome thick, fleshy, sending out suckers ; aerial stems dying down annually, downy with viscid glandular hairs. Leaves large, stalked, broadly oval, pointed, undivided, alternate. Flowers almost solitary, drooping on curved axillary stalks, with spreading leafy calyx and bell-shaped corolla opening in 5 broad segments to nearly an inch in diameter. Flowers have changing colours which appear lurid and threatening. They open a greenish yellow externally, becoming brownish cream, slightly downy ; internally they change to reddish brown or chocolate, acquire a dull violet bloom, and fade to sickly brown. Club-like stigma projects slightly beyond mouth of corolla. Anthers heart-shaped ; filaments curved, with stiff hairs to protect nectar secreted below ovary. Fruit spherical, violet-black, polished berry, resembling a small cherry, with sweetish taste, which makes it dangerous where children are concerned. Also called Dwale. Often found on former garden sites, for it anciently was cultivated for medicinal purposes. Exhales a heavy, fetid odour, especially when bruised. Still used as a sedative and narcotic ; its well-known properties of enlarging the pupil by application to the eye is used by theatrical people, and gave rise to specific name : *Belladonna,* ' beautiful lady ' (Italian). *Atropa,* from Greek *atropos,* one of the Fates. Common name refers to colour of berries.

HYOSCYAMUS

Hyoscyamus includes 10 or 12 species, natives of warmer temperate regions of Old World, but only 1 appearing on British list.

HENBANE [Pl. 15] *Hyoscyamus niger*

Shrubby annual or biennial herb, possibly indigenous on sand-dunes near coast, but found chiefly in waste places, where it is generally an escape, having formerly been extensively cultivated for medicinal purposes. Grows about 2 feet high ; flowers June to August. Stem stout, rounded and tapering, branching bushily, thinly covered with long, soft hairs. Radical leaves long, oval, stalked, covered with glandular hairs ; stem leaves crowded, mostly stalkless or clasping stem, pinnately lobed, soft or limp, greyish green with thick covering of colourless hairs. Flowers drooping, almost stalkless, in axils of upper leaves, forming 2 rows on upper surface of branches. Calyx bell-shaped, with 5 leafy lobes, downy, enlarging and persisting in fruit as an erect, pale brown bell. Corolla funnel-shaped, with short tube and 5 spreading rounded lobes, creamy white or yellowish, generally with purple-violet centre and complex veining of same colour. Stamens 5, unequal, with hairy filaments and heart-shaped, purple anthers, inserted near base of corolla-tube. Simple style has club-shaped stigma. Nectar secreted below ovary ; flowers visited by humble-bees. Fruit : 2 carpels form 2-chambered capsule, enclosed by persistent calyx, and narrowed by flat belt near lid at top. Lid breaks off to release numerous grey, kidney-shaped, minutely warted seeds which are jerked out a few at a time by action of wind. Plant is a narcotic

from which drug hyoscyamine is prepared, and is highly poisonous. Common name denotes its fatal effects on hens. *Hyoscyamus*, the classical name ; *niger*, black.

SOLANUM

Solanum is an extensive genus, comprising some 900 species distributed over most temperate and tropical regions. There are only 2 British species.

WOODY NIGHTSHADE [Pl. 15] *Solanum dulcamara*

Lovely, striking perennial climber with shrubby base, of hedgerows and rank vegetation near water. Stems may reach 14 feet in length ; flowers June to September. Rhizome creeping, covering extensive area. Stem clambering, with branches and leaf-stalks growing at a high angle ; surface varies, being either smooth, downy with spreading hairs, or woolly. Leaves very dark green, all stalked ; lower ones heart-shaped ; upper ones spear-shaped, with 2 spreading basal lobes, each narrowed into stalk-like base. Flowers in loose clusters, with violet corolla and conspicuous golden anthers. Calyx 5-lobed. Petals 5, joined in spreading tube, with 2 polished green knobs at base of each. Style protrudes through tube formed by anthers which are joined at their edges. Fruit : polished, oval, 2-chambered juicy fruits, changing from vivid green to bright scarlet, and containing numerous kidney-shaped seeds. Supposed to be poisonous, but birds eat them freely. Also called Bittersweet, for when stem bark is first tasted it is bitter, then sweet. A very distinct variety, *var. marinus*, prostrate in growth and somewhat fleshy in texture, inhabits our southern seashores. *Solanum*, the classical name ; *dulcamara*, sweet-and-bitter.

COMMON OR BLACK NIGHTSHADE [Pl. 16] *Solanum nigrum*

Small, annual, common herbaceous weed of fields and waste places. Grows up to 2 feet high ; flowers July to October. Stem erect, with spreading branches. Leaves egg-shaped, with wavy margins or equipped with coarse angular teeth. Flowers small, white, in tight cymes ; corolla-lobes lance-shaped, and anthers in prominent erect cones. Berries rounded, generally black. Plant is poisonous and has strong smell. *nigrum*, black.

THE FIGWORT FAMILY

SCROPHULARIACEAE

Includes few trees but produces forms adapted to very varied conditions, including climbers and semi-parasites. It comprises some 180 genera with 2,000 species. Seventeen genera occur in Britain.

Stem not usually square. Leaves simple, usually alternate without stipules. Flowers always essentially in cymes, generally with bracts.

Calyx 5-lobed, persistent. Corolla 4- or 5-lobed, variously shaped. Stamens usually 4, attached to corolla-tube, and there is a nectar-secreting disk. Fruit usually a 2-chambered, many-seeded capsule.

VERBASCUM

Verbascum contains about 160 species, natives chiefly of temperate regions of the Old World. There are 6 British species, and natural hybrids between most of them are not uncommon. Differs from other genera in family by presence of 5 stamens instead of usual 4, showing it to be a rather more primitive form.

GREAT MULLEIN [Pl. 16] *Verbascum thapsus*

Tall, erect, woolly, very handsome biennial herb of dry waste places, especially on chalk, throughout Great Britain. Grows about 4 feet high; flowers June to August. Stem erect, stout, ending in flower spike. Radical leaves very large, broadly lance-shaped, stalked; stem leaves becoming smaller higher up, upper ones becoming stalkless, pointed, with toothed margins, and their edges running down stem as wings. Upper leaves droop at their tips and discharge rain-water into channelled midribs of leaves below them, so that it finally reaches tap-roots. Flowers golden, in foot-long, flame-like spike, each flower subtended by prominent green bract. Calyx 5-lobed; corolla 5-lobed, open, yellow with a short tube; stamens 5, the shorter 3 having hairy filaments, the longer 2 being smooth. Ovary 2-chambered, surmounted by style with club-shaped stigma. Fruit: egg-shaped capsule opening by 2 valves to release many minute seeds. Also called Aaron's Rod, Torch-blade, and Hedge-taper. *Verbascum*, the classical name; *thapsus*, from Thapsus in Africa where it was said to abound.

WHITE MULLEIN *Verbascum lychnitis*

Uncommon biennial herb, growing a yard high; flowers July and August. Angled stem has stalked root-leaves, hoary beneath and smooth above. Flowers in narrow spikes, whitish yellow. *lychnitis*, a plant from which wicks were made.

HOARY MULLEIN *Verbascum pulverulentum*

A very local biennial of roadsides in East Anglia, differing mainly from *V. lychnitis* in its rounded stem and leaves very mealy on both sides, the lower leaves larger. *pulverulentum*, mealy.

DARK MULLEIN [Pl. 1] *Verbascum nigrum*

A rarer, smaller, darker perennial, less woolly in appearance. Grows up to 3 or 4 feet high; flowers June to October. Stem simple or branched, with woolly hairs less dense. Leaves, although woolly on under surfaces, are more or less smooth on upper side and therefore appear of a darker green than previous species. Flowers in golden yellow spike, with long, conspicuous purple hairs on filaments, and orange-red anthers. *nigrum*, black.

MOTH MULLEIN *Verbascum blattaria*

Rarer biennial, growing 1–4 feet high ; flowers June to October. Stem slender, angled, almost hairless. Flowers golden or creamy yellow, with purple hairs on filaments. *blattaria*, from *blatta*, a moth.

ANTIRRHINUM

Antirrhinum includes over 30 species, annuals or perennials, herbs, shrubs or climbing plants. Only 1 species in British Isles. Although the Common Snapdragon of our gardens (*A. majus*) is commonly found naturalized on old walls it has no claim to be considered a native.

LESSER SNAPDRAGON *Antirrhinum orontium*

Uncommon, generally annual (but sometimes biennial) cornfield weed. Grows up to 1 foot high ; flowers July to October. Stem very slender, branching freely from ground, upper part thinly clothed with long, viscid, glandular hairs. Leaves slender, narrowly lance-shaped, stalkless, about 2 inches long. Flowers small, nearly sessile in axils of scattered leafy bracts, forming a loose spike. Calyx-lobes spreading, linear, as long as corolla when flower opens but soon elongating to nearly twice its length. Corolla rose-red, or very rarely white. Erect upper lip of corolla presses down on spreading lower lip, tightly closing mouth of tube, and separating with spring-like movement only when considerable weight is applied. Stamens 4, lying in pairs along upper lip, anthers of 2 longer ones being in front. Nectar secreted at base of ovary in shallow nectar-pouch. Anthers and 2-lobed stigma mature simultaneously. Fruit : downy, 2-chambered capsule with 3 pores, each opening by a lid. Also called Weasel-snout and Calf's-snout. Children like to pinch flowers between finger and thumb thus making them open and shut, like mouths of snapping dragons. *Antirrhinum* derived from Greek *anti*, against, and *rhin*, nose, referring to mask-like flower ; *orontium*, derivation obscure.

LINARIA

Linaria comprises about 150 species, mostly natives of the Northern Hemisphere. There are 18 species recorded in England, but most are considered alien. Toadflaxes differ mainly from Snapdragons by having a spur at base of corolla instead of a mere pouch ; it serves as a receptacle for nectar.

YELLOW TOADFLAX [Pl. 16] *Linaria vulgaris*

Common perennial of hedgerows and field sides, flourishing in extremely poor, dry, porous soil, on gravel, or sand, or pure chalk, generally in full glare of sun. Grows up to 3 feet high ; flowers June to October. Rhizome somewhat woody, creeping, each year's aerial growth springing from adventitious bud near its summit. Stems many, stout, erect, branching. Leaves thickly set, mostly linear, 1 or 2 inches long, with 3 faint, longitudinal veins. Both stems and leaves are smooth and glaucous, but flower-stalks bear glandular hairs. Flowers in crowded terminal racemes, generally

primrose-yellow, blending with deep orange of downy palate. Each flower is 1 inch long, spur equalling length of tube. Calyx deeply 5-lobed ; corolla mask-like, consisting of 5 petals united in tube below and divided into 2 lips above—upper of 2 petals and lower of 3. Lower lip is inflated and tightly closes entrance to corolla-tube. Stamens 4, sometimes with rudimentary fifth. Two-celled capsule, opening by 8 or 10 teeth at top, greatly exceeds calyx in length. Seeds rough with minute warts, surrounded by smooth wing. The commonest and one of the most beautiful species. Remarkable colouring effect gives rise to such popular names as Butter-and-Eggs, Eggs-and-Bacon, etc. Common English and Latin generic names arise from resemblance of foliage to that of Flax. *Linaria* from Latin *linum*, flax ; *vulgaris*, common.

PALE TOADFLAX — *Linaria repens*

A local perennial, usually on calcareous soil, flowering June to September. Readily distinguished from *L. vulgaris* by its smaller whitish flowers striped with purple, in laxer inflorescences. *repens*, creeping.

KICKXIA

ROUND-LEAVED FLUELLIN — *Kickxia spuria*

A local, hairy, glandular, decumbent annual of arable land in S. England, flowering July to September. Like *Linaria*, but with axillary yellow flowers, the upper lip purple, and broadly oval leaves. *K. elatine*, Fluellin, differs from *K. spuria* in being less hairy and less glandular and having spearhead-shaped leaves. Names after J. Kickx, a Belgian botanist ; *spuria*, spurious, and *elatine*, a classical plant name.

CHAENORRHINUM

SMALL TOADFLAX — *Chaenorrhinum minus*

An erect, glandular, annual, 4–10 inches, of fields and waste places, flowering June to September. Similar to *Linaria* species, but the shortly-spurred purple flowers are smaller, solitary and axillary ; the corolla is open at the mouth ; the capsule open by pores. *Chaenorrhinum* from *chainein*, open, and *rhinos*, nose ; *minus*, lesser.

CYMBALARIA

IVY-LEAVED TOADFLAX — *Cymbalaria muralis*

Widely distributed perennial in stony places, on walls, and around gardens. Grows a few inches high ; flowers May to November. Small fibrous roots are shot out at the joints of the stems. Stems long, slender. Leaves almost round, lobed like ivy. Flowers small, several, shaped like Snapdragon ; calyx 5-parted ; corolla lilac with yellow lip. Fruit : capsule, which when ripe bends towards crack in supporting wall where it can deposit numerous small seeds. Makes decorative patterns on walls. Possibly a greenhouse escape. *Cymbalaria*, from *Cymbaluen*, cymbal, from the form of leaves ; *muralis*, of walls.

SCROPHULARIA

Scrophularia comprises over 120 species, natives of the north temperate zone. Mostly perennial herbs or slightly shrubby plants, generally with a fetid smell. Four species are British.

KNOTTED FIGWORT — *Scrophularia nodosa*

Widely distributed perennial in shady, moist places. Grows 3–4 feet high; flowers July to October. Rootstock tuberous, knotted. Stems quadrangular, unbranched, smooth, dull green. Leaves hairless, 2–4 inches long, opposite, stalked, pointed, egg-shaped, toothed. Flowers green or brownish in loose panicles, composed of small cymes. Calyx-lobes 5; corolla-tube with unequally 5-lobed mouth; stigmas ripen before anthers ensuring cross-pollination. Fruit: pointed, oval capsule, with brown, rough seeds. Usually pollinated by flies and wasps, attracted by its carrion-like smell. Once used as a remedy for scrofula; *nodosa*, with swollen joints, in reference to tuberous roots.

WATER FIGWORT — *Scrophularia aquatica*

Waterside perennial, 3 feet high, flowering July to September. Chiefly distinguished from allied forms by fibrous root; polished, hairless surface; winged angles on stems; blunt, kidney-shaped leaves, and narrow linear bracts below each pair of cymes. Flowers green on lower surface and brown on upper; sometimes pure white. *aquatica*, of water.

MIMULUS

YELLOW MIMULUS or MONKEY FLOWER [Pl. 16] — *Mimulus guttatus*

Commonly established by riversides all over the country but never truly wild. Striking plant growing about 3 feet tall with opposite leaves, the lowest of which are stalked. Flowers yellow, variously marked with small deep red spots, tubular with 5 spreading lobes. Calyx enlarges to enclose the capsule after flowering. *Mimulus* from Latin *mimo*, I mimic; *guttatus*, spotted.

LIMOSELLA

MUDWORT — *Limosella aquatica*

A local, creeping annual of wet mud, flowering July to September. Leaves all radical, elliptic, on long stalks. Flowers very small, white or rose, solitary, axillary, stalks shorter than leaf-stalks. Capsule minute, roundish-oval. *Limosella*, diminutive, derived from *limosus*, muddy; *aquatica*, aquatic.

SIBTHORPIA

CORNISH MONEYWORT — *Sibthorpia europaea*

A very local, creeping perennial of damp, shady places in the South and South-West, flowering July to October. Stems very slender, bearing long-stalked, kidney-shaped alternate leaves with broad crenatures. Flowers solitary, axillary, pinkish, inconspicuous. Named after J. Sibthorp, an English botanist; *europaea*, European.

DIGITALIS

Digitalis contains some 20 species, only one of which is native to Britain.

FOXGLOVE [Pl. 1] *Digitalis purpurea*

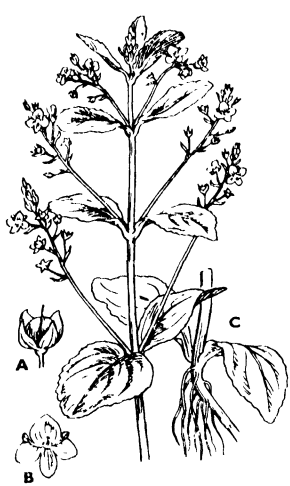
A very familiar and much-loved flower of dry waste places and woodland glades throughout the country. Grows 2–4 feet high; flowers June to September. Stems erect, downy; leaves kidney-shaped, wrinkled, lower ones tapering into winged petioles. Flowers large purple bells with dark spots and white hairs. Sepals 5, forming tube with unequal teeth; petals irregular, forming shallow-lobed bell. Stamens (2 long and 2 short) ripen before stigma. Fruit: large 2-chambered capsule, surrounded by persistent calyx and containing immense number of angular seeds. Will not grow near lime. Whole plant dangerously poisonous from alkaloid, *digitalin*, which affects the heart. *Digitalis* from Latin, belonging to the finger (hence popular name; *purpurea*, purple.

VERONICA

Veronica comprises about 200 species, extending from Europe to New Zealand. Some are annuals and some perennials. There are 17 British representatives.

BROOKLIME *Veronica beccabunga*

Common perennial of streams and ditches; flowers May to September. Stems float and root at base, inclined to be succulent, hairless. Leaves fleshy, oblong, shortly stalked. Flowers typically blue (sometimes pink), small, in racemes. *Veronica*, the classical name; *beccabunga*, from German Bachbunge, a brook.



BROOKLIME
Veronica beccabunga
(A) Fruit (B) Flower
(C) Rootstock

WATER SPEEDWELL *Veronica anagallis-aquatica*

Thick, fleshy, erect perennial of ponds and ditches. Grows 3 feet high; flowers July and August. Leaves lance-shaped, sessile. Flowers pale mauve or white, in long racemes. *anagallis* — *Anagallis*-like; *aquatica*, of water.

MARSH SPEEDWELL *Veronica scutellata*

Semi-procumbent little perennial of bogs and ditches; flowers July and August. Stems half-erect, slender; leaves lance-shaped, sessile; slightly toothed; flowers small, white and pink, in very loose racemes. *scutellata*, shield or saucer shaped.

COMMON SPEEDWELL *Veronica officinalis*

Creeping perennial of open woods and dry fields. Stems up to 1 foot long, hairy,

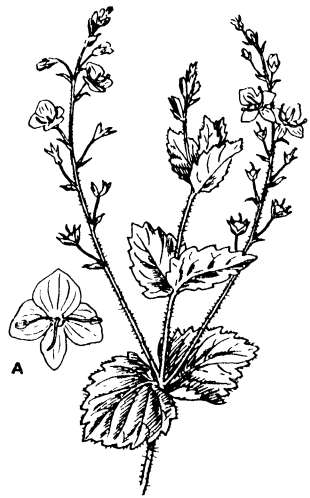
rooting as they run. Flowers very small, pale blue, in dense racemes, appearing in May to July. *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.

MOUNTAIN OR WOOD SPEEDWELL
Veronica montana

Perennial similar to Germander Speedwell. Occurs in moist, shady places, and flowers June to September. Differs in having stem hairy all round, leaves larger and stalked, and flowers smaller and paler. *montana*, of mountains.

GERMANDER SPEEDWELL
Veronica chamaedrys

Our most beautiful species, of woods, fields and waysides. Grows 6 inches high; flowers May and June. Stems at first creeping and rooting, then ascending; branches have 2 lines of delicate hairs down each inter-node. Leaves sessile, oval, opposite, coarsely toothed. Flowers massed in axillary racemes. Corolla bright blue, funnel-shaped, opening with 4 spreading lobes; dark blue lines on petals lead to nectar, which is protected by hairs. Fruit: capsule, flattened, heart-shaped, consisting of 2 compressed carpels; few-seeded. Has elected many terms of endearment among which are Blue-eye, Eyebright, Angel's-eye and Blue Stars. *chamaedrys* from Greek *chamaidrus*, ground oak, from shape of leaf.



GERMANDER SPEEDWELL
Veronica chamaedrys
(A) Flower

ALPINE SPEEDWELL *Veronica alpina*

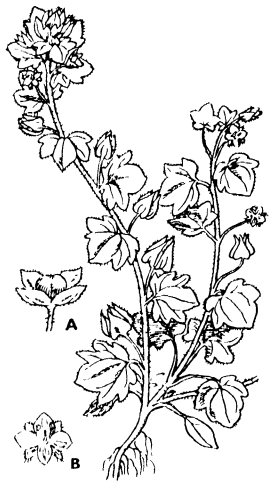
A local perennial, up to 6 inches, of Scottish Highlands, flowering July and August. Inflorescence terminal as in *V. serpyllifolia*, but with fewer, more crowded, blue flowers, pedicels shorter than calyx and capsule longer than broad. *alpina*, alpine.

THYME-LEAVED SPEEDWELL *Veronica serpyllifolia*

Creeping perennial of roadsides and pastures. Grows a few inches high; flowers May to July. Stem hairy, lying on ground, but branches ascending, forming dense leafy tuft. Leaves leathery, slightly kidney-shaped. Flowers small, pale blue, in terminal raceme. *serpyllifolia*, thyme-leaved.

WALL SPEEDWELL *Veronica arvensis*

Hairy, small annual of old walls and dry stony places. Flowers April to September. Stems ascending; leaves heart-shaped, with rounded



IVY-LEAVED SPEEDWELL
Veronica hederifolia
(A) Fruit (B) Flower

teeth ; inflorescences crowded with small, pale blue flowers with white centre. *arvensis*, of cultivated fields.

IVY-LEAVED SPEEDWELL *Veronica hederifolia*

Common in cornfields, annual, flowers April to June. Leaves stalked, lobed, heart-shaped. Flowers pale blue, solitary, stalked, from axils of leaves. Capsule has 2 seeds in each chamber. Also called Corn Speedwell, Mother of Wheat, Winterweed and Hen-bit. *hederifolia*, ivy-leaved.

BUXBAUM'S SPEEDWELL *Veronica persica*

Resembles *V. agrestis*, but larger all round. Annual weed of cultivation. Flowers March to September ; of waste ground and fields. Stems prostrate ; leaves toothed, stalked, heart-shaped ; flowers large, solitary, bright blue, with white heart. *persica*, Persian.

FIELD SPEEDWELL *Veronica agrestis*

Small annual, of fields and waste places. Flowers April to September. Stems hairy, branching, prostrate. Leaves heart-shaped, stalked, coarsely toothed. Flowers small, pale blue or white, solitary. Capsule hairy. *agrestis*, of the field.

PEDICULARIS

There are some 250 species in the genus, but only 2 are British. Most are natives of the Northern Hemisphere, and many are alpines. Partly parasitical upon various roots.

MARSH LOUSEWORT *Pedicularis palustris*

Annual of marshy places. Grows 6–18 inches high ; flowers May to September. Rises stiffly in pyramidal form out of surrounding vegetation. Stem angular, nearly hairless, deeply tinged with red, as are branches. Stem leaves partly opposite, partly alternate, twice pinnate, bright green. Calyx oval, downy, ribbed, divided into 2 main lobes, tinged with red. Corolla dull red ; has short beak on upper lip, with triangular tooth on each side. *Pedicularis* (from which alternative English name is taken) from Latin *pediculus*, a louse, because the poverty of the pasture caused by their partial parasitism, has led to a charge against these plants of producing lice in sheep ; *palustris*, of swampy places.

DWARF RED RATTLE or LOUSEWORT [Pl. 16] *Pedicularis sylvatica*

Common perennial of moist upland heaths. Grows up to 6 inches high ; flowers April to August. Tap-root thick, fleshy, slightly branched, sur-

mounted by whorl of small, undivided, kidney-shaped leaves. Branches given off from base, and lie prostrate on ground. Stems erect, leafy. Leaves feathery, fern-like. Flowers bright pink in loose spikes. Calyx bright green, angular, hairless, dividing above into about 5 leafy lobes. Corolla-tube deep, narrow, constricted, ending in 2 red lips. Fruit: 2-valved capsule, containing a few angular seeds. Seeds rattle when ripe, whence comes one of plant's popular English names. *sylvatica*, of woods.

RHINANTHUS

YELLOW-RATTLE [Pl. 16] *Rhinanthus minor*

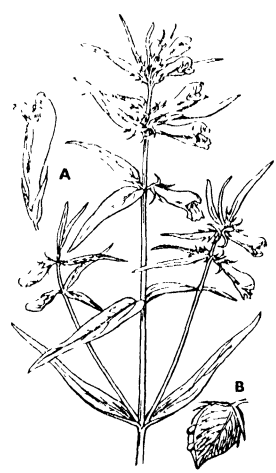
Tall, erect, stiff annual, partly parasitic upon the roots of other plants, of poor, dry pastures and meadows; conspicuous by its yellow flowers. Grows 6–12 inches high; flowers May to August. Stem square, erect. Leaves lance-shaped, narrowly pointed, sessile, deeply toothed. Flowers yellow, in leafy spike. Calyx has 4 sepals, forming a 4-toothed, light green inflated bladder. Petals 5, yellow, forming large open tube with 2-lobed upper lip, and 3-lobed lower lip. Stamens 4, protected by upper lip. When visiting insect alights on lower lip, it brushes first against projecting style (from upper lip) thus ensuring cross-pollination, and as it continues to probe for nectar at base of tube, is showered by pollen from anthers above. Fruit: large flattened capsule, surrounded by persistent calyx. Can be very damaging to grass. *Rhinanthus minor* is now divided into several microspecies, not easy to distinguish, but *Rhinanthus major*, relatively larger but less common, is recognized as distinct. *Rhinanthus* from Greek *rhinos*, a nose, and *anthos*, a flower, from peculiar shape of the flower; *minor*, lesser.

MELAMPYRUM

The genus consists of some 25 species of branched and spreading annual herbs. There are only 4 British species, of which this is the only common one.

COMMON COW-WHEAT *Melampyrum pratense*

Erect annual of dry heaths and open woods. Partly parasitic upon roots of other plants. Grows up to 12 inches high; flowers May to September. Stem bluntly 4-angled; leaves opposite, narrow, mostly entire, upper ones more or less toothed at base. Flowers pale yellow, solitary, in axils, but those at nodes are so bent as to face in one direction. Calyx persistent, tubular, divided above into 4 long, narrow, unequal lobes. Corolla has a long tube slightly dilated above, with limb divided into 2 lips; upper one short, vaulted, compressed; lower one divided into 3 obtuse lobes. Stamens 4, with anthers converging under upper lip and forming



COMMON COW-WHEAT
Melampyrum pratense
(A) Flower (B) Fruit

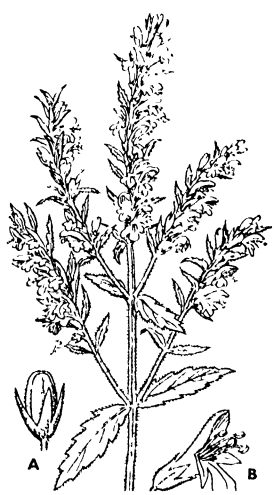
'pollen-box'. Visiting bees inevitably unlock this box and get showered with pollen. This is known as the 'loose-pollen mechanism'. If insect visits do not occur, anthers fall apart and self-pollination may apparently take place. Fruit: capsule containing 1 or 2 oblong, smooth, white seeds in each cell. Seeds resemble grains of wheat, thus gaining for the plant its popular name. Prefix 'Cow' denotes their worthless nature. *Melampyrum* from Greek *melas*, black, and *puros*, wheat; *pratense*, of meadows.

Three very local species occur in addition to *M. pratense*. Crested C. (*M. cristatum*) of woods in the East has a 4-sided, very dense spike of yellow flowers tinged with purple; Field C. (*M. arvense*) of cornfields in the South-East has a laxer conical spike of variegated flowers, pink and yellow. The Wood C. (*M. sylvaticum*) of northern woods differs from *pratense* in a shorter yellow flower, tube about the same length as calyx, the teeth of which are spreading. *cristatum*, crested; *arvense*, of arable land; *sylvaticum*, of woods.

EUPHRASIA

EYEBRIGHT — *Euphrasia officinalis*

Pretty little annual, partly parasitic upon roots of grasses, of commons, meadows and heaths. Grows a few inches high; flowers May to September. Stem strong with branches in opposite pairs. Leaves sessile, in opposite pairs, broad oval, dark green, deeply toothed. Flowers small, in dense terminal spikes. Corolla may be almost completely yellow, or white or lilac with purple veins and spots. Central lobe of lower lip is generally yellow. Fruit: oblong capsule with numerous minute seeds. Popular name refers to its reputed properties as an eye lotion. This species is split into many microspecies. *Euphrasia*, the classical name; *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.



RED BARTSIA
Odontites verna
(A) Fruit (B) Flower

ODONTITES

RED BARTSIA — *Odontites verna*

Erect branching annual of waste places and dry fields, partly parasitic on the roots of other plants. Grows 9 inches high; flowers June to August. Stem erect, smooth, wiry, 4-angled. Leaves narrow, lance-shaped, in opposite pairs, with toothed edges. Flowers dull red, downy, in long one-sided racemes. Corolla with an open tube and hairy anthers close together over mouth. Fruit: oblong capsule surrounded by persistent calyx. Also called Red Eyebright. *Odontites*, a plant good for the toothache; *verna*, spring.

BARTSIA

ALPINE BARTSIA — *Bartsia alpina*

A local and rare northern alpine perennial, 4–8 inches, flowering June to August. Similar to *Parentucellia*, but with purple flowers on a short inflorescence and a broad capsule with few large seeds. Named after J. Bartsch, a Dutch physician. *alpina*, alpine.

PARENTUCELLIA

YELLOW BARTSIA — *Parentucellia viscosa*

An erect annual, 6–18 inches, of damp, grassy places in the West and South, flowering July to October. Stem round, simple, bearing toothed, opposite leaves. The flowers are two-lipped, the upper hood-like and shorter than the lower, yellow. Inflorescence somewhat crowded at the top. Fruit a narrow capsule with many small seeds. Whole plant characteristically covered with sticky hairs. Named after T. Parentucelli, founder of Botanic Garden at Rome; *viscosa*, sticky.

THE BROOMRAPE FAMILY

OROBANCHACEAE

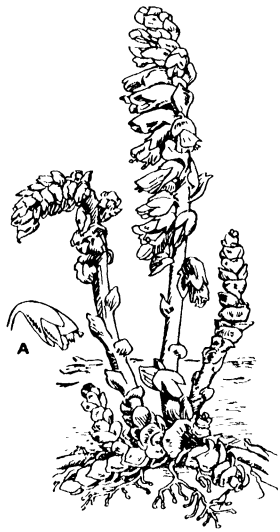
A small family of herbaceous root parasites, destitute of true foliage leaves and mostly perennial. They include about 12 genera, with 150 species in all, 90 of which belong to the genus *Orobanche*. They are chiefly natives of the warm and temperate regions of the Old World, 6 genera and 90 species being recorded from Europe, with 2 genera and 10 species in Britain.

Leaves and bracts are reduced to scales, and corolla is 2-lipped and irregular. All 4 stamens (2 long and 2 short) are attached to corolla-tube.

LATHRAEA

TOOTHWORT — *Lathraea squamaria*

Bizarre perennial herb, resembling the Broomrapes, parasitic in humus on roots of Elm, Hazel, Beech or Lime trees. Grows about a foot high; flowers March and April. Rhizome thick, freely branching, fleshy, cylindrical, giving off slender rootlets, and thickly covered with white fleshy, tooth-like scales in opposite pairs, giving a quadrangular outline to the whole shoot. Rootlets swell out into tubercular bases at their points of attachment to tree-roots. Scales end above in a blunt point, being in reality bent back upon themselves, so that a hollow cavity, branching out irregularly into from 5 to 13 lateral spaces with wavy outlines, is formed in interior of each scale. Inner surface of cavity is thickly set with both stalked and sessile glands. A theory is widely held that many small mites



TOOTHWORT
Lathraea squamaria
(A) Flower

enter these cavities, where reaction is acid, and certain foods are sucked out of their bodies. Flowering branch rises from ground, much bent over to one side, bearing bracts, similar to scales of rhizome but more loosely arranged, with an almost sessile flower drooping in axil of each. The whole forms a 2-rowed raceme 4–6 inches long, straightening itself as flowers open. Calyx white, hairy at base, bell-shaped, 4-lobed, with 2 posterior ones the larger. Corolla-tube also white, but limb divides into 2 pale purplish lips, upper one arched, either entire or 2-lobed, and lower one smaller, 3-lobed. Nectar abundantly secreted in nectary below lower surface of ovary. Stigma 2-lobed, maturing before anthers, and at first projecting beyond hood of corolla. Pollination mainly by humble-bees. Fruit : one-chambered, oval ovary develops into capsule which when half-ripe is so like a human tooth in form and colour that some people ascribe plant's name to this feature and not to leaf-scales. Ripe capsule has thin wall which bursts elastically, releasing many seeds. Although not beautiful this is an interesting and highly specialized plant. *Lathraea* from Greek *lathraios*, hidden, referring to shady spots in which plant grows ; *squamaria* from Latin *squama*, a scale.

OROBANCHE

There are 11 species of this genus in Britain, but only 2 are common.

BLUE BROOMRAPE — *Orobanche purpurea*

Blue Broomrape differs from the other species in having flowers with 1 bract and 2 bracteoles. Found locally in coastal districts of our eastern and southern counties. Flowers June to October. Stem slender, purplish blue, about 1 foot high. Flowers with pale blue corolla-lobes and white stigma. *Orobanche*, from Greek *orobos*, vetch, and *anchein*, to strangle, literally translated in the local name of Strangletare. *purpurea*, purple.

GREATER BROOMRAPE — *Orobanche rapum-genistae*

Perennial similar to *O. elatior*, but more widely distributed, parasitic mainly on Furze, Broom and other leguminous plants. Flowers June to August. Grows 1 to 2 feet high. Calyx-lobes may be 1, 2 or 3, and flowers are at first yellow, becoming dull purplish. Stigma—lobes yellow ; stamens inserted at base of corolla-tube. *rapum-genistae*, Broom rape.

RED BROOMRAPE *Orobanche alba*

Daintiest species of all, parasitic on Wild Thyme, chiefly found in W. Britain and Ireland. Flowers June to August. Stem slender, up to 1 foot high. Flowers reddish, with stigma lighter shade than corolla. *alba*, white.

CLOVE-SCENTED BROOMRAPE *Orobanche caryophyllacea*

Uncommon Kentish species, parasitic on Bedstraws. Stem 1 foot high, reddish brown. Flowers June. Flowers reddish brown with dark purple stigma. *caryophyllacea*, clove-coloured.

TALL BROOMRAPE *Orobanche elatior*

Perennial, generally parasitic on roots of Great Knapweed. Grows about 2 feet high; flowers June to August. Stem short, fleshy, stout, underground, developing into aerial many-flowered scape, dead-brownish. Leaves replaced by scales. Flowers numerous, yellow, in axils of narrow brown bracts, generally sessile, on somewhat fleshy axis. Calyx 2-lobed, persistent in fruit, as is corolla-tube. Corolla arched, divided above into 2 gaping lips, yellow tinged with purple, upper lip or hood being 2-lobed, lower being divided into 3 spreading lobes. Stamens 4, attached to petals; filaments dilated and hairy at base; anthers split lengthwise. Stigma yellow, bi-lobed, projecting beyond anthers. Fruit: capsule splitting into 2 valves releasing many minute wrinkled seeds. Contains bitter, acrid and astringent principles; formerly but not now used medicinally. Derives its entire food from roots of host-plant whose tissues it penetrates. *elatior*, taller.

LESSER BROOMRAPE *Orobanche minor*

A variable plant, most commonly found on Clover to which it is often very destructive, so that Kentish farmers sometimes call it Devil's-root or Hell-root. Flowers June to October. Stem slender, 1–2 feet, yellowish brown. Flowers with purple stigma. Back of corolla-tube slightly curved throughout. *minor*, lesser.

IVY-BROOMRAPE *Orobanche hederae*

Very rare species, always confined to roots of Ivy. Flowering June and July. Stem up to 2 feet high, purple. Flowers rather distinct cream coloured with purple veins; stigma yellowish. Back of corolla-tube strongly curved near base, then almost straight. *hederae*, of ivy.

THE BUTTERWORT FAMILY

LENTIBULARIACEAE

Lentibulariaceae includes only 5 genera with some 250 species between them. All the members of this family are aquatic or marsh plants, with insectivorous functions.

PINGUICULA

PALE BUTTERWORT *Pinguicula lusitanica*

P. vulgaris is replaced in the south-western bogs by this smaller, paler perennial. Grows 3 or 4 inches high ; flowers June to October. Leaves thin, small ; corolla very pale lilac, inconspicuous, with almost equal lips and short, blunt spur. *Pinguicula* from Latin *pinguis*, fat, with reference to greasy surface of leaf; *lusitanica*, Portuguese.



COMMON BUTTERWORT
Pinguicula vulgaris
(A) Calyx (B) Flower

COMMON BUTTERWORT *Pinguicula vulgaris*

Small perennial of boggy moors and mountains mostly in Western Britain. Grows up to 6 inches high ; flowers May to July. Leaves all radical, in rosette, entire, pale yellow, surface covered with a sticky substance. When an insect alights on this surface, the edges roll up inwards, trapping the insect, and certain glands secrete a digestive juice which helps the leaf to absorb nitrogenous parts of the insect. Flowers solitary, violet, on leafless purplish stalks from centre of rosette of leaves. Calyx persistent, 5-lobed ; corolla of 5 united petals, forming spurred, 2-lipped tube. Stamens 2, with 2-valved anthers ; ovary single-chambered, topped by short, thick style, and unequally 2-lobed stigma. Fruit : 2-valved, 1-celled capsule. Flowers bear a superficial resemblance to Violets and this species is sometimes known as Bog or Marsh Violet. *vulgaris*, common.

UTRICULARIA

GREATER BLADDERWORT *Utricularia vulgaris*

Fairly common aquatic perennial of stagnant water in ponds, ditches and bogs. Flowers July and August. Absolutely rootless, with stems and leaves floating submerged in an intricate, root-like mass just below surface of water. Leaves very much divided into small, slender thread-like pointed segments. Generally near base of leaf segment, on short footstalk, are little bladder-like traps, representing modified leaf-segments. They are translucent and pale green, opening by an elastic trapdoor-like valve fringed with sensitive hairs. When a small creature touches these hairs the door swings open inwards and sucks creature in with a rush of water. Inside the bladder it swims about until asphyxiated, for the valve is now closed. Certain glands lining bladder walls absorb liquid products of decaying prey. Flowers rather large, yellow, borne in a simple, few-flowered raceme. Calyx deeply bi-lobed ; corolla mask-like, with undivided upper lip, prominent orange palate or lower lip, and nectar-containing spur to this. Stamens 2, so bent that their anthers burst downwards. Style short, with 2 unequal stigma lobes, larger of which

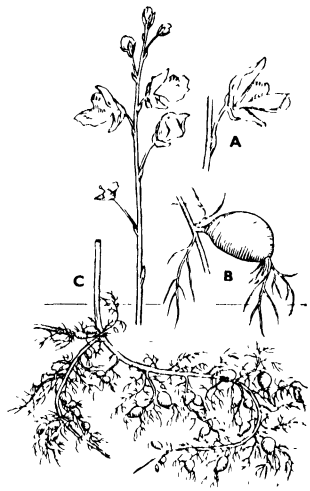
projects beyond anthers. Fruit : globose capsule, embraced by persistent calyx, containing many rather angular seeds. Although the plant does rise and sink periodically the bladders have no effect on these movements and seem to be provided solely as a means of trapping small creatures. *Utricularia* from Latin *utriculus*, a little bladder ; *vulgaris*, common.

INTERMEDIATE BLADDERWORT
Utricularia intermedia

Rather smaller in habit than previous species, but otherwise very similar, growing in same places. Flowers July to September. Leaves rather flat, all spreading in one plane, bristly ; bladders borne on leafless branches. Flowering stem (which is rarely produced) stout, with few pale yellow flowers ; lower lip twice as long as upper ; nectariferous spur sharply pointed. *intermedia*, intermediate.

LESSER BLADDERWORT *Utricularia minor*

Resembles 2 previous species but altogether smaller, of similar situations. Flowering stems project about 3 inches out of water ; flowering June to September. Leaves smaller, roundish in section, with fewer forked lobes. Bladders on slender stalks. Flowers rather more numerous, very pale yellow, lips about equal in length, with only a very slight spur to lower one. *minor*, lesser.



GREATER BLADDERWORT
Utricularia vulgaris

(A) Flower (B) Bladder
(C) Root-like stems below the water.

THE VERVAIN FAMILY

VERBENACEAE

The family includes about 80 genera and 800 species, of which only 3 are European and 1 British.

VERBENA

Verbena comprises nearly 200 species, only 2 being European, including 1 British. They are herbs and small shrubs, with 4-angled stems.



VERVAIN *Verbena officinalis*

Straggling perennial of waysides and waste places. Grows up to 2 feet high ; flowers July to September. Stems tough, wiry, 4-angled. Leaves oblong, rough, opposite. Flowers lilac, in terminal spikes or racemes, with bracts. Nectar is secreted by ring-shaped disk below ovary, and protected by ring of hairs in tube of corolla. Only 1 fork of the style becomes stigmatic. Fruit : 4-ribbed nutlets. Anciently used as a charm against evil spirits. *Verbena* is the classical Roman name for this plant ; *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.

VERVAIN
Verbena officinalis

(A) Inflorescence (B) Flower

THE MINT FAMILY

LABIATAE

A very large and clearly defined family with about 3,000 species in about 150 genera. They are all herbs or undershrubs, with their chief centre in the Mediterranean. They have square stems, opposite, simple leaves without stipules. Flowers irregular, solitary or in axillary cymes. Calyx tubular, 5-cleft, persistent. Corolla tubular below, opening into 4 or 5 lobes, with 2 lips. Stamens 4, attached to corolla-tube. Fruit : 2 carpels forming 4 1-seeded nutlets. Generally have strong aromatic but pleasant perfumes, due to many oils, especially in leaves.

MENTHA

A genus of mainly waterside plants characteristic for their sweet-smelling oils. There are perhaps 40 species in the genus and the number of British species is about 16. The species are very variable, and they often produce hybrids. All are perennial herbs with creeping rhizomes and small flowers crowded into many-flowered whorls.

PENNYROYAL *Mentha pulegium*

Leaves slightly toothed, small, on very short stalks. Flowers in axils of widely separated leaf bracts. Calyx slightly 2-lipped and hairy, throat closed with hairs. *Mentha* was the name of a beautiful nymph ; *pulegium*, origin obscure.

CORN MINT *Mentha arvensis*

Perennial of corn and other arable fields, growing up to 1 foot high; flowering, like all species, in August and September. Rootstock suckering. branches spreading; leaves with blunt teeth. Calyx and corolla both hairy, the latter purplish. *arvensis*, of cultivated fields.

WATER MINT [Pl. 16] *Mentha aquatica*

Commonest British species and most variable. Found in marshes and wet places. Grows 2-3 feet high; flowers August and September. Stems square, generally covered with short hairs pointing downwards. Leaves stalked, broad-oval, toothed, pointed, downy above and below, often darkly tinged with purple. Flowers pale lavender, usually collected into rounded axillary and terminal heads. Flower-stalks densely covered with white recurved hairs. Calyx covered with hairs of various lengths and corolla is externally hairy. Fruit: 4 nutlets. Scent varies from a fetid pungent odour to a camphor-like smell. *aquatica*, of water.

PEPPERMINT *Mentha piperita*

Perennial of moist places, with a smooth stem, stalked, conspicuously toothed leaves, and dense whorls of lilac flowers arranged in spikes. Stamens are exserted. *piperita*, pepper-like.

SPEARMINT *Mentha spicata*

This species, used so much in the kitchen, is often cultivated. Naturalized in many places by roadsides and waste ground. Stem, leaves, flower-stalks and calyx are glabrous. Flowers lilac, in terminal cylindrical spike. *spicata*, spicate.

HORSE-MINT *Mentha longifolia*

A perennial, 2 or 3 feet high, whose stem is white with woolly hairs. Leaves sessile, sharply toothed. Flowers lilac, in unbroken spikes. *longifolia*, long-leaved.

ROUND-LEAVED MINT *Mentha rotundifolia*

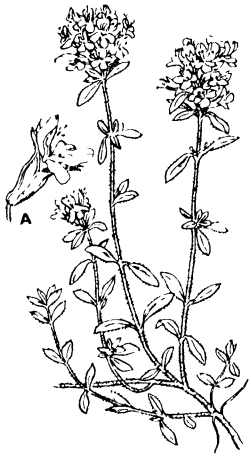
Leaves sessile, round-toothed, with wrinkled upper surface. Flowers in dense whorls, pink (sometimes white) in interrupted terminal spikes. *rotundifolia*, round-leaved.

LYCOPUS

The genus is a small one, including at most some 10 species of marsh plants, and represented in this country by a single species.

GIPSYWORT *Lycopus europaeus*

Common perennial herb on banks of streams, ditches and pools; said to prefer clear water and a sandy or gravelly soil. Grows up to 3 feet; flowers June to September. Rhizome creeping, slender, with runners given off. Aerial stem erect, acutely 4-angled, generally branched. Leaves slightly stalked, pinnately lobed; often with shallow lobes. Whole plant has a yellowish-green tint. Flowers small, white, sometimes with



WILD THYME
Thymus serpyllum
(A) Flower

a faintly bluish tint, with anterior petal dotted with red. Throat of corolla is densely hairy. Fruit : 4 nutlets supported on a large nectar-secreting disk. Called Gipsywort because formerly used by gipsies and vagabonds who stained their skins with its juices. *Lycopus* from Greek *lukos*, wolf, and *pous*, foot, probably referring to shape of leaves ; *europaeus*, European.

ORIGANUM

MARJORAM — *Origanum vulgare*

A common plant in dry, hilly districts, especially on chalk. Rootstock perennial, stems annual, 2 feet high ; flowers July to September. Rootstock short, woody, sending out runners. Stem thin, woody, erect, tough, hairy. Leaves in opposite pairs on long stalks, generally untoothed. Flowers purple, in crowded, terminal, globular heads, at end of branch stems. Each flower subtended by a purple or green bract. Calyx with 5 nearly equal teeth, spotted with yellow. Corolla-tube almost regular, although upper lip is distinctly 2-lobed, and lower one 3-lobed. There are 2 kinds of flower—the larger perfect, and the smaller exclusively female. Fruit : 1-seeded nutlets. Highly aromatic ; generally surrounded by clouds of insects. *Origanum* from Greek *oros*, a hill, and *ganos*, brightness (it brightens the hillsides) ; *vulgare*, common.

THYMUS

WILD THYME — *Thymus serpyllum*

Densely branched perennial of dry pastures and high heaths. Grows a few inches high ; flowers June to September. Stem prostrate, creeping, equally hairy all round, almost woody at base. Leaves very small, oval, stalked. Flowers rosy purple, in dense terminal whorls which resemble spikes. Calyx irregular, 2-lipped, with 3 long-ciliate teeth in upper and 2 in lower. There are 2 types of flower, large and small ; the former are male only, the latter bi-sexual. Fruit : single-seeded nutlets. The whole flower has a strong, not unpleasant scent and produces copious amounts of honey. The cultivated herb is *T. vulgaris*, in varied forms, an alien. *Thymus drucei*, the commonest form, is now separated, as having stem hairy on two opposite sides ; and *Thymus pulegioides* is recognized by having hairs on the angles only. *Thymus* is the old Greek name ; *serpyllum*, the Latin name.

CALAMINTHA

COMMON CALAMINT — *Calamintha ascendens*

A tall hairy perennial of dry woods and hedgerows. Grows up to 3 feet high ; flowers July to September. Rootstock creeping ; stem with many long branches. Leaves egg-shaped, round-toothed. Flowers in

one-sided whorls, purple streaked with white. Calyx-tube straight. *Calamintha* from Greek *kalos*, beautiful, and *mentha*, mint ; *ascendens*, curving upwards.

ACINOS

The genus is represented in this country by only 1 species.

BASIL THYME — *Acinos arvensis*

Common annual or biennial herb of dry banks and fields throughout the country. Grows up to 6 inches high ; flowers July and August. Stem prostrate at first, then ascending. Leaves egg-shaped, sharply pointed, faintly toothed, on short stalks. Flowers bright purple, spotted with white and darker purple, in dense whorls. There are leafy bracts just underneath these whorls. Fruit : single-seeded nutlets. Especially plentiful on chalk downs. Calyx-tube curved. *Acinos*, a fragrant plant ; *arvensis*, of cultivated fields.

CLINOPODIUM

WILD BASIL [Pl. 16] — *Clinopodium vulgare*

A hairy perennial of dry copses, hedgerows and stony places. Grows up to 3 feet high ; flowers July to September. Rootstock woody, sending out runners. The thin stem is generally unbranched but bears scattered, egg-shaped, rather large leaves. Flowers rosy purple, hairy, crowded whorls, with 2 lips. Calyx-tube curved. *Clinopodium*, Greek name for the plant ; *vulgare*, common.

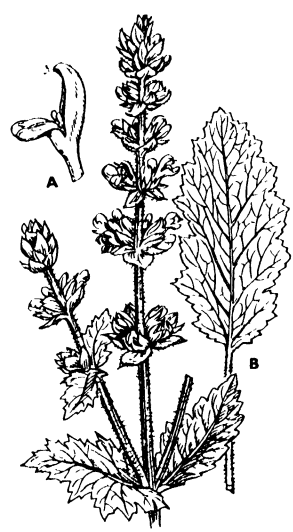
SALVIA

MEADOW CLARY or SAGE [Pl. 16] — *Salvia pratensis*

A rare perennial, found only in a few southern counties. Grows 18 inches high ; flowers June to August. Distinguished by soft wrinkled leaves and large bright blue flowers in long spikes, and upper lip glandular outside. *Salvia* from Latin *salvo*, to save, from the plant's reputed medicinal properties ; *pratensis*, of meadows.

CLARY — *Salvia verbenaca*

Perennial of dry fields, roadsides and waste places ; not very common in this country. Grows up to about 2 feet ; flowers June to September. Rootstock woody ; stem erect, square, leafy. Lower leaves on long stalks, oblong, irregularly toothed or lobed ; stem leaves sessile, opposite, rather triangular, reducing in size higher up ; leaf stalks tinged with



CLARY
Salvia verbenaca
(A) Flower (B) Lower leaf

crimson. Flowers purplish blue in whorls of 6. Calyx large, bell-shaped, hiding corolla-tube. Corolla 2-lipped, with hood-like upper lip, which is not glandular outside. Stamens 2. Ovary 4-lobed. Fruit : 4 nutlets. An eye-wash was once made from seeds soaked in water. Clary Water, a cordial, was formerly made by mixing flowers with brandy and cinnamon. *verbenaca,* verbena-like.

MELITTIS

BASTARD BALM [Pl. 17] *Melittis melissophyllum*

Rare but very striking perennial of woods in the West of England. Grows up to 2 feet high ; flowers May and June. Leaves oval, shortly stalked and coarsely toothed. Flowers large in the axils of the upper leaves, the corolla over 1 inch long, cream inside and pink outside. Fruit 4 smooth nutlets. *Melittis* from *mel,* honey ; *melissophyllum,* with leaves like Melissa.

PRUNELLA

Prunella comprises about 6 species of low-growing, hairy perennial herbs. There are 2 British species.

SELF-HEAL [Pl. 17] *Prunella vulgaris*

Common pasture plant, frequent in waste places, especially in moist grass. Grows a few inches to a foot high ; flowers July to September. Rhizome creeping ; aerial stems short, sometimes branched. Leaves stalked, oval-oblong, paler underneath, downy along chief veins. Flowers generally purple, sometimes pink or white. Large leafy bracts in flower-heads, have purplish edges. Calyx 2-lipped, segmented, with purple edges. Flowers collected in whorls of about 6 flowers to each. Dimorphic, i.e. there are large and small flowers, the former perfect—latter without anthers. Fruit : 4 smooth nutlets enclosed by withered calyx. Also called Carpenter's-herb, Hook-heal, etc. Foliage is not aromatic nor are flowers scented. Anciently believed to be a universal panacea, especially for all types of wounds. *Prunella* is a corruption of *Brunella* from German Braune, quinsy, which it was supposed to cure ; *vulgaris,* common.

There is a very rare British species, *P. laciniata,* recorded from the Mendips in Somerset, the North Downs in Surrey, chalk downs in Berkshire and limestone hills in Gloucestershire. It has pinnately divided upper leaves, longer calyx teeth, and a larger, cream-coloured corolla. *laciniata,* cut-leaved.

STACHYS

The genus comprises some 200 species, of which there are more than 50 European species, including 6 English—4 of these occurring in Scotland and Ireland. They are mostly herbaceous.

WOOD BETONY [Pl. 17] *Stachys officinalis*

Hairy perennial of thickets, copses and pastures. Grows up to 2 feet high ; flowers June to August. Root leaves form basal tuft ; stem leaves thick, heart-shaped. Flowers hairy, purplish, in dense spikes ; calyx

teeth prickly, stiff; anther-cells parallel. *Stachys*, from Greek *stachys*, a spike, referring to the flowers; *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.

CORN or FIELD WOUNDWORT — *Stachys arvensis*

Annual weed in cornfields, weak, small, spreading, only a few inches high; flowers April to November. Stem procumbent, branching from base. Leaves long, oval. Flowers with white corolla shading into pink; anthers and stigmas mature simultaneously. Also called Field Woundwort. *arvensis*, of cultivated fields.

MARSH WOUNDWORT — *Stachys palustris*

Perennial resembling *S. sylvatica* in growth, but found on river banks and similar moist, shady places. Grows up to 3 feet high; flowers July to September. Stem hollow, stouter and less hairy. Leaves longer, narrower, lance-shaped, on shorter stalks. Flowers in interrupted spike, of a paler purple; odour much fainter. *palustris*, of marshes.

HEDGE WOUNDWORT [Pl. 17] — *Stachys sylvatica*

Common hairy perennial of shady places in ditches and woods. Grows 3 or 4 feet high; flowers July to September. Stems tall, erect, solid, soft, hairy, evil-smelling, much branched. Leaves large, stalked, heart-shaped with tooth edges and pointed tips. Flowers crimson, in long, attractive, terminal spikes. Calyx 5- or 10-ribbed, with 5 equal teeth. Corolla-tube as long as calyx, with arched upper lip, and lower one divided into 3 unequal lobes. Stamens have parallel filaments and smooth anthers. Fruit: 4 nutlets, blackening as they ripen. Corolla-tube sometimes contains nectar for a quarter of its length. 'Woundwort' refers to former use of plant's fresh leaves as a styptic. *sylvatica*, of woods.

BALLOTA

BLACK HOREHOUND — *Ballota nigra*

Fairly common perennial of hedgebanks and roadsides. Grows 2 or 3 feet high; flowers June to September. Stem stout, hairy, branched; leaves heart-shaped lower down, oval above, wrinkled, stalked, toothed. Flowers reddish purple, with awl-shaped bracteoles, in dense whorls. Calyx ribbed, tubular, with 5 teeth. Corolla spreads out into 2 lips, upper one hairy, lower one divided into 3 lobes. Fruit: 4 polished, triangular nutlets, brown. Also called Foetid Horehound. Rare in Scotland and Ireland. *Ballota* is the old Greek name; *nigra*, black.

GALEOBDOLON

YELLOW ARCHANGEL [Pl. 12] — *Galeobdolon luteum*

Attractive and distinctive perennial, of woods and thickets. Grows up to 2 feet high; flowers May and June. Similar to *L. album* but is taller, not so densely branched, and its leaves are much narrower. Flowers golden yellow, in distant whorls, lower being spotted and veined with brown. Corolla has short tube and anthers have no hairs. Called Weasel-snout. *Galeobdolon*, from *galea*, a weasel, *bdolos*, stench; *luteum*, yellow.



WHITE DEAD-NETTLE
Lamium album
(A) Flower

LAMIUM

The genus comprises some 40 species of herbaceous plants, natives of temperate regions. There are 6 British species.

HENBIT *Lamium amplexicaule*

Spreading, branched annual, of waste places. Grows 6 inches high ; flowers April to August. Lower leaves small, upper leaves sessile. Flowers rose-coloured, some remaining closed in spring and becoming self-pollinated while in bud (cleistogamous). Calyx is hairy and bracts are broad, overlapping. *Lamium* from Greek *lamios*, throat, with reference to corolla-tube ; *amplexicaule*, with leaves that clasp the stem.

RED DEAD-NETTLE [Pl. 12] *Lamium purpureum*

A smaller plant than the next, common on all waste ground. Annual, grows about 8 inches high ; flowers April to October. Leaves heart-shaped, shortly stalked. Flowers purplish red, crowded at top of stem. Bases of flower-bracts do not overlap. *purpureum*, purple.

WHITE DEAD-NETTLE *Lamium album*

Spreading perennial of hedgerows, banks and waste places. Grows about 1 foot high ; flowers May to December. Rootstock slightly creeping. Stem square, hairy ; leaves hairy, opposite and distinctly toothed, very closely resembling those of unrelated Stinging Nettle. Flowers pure white, in whorls of 6–10, scentless, with leafy bracts. Calyx tubular, rigid, persistent. Corolla has well-developed hood. Stamens 4, parallel, with hairy anthers. Fruit : 4 nutlets. Flowers contain much nectar and whole plant has pungent aromatic smell. Also called White Archangel. Readily distinguished from true Nettle by square stem. *album*, white.

GALEOPSIS

NARROW-LEAVED HEMP-NETTLE [Pl. 17] *Galeopsis angustifolia*

A softly downy annual, smaller than *G. tetrahit* (about 9 inches high), of similar situations. Flowers July to October. Stems not swollen at joints. Corolla rose-coloured, mottled with crimson and yellow. *Galeopsis*, from Greek *galea*, a weasel, and *opis*, appearance, due to flower's likeness to a weasel's head ; *angustifolia*, narrow-leaved.

COMMON HEMP-NETTLE [Pl. 17] *Galeopsis tetrahit*

Common annual of cornfields and waste places near cultivated ground. Grows 3 feet high; flowers July to September. Stem squarish, hairy, with spreading branches swollen below the joints. Leaves large, long-stalked, coarsely toothed. Flowers yellow and purple, or white, in dense whorls, with leafy bracts just below. Calyx bell-shaped, 5-toothed; corolla-tube straight, with teeth between the lobes of the lips. Fruit: 4 nutlets. *tetrahit*, from *tetra*, four, referring to the square stem.

LARGE-FLOWERED HEMP-NETTLE [Pl. 17] *Galeopsis speciosa*

Annual weed of sandy and peaty fields, mainly in the North. Similar to *G. tetrahit* but rather larger, with more pointed leaves and much larger flowers. Corolla yellow with a purple mark on lower lip. *speciosa*, beautiful.

NEPETA

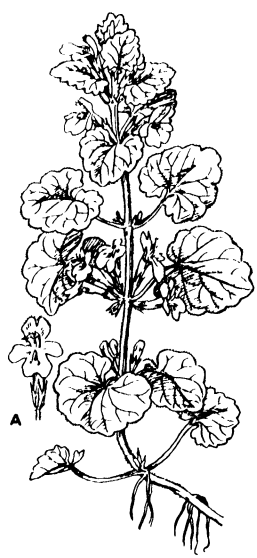
CATMINT *Nepeta cataria*

An uncommon perennial, of banks and waste places. Grows 2–3 feet high; flowers July to September. Stem erect, leafy, downy, whitish. Leaves heart-shaped, sharply toothed. Flowers white, in terminal whorls, and anthers parallel. *Nepeta*, the classical Latin name; *cataria*, of cats.

GLECHOMA

GROUND IVY *Glechoma hederacea*

An attractive, trailing, perennial, generally distributed in shady places; one of the first flowers of spring. Grows 6–12 inches high; flowers March to June. Stem slender, square, procumbent, creeping and rooting at joints. Leaves on long stalks, kidney-shaped, deeply round-toothed. Flowers purplish blue (each flower stalked), in comparatively scattered whorls, from the axils of leafy bracts. Corolla-tube long, enclosing converging anthers. Fruit: 1-seeded nutlets. Also called, among other names, Ale-hoof and Tun-hoof, having once been used in brewing. Has little or none of the aromatic properties general in the family, and therefore put to no domestic use. *Glechoma* is the classical Greek name; *hederacea*, ivy-like.



GROUND IVY
Glechoma hederacea
(A) Flower

MARRUBIUM

WHITE HOREHOUND *Marrubium vulgare*

An erect perennial, 1–2 feet, of waste places and downs, not common, flowering July to October. Stem with short rhizome, branched,

bearing whorls of small, whitish flowers. Leaves roundish, bluntly toothed, rough, lower on long stalks, more whitely-hairy beneath. Corolla 2-lipped; calyx with 10 hooked teeth. *Marrubium*, the classical name; *vulgare*, common.

SCUTELLARIA

Scutellaria comprises about 180 species, and is almost cosmopolitan in distribution. There are about 12 European species, but only 2 are British.

SKULL-CAP [Pl. 17] *Scutellaria galericulata*

Handsome, slender, perennial herb, fairly common on banks of rivers and ponds throughout Britain. Grows 12–18 inches high; flowers July to September. Rhizome creeping, sending up stiff, erect, leafy aerial stem with spreading branches. Stem and leaves are deep green, often tinged with violet, smooth or slightly downy. Leaves 1 or 2 inches long, shortly-stalked, lance-shaped. Flowers scentless, bright violet-blue, solitary in axils, but appear as if in pairs. Calyx bell-shaped below, 2-lipped above, each lip slightly divided. Behind this lip is a broad, flat, hollow pouch. After the corolla falls, this pouch acts as a hinge, and the upper lip above it falls forward over fruit. Corolla larger than calyx, white inside, marked with nectar-guides. Fruit: 4 nutlets, borne on elongating, nectar-secreting axis. Common English name comes from peculiar shape of calyx, as do Latin generic and specific names. *Scutellaria* from *scutella*, a little dish; *galericulata*, from *galericulum*, a small hood.

LESSER SKULL-CAP *Scutellaria minor*

A similar perennial but much smaller and more slender; of bogs, especially in West of England. Grows 4–8 inches high; flowers July to October. Leaves small, oval, almost sessile and entire. Flowers small, axillary, pale purple, lip white spotted with red. Calyx downy, with a pink hood. *minor*, smaller.

A hybrid between the 2 British species is common at Virginia Water on the borders of Surrey and Berkshire.

TEUCRIUM

The genus comprises about 100 herbaceous or slightly woody plants, practically cosmopolitan. All are downy or hairy, bitter and aromatic; several giving off a garlic-like smell when they are bruised. There are 4 British species.

WATER GERMANDER *Teucrium scordium*

A rare, creeping perennial, 1–2 feet long, of S. England and Ireland, flowering July to September. Stems ascending from a procumbent rooting base. It differs from *T. scorodonia* in having axillary whorls of purple flowers and bracts similar to the leaves. *Teucrium*, from Greek *Teukrion*, a name given in commemoration of Teucer, first King of Troy, who is

said to have discovered medicinal value of some such plant ; *scordium*, a classical plant name.

CUT-LEAVED GERMANDER *Teucrium botrys*

A rare annual, of chalky fields in the South, up to 1 foot, flowering July to September. It differs from other species in its deeply-cut leaves. Inflorescence a spike of whorled purple flowers. *botrys*, a classical plant name.

WOOD SAGE [Pl. 12] *Teucrium scorodonia*

Very abundant perennial, common on sandy banks and open heaths, and woods on similar soil. Grows 1 or 2 feet high ; flowers July to September. Rhizome creeping, woody, producing underground suckers, and sending up erect, stiff, acutely 4-angled, hairy aerial stems. Leaves all shortly stalked, variously oval, heart-shaped and kidney-shaped, much wrinkled, downy and sage-like, but green on both sides. Flowers small, cream-coloured, in terminal and lateral clusters. Calyx pouched at base and divided above into 2 lips—the one behind consisting of a single sepal, and the front lip of the 4 others, which are small and incurved. Fruit : 4 brown nutlets. Also called Wood Germander and Garlic Sage. Said to have been used as a substitute for Hops in brewing. *scorodonia*, derived from Greek *skorodon*, garlic, with reference to its odour when bruised.

AJUGA

The genus comprises 4 British species, 2 of which are rare.

GROUND PINE *Ajuga chamaepitys*

Rare annual, confined to chalky fields in S.E. England. A cornfield weed, unpleasantly clammy and pungent, grows 6 inches high ; flowers May to September. Stem branched, spreading, often reddish brown, viscidly hairy. Leaves hairy, light green, divided into 3 linear segments almost to the base. Flowers yellow, dotted with red, short-stalked. *Ajuga*, the classical name ; *chamaepitys*, ground pine.

COMMON BUGLE [Pl. 12] *Ajuga reptans*

Familiar perennial of meadows and coppice-woods, especially on moist, clayey ground. Grows 6–12 inches high ; flowers April to July. Rhizome short, thick, sending out slender, ascending, leafy suckers. Aerial stems have 2 lines of hairs running down opposite sides, shifting to the other 2 sides at each node. Leaves opposite, simple, without stipules, radical ones on long stalks, stem ones sessile ; under sides generally darkened or reddened with anthocyanin. Flowers generally bluish purple (occasionally white or pink) in tightly packed whorls. Calyx bell-shaped, divided into 5 nearly equal segments. Corolla has very short, erect, 2-lobed lip, and a much longer, spreading 3-lobed lower one. The 4 parallel stamens project far beyond tube and upper lip of corolla. Fruit : 4 shining brown nutlets. Ornamental forms are grown in gardens. *reptans*, creeping.

PYRAMIDAL BUGLE *Ajuga pyramidalis*

Rare plant of Highland pastures. Flowers bluish purple, in compact pyramidal spike, upper bracts of which are longer than the flowers and are pressed flat towards the axis. Whole plant softly hairy. *pyramidalis*, shaped like a pyramid.

THE PLANTAIN FAMILY

PLANTAGINACEAE

The family is represented in most temperate regions and comprises only 3 genera, 2 of which are British. In Britain they are herbs (generally weeds), with radical leaves, leafless flower stems and dense spikes of flowers.

PLANTAGO

The Plantains comprise some 200 species, about a quarter of which are European, whilst 5 are British.

GREATER PLANTAIN *Plantago major*

Perennial of variable size, of pastures, roadsides and waste places generally. Leaves erect or spreading, oval, extremely broad, with 5, 7 or 9 ribs coming together in a short, broad stalk. Flower spikes long, slender ; stamens short with purple anthers ; seeds black, rough. Flowers May to September. Leaves cooked as greens by some people. *Plantago*, the classical name ; *major*, greater.

LAMB'S-TONGUE or HOARY PLANTAIN *Plantago media*

Broad-leaved, downy, perennial weed of waste places, lawns, etc., especially on limy soils. Flowers June to October. Leaves stalkless, 5- or 6-ribbed, spreading in firm, broad rosettes. Flowers in shorter spikes, fragrant, with lilac bracts and cream-coloured anthers. Seeds brown, rough. *media*, intermediate.

RIBWORT PLANTAIN *Plantago lanceolata*

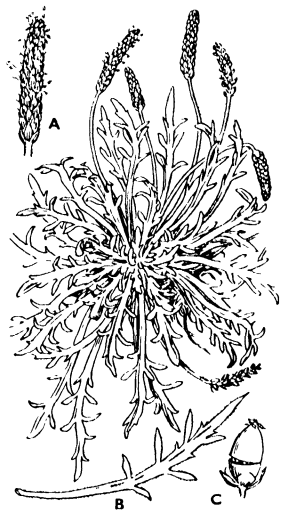
Almost cosmopolitan perennial, of pastures, heaths and waste places. Leaves erect, long, narrow, lance-shaped, generally strongly 5-ribbed. Flowers in short spike at end of long peduncle, with black bracts and white anthers. Sepals have prominent green rib. Seeds black, polished. Flowers May to October. *lanceolata*, lance-shaped.

SEA PLANTAIN *Plantago maritima*

Perennial of rocky coasts and salt marshes. Flowers June to September. Rootstock branched ; leaves succulent, long, narrow, weakly ribbed. Stamens pale yellow ; seeds brown. *maritima*, of the sea.

BUCK'S-HORN PLANTAIN *Plantago coronopus*

Fairly common annual or biennial, varying in size and succulence. Grows in dry, sandy and sunny spots; flowers June to August. Rootstock stout, stem round; leaves narrow, much divided, not overlapping, hairy to lessen transpiration. Flowers typically insignificant and colourless, in cylindrical spike. Sepals 4, placed diagonally, the 2 lateral ones having a membranous keel. Bracts longer than sepal. Corolla 4-lobed, salver-shaped; stamens 4, pale yellow. Style long, simple, hairy. Ovary has 3 or 4 chambers, each containing 1 seed. Fruit: dry capsule containing brown, rough seeds. Also called Star of the Earth. *coronopus* from Greek *korone*, a crow, and *pous*, a foot, with reference to much divided leaves.



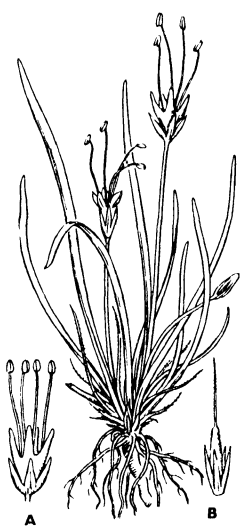
BUCK'S-HORN PLANTAIN
Plantago coronopus

(A) Inflorescence (B) Leaf (C) Seed-capsule

LITTORELLA

SHOREWEED *Littorella uniflora*

Amphibious perennial, generally distributed on sandy or gravelly soil wherever there is water—lakes, canals, ponds, etc. Flowers July and August. Usually grows in shallow water near the edge. In dry seasons produces flowers; otherwise no flowers are produced and reproduction is by means of runners. Rootstock white, erect, sending off long white roots. On land leaves are flat, pressed close to ground in rosette. In water radical leaves are cylindrical, erect, sharply pointed. Flowers white (borne only on land), unisexual, both kinds on same plant, in groups of 3. There is 1 long-stalked male flower and 2 sessile female ones. Male flower consists of 4 sepals, tubular, 4-lobed corolla, 4 very long stamens with large anthers, and a small reduced ovary. Female flowers have 3 or 4 sepals, pitcher-shaped corolla and flask-shaped 1-chambered, 1-seeded, ovary with very long style. Fruit: hard, non-splitting capsule, with 1 seed. Flowers obviously wind-pollinated. *Littorella* from Latin *littus*, shore; *uniflora*, single-flowered.



SHOREWEED
Littorella uniflora

(A) Male flower
(B) Female flower

THE BELLFLOWER FAMILY

CAMPANULACEAE

Campanulaceae is a family of herbs (with a few shrubs and trees), many containing a bitter, acrid, milky juice or latex. They are represented in all regions, but found mainly in temperate parts of the Northern Hemisphere. There are 12 genera in Europe, with about 150 species, of which 6 genera and 14 species are British.

They are distinguished by having alternate leaves, without stipules. Flowers usually bell-shaped, blue, white, or rarely red. Petals united in 5-lobed tube. Ovary inferior. Fruit generally a dry capsule, with numerous seeds.

WAHLENBERGIA

IVY-LEAVED BELLFLOWER — *Wahlenbergia hederacea*

An interesting but rather rare little perennial of bogs, damp woods and stream-sides in a few southern and western counties. Grows a few inches high; flowers July and August. Small creeping rootstock sends off spreading, trailing, threadlike stems. Leaves very small, 5-pointed, ivy-like, on stalks which taper towards stem. Flowers solitary on long, erect, leaf-opposed stems. Corolla pale blue, bell-shaped, bluntly 5-lobed; calyx triangularly 5-lobed, clasping base of corolla. Fruit: rounded capsule, opening within calyx. Originally included in *Campanula*, this plant was separated owing to structural differences in fruit. *Wahlenbergia*, named after Professor Wahlenberg, nineteenth-century Swedish botanist; *hederacea*, ivy-like.

CAMPANULA

LARGE CAMPANULA or GIANT BELLFLOWER [Pl. 1] — *Campanula latifolia*

Similar perennial to Nettle-leaved Bellflower, of moist woods and thickets mainly in N. England and Scotland. Grows 4 feet high; flowers July and August. Stem stouter, downy, furrowed. Radical leaves stalked, hairy; stem leaves longer, narrower, stalkless. Flowers larger, generally blue, sometimes white, solitary in axils of upper leaves. *Campanula*, diminutive of *campana*, bell; *latifolia*, broad-leaved.

BATS-IN-THE-BELFRY or NETTLE-LEAVED BELLFLOWER [Pl. 21]
Campanula trachelium

Beautiful, large-flowered perennial of woods, copses, thick hedges and thickets, especially on chalky soils. Grows 3 or 4 feet high; flowers August to October. Stem angular, erect, covered with reflexed hairs. Root leaves large, heart-shaped, long-stalked, irregularly toothed, bristly; stem leaves becoming lance-shaped, slender, long, pointed, and sessile further up stem. Flowers large, bell-shaped, bluish purple, sometimes axillary, generally in a leafy, loose terminal, panicle. Sepals coarsely hairy. Capsules open by valves at base. *trachelium* from *trachelos*, the neck, as it was formerly used as a cure for throat ailments.

CLUSTERED BELLFLOWER [Pl. 21]
Campanula glomerata

Very handsome perennial, occurring in dry sunny places, chiefly in pastures on a limestone soil. Grows up to 15 inches high; flowers July to September. Rootstock short, creeping. Stem downy, erect, tinged crimson. Radical leaves heart-shaped, long-stalked; stem leaves lance-shaped, alternate, sessile, clasping stem, softly hairy. Flowers deep purple, crowded, sessile or nearly so, erect, mostly at apex of short stem. Corolla bell-shaped, slightly lobed. Flowers close at night and in wet weather to protect nectar. At first hairy style is embraced by long anthers, but eventually style lengthens, loses its hairs, and stigmas, well away from anthers, become receptive to pollen from other flowers. Fruit: erect capsule, opening by valves near base. One of the few British wild flowers often transferred unaltered to our gardens. *glomerata*, clustered.



IVY-LEAVED BELLFLOWER
Wahlenbergia hederacea
(A) Flower, with corolla removed

HARE-BELL *Campanula rotundifolia*

Perennial, widely distributed in north temperate regions, of open sunny heaths, often at a considerable altitude. Grows up to 1½ feet high. Flowers July to September. Rootstock creeping, sending out runners. Stem erect at first, but later leaning weakly, slender, angled. Radical leaves large, rounded, heart-shaped, often dead by the time of flowering; stem leaves lower down broad and lance-shaped—higher up grass-like. Flowers, several beautiful nodding blue bells in open raceme. Sepals 5, long, narrow, united at base; petals 5, united, with pointed recurved lobes. Capsule bears persistent withered remains of petals and sepals. This is the true Scottish Blue-bell; in England that name is given to Wild Hyacinth. *rotundifolia*, round-leaved, alluding to radical leaves.

SPREADING BELLFLOWER *Campanula patula*

Rather local biennial or perennial, of hedges and thickets in the Midlands and S. England. Grows 2 feet high; flowers July and August. Radical leaves on long stalks, oblong; stem leaves narrow, lance-shaped. Flowers purplish with funnel-shaped corollas, few in leafy panicles, erect on long slender stalks. During wet weather and at night they hang downwards to protect nectar. *patula*, spreading.



VENUS'S LOOKING-GLASS
Specularia hybrida
(A) Flower

SPECULARIA

VENUS'S LOOKING-GLASS *Specularia hybrida*

Annual weed of cultivation, chiefly of arable land in eastern counties. Grows 9 inches high; flowers June to September. Stem slender, generally branched, angled and shortly hairy. Radical leaves stalked, oblong, with wavy, slightly toothed edges; stem leaves similar but sessile. Flowers solitary, terminal, with petals blue inside and lilac outside. Sepals very long, leafy, enclosing ovary. Fruit: long, angular capsule. Also called Corn Violet and Corn Bellflower. Venus's Looking-Glass of gardens is a different species. Common name refers to flower's resemblance to a mirror. *Specularia* from Latin *speculum*, a mirror; *hybrida*, hybrid.

PHYTEUMA

RAMPION *Phyteuma tenerum*

Uncommon perennial, found on chalk downs of certain southern counties. Grows 12–18 inches high; flowers July and August. Rootstock tuberous. Stems several, erect, hairless. Radical leaves broadly lance-shaped, with rounded teeth, long-stalked; these are usually withered by the time of flowering. Stem leaves few, sessile, lance-shaped, growing smaller further up stem. Flowers in solitary, terminal, dense, globular, deep blue heads, with up to 50 in a head. Petals 5, slender, at first united, but later spreading. Fruit: capsule, usually 3-celled. Flower structure resembles that of Sheep's Bit. *Phyteuma* probably from Greek *phyteuo*, I sow, from its rapid increase in growth; *tenerum*, tender.

SPIKED RAMPION *Phyteuma spicatum*

An extreme rarity, found only in E. Sussex. It is taller and sturdier in habit and bears cream-coloured flowers. *spicatum*, spicate.



RAMPION
Phyteuma tenerum
(A) Single flower
(B) Fruit (C) Rootstock

JASIONE

SHEEP'S BIT *Jasione montana*

Pretty annual or biennial of light soils on heath and down, especially in S. and W. England. Grows about 1 foot high; flowers June to September. Stems diverge from base, rough with white bristly hairs; rosette of stalked, spoon-shaped leaves at base. Upper leaves alternate, stalkless, rough, long, hairy. Flowers on short stalks, crowded into round, many-flowered head on long stalk. Involucral bracts triangular, green, toothed, in 2 or 3 rows. Sepals 5, small, united. Petals 5, lilac, free, oblong, united at base. Stamens 4, with filaments and anthers free, but united at bases. Nectar secreted on top of ovary. Fruit: 2-valved capsule, containing numerous tiny shining seeds. Also called Sheep's Bit Scabious, because of resemblance in flower to Devil's Bit Scabious, though their families are unrelated. May also be mistaken for composite flower. *Jasione*, from Greek *iasone*, a wild potherb, now unknown; *montana*, of mountains.



SHEEP'S BIT
Jasione montana
(A) Single flower
(B) Rootstock

THE LOBELIA FAMILY

LOBELIACEAE

This family, once associated with *Campanulaceae*, includes herbs and sometimes small trees. They are to be found in all warm and temperate parts of the world. There are some 25 genera and about 400 species, most of which are located in tropical and subtropical areas. 1 genus, with 2 species, is British.

LOBELIA

ACRID LOBELIA *Lobelia urens*

Rare perennial of damp heaths in S.W. England. Grows 1–2 feet high; flowers August and September. Stem slender, angular, roughly ridged. Radical leaves oblong, slightly toothed; stem leaves smaller, lance-shaped, coarsely toothed. Flowers erect, purplish, in loose sprays. Named after Mathia de L'Obel, seventeenth-century Flemish botanist. *urens*, burning.

WATER LOBELIA *Lobelia dortmanna*

Aquatic perennial, found in mountain lakes of N. England, Wales, Scotland and Ireland. Grows up to 18 inches high (according to situation); flowers July and August. Rootstock short, white, sending off



creeping runners. Leaves all radical, bluntly tipped, semi-cylindrical, and consisting in section of 2 tubes side by side. All foliage entirely submerged. Slender, hollow, flowering stems emerge about 6 inches above water's surface and end in raceme of nodding lilac flowers. Sepals joined, conical, bluntly 5-lobed. Petals form 2 lips. Stamens 5, with united anthers, forming tube round style. Fruit: club-shaped capsule. Lobelias are very popular in gardens, especially dwarf bedding forms. *dortmanna*, in honour of Dortmann, a Dutch apothecary.

WATER LOBELIA
Lobelia dortmanna
(A) Flower (B) Rootstock

THE BEDSTRAW FAMILY

RUBIACEAE

The family *Rubiaceae* has some 4,500 species in 350 genera. Most of them are tropical trees and shrubs. In Britain they are all slender herbs with square stems, usually narrow, undivided leaves in whorls, small flowers in cymes, with calyx inconspicuous or absent, and a dry or fleshy pericarp (2 one-seeded carpels joined by their sides) for fruit. Ovary inferior. Coffee and quinine are 2 important products derived from members of this family.

FIELD MADDER *Sherardia arvensis*

A common, striking little annual weed of cultivation, of fallow fields or other sunny places in light soil. Grows about 6 inches high; flowers April to October. Habit prostrate; stems branch from base, bristly with short hairs. Leaves, apparently in whorls of 6, sessile, lance-shaped, undivided, pointed and bristly. Flowers small, lilac, in terminal sessile heads surrounded by an involucre of 7 or 8 leaves. Calyx has 4–6 very short lobes. Corolla funnel-shaped, with a short tube and 4 lobes; stamens 4, alternating with petal lobes; style protrudes from fleshy disk. Some flowers are exclusively female. Nectar is secreted. Fruit: bristly, to aid dissemination, and crowned by persistent calyx-teeth. Female flowers are smaller than perfect ones. In the latter anthers and stigmas mature almost at the same time, and stigmas are perfectly fertile if pollinated by

pollen from same flower. Cross-pollination, however, may be affected by flies which crawl about flowers looking for nectar. *Sherardia* named after W. Sherard, seventeenth-century botanist who founded chair of botany at Oxford University; *arvensis*, of cultivated fields.



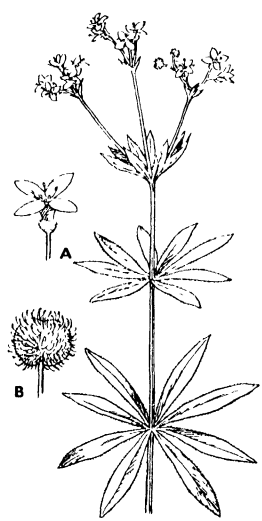
FIELD MADDER
Sherardia arvensis
(A) Flower

ASPERULA

A large genus, containing some 80 species, half of which are European, but with only 2 native species in Britain.

WOODRUFF *Asperula odorata*

An old-fashioned, favourite perennial, generally found growing among dead leaves under shady trees, especially in Beech woods. Grows up to about 9 inches high; flowers May and June. Rootstock slender, creeping; aerial stems erect, angular, smooth, unbranched. Leaves arranged in whorls of 6 to 9, looking like a series of bright, shining green ruffs up the stem; oblong, lance-shaped, almost smooth. Flowers minute, white, fragrant, funnel-shaped, in small, graceful heads. Calyx insignificant; corolla-lobes 4, white, opening out widely; stamens 4, alternating with the corolla-lobes. Nectar abundant at bottom of corolla-tube. Fruit: tiny, globular, finely hooked. Cannot stand strong sunlight, and soon dies when shade is removed. Formerly much in demand for scenting linen, as pressed flowers and foliage smell strongly of new-mown hay from coumarin contained. *Asperula* from Latin *asper*, rough, referring to bristles on certain exotic species; *odorata*, scented.



WOODRUFF
Asperula odorata
(A) Flower (B) Fruit

SQUINANCY-WORT *Asperula cynanchica*

A similar perennial to the above, of dry sunny chalkbanks. Flowers June and July. It is smaller and not scented. Leaves narrow, linear, in whorls of 4. Flowers much smaller, white or pink. *cynanchica*, of squinancy, old name for quinsy, for which this plant was claimed to be a remedy.



CROSSWORT or MUGWORT
Galium cruciata
(A) Flower
(B) Aerial stems

GALIUM

Galium is one of the largest genera in the family, containing about 300 species, half of which are European, including 13 British.

CROSSWORT or MUGWORT *Galium cruciata*

Common perennial, widely distributed on dry banks, in woods and hedges throughout the country, but rare in Eire. Grows 12–18 inches high; flowers April to June. Rhizome slender, creeping. Aerial stems, branching slightly at the base, either lie prostrate or support themselves among bushes. Leaves large, soft, egg-shaped, pointed, apparently arranged 4 in a whorl, cross-wise around stem; leaves and stems covered with long white spreading hairs. Flowers small, bright yellow, in small axillary cymes of about 8 flowers each, with 2 minute bracts to each cyme. Lower and outer flowers generally exclusively male, while terminal ones are perfect. Calyx missing; corolla-lobes 4, yellow, united at base, spreading; stamens 4 alternating with corolla-lobes; ovary, with 2-lobed style. Flowers rich in nectar and deliciously fragrant. Fruit: smooth, relatively large globular fruits hang and ripen beneath leaves. *Galium*, from Greek *gala*, milk, with reference to the plant's former uses in curdling milk; *cruciata*, cross-shaped, from arrangement of leaves.

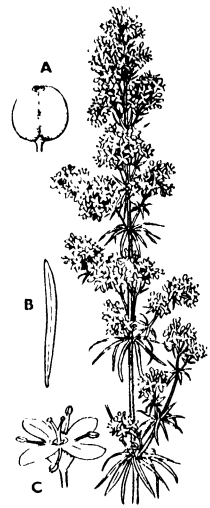
CROSS-LEAVED or NORTHERN BEDSTRAW *Galium boreale*

Smooth or downy tufted perennial of upland pastures and rocky situations to the north of the British Isles. Grows up to 2 feet high; flowers June to August. Stems stiff, brittle, erect, branching; leaves narrowly lance-shaped, 4 in a whorl; flowers small, white, in packed clusters. Fruit tiny, prickly. *boreale*, northern.

GREAT HEDGE BEDSTRAW *Galium mollugo*

Common straggling perennial, conspicuous in upper parts of hedges. Stems grow to about 4 feet long; flowers June to August. Stems may be trailing or erect, stout, but smooth or softly hairy, as are leaves. Leaves variable, but generally narrowly lance-shaped (although broader than those of Goose-grass), sharply tipped, lacking prickles, in whorls of 8. Flowers tiny, white, in large leafy clusters. Calyx very much reduced, on top of ovary; corolla-lobes 4, white, spreading; stamens 4, alternating with corolla-lobes; styles 2, with rounded stigmas and nectar disk at base. Fruit: small, black and rough, without hooks. Resembles Goose-grass except for smooth stems, leaves and fruit; and Lady's Bedstraw except

for larger leaves and white flowers in smaller and looser clusters. *mollugo* is the Latin name of a plant.



LADY'S BEDSTRAW
Galium verum
(A) Fruit (B) Leaf (C) Flower

LADY'S BEDSTRAW *Galium verum*

Striking perennial of banks, downs, dunes, commons and similar dry situations. Grows 12–36 inches high ; flowers June to September. Rhizome tawny, woody, short, creeping, sending out suckers. Stems numerous, spreading or erect, 4-angled, somewhat woody at their base, sometimes covered with minute hairs. Leaves small, slender, with hard-pointed tips and rough turned-down margins, one-veined, downy underneath, in whorls of 8 to 12. Flowers numerous, small, golden, in extensive, densely-crowded terminal as well as axillary clusters, all perfect. Calyx minute, surmounting ovary ; corolla-lobes 4, yellow, spreading ; stamens 4, alternating with corolla-lobes ; ovary composed of 2 united carpels with 2 separate styles. Nectar freely exposed. After discharging their pollen anthers turn brown and whole plant turns black in drying. Fruit : small, round, smooth, slightly 2-lobed, becoming black, unconcealed as they ripen. The root yields a similar red dye to the Madder. Once used to curdle milk in cheese-making, hence known as Cheese-rennet ; also called Yellow Bedstraw. *verum*, true.

HEATH BEDSTRAW *Galium hercynicum*

Prostrate little perennial, of heaths, hilly and stony places. Flowers July and August. Its smooth 6-inch stems are produced in tufts from the root-stock along the ground, and from these spring weak, erect flowering stems. There are 6 pointed leaves in each whorl. Flowers white. Also called Stone Bedstraw. *hercynicum*, of the Hartz Mountains.

WATER or MARSH BEDSTRAW *Galium palustre*

Weak, branched, trailing perennial of marshes, ditches and other wet places. Stems grow up to 3 feet in length ; flowers July and August. Rootstock creeping ; aerial stems weak, rough at the angles. Leaves narrowly oblong lance-shaped, smooth, rather polished, rough at margins, 4 or 6 in a whorl. Flowers small, white, in loose, leafy clusters. Fruit rounded, 2-lobed, almost smooth. *palustre*, of swampy places.

BOG or FEN BEDSTRAW *Galium uliginosum*

Similar perennial to the above, of similar situations. Leaves narrower, stiffer, sharply pointed, 6–8 in each whorl. Flowers fewer, larger, appearing in July and August. Fruit rougher and smaller. *uliginosum*, of marshes.



GOOSE-GRASS
Galium aparine
(A) Flower (B) Fruit

GOOSE-GRASS *Galium aparine*

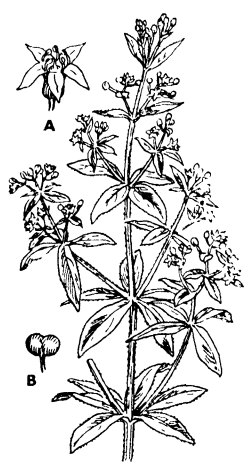
A vigorous, slender, climbing and trailing annual, common in hedgerows where it often appears in tufted masses. Flowers June and July. Stems several feet long, slender, square, covered with small hooked prickles which help in climbing. Leaves and stipules simple, in whorls, 6–8 in each, lance-shaped, pointed, up to 2 inches long, with edges and midribs covered with similar prickles. Flowers small, white, in small leafy inflorescences springing from axils of upper leaves. Calyx reduced to a mere ring; corolla-lobes 4, white, spreading; stamens 4, alternating with petal lobes; ovary 2-lobed, prickly, with 2 separate styles; nectar freely evident. Fruit: a schizocarp, formed of 2 joined, rounded carpels, densely covered with minute hooks, with 1 seed in each carpel. Hooks aid in dissemination. Possibly the best known British species of the genus. Also called Cleavers, Clivers, and Tongue-bleeder, referring to the clinging persistence of plant and fruit. *aparine*, is classical name of plant.

RUBIA

There is only 1 British species of the genus.

WILD MADDER *Rubia peregrina*

A long, straggling, bristly, evergreen, perennial herb of our southern coasts, in rocky and bushy places. Stems grow 2 or 3 feet long; flowers June to August. Stems long, sometimes woody below, scrambling over bushes and other vegetation, holding on by prickles on stems and leaves. Side-shoots quadrangular, deeply furrowed between angles. Leaves lance-shaped, with prickly teeth along margins, produced in scattered whorls of 4 to 6. Flowers minute, yellowish green, in small cymes, loosely clustered. Sepals absent; corolla wheel-shaped, 5-lobed with a short tube; stamens 5, short, alternating with corolla-lobes; ovary crowned with 2 styles. Fruit: small succulent black berry. Called Wild Madder to distinguish it from cultivated Madder (*R. tinctoria*) which was formerly grown for red dye alizarin produced from its roots, though now produced



WILD MADDER
Rubia peregrina
(A) Flower (B) Fruit

synthetically ; and from Field Madder (*Sherardia arvensis*). *Rubia* from Latin *ruber*, red ; *peregrina*, foreign.

THE HONEYSUCKLE FAMILY

CAPRIFOLIACEAE

Shrubs or small trees, and a few herbs, mainly of the north temperate regions. Leaves opposite, generally without stipules ; flowers in heads or cymes ; ovary inferior ; fruit a fleshy berry.

SAMBUCUS

DWARF ELDER — *Sambucus ebulus*

Perennial herb of shady waste places, growing up to 3 feet high. Differs from *S. nigra* in its pinnately compound leaves having stipules, and its white or purplish flowers being clustered in smaller inflorescences. Also called Dane's-blood, because of some fancied connection with the Danes in the past. *Sambucus*, the classical name of this plant ; *ebulus* is the Latin name for this plant.

COMMON ELDER [Pl. 11] — *Sambucus nigra*

Small, deciduous, spreading tree or shrub, commonly distributed in woods, hedges and waste places. Grows 10 to 20 feet high ; flowers May and June. Stem crooked, covered with rough, corrugated bark ; twigs greyish brown, marked with breathing spores ; old and young stems full of pith. Leaves large, compound, opposite, pinnately divided into 2 or 3 pairs of lance-shaped, sharply toothed leaflets, with an odd terminal one ; these too are opposite, without stipules. Flowers very small, white or cream-coloured, scented, arranged in dense disk-shaped inflorescences, of 5 main branches each. Calyx-lobes 5, very small, green, united, toothed ; corolla-lobes 5, cream-coloured, spreading ; stamens 5, alternating with corolla-lobes, with large anthers ; ovary composed of 3 united carpels with 3 sessile stigmas. No bracts or nectary. Fruit : dense clusters of juicy berries, ripening from green through red to purplish black ; edible but unpalatable. Very useful plant economically : hardwood used for making pegs and skewers ; flowers formerly employed medicinally ; leaves sometimes used in insecticide ; and fruit frequently taken for wines, jams and jellies. *nigra*, black.

VIBURNUM

The genus probably comprises more than 120 species. Few can be called trees, though all are woody, with leaves stalked and simple, flowers grouped in corymbose clusters, and ovary surmounted by the stigmas. 2 species are British.



WAYFARING TREE
Viburnum lantana
(A) Flowers (B) Flower buds
(C) Fruit

WAYFARING TREE *Viburnum lantana*

A deciduous shrub, growing up to 10 feet high in hedgerows, on chalky soil, especially in S. England. Flowers May and June. Branches spring from leaf-axils at angles of about 45°. Older parts are covered with grey-brown bark, marked with leaf-scars; younger parts slightly angular, paler brown. Leaves in opposite pairs, 3–6 inches long, ovate, sharply toothed, ridged on upper surface, thick, opaque, dull yellow-green. Shoots and under surfaces of leaves are thickly covered with a felt of mealy grey, star-shaped hairs, which give the shrub an appearance of being covered with wayside dust. Flowers white, in flat-topped cymes at end of rigid branches. Calyx-lobes 5, minute, on top of ovary; corolla-lobes 5, spreading; stamens 5, small, projecting beyond corolla; ovary surmounted by disk secreting nectar and 2–3 short styles. Fruit: lustrously polished berries, about $\frac{3}{8}$ inch in diameter, ripening from pale green, through crimson to purplish-black. They are slightly astringent, though greedily eaten by birds, and contain 1 hard, slightly flattened seed. Also called Mealy Tree and Whitewood from dusty, felted appearance of leaves. The tough, pliant branches are used for binding, whips and basket-making in certain localities. *Viburnum*, the classical name; *lantana*, a new Latin name for this plant.

GUELDER ROSE *Viburnum opulus*

A straggling, deciduous shrub or small tree, thriving in moist situations, and extending as far northwards as Scotland and Scandinavia. Grows 6–12 feet high; flowers June and July. Branches long, slender, smooth, green, slightly 4-angled towards apex, turning to pale brown. Terminal buds generally aborted and replaced by a pair of small, slightly stalked lateral ones, which are smooth, reddish brown, slightly sticky, and enclosed by 2 pairs of bud-scales. Leaves in opposite pairs, rounded but deeply 3- or 5-lobed, coarsely toothed. Each has 2 or more glands at the top of the short leaf-stalk. Flowers white, in corymbose cymes; outer neuter flowers are nearly 1 inch across, 4 times the size of inner fertile ones. Calyx-lobes 5, minute; corolla lobes 5, spreading; stamens 5 with anthers facing inwards; ovary 1-celled, with 1 ovule. Fruit: clusters of loosely-grouped, oval, 1-seeded berries, ripening from green to a pure limpid crimson. In gardens, the neuter form of this species, *V. opulus* var. *sterile*, well known as the Snowball Tree, is valued for its masses of snowy white flowers; *opulus*, a kind of Maple tree, from lobing of leaves.

LINNAEA

A genus with only 1 species.

LINNAEA — *Linnaea borealis*

A rare, creeping evergreen of northern pine-woods, flowering June to August. Characterized by small roundish opposite leaves, and pink flowers borne in pairs on a long stalk. Seldom fruiting. Named after the famous Swedish botanist, Linnaeus. *borealis*, northern.

LONICERA

The genus contains over 180 species of erect or twining shrubs, mainly from Western China; there are 2 native British species.

FLY HONEYSUCKLE — *Lonicera xylosteum*

A local, erect shrub of Sussex, but introduced elsewhere, flowering May and June. As well as in habit it differs from *L. periclymenum* in having its smaller yellow flowers in axillary pairs. *Lonicera*, named after Adam Lonicer, a Frankfurt botanist (1528 86); *xylosteum*, from *xylon*, wood, and *osteon*, bone (referring to the hard wood).

HONEYSUCKLE [Pl. 11] — *Lonicera periclymenum*

Common deciduous, climbing shrub with twining stems. Widely distributed in hedges, copses, woods and heaths. Flowers May to September. Stem up to 20 feet long, tough, woody, twining gracefully from left to right over bushes, hedges and trees. Leaves simple, lance-shaped, entire, without stipules, in opposite pairs, each pair at right angles to the next. Flowers irregular, yellowish pink, several in a cluster. Calyx-lobes 5, green; corolla-lobes 5, large, with a long, funnel-shaped tube, 2-lipped, upper lip with 4 lobes, lower with 1; stamens 5; style 1. Method of cross-pollination is interesting, being effected mainly by hawk-moths at night. At evening flower-buds are erect; as night falls anthers burst inside, and flowers begin to expand, becoming strongly scented, and moving into horizontal position. Stamens protrude first, stigma being held back by upper lip of corolla. As flowers settle to their new positions, style curves downwards, resting below and beyond anthers. Flies settled on anthers for pollen and may touch stigma, effecting pollination; hawk-moths probe for deep-seated nectar and carry off pollen from anthers. Next evening fresh flowers in head have opened; but in previous day's flowers stigma has changed places with stamens, and moths going for more nectar are bound to pollinate the prominent stigma with grains adhering to their bodies. When fertilized, flowers turn a dirty orange-brown and become scentless. Fruit; cluster of bright red berries. Also called Woodbine. *periclymenum*, from Greek *perikleia*, I entwine.

THE MOSCHATEL FAMILY

ADOXACEAE

This family consists of only one genus and only one species.

ADOXA

MOSCHATEL or TOWN HALL CLOCK — *Adoxa moschatellina*

Weak, small, smooth, somewhat succulent perennial herb, locally abundant in moist, shady places, and widely distributed throughout the country. Grows up to 6 inches high ; flowers March to May. Rhizome white, creeping, producing small, tooth-like scale-leaves, with suckers from their axils, and long, unbranched root fibres. Suckers are only half buried. Stems slender, erect, unbranched, brittle. Radical leaves semi-erect, on rather long stalks ; divided into 3, and each leaflet again split into 3, these last generally lobed. There is a pair of leaves on each stem ; these also divided into 3 leaflets each. Flower-stalks end in 5 flowers, in stalkless head, one on top with 4 corolla-lobes and 4 others, each with 5 corolla-lobes, facing points of a compass, as in a 4-faced clock. All flowers are perfect. Calyx 2–3 lobed ; corolla-lobes yellowish, spreading ; stamens alternate with corolla-lobes, but due to divided filaments appear to be double the number ; ovary composed of 2–5 carpels, each consisting of a parchment-like chamber containing 1 pendulous seed and some pulp, with a distinct style above. Nectar secreted and freely exposed to flies, etc., when plant has musky odour. Fruit : berry-like, with persistent calyx, on bent stalk, becoming succulent, but remaining green and divided internally. Also called Town-clock, from distinctive position of flowers. It is often overlooked at hedge bottoms, and may sometimes be mistaken for Wood Anemone. Popular and specific names derived from Italian *moscado*, musky, with reference to plant's distinctive scent ; *Adoxa* from Greek *a*, without, and *doxa*, glory, in allusion to its very unpretentious appearance.



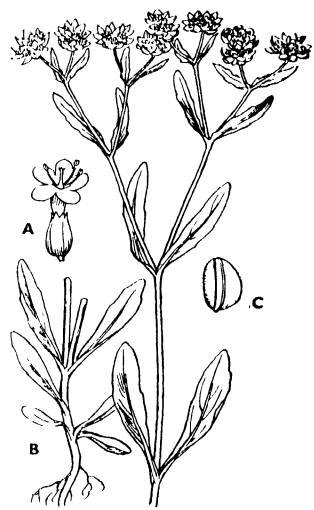
MOSCHATEL or TOWN HALL CLOCK
Adoxa moschatellina
(A) Flower (B) Fruit

THE VALERIAN FAMILY

VALERIANACEAE

The family comprises some 8 genera, with rather more than 350 species between them. Chiefly natives of Central Europe, they are represented from South Africa to North America, and from the Falkland Islands to Siberia. Four genera and some 50 species are European; whilst in Britain we have 3 genera, 2 native and 1 introduced, and some 5 species of common occurrence, and a further 4 that are either rare or are recent introductions.

In Britain they are all annual or perennial herbs, with opposite leaves and no stipules. Flowers small, in crowded cymes. Calyx a small ring, little developed at time of flowering, but later enlarging often into a feathery rim to the fruit. Petals 5, joined in tube, with irregular spreading lobes, and usually a honey pouch or spur. Stamens generally 3; ovary inferior, 3-celled, although only 1 contains an ovule. Fruit dry, small. Rhizomes of perennial species generally contain starch, a bitter principle, an acid, and an aromatic, volatile oil, so that they have an acrid taste and a penetrating odour.



LAMB'S LETTUCE
Valerianella locusta
(A) Flower (B) Rootstock
(C) Fruit

VALERIANELLA

The genus contains some 50 species of annual plants. They are mostly cornfield weeds in Europe. Five species occur in this country.

LAMB'S LETTUCE *Valerianella locusta*

A small, very much branched annual, of cornfields, hedgerows and waste places. Grows 1 foot high; flowers April to June. Stems slightly angular, green, forking repeatedly, juicy. Leaves spoon-shaped lower down, narrowly oblong further up, green, soft and brittle. Flowers minute, bluish, in small dense cymes from branch forks, with leafy green bracts below. Calyx indistinct with 1 tooth, remaining on fruit, though no pappus is formed. Corolla funnel-shaped, 5-lobed, without a spur though containing nectar; stamens 3; style with 3-lobed stigma. Fruit: minute, nut-like, ribbed, the chamber containing the seed having a corky back. Seed flattened on one side. Also called Corn Salad, because often used in salads. Lambs are said to be fond of it. *Valerianella* is a diminutive of *Valeriana*; *locusta*, derivation obscure.

CORN SALAD *Valerianella dentata*

A locally common annual of cornfields, up to 1 foot, flowering June to July. It is distinguished from *V. locusta* by the distinct fruiting calyx which is toothed with one tooth much larger than the others ; the fruit is oval and flat on one side, convex on the other ; the large fertile cell is not corky. Other species of *Valerianella* are more local and distinguishable mainly by their fruits. *dentata*, toothed.

VALERIANA

GREAT WILD VALERIAN *Valeriana officinalis*

Handsome perennial, abundant locally, of moist woods, wet meadows, etc. Grows up to 4 feet or more high ; flowers June to August. Root-stock short, sometimes spreading by suckers ; leaves narrow, compound, pinnately divided into 4–6 pairs of lance-shaped toothed leaflets ; lower leaves on long, grooved stalks ; higher stem leaves reduce in size and become sessile. Flowers small, pale pink or white, in broad, loose clusters, with bracts immediately below. Calyx superior to ovary, 5-lobed, at first inrolled, but later opening out into feathery pappus attached to fruit. Petals 5, in long tube, irregularly lobed at rim ; stamens 3, with rounded anthers, projecting above petals ; 3 carpels form ovary, with 1 common slender style, and 2-lobed stigma. Corolla-tube has small pouch at base containing honey, with 5 purple nectar-guides leading to it. Flowers are scented. Fruit : small, dry, ribbed, crowned with feathery pappus by means of which it is dispersed by wind. Also called All-heal and Cat's Valerian ; the former because it was reputed to cure almost any ailment (to-day a preparation from roots is used in nervous diseases) ; the latter because cats are strongly attracted by its scent. *Valeriana* from Latin *valeo*, to be well ; *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.

SMALL MARSH VALERIAN *Valeriana dioica*

A perennial of marshy places, flowering May and June. It is a stiff, erect plant, with creeping rootstock and oval radical leaves on long foot-stalks ; stem leaves simple, but very deeply pinnately lobed. Flowers minute, pinkish, in crowded terminal corymbose cymes. *dioica*, dioecious, i.e. with male and female flowers on separate plants.

KENTRANTHUS

SPUR OR RED VALERIAN [Pl. 11] *Kentranthus ruber*

A noble and handsome perennial, very familiar on old walls, in chalk-pits and in railway cuttings, but probably never truly native. Grows up to 3 feet high ; flowers May to September. Stem woody, much-branched, smooth, tough. Leaves entire, thick, lance-shaped, sessile, of a glaucous hue, slightly toothed, but quite different from those of Great Wild Valerian. Flowers individually very small, but appearing profusely in massed, crimson heads. Insignificant calyx unfolds in fruiting stage to a feathery persistent pappus ; corolla-tube long, with a long nectar spur ; style with

rounded stigma protrudes beyond petals. There is a single stamen, with purple anther. Fruit: small, dry, remaining closed. Also called Red Valerian. Often seen cultivated in gardens. Although a most attractive sight, with a few specimens perhaps naturalized here and there, the Spur-Valerian has little claim to be considered a native, having been originally introduced from the Mediterranean. *Kentranthus* from Greek *kentron*, a spur, and *anthos*, a flower; *ruber*, red.

THE TEASEL FAMILY

DIPSACACEAE

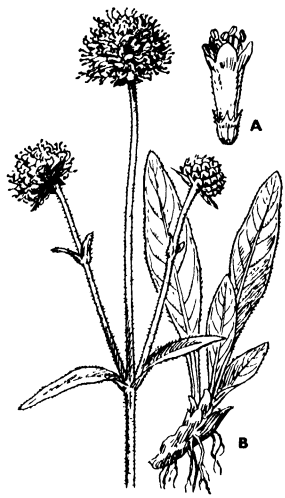
The family comprises some 150 species in about 10 genera, belonging mainly to the north temperate region of the Old World. Biennial or perennial herbs with opposite leaves and no stipules; small flowers arranged in a dome-like inflorescence; an epicalyx, in most cases, enclosing base of flower; 4 or 5 unequal corolla-lobes; 4 free stamens; and a 1-chambered ovary, formed from 2 carpels, containing a single pendulous seed. Casually resemble *Compositae*, but are readily distinguished by absence of any union between anthers, and by distinct tubular calyx instead of pappus, with separate epicalyx. There are 4 British genera.

DIPSACUS

There are about a dozen species in the genus, all erect, biennial plants with angular, prickly stems. Only 2 species are native.

COMMON TEASEL [Pl. 11] *Dipsacus fullonum*

Striking plant of country hedgerows and waste places on moist clays and loams. Grows 3–6 feet high; flowers August and September. Roots stout, alternately expanding and contracting to ensure firm anchorage in soil and thus becoming much wrinkled transversely. Stem stout, angular, spiny. Radical leaves in bright green rosettes, with toothed margins and stiff spines on their spreading blades; there are also prickles along midrib of under surface. Stem leaves united in pairs at their bases, forming water-filled 'moat' round stem. Flowers tiny, lilac, in prickly, cylindrical heads. Each flower has a spiny straight bract, with long spinous involucral bracts sweeping upwards from base of flower-head. Calyx very small, above ovary; corolla hairy, 4-lobed; stamens 4, long; style simple, short; ovary 1-celled, with 1 seed. Nectar is secreted. Fruit: very small, enclosed in involucel. A cultivated form, Fuller's Teasel, *D. fullonum var. sativus* (not known wild anywhere), has long been cultivated to provide Teasels for 'teasing' or combing wool, and raising a 'nap' on fabrics of cloth-manufacturers (Fulling). Stiff, hooked bracts on fruiting heads provide exact degree of strength and elasticity, and cannot satisfactorily be supplanted by mechanical means. *Dipsacus*, probably



DEVIL'S-BIT SCABIOUS
Succisa pratensis
(A) Single flower
(B) Rootstock

from Greek *dipsao*, I thirst, from water-filled cups formed by stem leaves ; *fullonum*, from name of process for which heads are used.

SMALL TEASEL *Dipsacus pilosus*

A more uncommon species than the last, growing in damp hedgerows, up to 2½ feet high and flowering in August and September. Stem more slender, hairier, prickles softer, leaves stalked. Flower-heads white, nodding at first, later straightening up ; rounder, smaller. Involucral bracts shorter than head. *pilosus*, hairy.

KNAUTIA

FIELD SCABIOUS *Knautia arvensis*

A common and striking plant in meadows, downs, and along river banks throughout the country. Grows 1–3 feet high ; flowers June to September. Rhizome stout ; aerial stem usually glabrous, branching above. Radical leaves stalked, lance-shaped, toothed, but generally undivided ; stem leaves large, deeply pinnately cut, with considerable variety of outline, in successive pairs ; all leaves more or less hairy. Flower-heads rise on long, rounded, somewhat slender stalks, and are often nearly 2 inches across, surrounded by 2 whorls of broad, ovate-lance-shaped, leafy bracts. Epicalyx springing from circumference of ovaries, is silky, and slightly 4-toothed above. Flowers delicately perfumed in centre of head are small and mauvish, but increase in size and turn sky-blue towards margin of head. Calyx with 8 hairy teeth. Corolla hairy inside and out, 4-lobed ; anthers yellow, maturing in succession, but well in advance of stigmas. Two carpels join to form ovary with common style. Fruit : small achene, with persistent calyx tube, densely hairy. *Knautia*, in honour of C. Knaut, seventeenth-century botanist ; *arvensis*, of cultivated fields.

SCABIOSA

The Old World genus *Scabiosa* comprises about 60 species. They are perennials with rounded stems, hemispherical flower-heads and a calyx with 4 or 5 persistent bristly teeth. Only 1 species is native in Britain.

SMALL SCABIOUS [Pl. 11] *Scabiosa columbaria*

Uncommon perennial of chalky soils in dry fields and banks. Grows up to 18 inches high ; flowers July and August. Rootstock stout, woody. Radical leaves narrow, entire ; stem leaves pinnately divided, supposedly resembling a dove's foot (hence specific name). Flowers lilac, in flatter

heads with 5-lobed corolla and yellow anthers. *Scabiosa* from Latin *scabies*, the itch, being used as a remedy for skin diseases ; *columbaria*, dove-like.

SUCCISA

The genus has 4 species (1 British).

DEVIL'S-BIT SCABIOUS *Succisa pratensis*

Pretty little perennial common in woodland rides and meadows. Grows 1–3 feet high ; flowers July to October. Rhizome abruptly short, as if cut or bitten off (from whence are derived its common and generic names). Radical leaves entire, hairy ; stem leaves usually toothed. Flowers bluish purple in slender-stalked, globose heads, lacking large outer flowers ; corolla 4-lobed ; involucre pronounced. *Succisa*, cut-off ; *pratensis*, of meadows.

THE COMPOSITE FAMILY

COMPOSITAE

This is one of the largest families among flowering plants, comprising upwards of 14,000 species in more than 900 genera. Distributed throughout the globe, the great majority being herbaceous — certainly all herbs in Britain. There is generally a tap-root ; leaves mostly scattered, simple, and without stipules ; flowers or florets very small but collected on a common receptacle and surrounded by an involucre of bracts. This arrangement is called a head (*capitulum*).

Parts of the individual florets are generally in fives, although the sepals usually appear as a pappus of many hairs. Petals united throughout their length, forming a 5-lobed or 2-lipped tube (tubular floret) or united into a long strap, in which case the flower is irregular (ligulate floret). Stamens 5, with anthers united to form a tube ; ovary 1-celled, formed from 2 united carpels, surmounted by a 2-lobed style. Fruit small, dry, nut-like, often crowned with a hairy pappus (modified persistent sepals) which assists in fruit's dispersal.

British genera number 44, of which 29 belong to the *Tubuliflorae* (all florets



THREE-CLEFT BUR-MARIGOLD
Bidens tripartitus
(A) Fruit (B) Floret

tubular or florets tubular and ligulate) and 15 to the *Liguliflorae* (all florets ligulate).

BIDENS

Genus of smooth, mostly annual plants comprising about 200 species; 5 of these occur in Europe and 2 in Britain.

NODDING BUR-MARIGOLD — *Bidens cernuus*

Annual, showing preference for wet borders of ponds and ditches. Grows 1 or 2 feet high, flowering July to September. Stem stout, often tinged with red or brown. Leaves simple, in opposite pairs, lance-shaped, toothed, sessile. Flower-heads large, decidedly drooping. There are usually 3 or 4 pappus bristles to the fruit. *Bidens*, ' double-toothed ', with reference to fruits' characteristic; *cernuus*, drooping.

THREE-CLEFT BUR-MARIGOLD — *Bidens tripartitus*

Slender annual herb, of marshes, ditches and river banks, widely distributed, but becoming uncommon towards N. Scotland. Grows 1–3 feet high; flowers July to September. Stem smooth, rounded, erect, slender, branches springing from axils of leaves. Leaves stalked, toothed, with blades divided usually into 3. Flower-heads solitary, sub-erect, yellowish, with generally only tubular 5-toothed florets. Involucre of bracts in 2 series, outer being leafy and spreading. Each arm of 2-armed style tipped with hairs. Fruit: compressed achene, lacking hairy pappus. Angles are prolonged upwards usually into from 2 to 3 stiff-barbed bristles which aid in dispersal of fruit by becoming entangled in fur of passing animals. Common English name derived from burr-like characteristic of fruit. *tripartitus*, three-cleft, alluding to leaves.

SENECIO

Senecio is one of the largest genera among flowering plants, forming nearly a tenth of all the *Compositae*. There are about a dozen species representing *Senecio* in England, of which only 8 occur in Ireland, and 7 in Scotland.

RAGWORT [Pl. 18] — *Senecio jacobaea*

Common and widespread perennial of fixed sand-dunes, gravel, upland, heaths, chalk downs, and similar situations with plenty of sun and good drainage, able to stand extremes of drought and heat. Grows 2–4 feet high; flowers June to October. Rhizome thick, fleshy, rather short. Stems erect, stout, fleshy, well-branched, leafy. Lower leaves stalked, stem leaves becoming sessile; all pinnately and deeply divided, lobed and coarsely toothed, sometimes lyre-shaped. Whole plant generally smooth, but sometimes slightly cottony, and fetid when bruised. Corymbose branches bear masses of golden flower-heads, each about an inch across, making a handsome display. Involucral bracts in two rows, without membranous margins, but withering black at their tips. Ray-florets in one row, female; disk-florets numerous, tubular, bisexual. Fruit: achenes of ray-florets smooth and ribbed, losing their pappus; those of disk-florets covered with short silky hairs and crowned with soft white

pappus. Also called St. James's-Wort, Staggerwort, Stammerwort, Stinking Weed, Stinking Willie, and others. Although avoided by cattle, has been eaten by sheep with impunity, and is devoured by caterpillars of the Cinnabar moth. Ragwort is derived from ragged appearance of leaves. *Senecio*, from *senex*, old man, with reference to hoary crown on fruit ; *jacobaea*, named after St. James.

MARSH RAGWORT [Pl. 18] *Senecio aquaticus*

Handsome biennial, similar to Common Ragwort, but found in wet places such as ditches, stream-sides, etc. Grows 1 or 2 feet high ; flowers July and August. It is altogether more slender and looser in habit, and is seldom quite hairless. Radical leaves very variable, sometimes nearly entire. Inflorescence consists of fewer, larger, and more loosely grouped flower-heads, with more elliptical ray-florets. Surface of all fruits free from hairs, only those of ray-florets slightly rough near their apex. *aquaticus*, of water.

HOARY RAGWORT [Pl. 18] *Senecio erucifolius*

Erect perennial of hedgerows and roadsides, closely resembling Common Ragwort. Stem has long, scattered cottony hairs, and leaves are far more regular and less divided. *erucifolius*, with leaves like *Eruca* (*Cruciferae*).

OXFORD RAGWORT [Pl. 18] *Senecio squalidus*

An alien, firmly established in this country, especially along railway embankments. Grows about 1 foot high ; and flowers June to September. This annual or biennial is chiefly distinguished from *S. vulgaris* by its large conspicuous ray-florets (which are normally lacking in the Groundsel and when present are much smaller), and its black-tipped involucral bracts. All leaves spring from and half clasp the stem ; flowers bright yellow, followed by tiny, slender, hairy, ribbed achenes, surmounted by white pappus. *squalidus*, inelegant.

MOUNTAIN or WOOD GROUNDSEL *Senecio sylvaticus*

Annual resembling Common Groundsel. Grows 3 or 4 feet high ; flowers July to September. It is a taller and more slender plant, found on heaths and hillsides. Stems ribbed ; leaves deeply divided and irregularly cut and lobed. Flower-heads golden, more numerous ; ray-florets small, generally rolled up, especially in dry weather. Achenes blackish, ribbed, hairy. Whole plant emits unpleasant odour. Also called Wood Senecio. *sylvaticus*, of woods.

STINKING GROUNDSEL *Senecio viscosus*

A locally common, fetid annual of waste places, 1–2 feet, flowering July to September. Distinguished from *S. vulgaris* by its short yellow ray-florets, dense covering of sticky glandular hairs and its glabrous achenes. *viscosus*, sticky.

GROUNDSEL *Senecio vulgaris*

Extremely common, annual noxious weed of cultivation, growing almost everywhere in Britain. Grows 6–12 inches high ; flowers all the year



GROUNDSEL
Senecio vulgaris

round. Root finely fibrous, easily eradicated. Stem erect, branching, succulent, smooth or thinly hairy. Leaves stalkless, alternate, deeply and irregularly cut, succulent and toothed. Flower-heads few, inconspicuous, in terminal corymbs. Florets yellow, nearly always all tubular, with bell-shaped involucre of bracts, and tubular, 5-toothed corolla, secreting nectar. Automatically self-pollinated, although sometimes visited by insects. Fruit: slender, smooth, ribbed, achene crowned with mass of white pappus hairs. Decidedly unpopular with horticulturists, but has its uses in providing bird-food. *vulgaris*, common.

TUSSILAGO

COLTSFOOT [Pl. 19] *Tussilago farfara*

Common creeping perennial of waste places. Grows about 6 inches high; flowers March to May. Rootstock thick, creeping, difficult to eradicate in stiff damp soil. Leaves rise direct from underground stem, and are large (up to 1 foot across), green, broadly heart- or shield-shaped, angled and toothed on the edges, generally smooth above and downy beneath. Flower-heads solitary, golden yellow, at the end of thick, erect, hollow stalks, covered with woolly scales. Flowers appear before leaves. Bracts about 20, thinly and minutely hairy. Disk composed of yellow tubular florets having stamens and style, but infertile; surrounded by outer ring of yellow ray-florets which are female and fertile. Disk-florets secrete nectar and push out pollen which is received by later-ripening, shortly 2-lobed stigma of ray-florets. Bees also effect cross-pollination. Each tiny achene ('seed') has a white pappus of hairs, making head look like a ball of fluff. One of the earliest spring flowers to open. Formerly very popular as a remedy for coughs, and an *ersatz* smoking mixture. *Tussilago* from Latin *tussis*, cough; *farfara* is old name for White Poplar because of a resemblance between their leaves.

PETASITES

BUTTERBUR [Pl. 18] *Petasites hybridus*

Handsome perennial, commonly found in wet meadows, and by ponds and stream-sides. Grows about 1½ feet high; flowers March to May. Rootstock thick, creeping, throwing off numerous roots. Leaves springing direct from rootstock, roughly kidney-shaped, huge (sometimes 3 feet across), lobed, toothed, and covered with white, cobwebby hairs, especially below. Flower-heads pinkish lilac, much smaller than those of Coltsfoot,

in racemose clusters at the top of thick bract-bearing flower-stalks ; florets are all tubular. In most cases flower-heads are functionally unisexual, the female plant being rare. Male flowers exude abundant nectar. Flowers usually appear just before leaves. Fruit : slightly angular smooth achenes, surmounted by large white pappus. Large, rhubarb-like leaves cause a dense shade and afford splendid cover for water-fowl and other creatures. *Petasites*, the classical name ; *hybridus*, hybrid.

INULA

Inula includes some 120 species, 24 occurring in Europe and a few extending into Northern Africa. There are 3 British species, all erect, perennial, rather stiff herbaceous plants with yellow-rayed flower-heads.

ELECAMPANE *Inula helenium*

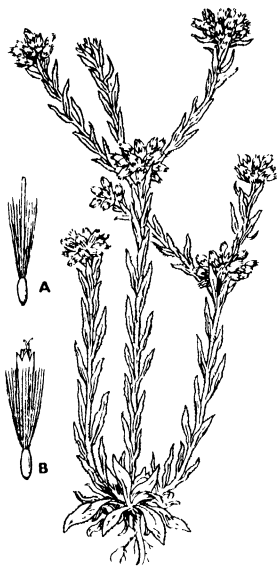
Coarse branching perennial, of meadows and copses, and often naturalized near old gardens. Grows 3–5 feet high ; flowers July and August. Rhizome massive, containing tonic and aromatic properties. Stem stout, fleshy. Radical leaves over 1 foot long, on long stalks, coarsely toothed ; stem leaves large, stalkless, clasping stem, bright green above, grey beneath. Flower-heads solitary, at summits of downy branches, 3 inches across, of a fine golden yellow. Several rows of green, leafy bracts form involucre ; the outer bracts broadly ovate. Inner disk-florets are dark yellow and surrounded by lighter outer ray-florets, which are long and slender, unequally 3-toothed at their ends, forming single row. Fruit : 4-angled, smooth achene, surmounted by pale reddish pappus. Introduced. Easily the most handsome of the species growing in this country. Also called Velvet Dock and Wild Sunflower. Rhizome still used in candied or liquid state for coughs. Elecampane is a corruption of *Inula* and *campana*, because the plant grew wild in Campania. *Inula* is derived from *Helen*, being fabled to have sprung from her tears ; *helenium*, derived from same root.



ELECAMPANE
Inula helenium

PLOUGHMAN'S SPIKENARD [Pl. 19] *Inula conyza*

Fairly common, erect, biennial weed, of dry banks, copses and waysides, but not found in Scotland. Grows up to 3 feet high ; flowers July to September. Stem downy, carrying lance-shaped, finely toothed, downy leaves, gradually becoming sessile higher up the stem. Involucre composed of long, narrow,



COMMON CUDWEED
Filago germanica

(A) Female floret
(B) Bisexual floret

overlapping, brownish bracts which almost hide loose yellow tufts of flower-heads. Ray-florets thin and threadlike, with purple styles. Achene has reddish pappus. *conyza* is the Greek name for a plant.

GOLDEN SAMPHIRE [Pl. 19] *Inula crithmoides*

Rare perennial maritime plant, of rocks and marshes on our southern coasts. Grows 18 inches high ; flowers July and August. Stem fleshy, stout, little branched. Leaves sessile, very narrow, glaucous, smooth, fleshy, yellowish green, entire. Flower-heads yellow, small, solitary at end of each branch. *crithmoides*, crithmum-like, because of a resemblance of its fleshy foliage to that of the true Samphire (*Crithmum maritimum*).

PULICARIA

Pulicaria comprises some 30 species, closely related to *Inula*. Main distinctive character is 2-rowed pappus, outer row being a series of more or less united, short, membranous scales, and the inner a few rough, bristle-like hairs, unequal in length, of a dirty white colour. They also generally have a looser involucre, with fewer rows of bracts.

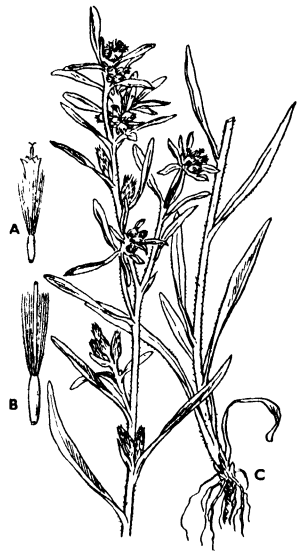
COMMON FLEABANE [Pl. 19] *Pulicaria dysenterica*

Waterside perennial commonly spreading over wide spaces of wet ground, especially on stiff, retentive soil. Grows 12–27 inches high ; flowers July to September. Rhizome creeping, giving off suckers. Aerial stems woolly or cottony, branching above, thickly set with leaves. Leaves scattered, slightly ascending, stalkless, clasping stem, oblong-pear-shaped, pointed, irregularly waved, cottony on under surface. Flower-heads flat, 1 inch across, more or less arranged in corymbs, making fine display of gold over broad patches covered by plant. Heads contain numerous narrow spreading ray-florets, almost twice as long as the disk-florets and the involucral bracts, which are bristle-like, densely woolly. Fruit : angular, silky achene. Plant is bitter, aromatic and mucilaginous. Pungent smell is obnoxious to fleas and other insects, hence common name. *Pulicaria* from Latin *pulex*, a flea ; *dysenterica*, curing dysentery.

SMALL FLEABANE *Pulicaria vulgaris*

A much smaller, rarer annual plant, confined mainly to a few parts of S. England in damp, sandy places. Grows 6–18 inches high ; flowers August and September. Stems cottony, branching, covered with slightly

toothed, lance-shaped leaves. Flower-heads golden yellow, ¼ inch across, with downy bracts. Ray-florets hardly exceeding the disk-florets and the involucral bracts. *vulgaris*, common.



WOOD CUDWEED
Gnaphalium sylvaticum
(A) Bisexual floret
(B) Female floret

FILAGO

Filago is closely related to *Gnaphalium*, members of both genera being called Cudweed. Chief difference between them is in common receptacle, which in latter is flat and free from scales, whilst in former it is conical and bears a few scales near margin.

There are about a dozen species of *Filago*, all hoary annuals, mostly small, of which 4 are British.

COMMON CUDWEED *Filago germanica*

A singular little slender annual plant, of dry sandy and gravelly places. Grows 4–12 inches high ; flowers July to September. Tap-root branched giving a good hold in loose soil. Stem erect, branching freely in cymose manner ; branches spring from below flower-heads. Stems and branches thickly set with ascending, lance-shaped leaves, and stem and leaves are densely cottony so as to appear pale grey. Florets in small, 5-sided heads, at first yellow, fading to dark brown ; these collected in globular clusters of from 20 to 40, terminating stem and successive branches. Involucral bracts, woolly at base, lance-shaped, longer than florets, continue and intermix with outer florets. Several rows of these outer florets are female, only a few towards centre being thicker and bisexual. Fruit : tiny achene, surmounted with white, silky pappus. Also called Chafeweed, Owl's Crown, Old Owl, Son-before-the-father, Quidwort. *Filago* derived from *filum*, thread, referring to cottony appearance of plant ; *germanica*, German.

GNAPHALIUM

There are 5 species in Britain, 2 of which are common.

WOOD CUDWEED *Gnaphalium sylvaticum*

Tufted little distinctive perennial herb, of clearings in woods, thickets and dry pastures. Grows up to 16 inches high ; flowers July to September. Rootstock woody ; aerial stem unbranched, erect, leafy all the way up, woolly. Basal leaves on long stalks, lance-shaped ; stem leaves narrower, pointed ; all leaves very woolly, especially beneath. They do not clasp stem. Flower-heads yellowish brown, almost sessile in axils of

upper leaves, forming long racemes. Involucral bracts brownish, shining. Receptacle flat, free from scales ; inner florets tubular, bisexual, fewer than outer thread-like female florets. Fruit : slender, slightly downy achenes, with white barbed pappus almost as long as corolla. Plant belongs to a genus of so-called ' everlasting flowers ' because stiff, dry scales of involucral bract remain long after flower is dead. *Gnaphalium* from Greek *gnaphallon*, felt ; *sylvaticum*, of woods.

DWARF CUDWEED *Gnaphalium supinum*

Small, tufted perennial of mountain summits only, locally abundant. Grows 2 or 3 inches high ; flowers July and August. Characterized by having numerous, short, leafy, non-flowering and simple, erect or ascending flowering stems. Leaves small, woolly, narrow, lance-shaped. Flower-heads small, brownish yellow, not more than 3 to each stem. *supinum*, stretched out.

MARSH CUDWEED *Gnaphalium uliginosum*

Annual of damp places in sandy soil. Grows 6 inches high ; flowers July to September. Stem procumbent, sending up numerous short branches. Leaves narrow, wavy and cottony, becoming narrower further up. Flowers in terminal clusters, yellowish brown. *uliginosum*, of marshes.

JERSEY CUDWEED *Gnaphalium luteo-album*

A somewhat larger annual, native in the Channel Isles, but found also as an introduction in light soils in Southern and Eastern England. Grows up to 1 foot high ; flowers July and August. Numerous branches are well clothed with long, narrow, wavy leaves which half clasp the stem. Flower-heads are most beautiful of the British species, appearing in dense, pale yellow corymbs, with shining bracts to the involucre. *luteo-album* from Latin *luteum*, yellow, and *album*, white.

ANTENNARIA

CAT'S-FOOT or MOUNTAIN EVERLASTING *Antennaria dioica*

Creeping or low, densely tufted perennial, of mountainous districts and heaths. Grows up to 6 inches high ; flowers May to August. Flowering stems extremely woolly. Leaves densely clustered, smooth above, but white and woolly beneath, spoon-shaped becoming lance-shaped. Florets clustered in white or rosy short-stalked heads ; unisexual and on separate plants (*dioecious*). Bracts of male flowers blunter, fatter and shorter than female, though both types are white and smooth. Flowers of male plants with swollen pappus hairs ; of female plants with divided style and longer pappus, which is almost smooth. Male florets have irritable stamens which bend over when touched. Fruit : oblong, slightly hairy achenes. Also called Cat's Ear. *Antennaria*, derived from resemblance of pappus hairs or of irritable curved filaments to a butterfly's antennae ; *dioica*, dioecious, i.e. with male and female flowers on different plants.

SOLIDAGO

GOLDEN ROD [Pl. 19] *Solidago virgaurea*

Fairly common perennial herb of woods, thickets, heaths and waste places on a sandy soil. Grows 1 or 2 feet high ; flowers July to September. Stems erect, annual, slightly woody and angular, generally downy, ribbed. Radical leaves stalked, coarsely toothed, short-lived ; stem leaves alternate, stalkless, lance-shaped, hairy, slightly toothed. Flower-heads golden yellow, in dense, narrow, leafy panicles. At base of flower-heads are about 5 rows of thin, green, overlapping bracts. Ray- and disk-florets are all yellow, the former few, in single row ; latter, about double the number, darker. Fruit : downy achene, with white pappus. When occurring on cliffs or mountains plant is usually much dwarfed. *Solidago* from Latin *solido*, I unite, with reference to reputed healing properties when applied to wounds ; *virgaurea* from *virga*, a rod, and *aurum*, gold.



CAT'S-FOOT or MOUNTAIN EVERLASTING

Antennaria dioica

ASTER

SEA ASTER [Pl. 19] *Aster tripolium*

Slightly branched perennial, widely distributed in salt marshes near the sea. Grows 6 inches to 3 feet high ; flowers July to October. Root stout and fleshy ; aerial stem erect, variously branched, smooth, fleshy. Leaves long, smooth and lance-shaped, with a broad midrib. Each branch crowned with head of scented flowers : these consist of a mass of tubular, bright yellow, bisexual disk-florets, surrounded by a varying number of violet-blue to whitish, female ray-florets. Sometimes ray flowers are absent. After fertilization disk-florets fade to a dirty orange-brown. Fruit : downy achene, with white, barbed bristles to the pappus. Only British representative of Michaelmas Daisy genus. *Aster*, star, inflorescences being star-like ; *tripolium* is the name given by Dioscorides, because it was supposed to change colour 3 times a day.

LINOSYRIS

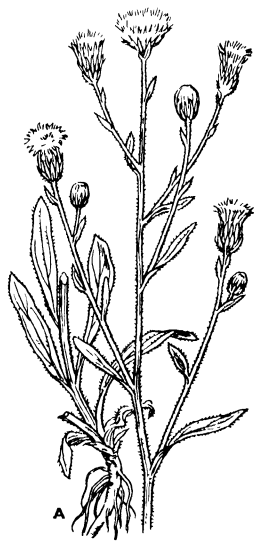
GOLDILOCKS *Linosyris vulgaris*

An extremely rare species found only on certain limestone cliffs. Grows up to 18 inches high ; flowers August and September. Wiry stem covered with narrow, dotted leaves. Flower-heads in compact bunches, cream-yellow, with no ray-florets. *Linosyris* from *Linum*, flax, and *osyris*, a plant name in Dioscorides ; *vulgaris*, common.

ERIGERON

BLUE FLEABANE *Erigeron acris*

Small annual or biennial herb, of chalk downs and dry banks. Grows up to 1½ feet high; flowers July and August. Stems erect, slightly branched, bristly, tinged with red. Radical leaves broad, entire; stem leaves long, narrow, pointed, entire, half clasping stem. Heads usually several in a corymbose panicle, with linear, red-tipped bracts in several whorls. Tubular disk-florets yellow and outer ray-florets pale purple (not blue), erect rather than spreading. Fruit: small achene with reddish downy pappus. *Erigeron* from Latin *ear*, early, and *geron*, old; alluding to appearance of premature age imparted by downy fruits; *acris*, sharp.



BLUE FLEABANE
Erigeron acris
(A) Rootstock

ALPINE or BOREAL FLEABANE *Erigeron borealis*

Extremely rare, bristly perennial of a few mountainous districts. Grows a few inches high; flowers July and August. Radical leaves spreading, lance-shaped; stem leaves few, narrow, oblong, all very hairy. Flower-heads usually solitary, with yellow disk- and purple ray-florets. Fruits have reddish pappus. *borealis*, northern.

CANADIAN FLEABANE *Erigeron canadensis*

A North American annual widely naturalized as a weed in cultivated and waste land, especially in railway cuttings. Grows 1 or 2 feet high; flowers August and September. Stems slender, slightly angular, scantily hairy. Radical leaves spoon-shaped, entire; stem leaves lance-shaped, slightly toothed. Flower-heads small (¼ inch across), in numerous, leafy panicles. Involucral bracts slender, green, with thin margins. Ray-florets small, inconspicuous, white, occasionally tinged with red; disk-florets yellowish white. Fruits bullet-shaped, topped with pappus of thin white bristles. *canadensis*, Canadian.

BELLIS

DAISY *Bellis perennis*

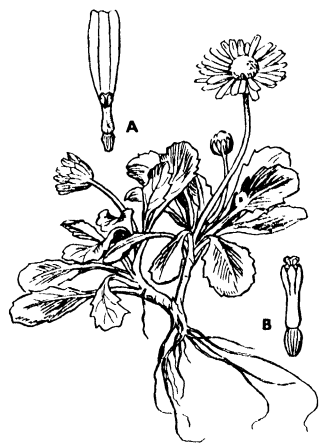
Possibly the best known of British flowering plants, found everywhere in grassland. Tufted perennial, growing up to 8 inches high; flowers almost all the year. Rootstock long, firm, fleshy. Leaves all radical, spoon-shaped, in rosette, hugging the ground, slightly toothed, downy. Scapes often hairy, unbranched, produced from tufts of leaves, each crowned with a single flower-head. Bracts dark green, narrow,

oblong, in 2 rows (looking like sepals). Florets of 2 kinds; outer 2 or 3 rows of ray-florets, white, tinged with pink (looking like petals), female only, thus lacking stamens; inner core of rich yellow disk-florets, very numerous, hermaphrodite (looking like a mass of stamens). Fruit: slightly hairy achene, lacking pappus. Plant multiplies rapidly by means of underground stems. Flower-heads open early in the morning and close at night, from whence is derived popular name Daisy (Day's-eye). Tubular florets in centre discharge pollen before their stigmas are ripe, and cross-pollination is effected by insects crawling over pollen and then

DAISY

Bellis perennis

(A) Ray-floret, female
(B) Hermaphrodite disk-floret

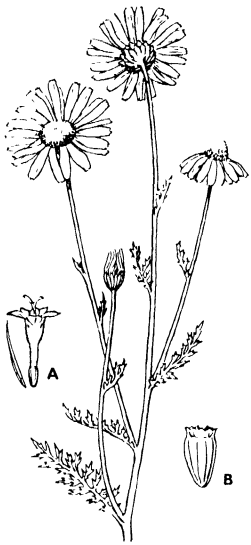


visiting other flowers. When ray florets close over tubular flowers their stigmas are also fertilized. *Bellis* from Latin *bellus*, pretty; *perennis*, perennial.

EUPATORIUM

HEMP AGRIMONY [Pl. 19] *Eupatorium cannabinum*

The only species, out of 400 in the genus, to occur in Britain. Downy perennial plant of river banks, damp woods and tangled hedgerows. Grows 3–6 feet high; flowers July to October. Stems rounded, erect, woody at base, tinged with red, branched at top. Leaves opposite, downy, palmately divided into 3–5 lance-shaped, toothed lobes. Florets collected into small, dull lilac heads, each containing about 5 florets on a flat, naked common receptacle, surrounded by 10 oblong bracts in 2 whorls, the outer being the shorter; the flower-heads are grouped into large, conspicuous, terminal corymbs. Florets all alike and regular. Corolla tubular, narrow, funnel-shaped, with 5 short teeth. Plant is slightly aromatic. Fruit: angular, crowned by white pappus of a single circle of hairs. Nectar is secreted at base of corolla-tube, and flower-heads are chiefly visited by butterflies. *Eupatorium* is classical name



CORN CHAMOMILE
Anthemis arvensis
(A) Floret (B) Fruit

for the plant; *cannabinum*, hemplike, from Latin *cannabis*, hemp. Leaves superficially resemble those of Hemp.

ANTHEMIS

CORN CHAMOMILE *Anthemis arvensis*

Downy annual of fields and waste places, abundant in some localities and scarce in others. Grows up to 18 inches high; flowers May to August. Stem much-branched, at first prostrate, erect further up. Leaves alternate, deeply and twice pinnately divided. Flower-heads solitary, on a long stalk. Involucral bracts in about 3 series, overlapping, slightly hairy, with membranous margins. Ray-florets white, numerous, with 3-toothed tip and 2-lobed style. Disk-florets yellow, each with very narrow pointed scaly bract at base, standing erect between florets on convex disk. Fruit: achenes bluntly cone-shaped, smoothly ribbed, lacking pappus. Exhales characteristic aromatic Chamomile scent. *Anthemis* is ancient Greek name for Chamomile, derived from *anthemon*, a flower; *arvensis*, of cultivated fields.

FETID or STINKING MAYWEED *Anthemis cotula*

Much-branched annual, very similar to *A. arvensis*, growing in abundance on waste land in S. England, but uncommon in the North. Differs mainly from *A. arvensis* in being smooth or definitely hairy, but not downy, and in acrid juice secreted by leaves when bruised, emitting a nauseous smell and sometimes blistering the skin. Grows about 12 inches high; flowers July to September. Leaves smooth, but dotted with minute glands. Ray-florets white, usually without styles; disk-florets yellow; flower-stalks are more slender than in last, and scaly bracts are subtended only by upper flowers on receptacle. Achenes have no pappus but are warted. *cotula*, a small vessel, application obscure.

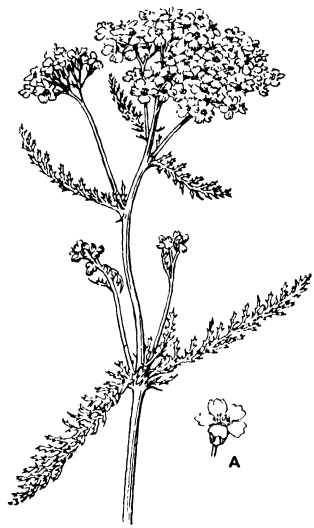
CHAMOMILE *Anthemis nobilis*

Fairly common perennial of dry and stony pastures and waste land. Grows about 12 inches high; flowers July to September. Sometimes found as an escape from gardens, being formerly cultivated for brewing chamomile tea—a supposed remedy for digestive complaints. Native in some places in S. England. Whole plant aromatic and downy; branches procumbent, grooved, hollow, and well clothed with leaves. Disk-florets yellow; ray-florets with styles, white, but these are sometimes absent. *nobilis*, noble.

ACHILLEA

YARROW or MILFOIL [Pl. 19] *Achillea millefolium*

Extremely common wayside perennial weed, found in waste and cultivated land. Grows about 1 foot high ; flowers June onwards. Rootstock tough, creeping underground. Leafy flowerless shoots, short, sent up at intervals. Flowering stems tough, erect, ribbed. Leaves very finely divided with fern-like appearance. Very large clusters of white or pink rather small flower-heads ; each flower-head being composed of about half a dozen ray-florets (female), and fewer whitish, bisexual tubular disk-florets in the centre. Bracts of involucre insignificant, in 3 or 4 series, green and brownish. Fruit : globose achene without pappus. *Achillea* derived from Achilles who is supposed to have used it to heal his wounds ; *millefolium*, a thousand leaves, with reference to feathery segments of leaves. Milfoil is merely an anglicized form of this.



YARROW or MILFOIL
Achillea millefolium
(A) Flower

SNEEZEWORT [Pl. 19] *Achillea ptarmica*

Very common similar perennial, of pastures and moist places. Grows up to 2 feet high ; flowers July onwards. Rootstock slender, creeping. Leaves more simple, very sharply toothed and pointed. Flower-heads several, in loose terminal clusters, heads being larger but fewer. Disk-florets greenish ; ray-florets more numerous. Also called Goosewort. *ptarmica*, causing to sneeze.

MATRICARIA

SCENTLESS MAYWEED *Matricaria maritima*

Attractive branching annual, of fields and waste places. Grows up to 18 inches high ; flowers June to October. Stem erect or spreading, branched ; leaves alternate, stalkless, smooth, 2 or 3 times pinnately cut into almost threadlike segments. Flower-heads large (2 inches across) on large, smooth, terminal flower-stalks. Bracts in several series, edged with brown. Ray-florets numerous, long, white ; disk-florets yellowish, very numerous, forming convex mass. Receptacle does *not* enlarge as in Wild Chamomile. Flowers scentless. Fruit : achenes conspicuously ribbed on one side only, with pappus forming a rim. Sometimes confused with Corn Chamomile, Wild Chamomile, and Stinking Mayweed. Also called Corn Mayweed. *Matricaria* from Latin *matrix*, a womb, being formerly used in uterine diseases ; *maritima*, of the sea.

The var. *maritima* is a seaside form, perennial, with thicker, fleshy leaves and fewer flower-heads.

WILD CHAMOMILE *Matricaria chamomilla*

Similar perennial to the last, both found in fields and waste places. Grows about 18 inches high; flowers June to August. Leaves when touched emit a sweet scent of Corn Chamomile (*Anthemis arvensis*). Flower-heads smaller, carried in a corymb; involucral bracts lack brown margins, and disk-florets form a cone; ray-florets shorter. Receptacle enlarges after flowering.



SCENTLESS MAYWEED
Matricaria maritima

CHRYSANTHEMUM

Genus comprises about 100 species, some shrubby and tending to form wood. Only 1 species is truly British.

OX-EYE DAISY *Chrysanthemum leucanthemum*

A lovely common perennial, of pastures and sunny banks, especially in long grass. Grows 1 or 2 feet high; flowers May to August. Stem slightly hairy or smooth, erect, seldom branched above ground, furrowed, with reddish ribs between furrows. Radical leaves, long, stalked, spoon-shaped, coarsely toothed; stem leaves narrowly oblong, deeply toothed, sessile, eared. Flower-heads large (2 inches across), Daisy-like, yellow and white, narrow bracts of involucre having dark purplish membranous margins. Ray-florets large, long, white, exclusively female; disk-florets creamy yellow, bisexual. Fruit: all fruits circular in transverse section, blackish but ribbed with white, those of ray-florets however distinguished by slight ring-like rudiment of a pappus. Also called Moon-Daisy, Moon-penny, Great Daisy, Midsummer Daisy, Big, Bull, Dog, or Horse Daisy, and others. *Chrysanthemum* from Greek *chrysos*, gold, and *anthemon*, a flower, originally probably applied to related Corn Marigold (*C. segetum*); *leucanthemum*, from Greek *leukos*, white, and *anthemon*, flower.

CORN MARIGOLD [Pl. 19] *Chrysanthemum segetum*

An annual cornfield weed, especially in the North. Naturalized in this country. Tap-root has well developed system of fibrous rootlets. Stem erect, smooth, leafy, up to 18 inches high. Leaves alternate, stalkless, somewhat lance-shaped but irregularly cut or lobed, aromatic and fleshy. Flower-heads are about equal in size to those of Ox-eye, but a golden yellow in centre, with ray-florets a deeper yellow, 2-lobed at tips, spread-

ing. Bracts broad, membranous, with wide margins. Flowering season June to September. Achenes lack pappus, but those of ray-florets are 2-winged, whereas fruits of disk-florets are not winged. *segetum*, of cornfields.

FEVERFEW *Chrysanthemum parthenium*

Handsome perennial species considered alien by some botanists. Found near walls, in hedgerows and in waste places. Grows about 18 inches high; flowers July to September. Freely branching stems ribbed and leafy; leaves broad, pinnately lobed, toothed, downy, aromatic. Flower-heads borne 3 or 4 at end of each branch, forming loose, flat-topped corymbs; bracts in about 3 series, slightly hairy. Ray-florets (about 16 to a head) white, short, broad, spreading, 3-toothed. Disk-florets numerous, golden yellow. Fruit conspicuously dark-ribbed, surmounted with toothed pappus. *parthenium* is the Greek name of a plant.

TANACETUM

Tanacetum includes some 50 species, natives of temperate regions of Northern Hemisphere, of which some 7 or 8 belong to Europe, but only 1 can be considered British.

TANSY [Pl. 19] *Tanacetum vulgare*

Scented, herbaceous perennial, cultivated for centuries in cottage gardens but almost certainly native by English river banks and in rough, hilly pastures. Grows up to 3 feet high; flowers July to September. Rhizome creeping, sending up radical leaves and flowering stems. Stem angular, furrowed, but unbranched. Leaves scattered, deeply and beautifully divided, with toothed margins. Flower-heads semi-globose, in golden corymbs. Involucral bracts leathery, in several rows, with membranous margins; common receptacle convex, naked. Flower-head mostly composed of disk-florets, but there is usually a single outer row of ray-florets, tubular below, and female, but with a short spreading 3- or 4-cleft limb, and same golden yellow as disk-florets. Scent pungent but not unpleasant. Fruit: angular, crowned with lobed, membranous disk. Often figures in ancient manuscript recipes as ingredient for puddings, candy and medicines. Tansy or *Tanacetum* is a corruption of Greek *athanasia*, immortality; *vulgare*, common.



OX-EYE DAISY
Chrysanthemum leucanthemum

(A) Rootstock
(B) Closed flower-head



MUGWORT
Artemisia vulgaris

MUGWORT *Artemisia vulgaris*

Aromatic wayside perennial. Grows about 3 feet high ; flowers June to September. Stems reddish, rough and ribbed. Leaves alternate, stalked, twice pinnately divided into sharp-pointed segments, green above but white and woolly below. Flower-heads small, reddish yellow, very many gathered into terminal leafy spikes. Bracts of involucre few, whitish. Florets of 2 kinds in each head ; inner ones few, bisexual, tubular, with bell-shaped 5-toothed corolla ; outer ones female, also tubular with smooth 2-lobed style, smooth ovary, rim-like pappus, and lacking stamens. Fruit : oval, glabrous achenes. Flower-heads often droop inconspicuously, are nectarless, therefore not very attractive to insects. As a consequence they are wind-pollinated. Once used to introduce bitter flavour into drinks, hence popular name. *Artemisia*, from *Artemis*, Diana of the Greeks, in whose honour it was named ; *vulgaris*, common.

WORMWOOD *Artemisia absinthium*

Similar aromatic perennial, occasionally seen by roadsides and in waste places, especially near the coast. Grows 1–3 feet high ; flowers July to September. Leaves silky, much cut into pointed segments. Flower-heads yellowish and tubular, with few florets per head, all drooping, in leafy spikes. Still used for flavouring the drink absinthe, as indicated in specific name.

SEASIDE WORMWOOD *Artemisia maritima*

Rather local perennial found near beaches and in salt marshes. Grows up to 18 inches high ; flowers August and September. The pinnately divided, downy leaves have their edges flat. Flower-heads narrow, reddish yellow, on short racemes, with inner and outer florets fertile. Wormwood is not connected with worms or wood, but is merely a corruption of Old English *wermod*, protection. *maritima*, of the sea.

FIELD WORMWOOD *Artemisia campestris*

Very local perennial of certain sandy heaths in eastern counties only. Grows about 2 feet high ; flowers August and September. Differs from previous species in lacking aromatic properties. Leaves smooth, silky, pinnately divided into narrow segments. Flower-heads small, numerous, yellowish, in long spikes, only outer florets fertile. *campestris*, of the plain.

CARLINA

Carlina comprises less than 20 species of stiff, spinous plants, with but one British representative.

CARLINE THISTLE [Pl. 20] *Carlina vulgaris*

Widely distributed biennial of sand-dunes, inland heaths, and chalk and limestone hills, especially near the sea and in places where soil is long undisturbed. Its deep roots enable it to flourish in very dry places. Grows 6–18 inches high; flowers July to October. Taproot long and slightly branched. Stem stout, erect, round, often tinged with red, sometimes branched, with a hoary or cottony surface. Radical leaves in a rosette, lance-shaped, spiny and cottony on under surfaces, spreading out on ground; stem leaves shorter, clasping stem, also cottony. Flower-heads globose, dull red with yellow anthers and stigmas to the florets, an inch or more in diameter. Bracts in several series: outer bracts spreading, twice pinnate, spiny and cottony; next series reddish; and innermost straw-coloured, narrow, rigid, pointed and fringed along lower half of their margins. Florets all alike, tubular and bisexual, with bell-shaped, 5-toothed corolla, embedded in flat but deeply pitted common receptacle. Fruit: brown, round in section, covered with long silky hairs, with stiff yellow bracteolar bristles being longer than soft row of feathery hairs which form crowning pappus. Glossy, straw-coloured inner bracts spread horizontally in fine weather and are more conspicuous than flowers. In moist air and at night they arch over the florets. They retain their form long after flowers are dead and leaves are become skeletons. For this reason the plant is sometimes gathered and hung up like a weatherglass. *Carlina* is an abbreviated form of *Carolina*, commemorating first Frankish Emperor, Karl the Great, commonly miscalled Charlemagne; *vulgaris*, common.

ARCTIUM

GREAT BURDOCK *Arctium lappa*

Somewhat similar to *A. minus* but larger in its parts and with solid leaf-stalks. The larger heads tend to be fewer in more terminal clusters and are open at the top in fruit. *Arctium*, from Greek *arktos*, a bear, with reference to plant's appearance; *lappa*, a bur.

LESSER BURDOCK [Pl. 18] *Arctium minus*

Tall, strong-growing, bushy, biennial herb —a weed of rubbish dumps and waste places. Grows up to 4 feet or more high; flowers June to September. Stem stout, erect, branching, leaves alternate, large, heart-



LESSER BURDOCK
Arctium minus

shaped, not toothed, slightly cottony beneath. Flower-heads purple, egg-shaped, all florets tubular. Head surrounded by involucre of spiny bracts, which are also purplish. When flower has fruited hooked bracts catch in fur of passing animals and thus help to distribute seed. Fruit : angular, with short bristly pappus. English name derived from remarkable bur formed by bracts. *minus,* lesser.

CARDUUS

A genus of erect or stemless herbaceous plants with spinous-toothed leaves, represented by 3 species in Britain.

SLENDER FLOWERED THISTLE [Pl. 18] *Carduus tenuiflorus*

Biennial of sand-dunes near the coast. Grows 1–4 feet high ; flowers June to August. Stem somewhat downy, branched, winged, with pinnately divided leaves whose lobes are toothed. Flower-heads small, pale purple, in inconspicuous clusters. Flowers all tubular ; corolla with equal lobes. *Carduus,* Latin name of various thistle-like plants ; *tenuiflorus,* slender-flowered.

WELTED THISTLE *Carduus crispus*

Annual or biennial similar to the Musk Thistle, of hedgerows and waste land, wherever man goes. Grows 1–3 feet high ; flowers June to August. Stem often branched, cottony all over, with continuous wings. Leaves pinnately lobed. Flower-heads purplish, rarely white, differing mainly from *C. nutans* in having small, erect heads in clusters. *crispus,* curled.

MUSK THISTLE [Pl. 18] *Carduus nutans*

Large, handsome and common biennial of dry fallow fields, on chalk or sand, in S. England. Grows 1–3 feet high ; flowers June to September. Stem erect, seldom branched, angular, furrowed, cottony and partly winged. Leaves usually hairy on both sides, with woolly veins on under surface, pinnately divided into spine-tipped, wavy segments, with base of wing running down stem. Flower-heads large, solitary, drooping, of deep magenta florets, with a grey cottony involucre, and a powerful musky odour, especially in sunny weather. Involucre globose, with many narrow, stiff, spiny, overlapping bracts. Common receptacle deeply pitted and furnished with bristly bracteoles. Florets all tubular. Corolla red, purple or white, 2-lipped, with 1 entire and 1 four-lobed lip ; filaments free and hairy in their middle parts ; arms of style fused together for most of their length, with ring of hairs at base. Fruit : smooth, not angled, but surmounted by a pappus of hairs in many rows, united into a ring below. Thistle-down is merely the tangled fruit of many heads, generally floating in the air. Regarded by farmers as a pernicious weed, despite its handsome appearance. The Goldfinch is very fond of Thistle fruits. *nutans,* drooping, from the droop of the flower-heads.

CIRSIUM

Cirsium differs from *Carduus* in that the pappus hairs are feathery instead of rough. There are more than 100 species in the genus, 8 of which are British.

WOOLLY THISTLE *Cirsium eriophorum*

Rather local biennial of limestone or chalk soils in S. England. Grows 4–6 feet high; flowers July to September. Stem stout, erect, woolly, furrowed, much branched. Radical leaves up to 2 feet long, very deeply and narrowly lobed, each lobe again divided, sharply spinous; dark green and bristly above, paler and cottony below. Stem leaves similar but smaller and generally toothed at the margins. Flower-heads very large, purplish, in massive terminal clusters. Involucral bracts long, slender and sharply pointed, green and purplish, with spines protruding from overall covering of white wool which embraces head. Stamens and stigmas blue, protruding conspicuously from bell-shaped corolla. Fruit: smooth yellowish achene mottled with black. *Cirsium*, the Greek name for a kind of thistle; *eriophorum*, wool bearer.



WOOLLY THISTLE
Cirsium eriophorum

SPEAR THISTLE [Pl. 1] *Cirsium vulgare*

Extremely common strong-growing biennial of fields, hedgerows and waste places. Grows 3–5 feet high; flowers July to October. Stem stout, erect, winged with 2 spiny ridges. Leaves large at base (6–12 inches long), lance-shaped, pinnately lobed, each lobe ending in a long spine, with smaller prickles in between; bristly above, woolly beneath. Flower-heads large, purplish, almost stalkless, few in cluster, surrounded by an egg-shaped involucre, slightly cottony, of spiny green bracts. All florets tubular, very numerous, bisexual. Corolla-tube very long and slender, containing nectar at the bottom. Fruit: smooth achene, with prominent feathery pappus. When fruit is still in the flower-head the collective feathery pappus gives it a shaving-brush appearance. *vulgare*, common.

MARSH THISTLE [Pl. 18] *Cirsium palustre*

Erect biennial, of wet meadows and similar places. Grows up to 5 feet high; flowers July to September. Stem stout, spiny, mostly unbranched, closely ribbed. Leaves lance-shaped, pinnately lobed, soft and hairy, continuing as wings down stem. Heads of flowers dark purple, massed

in terminal clusters. Florets all tubular with narrow, sharp-tipped involucral bracts, and narrow 5-lobed corolla-tube. Fruit smooth with feathery pappus. *palustre*, of swampy places.

CREEPING THISTLE *Cirsium arvense*

Very common perennial with creeping rootstock, of cultivated and waste land. Difficult to eradicate, and therefore detested by the farmer. Grows 2–4 feet high ; flowers July to September. Stems annual, erect, leafy and angular. Leaves broad, lance-shaped, deeply lobed with prickly margins, woolly when young. Male and female florets in separate heads on the same plant. Flower-heads short-stalked, solitary or in clusters of 2–7, forming lax corymbs. Male heads globular, female narrower and shorter, rather egg-shaped, but with longer bracts, rosy-purple. Fruits smooth, with feathery pappus. *arvense*, of cultivated fields.

STEMLESS THISTLE [Pl. 20] *Cirsium acaule*

Small, tufted perennial, forming rosette of spiny leaves on ground, of dry pastures in the South, especially on chalk or limestone soils. Grows an inch or two high ; flowers July to September. Distinguished by a solitary crimson head of florets, quite or almost stemless. *acaule*, stemless.

MELANCHOLY THISTLE [Pl. 20] *Cirsium heterophyllum*

Tall, strong perennial of hilly pastures in N. England and Scotland. Grows 2 or 3 feet high ; flowers July to September. Creeping rootstock sends out runners as in Meadow Plume Thistle. Stem tall, branched, stout and furrowed, but not prickly. Radical leaves long-stalked, finely toothed ; stem leaves clasping the stem, entire or more or less toothed, lance-shaped, white and cottony. Flower-heads larger, reddish purple. *heterophyllum*, various leaved.

MEADOW or MARSH PLUME THISTLE [Pl. 20] *Cirsium dissectum*

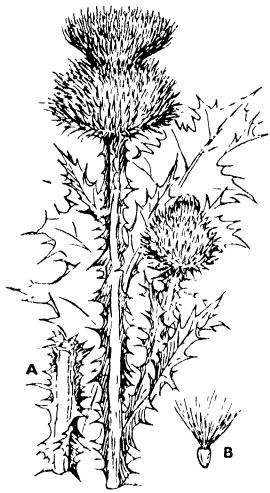
A small perennial of boggy land, locally common in S. England. Grows about 2 feet high ; flowers June to August. Root somewhat fibrous, sending out runners. Radical leaves long-stalked, lance-shaped, sinuate-toothed, sometimes lobed, wavy, armed with small prickles. Stem leaves sessile, half clasping stem. Stem and leaves cottony. Flower-heads solitary, dark purple, generally one to a plant, surrounded by rounder involucre of cottony bracts. *dissectum*, cut up.

ONOPORDUM

COTTON THISTLE *Onopordum acanthium*

Handsome, strong-growing biennial, widespread in dry and sandy soil but not truly native. Grows up to 6 feet high ; flowers July and August. Stem erect and vigorous, broadly winged, white-woolly and prickly all over. Radical leaves long, stalked, pinnately lobed, each lobe prickly ; stem leaves slender, densely prickly. Flower-heads pale purple, large,

solitary, terminal. Involucral bracts packed in several rows, covered in cottony hairs; common receptacle deeply pitted. Florets all tubular, with narrow 5-lobed corolla and bi-lobed style. Fruit: slightly compressed achene, 4-angled, with rough pappus bristles. This 4-angled fruit clearly distinguishes the genus within the Family. Also called Scotch Thistle, because although not a native of Scotland it is now adopted by heralds as the emblem of that country. *Onopordum*, from Greek *onos*, an ass, and *perdo*, 'I break wind', some of the species producing this effect on asses. *acanthium*, from a slight resemblance to Acanthus.



COTTON THISTLE
Onopordum acanthium
(A) Stem (B) Achene

SAUSSUREA

ALPINE SAUSSUREA *Saussurea alpina*

A northern perennial, of mountains and cliffs, flowering August and September, with short runners. Stem erect, downy, bearing a terminal cluster of heads. Lower leaves stalked, upper sessile, narrowly oval, toothed, cottony beneath. Florets all tubular, purplish; heads surrounded by cottony bracts. Achenes 4-ribbed, with long, whitish pappus. A very cottony plant. Named after H. P. de Saussure, a Swiss philosopher; *alpina*, alpine.



ALPINE SAUSSUREA
Saussurea alpina
(A) A floret

CENTAUREA

Centaurea comprises some 470 species, widely distributed in all continents, represented by more than 170 species in Europe, of which 4 are native in Britain. The genus includes annuals and perennials, with considerable variation in their leaves.

GREATER KNAPWEED [Pl. 20]
Centaurea scabiosa

A common strong-growing roadside perennial of chalky soils. Grows 2 or 3 feet high; flowers July to September. Rootstock thick, woody. Stems downy with soft hairs. Leaves pinnately lobed into egg-shaped segments. Flower-heads large, with showy

5-lobed neuter, bright purple ray-florets, and inner tubular, purplish crimson disk-florets. Involucre composed of cottony scales with black margins and a paler bristly fringe. Fruits downy, with stiff white pappus. *Centaurea*, so-called after centaur Chiron had been healed of wounds after using one of these species ; *scabiosa*, from a resemblance to that plant.

CORNFLOWER or BLUEBOTTLE [Pl. 20] *Centaurea cyanus*

Beautiful annual or biennial of corn or turnip fields, formerly common but now rare. Grows 2 feet high ; flowers July and August. Stem wiry, tough, grooved, slender, erect, hoary with a mass of cottony hairs. Lower leaves long, narrow, lobed ; upper leaves small, slender. Flask-shaped involucre has greenish bracts with brown, toothed margins. Common receptacle bears silvery membranous bracteoles. Ray-florets large, bright blue, 5-toothed, neuter ; inner disk-florets small, bisexual, deep violet, with conspicuous tubes of anthers which withdraw into corolla-tube when touched. Flowers scentless. Fruit : grey and silky, surmounted by dirty white or tawny pappus. Also called Hurt-sickle, Ragged Sailors, Ragged Ladies, Corn-blinks, and Blawort. Another similar species is often grown in gardens, especially white, deep violet and rose-coloured forms. *cyanus* from Greek *cyaneus*, dark blue.

BROWN RAYED KNAPWEED *Centaurea jacea*

Uncommon perennial of waste places. Introduced. Grows about 2 feet high ; flowers August and September. Leaves simple, lower ones broad and slightly lobed. Flower-heads apparently almost radiant, and involucre appears brown, its bracts having a rounded margin of comb-like teeth pointing slightly outwards. *jacea*, in Latin, a wooden hay-rack.

BLACK KNAPWEED or HARDHEADS [Pl. 20] *Centaurea nigra*

Very common perennial, of heaths, pastures and lowland meadows, on sand, loam or clay. Grows 1–3 feet high ; flowers July to September. Stem and foliage : stem erect, grooved, slightly branched, softly hairy. Leaves large, green, roughly hairy, deeply divided into egg-shaped lobes. Flower-heads large and solitary on each branch, surrounded by tightly packed, hard involucre of overlapping green bracts, each fringed with brown hairs. Common receptacle flat, with bristle-like, bracteolar scales. Through this 'hard head' grow purple or bluish red florets, tubular and bisexual, surrounded by an outer row of large, unsymmetrical, neuter ray-florets. Fruit : achenes are compressed, slightly hairy, surmounted by pappus of short, slender, stiff, rough hairs in several rows. *nigra*, black, with reference to plant's dark brown involucral fringe.

STAR THISTLE [Pl. 20] *Centaurea calcitrapa*

Rare biennial, found in dry soil of waste places in S. England. Probably introduced. Grows about 2 feet high ; flowers July to September. Stem stiff, erect, well clothed with leaves, branching freely above. Leaves pinnately divided into slender pointed lobes. Involucral bracts few,

large, yellowish, edged with prickles, and ending in long spine. Flower-heads very small, with tubular, rosy-purple florets. *calcitrapa* from caltrop —an iron ball covered with spikes, the prickly flower-head resembling this.

SERRATULA

Serratula includes some 40 species of perennials, inhabiting north temperate regions of the Old World. Only 1 is British.

SAW-WORT [Pl. 18] *Serratula tinctoria*

Erect perennial of dry heaths in S. England, on old pasture land, and in open thickets, but not under much shade nor at any altitude. Grows 2 or 3 feet high; flowers July to September. Rhizome rather woody; aerial stem slender, erect, grooved or angular, leafy, branching in loose corymb. Radical leaves large, pinnately divided into lyre-shaped leaflets, with distant lobes and stiff but not prickly teeth to all margins. Root leaves 5–9 inches long; stem leaves small and stalkless. Flower-heads egg-shaped, ½ to ⅔ inch across; involucral bracts stiff, minutely hairy—outer ones oval, inner ones linear and tinged with red. Florets all tubular, either crimson or very rarely white. Some plants have bisexual flowers, others have imperfect anthers. Stigmas and anthers are prominently displayed beyond corolla. Fruit: oblong, compressed, smooth, grey, with dirty white pappus of many rows of stiff rough hairs, branched in a feathery manner, rows being of very unequal length. Plant gives a yellow colour to wool, and was formerly much used in Sweden for this. The yellow, when fixed with alum, was said to be beautiful and permanent. *Serratula*, the name probably refers to chipped appearance of leaves; *tinctoria*, used for dyeing.

CICHORIUM

Cichorium comprises less than a dozen species, mostly of the Mediterranean region, with but 1 British species.

CHICORY or WILD SUCCORY [Pl. 21] *Cichorium intybus*

Perennial herb, generally distributed, mostly on chalky but also on sandy and gravelly soils. Grows 1–3 feet high; flowers July to October. Tap-root fleshy. Stems tough, rigid, angular, grooved, rough with bristly hairs, zig-zagging from side to side. Radical leaves spreading, oblong-lance-shaped, with teeth hooked backwards (like those of Dandelion), and glandular hairs on margins; stem leaves stalkless, oval, heart-shaped, clasping stem. Flower-heads expand to 1½ inches in diameter, but only in fair weather and between certain hours of morning. Outer green bracts of involucre fringed with glandular hairs; inner 8–10, united at base, longer, and at first erect but afterwards reflexed. Common receptacle flat, naked, pitted. Florets large, usually bright blue, rarely white or pink, with no tails to anther-chambers. Upper part of style with its slender arms hairy. Fruit: smooth, compressed, grooved achenes, crowded on hardened receptacle, embraced by stiff involucral bracts, crowned by pappus

of 2 rows of minute, erect, obtuse, chaffy scales. Cultivated plant does not differ from wild form. Chief use is as an adulterant of coffee, for which fleshy root is cut up, roasted and ground. Generic and specific names derived from Greek, but meaning is obscure.

LAPSANA

NIPPLEWORT — *Lapsana communis*

A very common annual weed of waste places, roadsides and edges of cultivated fields. Grows 1–3 feet high; flowers July to September. Stems slender, branching, hollow. Lower leaves large, thin, with broad, spoon-shaped terminal lobe and 2 pairs of smaller side lobes below; upper leaves sessile, lance-shaped, slightly toothed. Flower-heads small, yellow, containing few florets, resembling those of Wall Lettuce. Outer and inner involucral bracts few, green, containing milky juice. Florets all ligulate, bisexual, with tailed anthers and hairy style. Fruit: oval, green-nerved achenes, without pappus, and partly enclosed by bracts. Also called Dockorenes, and formerly used in salads. Flowers close in bad weather. Common name derived from its supposed soothing properties for sore nipples. *Lapsana*, the classical name; *communis*, common.



NIPPLEWORT
Lapsana communis
(A) Floret

ARNOSERIS

LAMB'S OR SWINE'S SUCCORY — *Arnoseris minima*

A local annual, up to 10 inches, of sandy fields, flowering from June to August. Characterized by the leafless stem which is hollow and gradually thickens towards the top and is little branched, the branches rising from the axils of a minute bract and overtopping the main stem. Leaves all radical, oblong, toothed. Florets yellow, in small narrow heads, enveloped by long-toothed, keeled bracts. Achenes ribbed and crowned by a short membranous border. *Arnoseris*, from *arnos*, lamb, and *seris*, salad; *minima*, very small (referring to the head).

HYPOCHOERIS

CAT'S-EAR [Pl. 21] — *Hypochoeris radicata*

Common strong-growing perennial of meadows and waysides. Grows 1 or 2 feet high; flowers June to September. Tap-root, thick, woody. Stem erect, leafless, simple or branched. Leaves all radical, spreading,

oblong-lance-shaped, pinnately lobed, hairy. A few small bracts are subtended at intervals up smooth stem, and these are said to resemble cat's ears. If flower-stem is branched, each branch bears solitary flower-head, handsomely golden yellow. Involucral bracts in 2 or 3 rows, overlapping, outer row short, inmost row long-pointed, about as long as flowers. Corollas of florets all strap-shaped, 5-toothed. Fruit: long, slender achenes, minutely pimply, narrowing into fine beak, crowned with spreading pappus in two rows; lateral hairs on outer row distinguish it from Dandelion. Quite a common plant but often overlooked because of its similarity to Dandelion and the Hawkweeds. *Hypochoeris* from Greek *hypo*, under, and *choiros*, a pig, because swine are supposed to eat certain species; *radicata*, rooted, alluding to thick, woody taproot.

SMOOTH CAT'S-EAR *Hypochoeris glabra*

Uncommon annual of dry gravelly meadows. Grows 18 inches high; flowers June to September. Differs from previous species chiefly in the leaves, which are usually hairless and broader, oval in outline; in the flower-heads, which are only half as large and have involucral bracts as long as florets; and in the outer achenes, which have no beak. *glabra*, glabrous, without hairs.

SPOTTED CAT'S-EAR *Hypochoeris maculata*

Very rare perennial, found only in fields of a few counties, on chalk and limestone soils. Grows 1 or 2 feet high; flowers July and August. Leaves roughly hairy, sessile, usually darkly spotted, oval in outline. Stem generally unbranched but bearing a few small leaves. Flower-heads one or more, terminal, large, with bracts shorter than florets, and pappus in one row, all with lateral hairs. *maculata*, spotted.



CAT'S-EAR
Hypochoeris radicata
(A) Floret (B) Rootstock

LEONTODON

AUTUMNAL HAWKBIT *Leontodon autumnalis*

Common perennial of meadows, pastures and waste places. Grows about 1 foot high; flowers July to October. Leaves all radical, narrow, deeply pinnately lobed, spreading, generally hairless. Flowering stems branched, somewhat enlarged and hollow above, with bracts beneath the heads. Flower-heads golden yellow with 1 whorl of long narrow bracts. Achene brown, tapering but not beaked, crowned with feathery pappus. Flower-heads contract in dull and wet weather. *Leontodon*, lion's tooth, alluding to toothed leaves; *autumnalis*, of autumn.

HAWKBIT *Leontodon hispidus*

A common and widespread perennial of pastures everywhere (except in N. Scotland), especially on chalky soils. Grows about 1 foot high ; flowers June to September. Flower-head stalks densely clothed with short hairs. Leaves about 6 inches long, narrow, spreading from base, coarsely toothed or lobed, narrowing into winged stalks. Flower-heads solitary, with florets all strap-shaped, bisexual, yellow. Corolla 5-toothed, anthers tailed at base, and style arms hairy. Fruit : achene slender, slightly curved and rough, with 2 lots of bristles to the pappus ; inner ones feathery, longer than achene ; outer ones fewer, shorter, smoothish. *hispidus*, hispid.

HAIRY HAWKBIT *Leontodon leysseri*

Allied to *L. hispidus*, but attaining only half the height, more sparsely hairy on the flower-stalks and with smaller heads. The pappus of the achenes at the rim of the flower-heads consists of small scales only. *leysseri*, of F. W. von Leysser, German botanist.

PICRIS

BRISTLY OX-TONGUE [Pl. 20] *Picris echioides*

A not very attractive annual or biennial, resembling the Sow-thistles but less common, of fields and waste places. Grows about 2 feet high ; flowers June to October. Stem stout, branched, full of acrid milky juices. Radical leaves broad, lance-shaped, rough, undivided, stalked ; stem leaves much smaller, heart-shaped, stalkless, half embracing stem. Stems have a purplish red tinge, and whole plant is clothed with stiff branched hairs. Flower-heads yellow, in small clusters ; all florets ligulate, bisexual. Involucral bracts in 2 whorls, an inner of 8, scale-like, and an outer of 5 large, heart-shaped, tinged with purplish red. Fruit : small achenes crowned with fluffy ball of white pappus. *Picris*, from Greek *pikros*, bitter, with reference to taste of milky juice ; *echioides*, like Echium (*Boraginaceae*).



HAWKBIT
Leontodon hispidus

HAWKWEED OX-TONGUE [Pl. 20]
Picris hieracioides

Similar bristly biennial of dry waste places. Grows 1 or 2 feet high ; flowers June to October. Differs mainly in having outer bracts of flower-head short and narrow, instead of heart-shaped, and covered with black hairs. *hieracioides*, Hieracium-like.

TRAGOPOGON

Tragopogon comprises some 45 species, nearly 20 being natives of Europe, but only 2 in our islands.



GOAT'S BEARD
Tragopogon pratensis

GOAT'S BEARD *Tragopogon pratensis*

Rather uncommon biennial herb of meadows, hedgerows, and waste places, especially on a chalky soil. Grows 1–2 feet high; flowers June and July. Tap-root yellow, fleshy, edible. Stem erect, sparingly branched. Leaves scattered, grass-like, long, undivided, tapering, sheathing at base. Stem and leaves generally hairless. Flower-heads large, solitary and terminal, with some 20–50 pale yellow florets, and are remarkable for closing before noon. Involucral bracts 8–16, in 2 alternating rows, all united at base, narrow, about same length as florets and as one another. Receptacle flat in flower stage, naked or fringed with hairs, and pitted with hollows in which ovaries are embedded. Florets all ligulate, with corollas 5-toothed, outer florets being slightly longer. Anther chambers tailed; style slender, hairy on upper portion, dividing into 2 slender arms which roll backwards. Fruit: angular, oblong achenes, covered with rough tubercles. Calyx-tube is prolonged into a slender beak, at least as long as ovary, which is surmounted by a large pappus of about 30 spreading feathery but rigid, branched hairs with unbranched tips. Hair-like branches of pappus of outer row of fruits interlace. As fruits develop common receptacle becomes more convex, so that they turn into a cobweb-like sphere of rigid plumes. Also called Jack-go-to-bed-at-noon, Shepherd's Clock, Nap-at-Noon, Noontide, Sleep-at-Noon, all from flowers' early closing. Names like Goat's Beard, Joseph's Flower, etc., refer to bearded fruiting head. *Tragopogon*, from Greek *tragos*, a goat, and *pogon*, a beard; *pratensis*, of meadows.

SMALLER-FLOWERED GOAT'S BEARD *Tragopogon minor*

A far more common biennial of meadows and waste places, differing only from the previous species in being rather taller (2 feet) with smaller flower-heads, and bracts being nearly twice as long as the florets. *minor*, smaller.

SALSIFY *Tragopogon porrifolius*

A native of Mediterranean regions (with leek-like leaves), is purple-flowered, and has eminently edible roots, grown under the name of Salsify or Vegetable Oyster. This sometimes occurs as an escape from cultivation. *porrifolius*, having leaves like the leek (*Allium porrum*).

LACTUCA

PRICKLY LETTUCE [Pl. 24] *Lactuca serriola*

Closely resembles the next species in all respects but branches are rather more upright, flower-heads smaller, and achenes grey, not black. *Lactuca*, from *lactis*, milk ; *serriola* is a corruption of *Scariola*, Italian name for the plant.

WILD or STINKING LETTUCE *Lactuca virosa*

Rather uncommon biennial, but widely distributed in hedge banks and waste places. Grows up to 6 or 7 feet high ; flowers July and August. Stem erect, branching, slender, containing acrid milky juice. Radical leaves glaucous, roughly oblong, with wavy, toothed margins ; stem leaves stalkless, eared at base and clasping stem, slightly spoon-shaped, bright green, with wavy toothed margins, and frequently prickly on under side of mid-rib. A small ear-like bract is present at base of each branch. Flower-heads small, yellow, in spreading panicles. Involucral bracts few, of unequal sizes, green tipped with red. Florets, about 20 in each head, all with strap-shaped corolla and hairy style. Fruit : blackish, flattened achene, with about half a dozen ribs on each side, narrowing into a beak, and surmounted by pappus of white, rough, spreading hairs. Flowers open in morning and close about noon. Bracts spread in fruiting stage. *virosa*, poisonous.

It cannot be said with certainty that any of these species is the forerunner of our cultivated lettuce (*Lactuca sativa*).

MYCELIS

WALL LETTUCE *Mycelis muralis*

Annual or biennial of old walls, rocky banks and hedgerows. Although the most common native species it is by no means abundant. Grows 3 feet high ; flowers July to September. Stem slender, branched. Leaves lyre-shaped, with bases clasping stem, and margins prominently lobed and jagged ; upper part forms wide, triangular, toothed lobe. Flower-heads small, yellow, massed in loose panicles. Each head is composed of about 5 ray-florets, surrounded by long green bracts. *Mycelis*, origin obscure ; *muralis*, of walls.

SONCHUS

FIELD MILK-THISTLE [Pl. 21] *Sonchus arvensis*

Common and attractive perennial of cultivated fields and waste places. Grows 3 or more feet high ; flowers August and September. Rootstock creeping, sending off runners. Stem succulent, hollow, hairless, containing milky juice. Radical leaves stalked, oblong, deeply pinnately lobed, with reflexed teeth at margins ; stem leaves stalkless, with teeth growing forwards, bases clasping stem. Flower-heads large (2 inches across), bright yellow, in handsome clusters. Involucral bracts in about 3 rows, clothed with golden-yellow, glandular hairs. All florets strap-shaped with toothed corolla. Fruit : closely ribbed achene surmounted by white bristly pappus.

Owing to its creeping rootstock it is difficult to eradicate from cornfields. Has a number of popular names such as Rosemary, Gutweed, Hogweed and Dindle. *Sonchus*, thistle-like plants ; *arvensis*, of cultivated fields.

COMMON or MILK SOW-THISTLE [Pl. 21] *Sonchus oleraceus*

Annual herb, similar to previous species but smaller. Commonly found in fields and waste land. Grows 2–3 feet high ; flowers June to September. Stem thick, hollow ; radical leaves pinnately lobed, sharply toothed ; stem leaves with long, rounded ears at base, clasping stem. Flower-heads numerous, pale yellow, rather small ; bracts smooth or with a few small hairs. Achenes ribbed, prickly, with white pappus. *oleraceus*, edible.

PRICKLY SOW-THISTLE *Sonchus asper*

Common annual weed of cultivated land and waste places. Grows 1 or 2 feet high ; flowers August and September. Stems hollow, succulent, often tinged with red. Radical leaves spoon-shaped, forming rosette ; stem leaves stalkless, oblong-lance-shaped, with sharp prickly teeth, eared at base, embracing stem. Flower-heads pale yellow, in loose cluster, with all florets strap-shaped. Achenes brownish, flattened, ribbed, with many whitish hairs forming pappus. Chiefly distinguished from *S. oleraceus* by prickly leaves ; *asper*, rough.

HIERACIUM

A large genus containing many not easily distinguished species, and generally passed over by the non-botanical observer as 'Dandelions'. Two hundred and sixty British species have been enumerated.

NARROW-LEAVED or UMBELLATE HAWKWEED *Hieracium umbellatum*

Tall perennial, frequent in dry, stony places. Grows up to 3 feet high ; flowers July to September. Stem erect, leafy, wiry. Radical leaves few, soon dying off ; stem leaves much narrower. Small flower-heads are produced from leaf-axils, and also in irregular umbels at top of stem. Corolla yellow, with yellow styles. *Hieracium*, from Greek *hierax*, a hawk ; *umbellatum*, umbellate.

MOUSE-EAR HAWKWEED *Hieracium pilosella*

Small, Dandelion-like perennial, frequent on commons and in dry pastures. Grows 6 inches high ; flowers May to August. Rootstock creeping, sending out leafy runners. Leaves all radical, in spreading tufts, downy below, hairy above, alternate, oblong-lance-shaped, not toothed ; leaves from runners are small, slender, narrow and spoon-shaped. Flower-heads solitary on unbranched stems which are clothed with glandular hairs. Involucre bell-shaped bracts in 2 or 3 rows, clothed outside with short stiff black hairs. Florets all ligulate, bisexual, with smooth, pale lemon-yellow rays, often with dull reddish stripes below. Fruit : achenes short and smooth, crowned with white pappus. *pilosella*, diminutive of *pilosus*, hairy. (See page 296.)



MOUSE-EAR HAWKWEED
Hieracium pilosella

(A) Floret

CREPIS

SMOOTH HAWK'S-BEARD [Pl. 21]
Crepis capillaris

Very common annual or biennial, of fields waysides, walls, etc. Grows up to 3 feet high ; flowers June to October. Stems erect, branched, furrowed. Radical leaves long (up to 9 inches), narrow, irregularly lobed and toothed, lance-shaped, with sheathing bases ; stem leaves few, stalkless, clasping stem with pointed ears. Flower-heads small, bell-shaped, yellow, a few in loose clusters, or occasionally solitary. Each flowering stem has small bract at base ; involucral bracts in 2 rows—outer awl-shaped, narrow, short ; inner more numerous, erect and glabrous within. Florets all ligulate and bisexual. Fruit : smooth, reddish brown achenes, closely 10-ribbed, without beak ; pappus white, silky and soft. Has the smallest flower-heads of any of the Hawk's-beards. *Crepis*, probably from Greek, *krepis*, a sandal, from shape of leaves ; *capillaris*, hairlike.

STINKING HAWK'S-BEARD *Crepis foetida*

Rather local annual or biennial of chalky or gravelly soils in S.E. England only. Grows 2 feet high ; flowers June and July. Stem furrowed, much-branched. Radical leaves lance-shaped, divided into wedge-shaped lobes ; stem leaves small, few, stalkless, deeply toothed. Flower-heads golden yellow, on long stalks ; achenes beaked ; the marginal with a short, and the central with a long beak. *foetida*, stinking.

BEAKED HAWK'S-BEARD [Pl. 21] *Crepis taraxacifolia*

Bristly biennial similar to last but smaller, of chalky and limestone soils in southern half of British Isles. Grows 1 or 2 feet high ; flowers May to July. Stem angular, faintly furrowed, branching freely above, tinged purplish at base. Radical leaves irregularly divided into backward-pointing lobes ; stem leaves sessile, toothed, clasping stem. Flower-heads large, yellow, with under surfaces of outer strap-shaped corollas striped red or purple. Achenes slender, brownish, roughly ribbed, long-beaked. *taraxacifolia*, dandelion-leaved.

LARGE ROUGH HAWK'S-BEARD *Crepis biennis*

Biennial of similar places to the last but with a greater range northwards. Grows 4 feet high ; flowers June and July Stem stout, ribbed, branching freely. Radical leaves long (up to 1 foot), irregularly lobed ; stem leaves very few, lance-shaped, clasping stem. Outer involucral bracts spreading ;

flower-heads yellow (¾ inch across) ; inner bracts hairy within ; achenes not beaked. Whole plant bristly. *biennis*, biennial.

MARSH HAWK'S-BEARD *Crepis paludosa*

Local perennial of upland pastures and damp woods, not south of Severn. Grows 3 feet high ; flowers July to September. Stem similar to other species but less branched. Radical leaves thin, on long slender stalks, irregularly divided into downward-pointing teeth ; stem leaves sessile, lance-shaped, toothed or entire, clasping stem. Flower-heads few, clothed with black hairs. Achenes ribbed, lacking beaks, but distinguished from other species by stiff, brittle, bristly, greyish-white pappus. *paludosa*, of swampy places.

TARAXACUM

DANDELION [Pl. 21] *Taraxacum officinale*

Perennial weed of cultivation, growing almost everywhere, especially in grassland. Grows up to about a foot high ; flowers March to October. Tap-root dark, fleshy, alternately expanding and contracting in length as it increases in girth, thus dragging stem downwards and preventing it ever rising much above ground. It abounds in bitter latex, and if injured has great powers of repair, forming scab over wound from which adventitious buds are developed. Main stem or rhizome very short forming cyme from which rosette of radical leaves and flowering stalks originate. A new main bud is formed each year on this leafy axis to develop in following season. Leaves all radical, with large teeth pointing downwards, but varying according to microspecies. Flower-heads solitary, on hollow, leafless stalks rising direct from rhizome. Involucre has 2 series of bracts ; outer, few in number, shorter, spreading or reflexed ; inner in one row, erect and equal. Common receptacle at first flat, naked and pitted, later becoming convex. Florets numerous, 200–300 in each flower-head ; all ligulate, yellow, bisexual. Corolla strap-shaped, 5-toothed, and that of outer florets often brown on the back. Anthers have no tails ; upper part of style downy, and its slender arms curve over. Fruit : compressed and ribbed achenes, contracting abruptly into a slender beak, which is surmounted by a pappus of many rows of radiating, soft, white, unbranched hairs. Flower-heads expand in early morning and close about 7 hours later. After fertilization there is an interesting series of changes. Withering florets twist into a mass which shelters elongating beak from rain. Then receptacle becomes convex and bracts expand till they bend over and point downwards along flower-stalk, and globe of down appears. Drying receptacle squeezes off fruits, and children helping to blow them off call them Blowball, What's-a-clock and Fortune-teller. Rhizome, when roasted, is a useful substitute for Chicory ; and leaves, blanched, are valued on the Continent as a salad. Name Dandelion originates from Latin *Dens leonis*, lion's tooth, most probably from irregular, backward curving, pointed lobes of leaves, resembling fierce jaws of heraldic lion. *Taraxacum*, medieval Latin name ; *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.

This species has been split into numerous microspecies.

CLASS: MONOCOTYLEDONES

Plants whose seeds have 1 seed-leaf or cotyledon. Primary or tap-root not as a rule developed, there being instead a bunch of unbranched fibrous rootlets. Stems without pith, wood or bark, but having bundles of fibres surrounded by tissue. Leaves usually simple, entire, parallel-veined, very often highly polished and glossy. Parts of flower usually in whorls of 3.

THE WATER PLANTAIN FAMILY

ALISMATACEAE

A widely distributed family, comprising some 10 genera with 50 species including some floating or largely submerged plants, but most of them water-side or marsh species. Leaves generally radical. Flowers usually large, coloured, with 6 segments to perianth. Fruit, a ring of leathery carpels. Represented in Britain by 5 genera, with 7 species between them.

BALDELLIA

LESSER WATER PLANTAIN — *Baldellia ranunculoides*

A locally common species, of ditches and bogs. Grows 1½ feet high; flowers May to September. Leaves about 3 inches long, narrow, lance-shaped. Flowers usually umbellate, pale purple, comparatively large. *Baldellia*, after the Marquis B. Bartolini-Baldelli, famous nineteenth-century Italian nobleman; *ranunculoides*, buttercup-like.

ALISMA

Genus characterized by erect leaves, and nectar-secreting, scentless flowers grouped in umbels.

WATER PLANTAIN [Pl. 22] — *Alisma plantago-aquatica*

Fibrous-rooted, erect perennial, abundant in the South in ponds, ditches and streams. Grows 2 or 3 feet high; flowers June to August. Stem swollen, fleshy at base. Leaves erect, 6–8 inches long, first-formed often submerged or floating; later ascending ones have 5–7 longitudinal ribs and taper at base. Flowers tiny, delicate; yellow-clawed petals suffused with pale pink. Umbels borne in graceful panicle, whose branches become more slender at each successive branching from bluntly triangular main stalk. Perianth consists of 2 whorls of 3 segments each, outer resembling sepals, inner composed of 3 good-sized petals. Stamens 6, carpels 20–30, maturing with stamens, and arranged in a ring, becoming laterally compressed. Honey glands concealed between bases of stamens. Fruit: dry, flat ring of 1-seeded carpels. *Alisma*, name of a water plant, used by Dioscorides; *plantago-aquatica*, water plantain.

DAMASONIUM

THRUMWORT — *Damasonium alisma*

A very local plant of ponds and ditches mainly in the South, flowering June and July. The leaves are shorter than in *Alisma* and tend to be heart-shaped at the base. Distinguished further from *Alisma* by the star-like heads of long-beaked carpels. *Damasonium*, the classical name; *alisma*, name of water-plant.

SAGITTARIA

ARROW-HEAD [Pl. 22] — *Saggitaria sagittifolia*

Aquatic perennial herb, common in shallow water. Grows about 18 inches high; flowers July to September. Rhizome short, thick, sending off runners each ending in a tuber. Reproduced vegetatively by means of winter buds. Leaves of 3 kinds: (*a*) entirely submerged, elongated, flattened, thin and pellucid leaf stalks without blades; (*b*) floating leaves on surface with heart-shaped blade; (*c*) majority distinctively arrow-shaped, rising erect above water. Flowers large, white, in 3–5 whorls, with 3–5 flowers in each whorl. Lower whorl female; upper, male. Calyx consists of 3 concave green sepals persisting in fruit stage. Petals 3 times as large as sepals, rounded, white, gradually spreading flat; short claws beautifully tinged with lilac. Anthers heart-shaped, violet. Fruit: carpels 1-seeded, numerous, compressed, forming a head; swelling out on their outer margins into spongy wing acting as float; polished seeds not wetted by water. Cultivated in China for its edible tubers. Name from Latin *sagitta*, an arrow.

THE FLOWERING RUSH FAMILY

BUTOMACEAE

A small family, with 1 British species.

BUTOMUS

FLOWERING RUSH [Pl. 22] — *Butomus umbellatus*

A common perennial of ditches and still water. Grows up to 4 feet high; flowers July to September. Rhizome stout, creeping in mud. Stem round. Leaves all radical, up to 4 feet long, erect for some distance above water, triangular in section, like a rapier, with sheathing bases. Flowers in umbels at end of leafless, thick, reddish-green stalks. Each umbel holds about 12 flowers, each on a long stalk; umbel is enclosed by a number of thin, brownish bracts. Perianth in 2 whorls of 3, pink, spreading leaves. Each flower has 6–9 stamens, and 6–9 dark pink carpels, exuding copious nectar. Flowers sweet-scented. Fruit: collection of follicles, splitting to release numerous seeds. A most handsome and attractive species, sometimes cultivated in water gardens. *Butomus* probably from Greek *bous*, an ox, and *temno*, I cut, because leaves of plant to which this name was originally applied were apt to cut mouths of cattle browsing on them; *umbellatus*, umbellate, referring to umbel-like arrangement of flower clusters.

THE FROGBIT FAMILY

HYDROCHARITACEAE

A small family of aquatic herbs, mostly perennial, either submerged, with ribbon-like leaves, or floating. It comprises some 14 genera and less than 60 known species, including several of the few genera that live in sea water.

HYDROCHARIS

A genus consisting of but a single species.

FROGBIT — *Hydrocharis morsus-ranae*

Aquatic herb of ponds and ditches. Flowers July and August. Consists mainly of leathery leaves springing in rosette from very short axis ; leaves round, obtuse, reddish purple beneath. Roots several, slender, transparent, descending from axis into water, but unconnected to the bottom—whole plant floats. Reproduction mainly by horizontal stolons developed from axillary buds ; these stolons have new plants at their ends. In autumn large buds form on stolons, become detached, sink, hibernate in mud, and float to surface in spring, developing into new plants. Flowers unisexual, male and female, on same plant. Sepals 3, small, oblong ; petals 3, large, delicate, white, crumpled, with yellow base and fleshy honey gland. Male flowers in stalked, 2-leaved spathe ; stamens 12, generally in 3 whorls, with broad fleshy filaments. Female flowers solitary in single-leaved sessile spathe ; carpels 6, united with styles separating above. Fruit : 6-celled berry, ripening under water, and splitting irregularly as it decays, to release numerous, minute, roundish seeds. Not known in extreme S.W. England nor in Scotland. *Hydrocharis* from Greek *hydor*, water, and *charis*, beauty ; *morsus-ranae* from Latin *morsus*, a biting, and *ranae*, of a frog ; so named because growing in frog-infested districts it was anciently believed that heart-shaped base of leaves was due to bite of a frog.



FROGBIT
Hydrocharis morsus-ranae

STRATIOTES

WATER SOLDIER — *Stratiotes aloides*

Rare perennial of lakes and ditches, especially in fen country. Flowers June to August. A short rootstock which creeps in mud, only after flowering. Leaves springing from this are long, narrow, fleshy, sword-like, sharply toothed at edges, spreading outwards in rosette. Flowers similar to those of previous species. Sepals 3, petals 3, white. Sexes separate: female flowers solitary, but male flowers in twos or threes. Ovary egg-shaped, styles 6; stamens numerous. Fruit: green, flagon-shaped berry bending over on stalk when ripe; seeds slimy. After flowering whole plant sinks to bottom where seeds ripen. Axillary runners are sent out and encircle old plant with new plants which are liberated when plant rises to surface. Whole plant sinks again for winter hibernation. *Stratiotes* a soldier; *aloides*, aloe-like.

ELODEA

CANADIAN POND WEED — *Elodea canadensis*

This notorious member of this family, introduced about 100 years ago from N. America, is now rapidly clogging a number of our rivers and canals. Plant is completely submerged, with dense, whorled, unstalked leaves. Somewhat resembles *Potamogeton densus*. *Elodea*, from Greek *helos* a marsh; *canadensis*, of Canada.

THE SCHEUCHZERIA FAMILY

SCHEUCHZERIACEAE

SCHEUCHZERIA

SCHEUCHZERIA — *Scheuchzeria palustris*

A rare perennial of Scottish sphagnum bogs, up to 1 foot, flowering June to August. Allied to *Triglochin* but with leafy stems, the leaves overtopping the few-flowered, lax inflorescence. Flowers yellowish green, subtended by bracts. Named after the Swiss brothers Scheuchzer; *palustris*, of swampy places.

THE ARROW-GRASS FAMILY

JUNCAGINACEAE

A small aquatic family represented in this country by the Arrow-grass.

TRIGLOCHIN

MARSH ARROW-GRASS — *Triglochin palustris*

Suckering, tufted perennial of marshes and wet meadows. Grows up to 1 foot high; flowers June to August. Leaves erect, slender, juicy



MARSH ARROW-GRASS
Triglochin palustris
(A) Flower (B) Fruit

thread-like, 6 inches long. Flowers purple, inconspicuous; perianth segments 6, stamens 6, carpels 3. Fruit: a clavate, seed-like nut, appressed to scape. *Triglochin* from Greek *treis*, three, and *glochin*, barb of an arrow, referring to bristles on carpels; *palustris*, of swampy places.

SEA ARROW-GRASS *Triglochin maritima*

A seaside and saltmarsh plant, also tufted, but with fleshier leaves, and with flowers in denser racemes. Carpels 6. *maritima*, of the sea.

EEL-GRASS FAMILY

ZOSTERACEAE

ZOSTERA

EEL-GRASS *Zostera sp.*

The only genus of *Zosteraceae*, a family of submerged, marine, perennial plants, with distinctive, grass-like leaves, spreading by rhizomes, flowering from June onwards and fruiting late in the year. Flowers without petals or sepals, male and female alternately in rows within a leaf-sheath. Fruit a 1-seeded nut. *Z. marina*, a local species, has branched stems and long, broad leaves; *Z. hornemanniana* and *Z. nana* have narrower, shorter leaves, the latter having unbranched stems, split sheaths and smooth, not ribbed, seeds. The last two are found in shallower water and in estuaries. *Zostera*, from *zoster*, a belt or girdle; *marina*, of the sea; *hornemanniana*, named after J. W. Hornemann, a Danish botanist; *nana*, dwarf.

THE PONDWEED FAMILY

POTAMOGETONACEAE

A world-wide family of marsh or aquatic herbs, represented in this country by 1 genus—*Potamogeton*. Rootstocks creeping, stems slender, branched, long, jointed. Leaves usually alternate, with sheathing bases, parallel veined, floating or submerged. Flowers small, green, with much reduced perianth, nearly always in terminal or axillary spikes projecting out of water. Sexes separate; perianth segments 4; stamens 4; ovary of 1–4 carpels with 1 style. Fruit: seed-like nuts, which are buoyant at first, but later sink to germinate.

POTAMOGETON

The most common species are :

BROAD-LEAVED PONDWEED — *Potamogeton natans*

Floating leaves leathery, egg-shaped ; submerged leaves ribbon-shaped, all on long stalks. Flower spike dense, short, slender. Perennial. *Potamogeton* from Greek *potamos*, a river, and *geiton*, a neighbour, with reference to their situation ; *natans*, floating.

VARIOUS-LEAVED PONDWEED — *Potamogeton gramineus*

Submerged leaves, sessile, limp, narrow, lance-shaped ; floating leaves (if present) oblong, thin, leathery, stalked. *gramineus*, grass-like.

SMALL PONDWEED — *Potamogeton berchtoldii*

Stem thread-like. Leaves all submerged, ribbon-shaped, dark green, translucent, half-clasping stem. Flower spike few-flowered. *berchtoldii*, in honour of Berchtold, a botanist.

CURLY PONDWEED — *Potamogeton crispus*

Leaves all submerged, in 2 rows, lance-shaped, wavy, with curled edges. Flower spike few-flowered. *crispus*, curled.

OPPOSITE-LEAVED PONDWEED — *Potamogeton densus*

Leaves numerous, minute, all submerged, in 2 close rows, opposite with bases overlapping, ovate-triangular to lanceolate, translucent. Flower spike with 4 flowers. Also called Close-leaved Pondweed. *densus*, dense.

RUPPIA

TASSEL-PONDWEED — *Ruppia maritima*

A local, perennial, submerged, aquatic plant of brackish pools, up to a foot, flowering from July to September. Stems very slender, much branched. Leaves thread-like, resembling tassels. Flowers small, without petals or sepals, in umbel-like clusters. Nut beaked, assymetrical, on a stalk, about as long as the common stalk of the cluster. *R. spiralis* is rare and differs mainly in having the common cluster-stalk much longer than the fruit-stalks and often coiled. *Ruppia* is the only genus of *Ruppiaceae*, named after H. B. Rupp, a European botanist ; *maritima*, of the sea ; *spiralis*, in a coil.

ZANNICHELLIACEAE

HORNED PONDWEED — *Zanichellia palustris*

The only representative of *Zanichelliaceae*. A submerged aquatic perennial, up to 18 inches, locally common in fresh and brackish water, flowering May to August. Stems very slender, creeping, often rooting. Leaves thread-like. Flowers small, unisexual, without petals or sepals, solitary or in clusters. Fruit a curved achene, toothed on one side, sometimes stalked, with a conspicuous, persistent style. The horn-like fruit is distinctive. Named after G. C. Zannichelli, an Italian chemist ; *palustris*, of swampy places.

NAJADACEAE

NAJAS

NAJAS — *Najas flexilis*

A rare aquatic of northern lakes, flowering in August and September. The narrow, thin leaves with minute teeth are whorled or almost opposite. The flowers are one-sexed, inconspicuous and axillary; fruit narrowly oval. *Najas*, a water-nymph; *flexilis*, flexible.

THE PIPEWORT FAMILY

ERIOCAULACEAE

ERIOCAULON

PIPEWORT — *Eriocaulon septangulare*

A slender, creeping perennial with soft, white, jointed roots, mat-forming in wet places in the Hebrides and on the West Irish coast, flowering July to September. Leaves awl-shaped, cross-jointed, in basal tufts. Flower-stem (up to 2 feet) twisted, with about seven ridges, bearing a terminal grey-black head of flowers. *Eriocaulon*, hairy-stemmed; *septangulare*, seven-angled.

THE LILY FAMILY

LILIACEAE

This family comprises some 2,500 species in 200 genera, of which 17 are British. Most perennial herbs with bulbous or creeping rootstock and 6 petal-like segments to flower perianth. Stamens 6, style sometimes split into 3. Ovary superior. Fruit, a capsule or berry.

TOFIELDIA

SCOTTISH ASPHODEL — *Tofieldia pusilla*

A local perennial, up to 8 inches, found in wet places on mountains. It flowers from June to August. The erect, un-branched stem has a tuft of short, sword-shaped leaves at the base and bears a dense head of small greenish-white flowers which are subtended by very small 3-lobed bracts. Fruit a many-seeded capsule. Named after Tofield, a Yorkshire botanist; *pusilla*, very little.

NARTHECIUM

BOG ASPHODEL [Pl. 23] — *Narthecium ossifragum*

Widely distributed little perennial of wet moors and boggy hillsides; seems to thrive too at very high altitudes. Grows 6–12 inches high; flowers July and August. Rhizome long, slender, wiry, with leaf-scales. Leaves narrow, rigid, strongly keeled, in a tuft. Stem slender, erect, rigid, twice the height of leaves. Flowers attractive, golden, star-like, each shortly stalked. Perianth leaves 6, pointed, lance-shaped. Stamens

6, with white woolly filaments ; anthers scarlet or orange, bursting inwards. Ovary narrow, oblong, bluntly 3-angled, tapering into short style surmounted by simple stigma. No honey but delicious fragrance. Fruit : erect, elongated, yellow, orange or red capsule, splitting open by 3 valves to release numerous little seeds. Only British representative. *Narthecium*, the classical name ; *ossifragum*, break-bone, referring to brittle qualities of stem.

CONVALLARIA

LILY-OF-THE-VALLEY [Pl. 23] *Convallaria majalis*

Locally common perennial plant of woods. Grows up to a foot high. Flowers usually in May. Rhizome long, creeping ; leaves about 5 or 6 inches long, in pairs, with leaf-stalks 2–8 inches long, oval, pointed at each end. Flowers very sweetly scented, small, white, bell-shaped, drooping from curved peduncle which arises from the rhizome with the leaves. Perianth with 6 recurved teeth at its mouth. Stamens 6, stigma with 3 blunt lobes. Fruit : small, smooth red berry. Very frequently grown in gardens for its pretty, fragrant flowers, but truly wild in many parts of the country. *Convallaria* from *convallis*, a valley ; *majalis*, flowering in May.

POLYGONATUM

SOLOMON'S SEAL *Polygonatum multiflorum*

A woodland perennial, 1–2 feet, flowering May and June. Rhizome long and creeping. The round stem is arching and leafy. Leaves alternate, oval or elliptic, pointed, hairless. The greenish-white flowers are tubular and contracted in the middle, few together in axillary inflorescences. The fruit is a globose, bluish berry. *P. verticillatum*, a rare species, has leaves in whorls and red berries, whilst the very local, scented *P. odoratum* has a cylindrical flower ; both have an angled stem. *Polygonatum*, from *polys*, many, *gony* knee ; *multiflorum*, many-flowered ; *verticillatum*, whorled ; *odoratum*, scented.

MAIANTHEMUM

MAY LILY *Maianthemum bifolium*

A very rare, woodland perennial in England, 6–8 inches ; flowering May and June. Distinguished by its flexuous stem bearing usually two alternate pointed leaves, deeply heart-shaped at the base. Inflorescence a short dense spike of whitish flowers ; fruit a red berry. *Maianthemum*, May-flower ; *bifolium* two-leaved.

ASPARAGUS

ASPARAGUS *Asparagus officinalis*

The wild form is rare and local on southern cliffs and in Ireland, flowering June to August. It bears cladodes as in *Ruscus* but they are narrow and needle-like, in whorls and not flower-bearing. Leaves reduced to small whitish scales. Flowers axillary, bell-shaped, whitish ; fruit a red berry. The taller, more erect, cultivated form with very slender cladodes is found naturalized in many places. *Asparagus*, the Greek name ; *officinalis*, from *officina*, druggist's shop, i.e. used medicinally.



BUTCHER'S BROOM
Ruscus aculeatus
(A) Flower (B) Fruit

RUSCUS

BUTCHER'S BROOM *Ruscus aculeatus*

Dark green, shrub-like, curious little plant, local in distribution, of commons, woods and forests in South and West of England. Grows 2 or 3 feet high; flowers January to April. Rhizome stout, creeping, sending up many much-branched rigid stems, which are round, furrowed, dark green and glabrous. Ultimate branches or twigs represented by flattened, leathery, leaf-like structures, called cladodes, ending in a sharp point. True leaves are minute deciduous scales. Flowers small, whitish, sexes nearly always separate on different plants. Perianth has 6 pale green leaves in 2 whorls. Male flower has 6 stamens united by their edges, filaments forming purple tube round rudimentary ovary. Female flower has no anthers, but a 3-celled ovary surmounted by very short style. Fruit: scarlet juicy berry holding hard, white, semi-transparent seeds. Young shoots formerly boiled and eaten like Asparagus. *Ruscus*, name of a prickly plant; *aculeatus*, prickly.

FRITILLARIA

The genus comprises about 100 species, natives of north temperate regions. There is 1 British species.

FRITILLARY or SNAKE'S HEAD [Pl. 23] *Fritillaria meleagris*

Rather rare bulbous perennial, wild locally in wet meadows and pastures in a few S.E. counties. Grows 12–18 inches high; flowers April and May. Bulb small, roundish, lobed, of 2 or 3 thick scales. Aerial stem slender, tapering, with a few scattered, highly glaucous, linear, channelled, pointed leaves, 6–8 inches long. Flowers generally solitary, occasionally 2, tulip-shaped but drooping. Perianth segments 6, narrow, oblong, commonly finely chequered in alternating squares of pink and deep full crimson. Stamens 6, with yellow anthers. Fruit: capsule, rising into an erect position. Also called Snake's Head. Frequently naturalized around gardens. *Fritillaria*, from Latin *fritillus*, a dice box; *meleagris*, chequered.

LLOYDIA

LLOYDIA *Lloydia serotina*

A rare bulbous plant of the Snowdon range, about 6 inches, flowering in June. It has erect white flowers with purplish veins, one or two on a

leafy stem ; stem leaves short, radical leaves long, very slender. Named after the discoverer E. Lloyd. *serotina,* late-flowering.

GAGEA

YELLOW STAR-OF-BETHLEHEM *Gagea lutea*

A very local, spring-flowering bulbous plant, of damp woods and pastures; up to 8 inches. Characterized by the umbel-like inflorescence of yellow flowers, subtended by leaf-like bracts. The long, narrow, suddenly-pointed leaf is longer than the stem. Fruit a capsule. Named after Sir Thomas Gage, British botanist. *lutea,* yellow.

ORNITHOGALUM

STAR-OF-BETHLEHEM *Ornithogalum umbellatum*

A local bulbous plant, 6–12 inches, of meadows, flowering in spring. The flowers are white with a green band, subtended by narrow membranous bracts, the lower with longer stalks than the upper, producing an umbel-like inflorescence. The leaves are all radical, long, narrow, green with a white stripe. Fruit capsular. *Ornithogalum,* from *ornithos,* bird, and *gala,* milk ; *umbellatum,* umbellate.

SCILLA

VERNAL SQUILL *Scilla verna*

Uncommon and rather small plant, of rocky pastures near coast. Grows about 6 inches high. Flower stalks 1 or 2, bearing upright blue flowers with conspicuous bracts. *verna,* of spring.

AUTUMN SQUILL *Scilla autumnalis*

Rare plant of dry fields in South and West. Flowers are erect, reddish purple, without bracts. *autumnalis,* of autumn.

ENDYMION

A large genus of some 80 species, all natives of temperate regions of Old World. Only 1 species British.

BLUE BELL or WILD HYACINTH [Pl. 23] *Endymion nonscriptus*

Beautiful, familiar spring favourite, growing in great numbers in woods and shady places. Grows about 1 foot high ; flowers in spring. Bulb roundish, white, gummy, with acrid taste. Leaves all radical, numerous, 12–18 inches long, brilliant glossy green, rising erect at first, but elongating and bending over in graceful curves. Flowers blue elongated bells, in drooping, one-sided, terminal raceme. There are 2 bracts below each flower. No distinction between 6 floral leaves which curl back to show 6 yellow anthers on slender filaments. Fruit : 3-celled capsule holding polished black seeds. Such a general favourite has a host of local names, and varieties are frequently cultivated. *Endymion,* name of Diana's famous lover ; *non-scripta,* not written upon, i.e. with no inscription on petals, according to ancient myth.

MUSCARI

GRAPE HYACINTH — *Muscari racemosum*

A local, bulbous plant of East Anglian grassland, up to 1 foot, flowering April and May. Distinguished by the dense drooping cluster of blue flowers, the upper ones not opening, the lower somewhat bottle-shaped. Fruit a 3-angled capsule. *Muscari*, an Arabic name ; *racemosum*, racemose, referring to the type of inflorescence.

ALLIUM

A genus of about 250 species, many of them in cultivation since at least 3000 B.C. ; there are a number of species, mostly introduced or very local, mainly differing from *A. ursinum* in having un-stalked, very narrow or cylindrical leaves.

CROW GARLIC — *Allium vineale*

A not uncommon plant of fields and waysides, 1–2½ feet, flowering June and July, has hollow, grooved, almost cylindrical leaves. Stem stoutish. The inflorescence often of bulbils only, may have an umbel of small pinkish flowers, and its long-pointed spathe eventually drops off. *Allium*, old Latin name for garlic ; *vineale*, wine-coloured.

RAMSONS—WILD GARLIC [Pl. 23] — *Allium ursinum*

Bulbous perennial, abundant in damp woods and shady hedgerows. Grows about 9 inches high ; flowers April to June. Slender, oblong bulbs have fibrous white outer coat. From them rise naked triangular stems, with bases sheathed by those of stalks of 2 leaves. Leaves lance-shaped, 6–8 inches long. Flowers pure white, starry, in conspicuous umbels of 12. Perianth has 6 spreading segments, and whole flower-head is enclosed in 2 oval, pointed spathes. Stamens 6 slender, 3 inner ones maturing first. Nectar is secreted. Fruit : small, 3-lobed, top-shaped capsule. Stem and leaves have rank pungent taste and smell. Also called Broad-leaved Garlic. Ramsons comes from a Scandinavian word meaning 'rank'. *ursinum*, of bears. There are about 8 other native species, all rare.

COLCHICUM

The genus comprises some 30 species, with 1 British native.

MEADOW SAFFRON [Pl. 23] — *Colchicum autumnale*

Bulbous perennial, common in moist meadows in England. Grows a few inches high ; flowers in succession, September and October. Underground stem is solid corm in brown sheath. In spring this sends up 3 radical leaves over a foot long and 1½ inches wide, rising erect, oblong-lance-shaped, smooth, dark green. Flowers rosy purple. Perianth tube very long, slender, buckling under weight of upper spreading 6 segments. Ovary at base of tube, protected underground. Stamens 6, each at base of a free segment ; anthers burst inwards. Styles 3, thread-like. Fruit : spindle-shaped capsule, splitting open at top to discharge numerous minute seeds. Remains underground throughout winter. Often mis-

takenly called Autumn Crocus, a name which belongs to an autumn-flowering species of *Crocus* (not native). Seeds, corm and leaves contain a violent purgative poison. *Colchicum*, from Kolchis in Asia Minor, famous for its sorcerers and poisonous herbs; *autumnale*, of autumn.

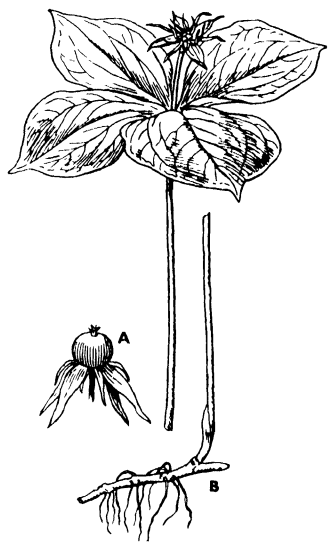
THE HERB PARIS FAMILY

TRILLIACEAE

PARIS

HERB PARIS *Paris quadrifolia*

Rather uncommon but strange perennial herb of woods. Grows about a foot high; flowers May and June. Rhizome slender, long, white. Aerial stems erect, springing from axils of leaf scales, round, tapering, dull dark green. At summit of stem is a whorl of leaves, 4 in the whorl, spread horizontally, 3–5 inches long, broadly elliptical, pointed, glabrous, shortly stalked. Slender, angular, erect peduncle rises from centre of whorl of leaves, ending in a solitary flower. Perianth segments are normal in fours, but if there are 5 or more foliage leaves, these will correspond. Sepals green, petals yellow; stamens long, 6, 8 or 12. Ovary superior, 4-celled. There is no honey, but a smell of putrefaction attracts flies. Fruit: berry, which ripens from reddish to almost black-purple. Seeds black. Poisonous. *Paris* from Latin *par*, equal, from the isomerous leaves; *quadrifolia*, 4-leaved.



HERB PARIS
Paris quadrifolia
(A) Fruit (B) Rootstock

THE RUSH FAMILY

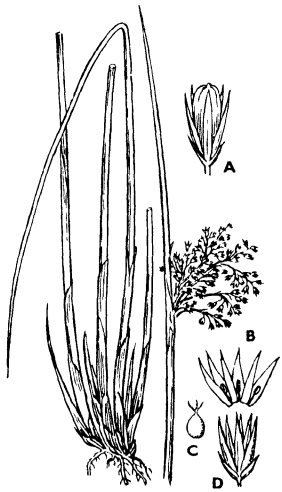
JUNCACEAE

A small, herbaceous family, comprising some 7 genera and 200 species, plentiful in damp and cold places in temperate or Polar lands. Mostly perennial herbs, with creeping, scaly, rhizome, with 1 branch rising annually above ground as leafy shoot. Leaves slender, round or flat. Flowers small, with 6 dry, sepal-like segments. Ovary superior, 1–3 celled. Fruit, a 3-valved capsule.

JUNCUS

TOAD RUSH *Juncus bufonius*

Very small and rather uncommon, slender annual, of marshy situations. Grows up to 5 inches high ; flowers July and August. Stem usually much branched, filiform, with setaceous leaves. *Juncus*, Latin name for rushes ; *bufonius*, toad-like.



COMMON or SOFT RUSH
Juncus effusus
(A) Capsule
(B) Perianth opened to show stamens
(C) Ovary (D) Flower

COMMON or SOFT RUSH *Juncus effusus*

Common perennial, abundant and gregarious in wet and marshy places. Grows 3 feet high ; flowers July and August. Rootstock matted, creeping. Stems cylindrical, in circular tuft, long, green, shiny, ending in yellowish point, stuffed with pure white pith. Flowers greenish or brown in clusters about halfway up stem. Perianth segments 6, sepal-like ; stamens 3, attached to segments. Ovary has single style, with 3 brush-like stigmas. Flower is wind-pollinated. Fruit : 3-valved capsule. *effusus*, spreading.

JOINTED RUSH *Juncus articulatus*

A perennial with branching rhizome and terminal branched inflorescence. Grows up to 2 feet high ; flowers June to August. Leaves stem-like, with interior transverse partitions, giving them a jointed look, especially in dried state. *articulatus*, jointed.

LUZULA

There are some 40 species of Woodrush, inhabiting open pastures, fens and mountain summits. 8 species are British. They are all perennials.

HAIRY WOODRUSH *Luzula pilosa*

Common perennial of shady banks, woods and pastures. Grows up to 1 foot high ; flowers March to May. Rootstock creeping. Leaves short, broad, soft, hairy. Flowers usually single, on erect stems, chestnut brown. Capsule blunt-topped. *Luzula* from Italian *lucciola*, glow-worms, an allusion to hairy heads of flowers, wet with dew, sparkling by moonlight ; *pilosa*, with scattered soft hair.

GREATER WOODRUSH *Luzula sylvatica*

A robust perennial, 1–2½ feet, of woods and peaty ground, flowering May to June. Differs from other species in its greater height, broader, longer leaves and larger, looser branched inflorescence of chestnut-coloured flowers. *sylvatica*, of woods.

SPIKED MOUNTAIN WOODRUSH *Luzula spicata*

A rarer species restricted to mountainous regions. Grows 9 inches high ; flowers July. Leaves narrow, leathery, slightly hairy. Bracteoles scaly, silvery, larger than flowers. Flowers in dense, drooping spike-like cymes. Capsule pointed. *spicata*, spiked.

FIELD WOODRUSH *Luzula campestris*

Conspicuous little perennial of meadows and pastures. Grows 4 or 5 inches high ; flowers March to June. Rootstock creeping. Leaves slightly lustrous, flat, grass-like, fringed with long, weak, white hairs and reddish-brown tinge at base. Flowers dark brown or almost black in tufts, 3 or 4 clustered together in 3- or 4-branched panicle. Perianth segments 6, in 2 series. Stamens 6, with filaments less than ½ length of anthers. Ovary broad with 3-lobed style. Fruit : one-celled, 3-valved capsule containing nearly globular brown seeds. Has a variety of popular names, most popular probably being Good Friday Grass. *campestris*, of the plains.

MANY-HEADED WOODRUSH *Luzula multiflora*

An abundant perennial of grassy places and woods, differing from *L. campestris* in greater height but more particularly in having a greater number of more numerously-flowered clusters. It is also more densely tufted and has no (or few) runners. *multiflora*, many-flowered.



FIELD WOODRUSH
Luzula campestris
(A) Flower (B) Fruit

THE DAFFODIL FAMILY

AMARYLLIDACEAE

A large family mainly of tropical or sub-tropical countries. Perennial herbs. Roots bulbous. Leaves radical. Flowers with perianth of 6 segments in 2 series. Ovary inferior. Fruit : 3-valved capsule.

LEUCOJUM

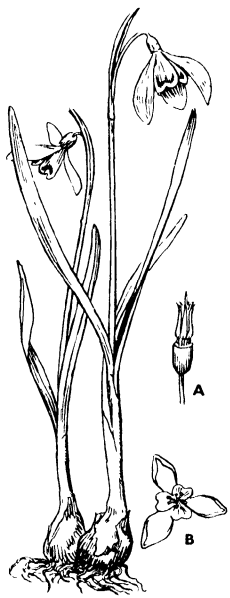
SNOWFLAKES [Pl. 23] *Leucojum vernum* and *Leucojum aestivum*

The Snowflakes (*Leucojum*) are very closely related to *Galanthus*. They differ mainly in having numerous leaves to each bulb ; several flowers

on each scape which retain an incurved bell-like form ; 6 perianth segments almost alike, each with a green patch at tip ; anthers with no bristle-like tip ; style club-shaped. Most common species is Summer Snowflake (*L. aestivum*), a doubtful native. *Leucojum* from Greek *Leukos*, white, and *ion*, a violet ; *vernum*, of spring ; *aestivum*, of summer.

GALANTHUS

Genus confined to Europe and S.W. Asia, including about 10 species.



SNOWDROP
Galanthus nivalis
(A) Ovary with stamens and style
(B) Outer and inner perianth

SNOWDROP *Galanthus nivalis*

Familiar perennial of woods, orchards and copses. Grows a few inches high ; flowers January to March. Bulb small, brown, egg-shaped. Leaves fleshy, bluish, with mealy covering of waxy bloom. Flower-stem slender, cylindrical, rising above leaves and bearing single transparent sheathing spathe with solitary flowers on thin, bending stalks. Outer perianth segments 3, spreading, pure white ; inner perianth segments 3, much smaller than outer, white, with tiny patch of green. Stamens 6 ; style slender. Flowers open 10 till 4. At best a very doubtful native, although thoroughly naturalized. *Galanthus* from Greek *gala*, milk, and *anthos*, a flower, from its milk-white flowers ; *nivalis*, snowy.

NARCISSUS

DAFFODIL [Pl. 23] *Narcissus pseudo-narcissus*

Perennial herb, extremely local as wild plant. Grows about 1 foot high ; flowers March and April. Rootstock bulbous. Leaves blunt, slightly keeled, sub-glaucous. Large, very shortly stalked solitary flower, drooping slightly, in axil of pointed spathe. Perianth segments pointed, pale yellow ; centre coronet funnel-shaped, equalling them in length, slightly notched. Also called Lent Lily. Too well known to need detailed description. *Narcissus* derived from ancient myth ; *pseudo-narcissus*, false Narcissus.

THE IRIS FAMILY

IRIDACEAE

A considerable family, with its chief centre in S. Africa. There is only 1 British genus with 2 species. Perennial herbs. Rootstocks creeping, bulbous or tuberous. Flowers with perianth in 2 dissimilar whorls of 3. Stamens 3 ; ovary inferior, 3-celled, many-ovuled ; style simple, with 3 stigmas. Fruit a 3-sided, 3-valved capsule.

SISYRINCHIUM

BLUE-EYED GRASS — *Sisyrinchium angustifolium*

An erect perennial, 6–12 inches, of meadows and hillsides, locally abundant in Ireland, naturalized in Great Britain. It flowers in July. Rhizome short, stem flattened and winged. Leaves long, narrow and grass-like. Inflorescence of few blue flowers, subtended by a spathe of 2 pointed narrow bracts. Fruit a somewhat globular, 3-angled capsule. *Sisyrinchium*, a classical plant name ; *angustifolium*, narrow-leaved.

IRIS

GLADDON or ROAST-BEEF PLANT — *Iris foetidissima*

A rare species, smaller than *I. pseudacorus*, with an unpleasant odour, occurring in woods and copses. Grows up to 2 feet high ; flowers May to July. Scape angled on one side. Perianth grey-blue. Capsule clavate. *Iris*, rainbow ; *foetidissima*, stinking.

YELLOW FLAG [Pl. 1] — *Iris pseudacorus*

A beautiful and fairly common perennial of marshes, ditches and alongside water-courses. Grows about 2 feet high ; flowers May to July. Rootstock thick creeping, fleshy, horizontal, with numerous fibres. Leaves sword-shaped, all radical 2–4 feet long, 1 inch wide, parallel-veined, stiff, sharp-edged, pale green. Flower-stem terete, compressed. Flowers bright golden yellow, large, erect, in twos or threes, sheltered by a sheathing bract. Flower parts in threes. Outer perianth segments yellow, very large, waved ; inner perianth segments alternating with the outer, lance-shaped, yellow. Stamens 3, springing from bases of sepals. In the centre a short, thick 3-sided style rises from ovary and divides into 3 broad, petal-like segments, each of which arches outwards over a stamen and then bends upwards into 2 triangular points. Just below where these 2 points divide, a little ledge projects over anther, and upper surface of this is stigma. Capsule elliptic, thick, fleshy, opening by 3 valves. One of the most handsome of our wild flowers. Has several local names. *pseudacorus* refers to resemblance of its rhizome and foliage to those of Sweet Sedge (*Acorus calamus*). Probable origin of the famous French *fleur-de-lis*.

CROCUS

AUTUMN CROCUS — *Crocus nudiflorus*

Not a native although long cultivated and practically naturalized in this country. Flowering in autumn. Leaves linear, with recurved margins.

Flowers purple, appearing long before the leaves. *Crocus*, saffron ; *nudiflorus* ; naked-flowered.

ROMULEA

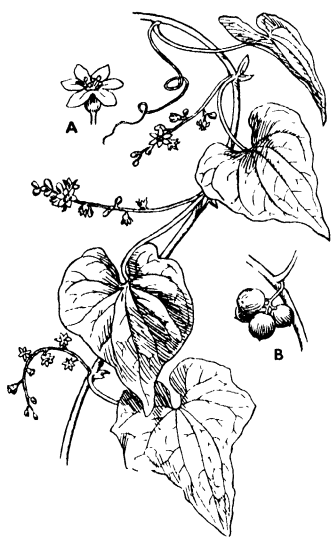
ROMULEA *Romulea columnae*

A very local plant near the sea in Devon and Channel Islands, about 4 inches, flowering March to May. Distinguished by the wiry, tufted, recurved leaves and nodding flower-stem, shorter than leaves, bearing a tubular flower, greenish outside, purplish white with yellow base within. Named after *Romulus*, founder of Rome ; *columnae*, after F. Colonna, of Naples.

GLADIOLUS

GLADIOLUS *Gladiolus illyricus*

A very local perennial of some southern heaths, 1–3 feet, flowering June to August. Stems leafy, leaves sword-shaped. Characterized by the long, spike-like, one-sided inflorescence of reddish-purple, curved flowers. *Gladiolus*, diminutive of *gladius*, sword ; *illyricus*, of Illyria.



BLACK BRYONY
Tamus communis
(A) Flower (B) Fruit

THE YAM FAMILY

DIOSCOREACEAE

A small family, mainly tropical, whose starchy tuberous roots have great food value. Generally climbing herbs or shrubs, with tuberous roots. Stems twining ; leaves alternate, netted. Flowers small, in racemes ; sexes separate on different plants. Fruit a capsule or berry.

There is 1 British species.

TAMUS

BLACK BRYONY *Tamus communis*

Perennial climber, common in England, not found in Scotland, rare in Ireland, of hedgerows and open woods. Flowers May and June. Rootstock forms large, fleshy, egg-shaped, subterranean black mass. From this tuber springs a rapidly growing, slender, twining stem, sometimes branching

but depending upon support around which to twine, clockwise. Leaves glossy, arising singly at nodes, having relatively long stalks, a heart-shaped base and long tapering tips. They have awl-shaped stipules and are palmately veined ; at first olive-green, becoming darker, a dark browny purple, almost black, then decaying to vivid lemon-yellow. Flowers minute green, bell-shaped ; perianth segments 6, deeply divided. Male flowers on slender slightly branched axillary racemes ; stamens 6, short. Female flowers in shorter, few-flowered clusters, with smooth, oval, inferior ovary. Oval juicy berry, turning from limpid emerald green to equally translucent crimson, containing 3–6 round blackish seeds. No relation to White Bryony (*Bryonia dioica*). Tubers and berries poisonous. Bryony derived from Greek *bryonia* from *bryo*, to shoot, referring to the rapidity of growth. Derivation of *Tamus* is obscure ; *communis*, common.

THE ORCHID FAMILY

ORCHIDACEAE

The largest family of the Monocotyledones, comprising over 18,000 species, spread from the tropics to the Arctic. Tropical species are mostly epiphytes (i.e. they grow on trees, but are not parasitical). All European species are geophytes, i.e. terrestrial.

Perianth consists of 6 segments in 2 whorls, outer generally equal and small, inner usually larger, unequal and often highly coloured. The middle one is generally the largest and is called the labellum or lip. Labellum usually extends backwards to form a spur, usually well filled with nectar. Ovary inferior (always below perianth), after fertilization develops into a capsule, and due to its length may sometimes be mistaken for flower-stalk. Stamens fused with style in a column, with only 1 stamen developed. Other 2 inner segments form an upright hood over column. Pollen usually sticky, never powdery.

An insect alighting on the labellum tries to push proboscis into spur for nectar and comes into contact with 2 anther lobes standing side by side (pollinia), each containing a mass of pollen. When insect withdraws, 2 disks adhere with pollen to its head, at first erect, but quickly bending downwards to come into contact with stigma of next flower.

Capsule splits to release thousands of seeds, resembling sawdust.

Roots usually thick, fleshy ; leaves long, strap-shaped, parallel-nerved, bases sheathing stem.

Although there are numerous British natives, few are really common owing mainly to the fact that the presence of a certain fungus (*Rhizoctonia*) is necessary for germination and growth.

Orchids are sometimes loosely referred to as *Orchis*, which is merely the name of a genus in the Orchid Family. All species are perennial herbs.

CEPHALANTHERA

WHITE HELLEBORINE [Pl. 22] *Cephalanthera damasonium*

Rather rare, but fairly plentiful locally in copses on chalky soils. Grows up to 2 feet high ; flowers May and June. Rootstock creeping (without tubers), sending up small stems. Leaves ovate or ovate-lanceolate, strongly ribbed, sheathing stem. Bracts large and long. Flowers erect, cup-like, creamy white, fragrant. Outer perianth segments oblong, blunt. Pollen grains loosely connected by slight threads. *Cephalanthera* from Greek *kephale*, a head, and *anthera*, anther, because anther is hinged on top of column ; *damasonium*, Greek name for a plant.

LONG-LEAVED HELLEBORINE [Pl. 22] *Cephalanthera longifolia*

Very similar, but rarer, generally found in beechwoods. Flowers May and June. Foliage longer, narrower. Flowers more slender, whiter, at end of stem. Outer perianth segments acute. *longifolia*, long-leaved.

RED HELLEBORINE *Cephalanthera rubra*

Rarest of the genus, of woods and copses on limy soil in West Country. Grows 6–18 inches high ; flowers June and July. Stem slender, purplish ; leaves lance-shaped. Flowers rose-red with downy ovaries. *rubra*, rose-red.

EPIPACTIS

The genus differs from *Cephalanthera* in having stalked flowers, the footstalk being twisted, whilst the downy ovary is straight.

MARSH HELLEBORINE *Epipactis palustris*

A near relative and rather prettier than *E. helleborine*. Uncommon, occurring in bogs, marshes and similar places. Grows 12–18 inches high ; flowers July and August. Rhizome long-creeping. Leaves long, narrow-pointed. Outer perianth segments purplish green and hairy outside ; inner perianth segments narrower and shorter, whitish with purplish veins. *Epipactis*, Greek name for the plant ; *palustris*, of swampy places.

BROAD-LEAVED HELLEBORINE *Epipactis helleborine*

A far from common but widely distributed plant, generally of woods. Grows 1–4 feet high ; flowers July to September. Leaves broad-oval, strongly ribbed, becoming narrower up stem. Bract below each flower slender and tapering. Flowers green, marked with purple and yellowish white, in long, terminal truss. Ovary pear-shaped, not twisted. Perianth made up of equal and similarly coloured segments. Lip deeply divided, with small recurved point. The terminal portion moves as on a hinge, so that its rebound throws visiting insects upwards against anther lobes. This at once becomes very viscid and cements pollen to insect. *helleborine*, the English name of this plant.

EPIPOGIUM

EPIPOGIUM *Epipogium aphyllum*

A very rare, saprophytic woodland orchid of S. England, about 6 inches, flowering June to August. It has no leaves, the pinkish-white stem bearing a few flowers, of which the white purple-dotted lip and spur are directed upwards. *Epipogium* from *epi*, on, and *pogon*, beard (in reference to the lip) ; *aphyllum*, leafless.

SPIRANTHES

Spiranthes comprises some 80 species, but there are only 3 British species, of which only 1 is at all common.

LADY'S TRESSES *Spiranthes spiralis*

Fairly common plant of dry pastures on chalk or gravelly soils. Grows 4–8 inches high ; flowers August and September. Tubers 2, 3 or 4, cylindrical. Stem slender, slightly downy. First leaves form rosette just above crown of root and wither before flowers begin to open ; succeeded by tuft of new leaves which spring from base of old stem. Leaves an inch long, oval, pointed, slightly glaucous. Lower part of flowering stem has several bracts, as well as pointed bracts which sheath the tiny flowers. Flowers very small, fragrant, white, expanding from below upwards, forming single spiral. Lip fringed, but has no spur ; anther hinged at base to back of column, persistent. Pollinia 4, powdery, united in pairs. Fragrance closely resembles that of Jasmine and has been extracted for purposes of perfumery. 'Lady's Tresses' compares spiral flower-spike to ringlets or plaits of hair. *Spiranthes* from Greek *speira*, a spiral, and *anthos*, a flower ; *spiralis*, spiral.



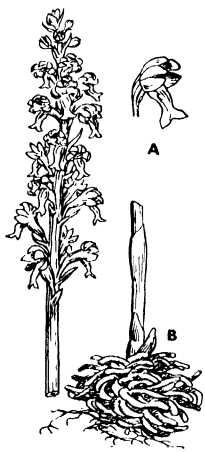
BROAD-LEAVED HELLEBORINE
Epipactis helleborine
(A) Rootstock

LISTERA

TWAYBLADE [Pl. 24] *Listera ovata*

One of the commonest species, yet one of the most striking, of rich meadows, orchards and copses. Grows over a foot high ; flowers May to July. No tubers, but shortened, ascending rhizome gives off long, slender, cylindrical root-fibres. Stem erect, stout, tapering, downy, base ensheathed by 1 or 2 brown leaf-sheaths. About a third of the way up an otherwise bare stem spring 2 large conspicuous, opposite leaves, which give the plant its name. They are 3–8 inches long, yellowish green, broadly oval, pointed, downy. Inflorescence rises between the 2 leaves

forming raceme of numerous, loosely-arranged short-stalked, yellowish-green flowers. Lip long, narrow, split halfway into 2 lobes. Genus named by Robert Brown in honour of Dr. Martin Lister (1638–1712)—an excellent all-round naturalist; *ovata*, egg-shaped, referring to leaves.



BIRD'S NEST ORCHID
Neottia nidus-avis
(A) Flower
(B) Rootstock

LESSER TWAYBLADE *Listera cordata*

A similar but much smaller and less common species of mountain and moorland. Grows 6 inches high; flowers July to September. Stem smooth, brownish, angled. Leaves very small, heart-shaped, pointed. Flowers minute, greenish brown, in short, loose spike. *cordata*, heart-shaped.

NEOTTIA

BIRD'S NEST ORCHID *Neottia nidus-avis*

A rather bizarre saprophyte, wan, pallid, uniformly light brown, found in varying numbers in beechwoods and other shady places. Grows about a foot high; flowers May to July. Roots throw off their root-caps, forming terminal buds and developing into shoots. Stem solitary, erect, unbranched, angular, hollow, glabrous, brittle, juicy. Absorbs its foodstuffs through roots from surrounding humus, therefore has no need of light or leaves; the latter are represented by membranous scales. Flowers brownish, unattractive, stalked, forming dense cylindrical raceme, with small oblong bracts. Flower structure closely resembles that of *Listera*, with sepals and petals slightly incurved, and lip pouched at base. Column is longer than in *Listera* and has no hood-like termination. Powdery-yellow pollen masses are only relief to monotonous brown of whole plant. Flies are chief agents of pollination. *Neottia* is Greek for a bird's nest, and *nidus-avis* has same meaning in Latin; refers to structure of roots.

GOODYERA

CREEPING LADY'S TRESSES *Goodyera repens*

A local, northern orchid, 6–10 inches, of pinewoods, flowering July and August. Creeping by rhizomes and runners. Stem erect, with closely-pressed, narrow, bract-like leaves; basal leaves stalked, roundly-oval, pointed, characteristically net-veined between the main veins. Inflorescence a spike of small white fragrant flowers, the lip resembling a little pouch with a projecting tongue. Plant covered in the upper part with numerous glands. Named after J. Goodyer, an early English botanist. *repens*, creeping.

HAMMARBYA

BOG ORCHID — *Hammarbya paludosa*

The smallest British orchid, not more than 4 inches, of wet sphagnum bogs, mainly in the North, flowering July to September. It is characterized by the 2 bulb-like root swellings, the upper concealed by leaf-sheaths. The stem bears small, oval, pointed basal leaves which are fringed with tiny bulbils; and a slender spike of tiny greenish-yellow flowers with narrow pointed lips. Named after Linnaeus' birthplace, Hammarby; *paludosa*, of swampy places.

LIPARIS

FEN ORCHID — *Liparis loeselii*

A rare orchid of fens in East England, about 6 inches, flowering in July. It has 2 pseudo-bulbs and is spurless, as in *Hammarbya*, but is stouter, with longer, oblong, greasy-looking leaves. The inflorescence, of greenish flowers with darker green lips pointing in any direction, is laxer. *Liparis* from *liparos*, greasy; *loeselii*, after J. Loesel, German botanist.

CORALLORHIZA

CORALROOT — *Corallorhiza trifida*

A rare saprophytic orchid of damp, northern woods, up to 10 inches, flowering June to August. Characterized by the much-branched, coral-like, fleshy rhizomes. Stems yellowish with brownish scales, bearing a few small greenish flowers with 3-lobed, whitish, red-dotted lips. *Corallorhiza*, coral-root; *trifida*, three-lobed.

HERMINIUM

MUSK ORCHID — *Herminium monorchis*

A rare and local orchid of the southern chalk, about 6 inches, flowering June and July. Somewhat like *Hammarbya*, but larger, and the 3-lobed lip directed downwards. Fragrant but not musk-scented. *Herminium*, from *ermin*, a prop (referring to the tuber); *monorchis*, *monos*, one, *orchis*, testicle (referring to single tuber at flowering time).

COELOGLOSSUM

FROG ORCHIS [Pl. 24] — *Coeloglossum viride*

A rather rare species, in spite of its wide distribution; of grassy land, particularly limy hillsides and downs in N. England and Scotland. Grows about 6 inches high; flowers June to August. Tubers 2, oval, divided into fleshy lobes. Stem ridged, short. Leaves few, oblong, unspotted, bases sheathing stem. Flowers brownish green, with purplish marks. Bracts green, longer than ovary; perianth forms a hood. Spur rather short, with 2 lobes. Formerly classified as *Habenaria viridis*. *Coeloglossum*, hollow-tongue; *viride*, green.

GYMNADENIA

FRAGRANT ORCHID [Pl. 24] — *Gymnadenia conopsea*

Generally distributed, preferring grassy places, chalk downs and banks, especially on limy soils. Grows 6–18 inches high; flowers June to August.

Tubers oval, lobed ; stem hollow. Leaves narrow, lance-shaped, pointed. Bract oval ; green, 3-veined, below each flower, of same length as ovary. Flowers rose-red, lilac or white, unusually fragrant, in a long, narrow, many-flowered spike. Each flower about $\frac{1}{3}$ inch across ; outer and inner perianth segments coloured alike—2 lateral outer perianth segments spreading widely. Lip rather deeply divided into 3 nearly equal, flat, rounded lobes and covered with fine down. Spur nearly twice as long as ovary, very slender and curved, often half full of nectar. *Gymnadenia* from Greek *gymnos*, naked, and *aden*, a gland, because the 2 glands at base of pollinia which serve to attach them to head of insect visitor are not enclosed in a pouch as in Orchis, but are naked. *conopsea*, from Greek *konops*, a gnat, with reference to long spur.

LEUCORCHIS

SMALL WHITE ORCHID — *Leucorchis albida*

Similar to previous species but smaller and rarer ; of hilly pastures and mountain-sides. Grows 6–12 inches high ; flowers June to August. Roots an unkempt mass of fibres. Lower leaves short and blunt, becoming sharp and lance-shaped higher up stem. Flowers small, yellowish white, in dense spike. Slightly scented. *Leucorchis*, white orchis ; *albida*, white.

PLATANTHERA

GREATER BUTTERFLY ORCHID — *Platanthera chlorantha*

Fairly common in damp heaths, woods and pastures. Grows up to 18 inches high ; flowers May to August. Root tubers egg-shaped, each tapering to a fibrous point, like small turnips. Stem angular. The 2 lower leaves 3–6 inches long, elliptical tapering to a sheathing base, spreading, lustrous, unspotted green. A third, smaller and more upright leaf is commonly present. Flowers greenish, deliciously scented, in lax pyramidal spikes, each flower an inch across. Outer perianth segments 3, widely spread ; inner perianth segments small, blunt, converging in an arch ; lip longer, straight, blunt, entire. Popular name comes from colour and shape of flower. *Platanthera*, broad anthers ; *chlorantha*, of yellow flowers.

LESSER BUTTERFLY ORCHID [Pl. 24] — *Platanthera bifolia*

Very similar to previous species, but smaller and more slender, of damp woods and heaths. Grows about a foot high ; flowers May to July. Spike narrower, almost cylindrical. Flowers whitish. *bifolia*, 2-leaved.

OPHRYS

BEE ORCHID [Pl. 24] — *Ophrys apifera*

Fairly frequent in open woods, clearings and downs on warm, dry chalky soils in S.E. England. Grows 4–18 inches high ; flowers June and July. Stem erect, slender. Leaves lance-shaped, clasping stem. Bracts large, leaf-like. Flowers few, large ; outer perianth segments pinkish. Lip, with rich velvety brown markings, resembles almost exactly a bee feeding at the flower. *Ophrys* from Greek *ophrys*, an eyebrow, referring to markings on lip ; *apifera*, with bee-like flowers.

FLY ORCHID [Pl. 23] *Ophrys insectifera*

A similar, but smaller plant, fairly plentiful locally in S.E. counties, in copses and thickets on chalk and limestone soils. Grows 4–12 inches high ; flowers May to July. Tubers undivided ; stem slender ; leaves narrow, pointed. Bracts twice as long as ovary. Outer perianth segments yellowish green, inner perianth segments reddish brown ; lip dark red-purple traversed by streak of purple. Whole flower closely resembles an insect. *insectifera*, insect-like.

HIMANTOGLOSSUM

LIZARD ORCHID *Himantoglossum hircinum*

A local, tuberous orchid, 6–18 inches, found on the edges of woods and fields, mainly on chalk in the South. It flowers from May to July. Leaves elliptic and unspotted. Readily distinguished by its goaty smell and by its long spike of greyish, purple-green, large flowers. The long, twisted, strap-like central lobe and shorter, narrow lateral lobes of the lip bear a resemblance to the tail-end of a lizard ; the body is represented by the hooded petals and sepals. *Himantoglossum*, from *himas*, strap, and *glossa*, tongue ; *hircinum*, goat-like.

ORCHIS

LADY ORCHID *Orchis purpurea*

A rare orchid of chalk woodland, 18 inches or more, flowering in May. Leaves unspotted. Inflorescence dense. Flowers with dark purple helmet and paler red-dotted lip lobed in the form of a human figure, the 2 lobes representing the legs being broad. *Orchis*, the classical name ; *purpurea*, purple.

SOLDIER ORCHID *Orchis militaris*

A very rare orchid of chalk grassland in the South, up to 18 inches, flowering May and June. Distinguished from *O. purpurea* by the paler, more greyish helmet and the narrower lobes representing the legs. *militaris*, military.

MONKEY ORCHID *Orchis simia*

Another very rare southern chalk orchid differing from *O. militaris* in its whitish, pink-flushed helmet and white lip with all lobes crimson and equally narrow. *simia*, an ape.

BURNT ORCHID *Orchis ustulata*

A small, tuberous orchid, 4–8 inches, found locally on English chalk downs and pastures ; flowering May and June. Spike densely crowded at top with dark maroon-coloured, unopened flowers, giving the ' burnt ' appearance. Lip of opened flowers whitish with purple dots. Leaves narrowly oblong, pointed, unspotted. *ustulata*, scorched.

GREEN-WINGED ORCHID [Pl. 24] *Orchis morio*

Fairly common in some southern districts, rarer further north. Grows about 6 inches high ; flowers May and June. Found in meadows. Has 2 nearly round tubers at base of stem. Leaves few, narrow, lance-shaped,

without spots. Flowers dark purple, about 15 in spike, rather scattered. Segments striped with parallel strips of green. Lip toothed ; spur curving slightly upward is about as long as ovary. *morio*, a fool.

EARLY PURPLE ORCHIS [Pl. 24] *Orchis mascula*

Gaily coloured and conspicuous species of woodlands. Grows 6–18 inches high ; flowers April to June. Has 2 egg-shaped tubers at base of stem. Leaves broad, with blunt points, often spotted with brown. Flowers purple, in lax spike. Outer segments upturned ; lip broad, spotted with dark purple. Spur stout, blunt, longer than ovary. Commonest and earliest flowering British Orchid. Also called Dead-men's Fingers, Skeat-legs, Bloody Man's Fingers, Gethsemane, and other local names. *mascula*, masculine.

SPOTTED ORCHIS [Pl. 24] *Orchis fuchsii*

One of commonest species, of copses, field sides and moist places. Grows about 1 foot high ; flowers June to August. Root tubers palmately lobed. Leaves usually broadly elliptical, blunt, darkly spotted. Flowers pale purple in dense pointed spikes. Lip marked with dots and cut into 3 sub-equal lobes. Spur straight, nearly as long as ovary. *fuchsii*, in honour of botanist Fuchs.

HEATH SPOTTED ORCHID *Orchis ericetorum*

Less common species of heaths and bogs. Grows 6–12 inches high ; flowers April and May. Closely resembles previous species in tubers and flowers. Differs from it in narrower, subacute leaves in lip with 3 unequal lobes (its middle lobe is much smaller than the lateral lobes) and in very slender spur. *ericetorum*, of heaths.

COMMON MARSH ORCHID *Orchis praetermissa*

Widely distributed in damp places throughout Britain. Grows 6–24 inches high ; flowers May to June. Tubers palmately lobed ; stem usually hollow ; leaves lance-shaped, blunt-tipped, bluish green, unspotted. Purple flowers in dense spikes ; lip very broad, reflexed, with dark lines and spots. Spur shorter than ovary. *praetermissa*, neglected, overlooked.

EARLY MARSH ORCHID [Pl. 24] *Orchis strictifolia*

Widely distributed in England in marshy and boggy ground. Grows 6–20 inches high ; flowers May to July. Tubers palmately lobed. Stem stout, hollow. Leaves long, lance-shaped, yellowish green, unspotted, inclined upwards. Flowers flesh-coloured, dense (about 40 per spike) in cylindrical spike. Lip often spotted and streaked. Spur conical, shorter than ovary. *strictifolia*, straight-leaved.

ACERAS

MAN ORCHID *Aceras anthropophorum*

A tuberous orchid, 6–12 inches ; of chalk slopes and grassy places in the South-East, flowering in June and July. Closely allied to *Orchis*, but with no spur to the flower. Recognized by the long spike of smallish yellow-green flowers, edged with red, which are hood-like except for the

lip. Lip with bifid central and two lateral lobes resembling arms and legs of a human figure. Leaves narrowly oblong, unspotted, becoming bract-like up the stem. *Aceras*, from *a*, without, and *keras*, meaning spur ; *anthropophorum*, man-bearing.

ANACAMPTIS

PYRAMIDAL ORCHID [Pl. 24] *Anacamptis pyramidalis*

Fairly common and very pretty species of chalk and limestone pastures in England. Grows 6–24 inches high ; flowers June to August. Tubers roundish. Stem slender. Leaves unspotted, sheathing stem, narrow, lance-shaped, sharply pointed. Flowers rose-coloured, in dense pyramidal spike. Bracts below flowers purple. Perianth forms pointed hood. Lip 3-lobed ; spur longer than ovary. Abundant locally ; has unpleasant odour. *Anacamptis*, bending backwards ; *pyramidalis*, pyramid-like.

THE ARUM FAMILY

ARACEAE

A very large family comprising about 100 genera and over 1,000 species, mainly tropical. Only 1 genus, with 2 species, is native. Habit and foliage very variable.

ACORUS

SWEET SEDGE or FLAG [Pl. 22] *Acorus calamus*

Perennial plant of river and lake sides in the South of England. Introduced (a native of S. Asia). Grows up to 4 feet high ; flowers June and July. Rootstock a creeping rhizome. Leaves 2–4 feet long, sword-shaped, erect, very similar to those of *Iris*, but very aromatic when crushed. Flowers very small, green, on a cylindrical, tapered spadix 2–4 inches long and about ½ inch thick, which is borne on a stem which resembles the leaves. Perianth of 6 membranous segments, stamens 6, with yellow anthers, stigmas 2 or 3. Does not produce fruits in this country. Often planted by ornamental waters for its attractive, aromatic foliage. *Acorus*, the classical Greek name ; *calamus*, a reed.

ARUM

LORDS-AND-LADIES [Pl. 22] *Arum maculatum*

Very common perennial of woods and hedge banks. Grows up to 1 foot high ; flowers April. Rhizome annual, shortened, starchy, sending up large, glossy, arrow-shaped leaves, with sheathing bases and often spotted with purple ; full of needle-like microscopic crystals which prick the tongue. In April a long green stalk called a spadix is sent up. The unisexual flowers are closely packed at the base of spadix. Whole spadix is enveloped by a large green bract, called a spathe, inserted on stem just below spadix and twice its length. Lower third of spathe is separated from remainder by a slight constriction, and flowers are found concealed in

this lower portion. Right at the bottom are female flowers, composed of 1 carpel only. Just above this is a collection of long, stiff wavy hairs; then comes a zone of closely packed male flowers with 2–4 stamens each. The top layer consists of more long stiff hairs, filling up neck of urn-shaped part of spathe. Flowers have nauseous smell which attracts numerous flies. These are drugged by nectar and probably ultimately digested. Fruit: upper part of spathe withers, and ovaries, which have become glossy green berries, burst through basal chamber and gradually turn to a brilliant scarlet. Fruits slightly succulent, each containing 2 or 3 seeds covered with network of ridges. Highly poisonous. Has a host of popular names, including Cuckoo-plant, Cuckoo-pintle, Priest's-pintle, Calves-foot, Wake-robin, Ramp, Starchwort, Wild Arum, Jack-in-the-pulpit, etc. Rhizome formerly used for starching linen. *Arum* is a Greek plant name; *maculatum*, spotted.

GREATER ARUM — *Arum neglectum*

The only other British species, closely similar but rather larger in all respects, and confined to our southern coasts. Spadix yellow; upper part of spathe bends over. Flowers June. *neglectum*, overlooked.

THE DUCKWEED FAMILY

LEMNACEAE

A family represented in this country by the Duckweeds which are aquatic plants reduced to the simplest and smallest proportions. There are 5 species belonging to 2 genera.

True stems and leaves are absent; instead a small green frond floats on the water sending down one or more simple roots or none. Flowers (seldom produced) appear from opening in margins; flower enclosed in minute spathe, with club-shaped pistil together with 1 or 2 stamens. Plants multiply by new fronds which grow from edges of old ones, and these eventually detach themselves.

LEMNA

GREATER DUCKWEED — *Lemna polyrhiza*

Has a bunch of roots trailing from each frond. Upper surface dark green, 7-nerved; under side purple. Rarely flowers. *Lemna*, name of a water plant in Theophrastus; *polyrhiza*, many roots.

IVY-LEAVED DUCKWEED — *Lemna trisulca*

Frond up to 1 inch long, flat, thin, with teeth at one end, tailed at the other. Roots solitary; new fronds produced at right-angles. Flowers June and July. *trisulca*, three-forked.

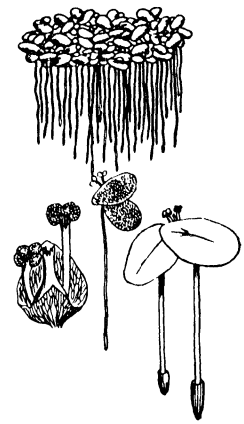
COMMON DUCKWEED *Lemna minor*

The most common species, floating in thousands on stagnant water, and forming a green layer on surface. Frond up to $\frac{1}{4}$ inch long, egg-shaped, top flat, bright green. Root single. At centre of frond 2 hermaphrodite flowers appear in July and August; spathe unevenly 2-lipped; stamens 2, style long. Also called Lesser and Small Duckweed. *minor*, smaller.

GIBBOUS DUCKWEED *Lemna gibba*

Frond large, green, flat, nearly round, opaque above, swollen below, white and semi-transparent. Root single and simple. Stamens 2. Flowers June to September. *gibba*, with a hump.

A member of this family, *Wolffia arrhiza*, very rare in Britain, is the smallest known flowering plant. Dimensions of a subglobon frond are $\frac{1}{20} \times \frac{1}{40}$ inch. There are no roots, and flowers are produced from upper side of frond. *Wolffia*, after J. F. Wolff, a doctor in Schweinfurt; *arrhiza*, rootless.



COMMON DUCKWEED
Lemna minor

Below: a flower (on left) and two stages in development of fronds.

THE BUR-REED FAMILY

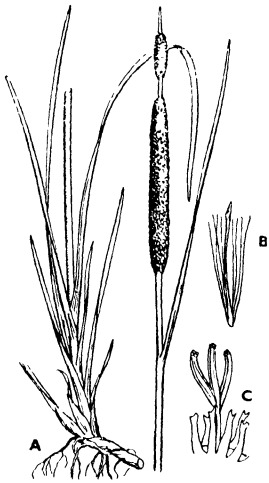
SPARGANIACEAE

A small family of aquatic plants, very similar to the previous family and consisting only of 1 genus with some 10 species. Four species are native.

SPARGANIUM

BRANCHED BUR-REED *Sparganium ramosum*

Colourful perennial, common on river banks and similar situations. Grows 3 or 4 feet high; flowers June to July. Rhizomes horizontal, buried in mud. Aerial stem round, smooth, solid branching chiefly in upper flowering region. Leaves all from stem, simple, entire, soft, pliable, triangular at base. Flowers: male and female, on same plant; all in globose heads—upper, smaller, olive-brown ones are male—lower, larger, glossy green ones are female. Flower branches spring from axils of large, leafy, sheathing bracts. Perianth consists of 3 or 6 thin scales. Male flowers usually have 3 stamens; female flowers have usually 1-celled ovary. Fruit: pear-shaped fleshy drupe, with hard core; seed has few slight ribs on surface. Golden tufts of ripe stamens against glossy polished stem and luxuriant foliage make a most attractive sight on river banks.



LESSER REEDMACE
Typha angustifolia
(A) Plant
(B) Female flower
(C) Male flower

Sparganium from Greek *sparganon*, a swaddling band, with reference to sheathing leaves; *ramosum*, branched.

SIMPLE BUR-REED [Pl. 22]
Sparganium simplex

Very similar species to the last, but less widely distributed in ditches, rivers and ponds. Grows only 2 feet high and flowers August and September. Stem erect, unbranched. Floating leaves distinctly keeled, at least at base or are lacking. Flowerheads in a raceme, fewer; female flowers shortly stalked. *simplex*, simple.

FLOATING BUR-REED
Sparganium angustifolium

Similar to previous species, especially in flower structure; flowers July and August. Stem limp, floating. Floating leaves not keeled, always present. When in flower, stem becomes partly erect. *angustifolium*, narrow-leaved.

THE REEDMACE FAMILY

TYPHACEAE

Perennial, marsh and aquatic herbs, with narrow root leaves and creeping rootstocks. Fruit, a drupe.

There is only one genus and about a dozen species.

TYPHA

There are 2 British species, both perennials.

GREAT REEDMACE [Pl. 22] *Typha latifolia*

Large, herbaceous, aquatic perennial of marshes or by running or stagnant water. Grows 6–8 feet high; flowers July to August. Rhizomes thick, creeping, buried in mud, giving off many thick roots, and erect, cylindrical wand-like aerial stem. Leaves nearly flat, 1 inch across, nearly as long as stem, covered with slight waxy bloom; sword-shaped, rising erect from base of stem in 2 vertical rows, sheathing at base. Stem and leaves free from hairs. Flowers male and female on same plant, in long,

dense, cylindrical spikes. Lower portion rich dark brown, consisting of female flowers on short stalks ; ovaries taper at both ends and have a single slender style with a 1-sided, lance-shaped stigma. Male flowers make up tapering yellowish upper portion ; this withers and disappears after discharge of pollen ; anthers usually 3, long, straight, yellow, with very short filaments. Perianth consists of numerous slender bristle-like hairs. A small splitting nut, with light brown hairs on the stalk. The true Bulrush is *Schoenoplectus lacustris*, but this plant is most commonly called by that name. More accurate names are Great Reedmace, Cat's-tail or Black Poker. Our largest herbaceous aquatic plant. *Typha* from Greek *typhos*, a marsh ; *latifolia*, broad-leaved.

LESSER REEDMACE *Typha angustifolia*

A less common but similar species, of ditches and pools ; flower July. Whole plant somewhat smaller ; leaves much narrower, dark green ; male and female flowers separated by bare gap on flower spike. Stigmas are broader. *angustifolia*, narrow-leaved.

THE SEDGE FAMILY

CYPERACEAE

A very large and widely distributed family of some 2,700 species, generally perennial rush-like herbs. Stems usually solid, 3-angled, surrounded by sheathing leaves. Flowers minute in small spikes. Stamens 3. Fruit : small 3-sided nut. Species in this country are numerous and often difficult to recognize.

ERIOPHORUM

COTTON-GRASS *Eriophorum angustifolium*

Rush-like, perennial herb, of wet moors and bogs. Grows about 1 foot high ; flowers May and June. Rootstock creeping ; stems triangular, with smooth, flat leaves enfolding them. Flowers are dull grey scaly bodies. Scales are called glumes and each contains a flower, with protruding anthers and stigmas. Perianth consists of bristles which lengthen after fertilization into long white hairs which eventually help to dispense fruit on wind. Fruit : seed-like, with white, cottony bristles. Not a true grass, but of similar flower structure. Hairs sometimes used for stuffing cushions. *Eriophorum* from Greek *erion*, wool, and *phora*, bearing ;



COTTON-GRASS
Eriophorum angustifolium
(A) Plant (B) Flower

angustifolium, narrow-leaved. There are 2 or 3 other native but rarer species.

TRICHOPHORUM

DEER-GRASS — *Trichophorum caespitosum*

A densely tufted perennial, up to 1 foot, locally abundant in peaty places and heaths, flowering in June and July. Stems, many of which are barren, slender, smooth, round. Sheaths shiny, brownish and only the uppermost with a short leaf-blade. Spikes small, solitary and terminal, few-flowered, enclosed by 2 outer oval, pointed brown glumes. The small, oval, 3-angled nut is overtopped by 6 bristles. *Trichophorum*, from *trichos*, hair, and *pherein*, bearing (referring to the bristles) ; *caespitosum*, tufted.

ELEOCHARIS

MANY-STEMMED SPIKE-RUSH — *Eleocharis multicaulis*

A densely-tufted, slightly-creeping perennial, 6–12 inches ; of marshy places, flowering July and August. Stems slender, round ; sheaths all leafless and the reddish rims surround the stem obliquely. Spikes solitary, terminal and many-flowered ; glumes blunt, reddish brown, lowest ¼ length of spike and encircling it. Bristles 6, shorter than the 3-edged nut. *Eleocharis*, from *helos*, marsh, and *charis*, beauty ; *multicaulis*, many-stemmed.

COMMON SPIKE-RUSH — *Eleocharis palustris*

A perennial, up to 2 feet, differing from *E. multicaulis* in having far-creeping rhizomes ; rims of sheaths not oblique ; glumes acute, only half encircling spike ; bristles 4, either shorter or longer than the biconvex nut. *palustris*, of swampy places.

SCIRPUS

SEA CLUB-RUSH — *Scirpus maritimus*

A stout perennial, 1–3 feet, often abundant on muddy banks of tidal rivers and in marshes near the sea. Flowering in July and August. Stems 3-angled, leafy ; leaves long, narrow, keeled and rough-edged. Inflorescence of densely-crowded large brown spikes, overtopped by long leaf-like bracts. Bristles 6, shorter than the brown, shiny nut. *Scirpus*, name of rush-like plant ; *maritimus*, of the sea.

WOOD CLUB-RUSH — *Scirpus sylvaticus*

A stout perennial of damp woods and marshes, distinguished readily from *S. maritimus* by its large, loose, branched inflorescence of greenish spikes not overtopped by the bracts, and its flat leaves. *sylvaticus*, of woods.

BLYSMUS

BROAD BLYSMUS — *Blysmus compressus*

A perennial, 6–12 inches, locally abundant in marshy fields, flowering in June and July. Stems smooth with far-creeping rhizomes. Leaves long and narrow, flat, keeled and rough-edged. Inflorescence of two

compact, opposite rows of spikelets, overtopped by the long, leaf-like projection of the lowest glume. Glumes pointed, reddish brown. The roundish, shiny black nut is overtopped by 3–6 bristles. *Blysmus*, from *blyze*, I flow, referring to its habitat; *compressus*, compressed.

NARROW BLYSMUS — *Blysmus rufus*

A saltmarsh perennial, similar to *B. compressus*, except for its inrolled, smooth leaves, fewer dark-brown spikelets, blunt, blackish-brown glumes and light brown oval nut; the bristles are short and deciduous. *rufus*, reddish brown.

SCHOENOPLECTUS

BULRUSH — *Schoenoplectus lacustris*

Common perennial of water-sides and marshy places, closely allied to Cotton-grass and Sedges. Grows up to 8 feet high; flowers July and August. Rootstock creeping. Stems erect, thick spongy, generally leafless. Leaves varying according to situation, generally sheaths on stem. Flowers hermaphrodite, in many-flowered, red-brown, cylindrical spikelets. Spikelets on long stalks, clustered into panicles at ends of erect stems. There are 6 perianth bristles, 3 stamens and an ovary. Fruit: seed-like nut. Also called Great Club-rush. Used in making mats and chair seats. *Schoenoplectus*, a rush; *lacustris*, of lakes.



BULRUSH
Schoenoplectus lacustris
(A) Spikelet
(B) Flower

ISOLEPIS

BRISTLE SCIRPUS — *Isolepis setacea*

A tufted plant, about 6 inches, of wet, sandy or gravelly places, flowering May to July. Stem very slender, with thread-like leaves at its base. Inflorescence of two or three very small spikelets, overtopped by a bristle-like bract. Glumes purplish with green midrib. Nut small, shiny dark brown, ribbed. *Isolepis*, from *isos*, equal, and *lepis*, scale; *setacea*, bristle-like.

NODDING SCIRPUS — *Isolepis cernua*

A local, coastal plant similar to *I. setacea*, but with the bract not overtopping (or only slightly) the inflorescence of usually only one spikelet; glumes greenish white with a brown spot. Nut reddish brown, not shiny, not ribbed. *cernua*, nodding.

ELEOGITON

FLOATING SCIRPUS — *Eleogiton fluitans*

A perennial, usually floating, of ditches and ponds, flowering up to September. Distinguished from *Isolepis* by its long, leafy branched stem up to 18 inches; its solitary terminal green spikelet not overtopped by a bract. *Eleogiton* from *helos*, marsh, and *geiton*, neighbour; *fluitans*, floating.

SCHOENUS

BOG RUSH — *Schoenus nigricans*

A locally abundant, tufted perennial, up to 2 feet; growing in damp peaty places and salt marshes. It flowers in May and June. The stems are wiry and smooth, bearing long, rolled, wiry leaves basally. The dark brown or blackish sheaths are characteristic. The inflorescence is a dense oval of spikelets with dark glumes overtopped by a long bract. The nut is globular, pale and shiny. *Schoenus*, the classical name; *nigricans*, blackish.

RHYNCHOSPORA

WHITE BEAK-SEDGE — *Rhynchospora alba*

A tufted perennial, 6–18 inches; of wet peaty places, flowering July and August. Stems slender. Leaves narrow and rough-edged. Distinguished by the compact heads of small whitish or pale brown spikelets, with a number of empty glumes, and scarcely overtopped by a bract. The beaked nut is biconvex and not exceeded by the numerous bristles. *Rhynchospora*, from *rhynchos*, beak, and *spora*, seed; *alba*, white.

BROWN BEAK-SEDGE — *Rhynchospora fusca*

A rare and local perennial, differing mainly from *R. alba* in its far-creeping rhizomes, longer bracts and darker brown, somewhat larger spikelets. *fusca*, tawny.

CLADIUM

(FEN) SEDGE — *Cladium mariscus*

A stout perennial, locally abundant in fens, 3–4 feet, flowering July and August. A distinctive plant with large, branched inflorescence of crowded brown spikelets and very long, wide, tough leaves, saw-edged and toothed along the keel. The nut is oval, dark brown and shiny. *Cladium* from *kladion*, branch; *mariscus*, name of a rush-like plant.

CAREX

SEDGES — *Carex*

This genus is characterized in general by solid, usually leafy and 3-angled stems; the species, of which there are over 70, may be recognized by the inflorescences of one-sexed flowers, covered by a glume, overlapping each other in spikes. The spikes are of three main types: (1) Solitary and terminal, male and female flowers on the same or on separate plants. (2) Branched, similar, unstalked, with male and female flowers together, often with small bracts from the base. (3) Several, unbranched, often stalked, the male and female on separate dissimilar spikes, often with long

bracts from the base. The male spikes are at the top of the stem. The male flowers have two or three stamens, the female one style with two or three stigmas. The fruit is a roughly bottle-shaped nut enclosed within an envelope or perianth, usually with a beak. The leaves are usually long, keeled or rolled. Sedges are found in various habitats, some more or less restricted to a particular type, e.g. *C. arenaria*, Sand Sedge, *C. sylvatica*, Wood Sedge, *C. riparia*, Great Pond Sedge (ponds and river-sides), *C. maritima*, Curved Sedge (a maritime species). The genus is usually readily recognized but the identification of species often demands minute attention to the characters of fruit and glumes and to the habit. Group 1 consists of about six, usually local, species ; group 2 of about twenty species, many common ; group 3 of numerous common and local species. *Carex*, a classical name.

FLEA SEDGE (Group 1) *Carex pulicaris*

A perennial, 6–12 inches, locally common on boggy ground, flowering May and June, fruiting June and July. Shortly creeping and forming dense patches. Stems slender, erect, smooth, round. Leaves long, narrow, somewhat rolled. Spike narrow, male flowers at top, glumes brown, bluntish ; fruits shiny, brownish, eventually deflexed ; the whole resembling a cluster of fleas. *pulicaris*, of fleas.

REMOTE SEDGE (Group 2) *Carex remota*

A densely-tufted perennial, 1–2 feet, of damp places, flowering in June and fruiting in July. Stem 3-angled, smooth, except at the top, where it is 2-angled and rough. Leaves long, narrow, channelled. Spikes with brownish-green glumes, not stalked, close together at top of stem but distant below ; exceeded by leaf-like bracts, the lowest considerably so. Fruit greenish, narrowly oval with a short, broad, notched beak. *remota*, remote, distant.

HAMMER SEDGE (Group 3) *Carex hirta*

A creeping perennial, 1–2 feet, of woods and damp grassy places. It flowers in May and June and fruits in June and July. Stem 3-angled, shiny. Leaves channelled, hairy on both sides ; sheaths often densely hairy. Inflorescence of two or three male spikes above, and two, three or more female spikes below. The male spikes are slender, with reddish-brown, hairy pointed glumes ; the greenish-glumed, fatter female spikes are far apart, the lowest often near the base of the stem. The female glumes taper to a long awn-like point. Fruit oval, greenish, hairy, ribbed and with a bifid beak. Distinguished by the hairiness of nearly all its parts. *hirta*, hairy.

COMMON SEDGE (Group 3) *Carex nigra*

Common perennial of marshes and river banks. Grows 12–18 inches high ; flowers June to August. Rootstock creeping. Stem slender, stiff, rough. Leaves narrow. Flowers unisexual in short spikelets without stalks, 3–5 to a spike. Glumes purplish brown. Male flowers in terminal spikelet only : remainder are female, with extra enveloping glume and 2 stigmas. *nigra*, black.

GRASSES

GRAMINEAE

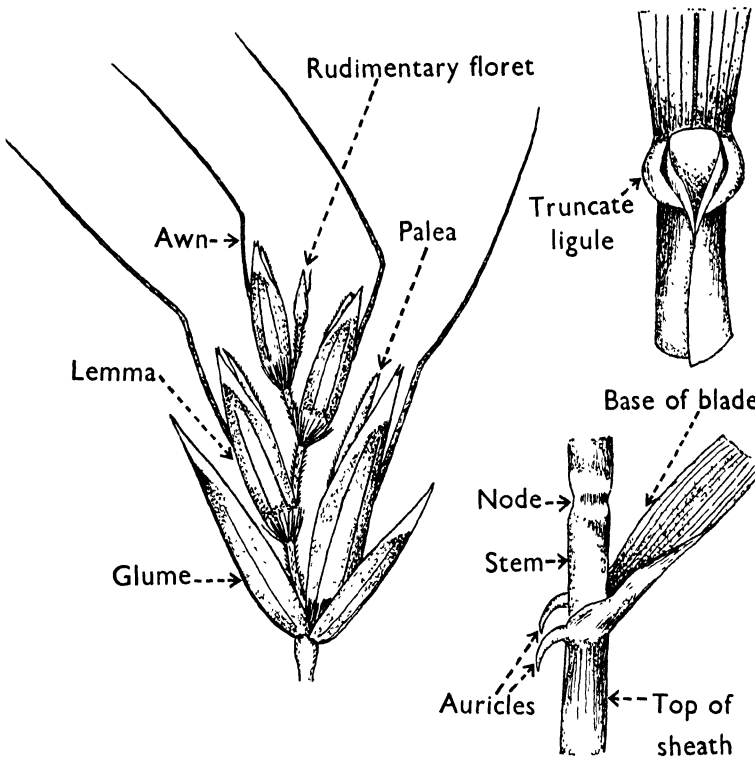
Grasses are recognized by most people, but as they lack the well-known organs such as petals and sepals, they are often thought not to be flowering-plants and their individual species prove puzzling to many. The unfamiliar structures are usually only modifications of more familiar ones, however, and once the necessary terms for these are mastered, recognition of the more common grasses, such as described here, should not be difficult. The *stems* are round or sometimes flattened and may spread by underground *rhizomes* or overground runners known as *stolons*.

The *leaves* have typically long and narrow *blades*, which may have small projections from the base known as *auricles*, and sheaths enfolding the stem ; at the junction of sheath and blade is a pointed or blunt or straight topped (truncate) membrane, the *ligule*.

The *inflorescence* consists of branches of *spikelets*, open and spreading or crowded into a spike. The spikelets may be built up of few or many *florets*, occasionally only one or two. The spikelet is subtended by two bracts, often membranous, known as *glumes*, which are usually unequal in length and not longer than the spikelet.

The *floret* contains the usual stamens and pistils, sometimes separately, sometimes together, enclosed in the *lemma* and *palea*, two structures, often membranous, usually about equal in length. They, as the glumes, may bear long or short projections known as *awns*.

Other organs are not here described as, being for the most part minute, they have not been referred to in the following text. It is not possible in the space available to give a detailed account of each grass, and where it has seemed possible to characterize the species with the use of larger and readily assessable features, this has been done and the more minute characters ignored. Exceptions from the above generalizations are noted in the text, as they are obvious recognition features ; the habitats, also, will prove useful guides in many cases. The fruit (the familiar ' grass-seed ') is a seed-like grain or *caryopsis*. The following exceptions to the ' Flora ' by Clapham, Tutin & Warburg have been made ; *catapodium*, substituted for *Desmazeria* (*rigida*) ; the order of the species in the genus *Poa* altered for convenience ; an occasional second common name has been added.



Left, spikelet with four fertile florets and with two glumes.
Right, side and front views of portions of leaves.

PHRAGMITES

REED — *Phragmites communis*

A perennial, up to 10 feet, growing in the shallow water of swamps and river-sides, flowering between July and September. Known readily by its tall, stout, erect stem with long creeping rhizomes and broad, flat leaves and its large, open, purplish inflorescence, on which tufts of silky hairs grow out between the florets. The ligule is replaced by a ring of hairs. The glumes are pointed and the palea is much shorter than the long-pointed, hairless lemma. Name refers to its habit of growth ; *phragmites*, from *phragma*, a fence ; *communis*, common.

MOLINIA

PURPLE MOOR-GRASS — *Molinia caerulea*

An erect, wiry, creeping perennial, often forming dense tussocks on damp heaths and fens. It flowers from June to August. Recognized by its stem, 1–4 feet, swollen at the base, bearing a long, close, purplish inflorescence, the spikelets being short-stalked. The leaves are broad and flat, with a ring of hairs for ligule. The glumes are pointed, but the lemma is blunt. Named after an Italian missionary, J. I. Molina ; *caerulea*, sky-blue.

SIEGLINGIA

HEATH GRASS — *Sieglingia decumbens*

A somewhat decumbent, tufted perennial, usually not above 1 foot, of rough pasture and peaty soils, flowering in July and August. The leaf, with a ring of hairs replacing the ligule, is short, flat and narrow. The inflorescence of short, close branches bearing few spikelets and the 3 short teeth at the apex of the lemma characterize this grass. The pointed glumes may exceed the florets. The palea is shorter than the leathery lemma. Named after a German scientist, Siegling ; *decumbens*, decumbent.

GLYCERIA

FLOTE-GRASS, FLOATING SWEET-GRASS — *Glyceria fluitans*

An aquatic perennial, 1–4 feet, found in slow-flowing or stagnant water ; flowering from May to August. The stem becomes erect but it may creep, rooting at the nodes, and float, habits which aid in its recognition. The inflorescence, with few branches of spikelets of translucent-tipped florets, is also distinctive. It has long, flat, pointed leaves with smooth sheaths, the ligule being very long. The spikelets are narrow, the glumes oblong, the palea usually longer than the prominently-veined lemma. *Glyceria*, some species of which have sweet grains, from *glukeros*, sweet ; *fluitans*, floating.

'PLICATE' SWEET-GRASS — *Glyceria plicata*

As commonly distributed as *G. fluitans*, and similar, except that the sheaths are rough, the inflorescence is more branched, the lemma is shorter ; the palea is as long as the lemma. *plicata*, folded.

REED-GRASS — *Glyceria maxima*

This perennial is distinguished from the other *Glycerias* by its height, up to 6 feet, its broader leaves with shorter ligules, smaller spikelets on a much larger, open inflorescence. The sheath is rough. This grass grows in deeper water than the others and does not have floating leaves. *maxima*, largest.

FESTUCA

MEADOW FESCUE — *Festuca pratensis*

A perennial, 1–1½ feet, of meadows and grassy places, flowering in mid-summer. Its erect stems, with the bases enclosed in the remains of dark brown sheaths, grow in tufts. The leaves have longish, flat blades, with small, hairless auricles at the base and smooth sheaths with very short ligules. A slender inflorescence, with short, stout branches bearing narrow

spikelets, is characteristic of this grass. The glumes are narrow, the lemma is transclucent at the tip and may have a short awn. *Festuca* is the old Latin name for a weedy grass ; *pratensis*, of meadows.

TALL FESCUE *Festuca arundinacea*

A larger plant than the preceding, up to 6 feet, and differing also in that the stems are enclosed in tough, whitish basal sheaths, and the leaf-auricles are fringed with hairs. *arundinacea*, reed-like.

TALL BROME *Festuca gigantea*

Also a taller plant than *F. pratensis*, with stems up to 4 feet, growing in woods and shady places. It has broader leaves and a very lax, nodding inflorescence, on which the spikelets are long-awned. *gigantea*, very tall.

CREEPING FESCUE, RED FESCUE *Festuca rubra*

A common perennial, 1–3 feet, of many habitats—meadows, mountains, salt marshes, dunes ; it flowers from May to July. It has more or less erect stems and creeps by means of runners. The lower leaves have dark, brownish sheaths ; the stem leaves are flat or rolled, whilst those of the sterile shoots are rolled, sometimes tightly, to resemble long bristles. The ligule is short. The spikelets are often reddish, on a somewhat spreading inflorescence. The lemma has a short awn. This grass has many forms. *rubra*, red.

SHEEP'S FESCUE *Festuca ovina*

Also a variable and widespread perennial, closely allied to *F. rubra*, from which it differs in forming dense tufts and having whitish or greyish sheaths at the base. All its leaves are bristle-like. The ligule is short and blunt. *ovina*, of sheep.

LOLIUM

RYE-GRASS *Lolium perenne*

A wiry, tufted perennial, 1–2 feet, found in waste places and pastures, often on bombed sites. It flowers through the summer. The stem bears vegetative shoots and narrow, flat leaves, with a short, truncate ligule. The inflorescence is long and spike-like, with the compressed spikelets placed edgewise to the stem. All spikelets, except the terminal, have only one glume, which is shorter than the spikelet. The narrow, pointed lemma is awnless. *Lolium* is the old Latin name for Darnel ; *perenne*, perennial.

ITALIAN RYE-GRASS *Lolium multiflorum*

An introduced, well naturalized annual or biennial grass, differing from the preceding in being a softer and taller plant, having no vegetative shoots and the lemmas awned. *multiflorum*, many-flowered.

DARNEL *Lolium temulentum*

A stout, erect annual, also introduced, but not so commonly found. It is taller than the last two ; the glumes are longer than the spikelets and the florets are turgid. *temulentum*, drunken, because it is used in the preparation of an intoxicating drink.

VULPIA

BARREN FESCUE — *Vulpia bromoides*

A slender annual, usually up to 1 foot, sometimes taller, found on dry heaths, rocky and waste places and walls, flowering during the summer months. The stem tends to be decumbent at the base. The leaves are narrow with short, truncate ligules, the sheath of the topmost being some distance below the inflorescence, which has close branches of short-stalked spikelets. The tough lemma narrowing into a long awn adds a distinctive feature to the prominent, bristly-looking inflorescence. Name refers to appearance of inflorescence, from *vulpes*, a fox, as it resembles a fox's tail; *bromoides*, brome-like.

PUCCINELLIA

SEA POA — *Puccinellia maritima*

A tufted perennial, 6 inches to 2 feet, growing around the coast in estuaries and salt marshes, flowering from June to August. The stem has runners and narrow leaves that may be flat or rolled; the ligule is short and blunt. The branches of the narrow inflorescence are usually upright, occasionally spreading. The translucent-tipped lemmas are broadly triangular at the apex, not tapering. The glumes are broad and bluntish. Named after an Italian botanist, B. Puccinelli; *maritima*, maritime.

CATAPODIUM

HARD POA — *Catapodium rigidum*

This somewhat spreading annual, up to 1 foot, is found mainly in dry chalky places, on rocks and banks, flowering in May and June. Its short stem bears flat, narrow leaves, and a conspicuously rigid, narrow inflorescence of narrow, compressed spikelets, borne on one side of the branches, which begin to appear from near the stem's base. The glumes are short, somewhat pointed and strongly veined, whilst the lemma is blunt and obscurely veined. *Catapodium* from *cata*, short, and *podion*, foot; *rigidum*, rigid.

POA

MEADOW-GRASS, SMOOTH MEADOW-GRASS — *Poa pratensis*

A perennial, 1–2 feet, of grassy places and dunes, flowering from May to July, exhibiting a variety of forms difficult to summarize. Its main features are a rather stiff, smooth, erect stem, with creeping rhizomes and flat or rolled leaves, the ligule short and truncate; and an open inflorescence with compressed spikelets. The glumes and lemmas are keeled, the latter copiously webbed at the base with silky hairs. Name from *poa*, grass; *pratensis*, of meadows.

ROUGH MEADOW-GRASS — *Poa trivialis*

A perennial similar to *P. pratensis* but of weaker habit, tufted in growth and with a very long ligule. The inflorescence branches are rough. It is often to be found on bombed sites. *trivialis*, trivial, ordinary.

WOOD POA — *Poa nemoralis*

A slender perennial, 1–3 feet, of shady places, with shortly creeping stem. It is similar to *P. trivialis* in being lax and weak in habit, but has a very

short ligule (or none). The inflorescence is usually drooping. The lemma is not prominently veined as in other Poas. *nemoralis*, of groves.

ANNUAL POA, ANNUAL MEADOW-GRASS — *Poa annua*

An extremely common ubiquitous annual, flowering nearly all the year round, usually less than 1 foot, tufted, erect or decumbent; sometimes rooting at the nodes. Its lemma is often hairless. The palea has short hairs on the veins. A familiar garden weed and a grass of bombed sites. *annua*, annual.

DACTYLIS

COCK'S-FOOT — *Dactylis glomerata*

A coarse perennial, 1–4 feet, of meadows, roadsides and waste ground, including bombed sites. It flowers through the summer. The erect or decumbent stems grow in tufts. The broad, rough leaves have rough, usually keeled, sheaths with a long, pointed ligule. Recognized mainly by its inflorescence, which has short-stalked, compressed spikelets crowded at the ends of the branches, of which the lowest are much longer than the upper. The glumes and lemmas have hairy keels and a tiny awn at the tips. *Dactylos*, a finger; *glomerata*, crowded.

CYNOSURUS

CRESTED DOG'S TAIL — *Cynosurus cristatus*

A wiry, erect, tufted perennial, 6 inches to 2 feet, flowering from June to August in pastures and grassland. The leaves are narrow and flat, the ligule short. The distinctive narrow, dense, spike-like inflorescence has the spikelets arranged neatly like the teeth of a comb. The spikelets are of two kinds: sterile with very narrow glumes and lemmas; fertile with stouter glumes and lemmas, the former strongly keeled, the latter with a short awn. Name refers to the inflorescence; *Cynosurus* from *kyon*, a dog, and *oura*, tail; *cristatus*, crested.

BRIZA

QUAKING GRASS — *Briza media*

A shortly-creeping, somewhat tufted perennial, 6–18 inches, growing in meadows and grassy places, flowering in June and July. The stem bears flat, narrow leaves with short, truncate ligules. The open inflorescence of broad, heart-shaped, purplish spikelets, on such slender stalks that they 'quake' at the slightest breeze, is easily recognized. The lemma, much longer than the palea, is broad, and lobed at the base. The glume is broad, boat-shaped, blunt. *Briza* is the ancient and modern Greek name for a cereal (possibly rye); *media*, intermediate, there being a *B. minor* and a *B. maxima*.

MELICA

WOOD MELICK — *Melica uniflora*

A perennial, 1–2 feet, found in woods and shady hedge banks, flowering in May and June. The stem is more or less erect, the leaves long and flat, with hairy sheaths and short ligules. The inflorescence is broad, spreading and lax. The spikelets are distinctive in appearing to be one-flowered,

although they are two-flowered with one floret sterile. The pointed, purplish-black glumes nearly equal the spikelets. The leathery lemma is rounded on the back, and awnless. *Melica* is the Italian name for a kind of Sorghum (a cereal) ; *uniflora*, one-flowered.

ZERNA

UPRIGHT BROME — *Zerna erecta*

A perennial, 2–3 feet, found on downs and banks on calcareous soils, flowering from June to August. The erect stems have flat, narrow upper leaves, the lower being rolled ; the sheaths may be hairy or not. The erect branches of the inflorescence, which may appear almost simple or branchless, give this grass its name. The reddish or purplish spikelets are slightly broader at the top. The glumes are pointed, the lemmas are keeled, hairless, distinctly awned ; the paleas are keeled and slightly shorter than the lemmas. *Zerna* is an old Greek name for a cereal ; *erecta*, erect.

HAIRY BROME — *Zerna ramosa*

A taller perennial than *Z. erecta*, up to 5 feet, and differing in having stiffly hairy sheaths, broad leaves, and particularly in its broad, nodding, more branched inflorescence. The lemmas are edged with hairs. It grows in woods and hedges. *ramosa*, branched.

ANISANTHA

BARREN BROME — *Anisantha sterilis*

An untidy-looking annual, 1–2 feet, flowering May to July, and found on roadsides, waste places and bombed sites. The erect or decumbent stems have flat, downy leaves, with the lower sheaths shortly hairy and short ligules. The appearance of the inflorescence is characteristic ; the branches are long and drooping, with only one or two compressed spikelets on each ; the long awns of the lemmas add to the rough, untidy effect. The glumes are pointed, and the lemmas rounded on the back, slightly longer than the paleas. *Anisos*, unequal, and *antos*, flower ; *sterilis*, sterile, barren, possibly because the few florets drop easily, leaving barish branches.

BROMUS

LOP-GRASS, SOFT BROME — *Bromus mollis*

Annual or biennial, 1–3 feet, growing in meadows and waste places, on dunes and cliffs. It flowers from May to August and is variable in general habit and hairiness. The most conspicuous feature of the contracted, dense inflorescence is the papery look of the spikelets, due to the scarious texture of the lemmas. The flat, narrow leaves are more or less hairy, the ligules short, truncate and hairy. The glumes and lemmas are broad, blunt and hairy. The palea is shorter than the long-awned lemma. *Bromus* from *bromos*, old name for a kind of oat ; *mollis*, soft.

MEADOW BROME — *Bromus commutatus*

A stouter, more erect grass than *B. mollis*, differing also in its looser inflorescence, hairless lemma and ligule. *commutatus*, changing (i.e. variable).

BRACHYPODIUM

SLENDER FALSE-BROME, WOOD FALSE-BROME *Brachypodium sylvaticum*

A tufted, soft perennial, 1–3 feet, of woodlands and hedges, flowering in June and July. The stem has hairy nodes, with hairy leaves and sheaths ; the broad leaves are drooping. The inflorescence is spike-like and nodding, with very short-stalked spikelets. The ligule is short and ragged. The leathery lemma, rounded on the back, has an awn as long as itself. The glumes are long-pointed. Name refers to very short spikelet-stalks, from *brachys*, short, and *podion*, foot ; *sylvaticum*, of woods.

HEATH FALSE-BROME *Brachypodium pinnatum*

Similar to *B. sylvaticum*, except that it spreads by short rhizomes and has an erect inflorescence ; the awn is not as long as the lemma. It grows on grassland. *pinnatum*, pinnate, arranged like a feather, referring to spikelets.

AGROPYRON

BEARDED COUCH-GRASS *Agropyron caninum*

An erect, tufted perennial, 1–3 feet, growing in woods and hedges, flowering in June and July. The stem is erect, with hairy nodes and broad, flat leaves ; the ligule short and ragged. The long, narrow, spike-like inflorescence, with narrow, unstalked spikelets, is characteristic. The glumes are pointed and narrow, the lemmas narrow, with long, slender arms. Name *Agropyron* from *agrios*, wild, and *pyros*, wheat ; *caninum*, of dogs (i.e. very common as in dog-rose, dog-violet).

COUCH-GRASS, TWITCH *Agropyron repens*

A perennial with creeping rhizomes, and otherwise differing from the last in having hairy lower sheaths and hairless nodes. A pernicious weed. *repens*, creeping.

ELYMUS

LYME-GRASS *Elymus arenarius*

A stout perennial, 3–4 feet, of sandy shores and dunes, flowering in July and August. Stem erect, creeping by runners. Leaves broad and stiffly pointed ; sheaths smooth, ligules very short. Inflorescence spike-like, whitish green, compact, with many unstalked spikelets at each node. The narrow, long-pointed glumes are nearly equal to the spikelets. The lemma is distinctly hairy. The broad leaves and short ligule differentiate this from *Ammophila*, with which it sometimes grows. *Elymus*, from *elymos*, a classical name ; *arenarius*, of sand.

HORDEUM

MEADOW BARLEY *Hordeum secalinum*

A perennial, 1–2 feet, flowering in June and July, found in meadows. The slender, erect stem has flat, narrow leaves, with the upper sheaths not inflated and the ligule very short. The inflorescence is spike-like with 3 spikelets at each node of its axis. the middle fertile, the lateral 2 sterile. The spikelet is 1-flowered. This arrangement, with the very

long awn of the lemma, gives a distinctive look to the plant. The glumes are bristle-like, and the lemmas very narrow. *Hordeum* is the old Latin name for Barley ; *secalinum*, resembling rye.

WALL BARLEY *Hordeum murinum*

A stout annual, 6–18 inches, more or less decumbent at the base, found in waste places, by walls and on bombed sites. It further differs from *H. secalinum* in its inflated upper sheaths, broader fringed glumes of the middle spikelets, and even longer awns. *murinum*, of walls.

KOELERIA

CRESTED HAIR-GRASS, SLENDER HAIR-GRASS *Koeleria gracilis*

An erect, rather stiff perennial, 6 inches to 1 foot, of dry calcareous pastures and sandy places, flowering in June and July. The somewhat hairy stem is sometimes creeping. The leaves, with downy sheaths and short ligules, are usually narrow and rolled. The close, cylindrical inflorescence, with its crowded, compressed spikelets, characteristically shining, is often lobed. The upper glume, keeled and pointed, almost equals the first floret. The narrow, keeled, long-pointed lemma may extend its point to a very short awn. Named after G. L. Koeler, a German botanist ; *gracilis*, slender.

TRISETUM

YELLOW OAT *Trisetum flavescens*

A perennial, 6–18 inches, of dry pastures and meadows, flowering from May to July. The erect stem has runners, flat, narrow leaves, downy lower sheaths with very short, truncate ligules, and bears an oblong inflorescence. The shining, yellowish colour of the spikelets is one feature of this grass and the 2 teeth at the apex of the lemma, with its long awn projecting from below the tip, are another. The glumes and lemmas are keeled. Name refers to the lemma : *Trisetum* from *tri*, three, and *setum*, a bristle ; *flavescens*, yellowish.

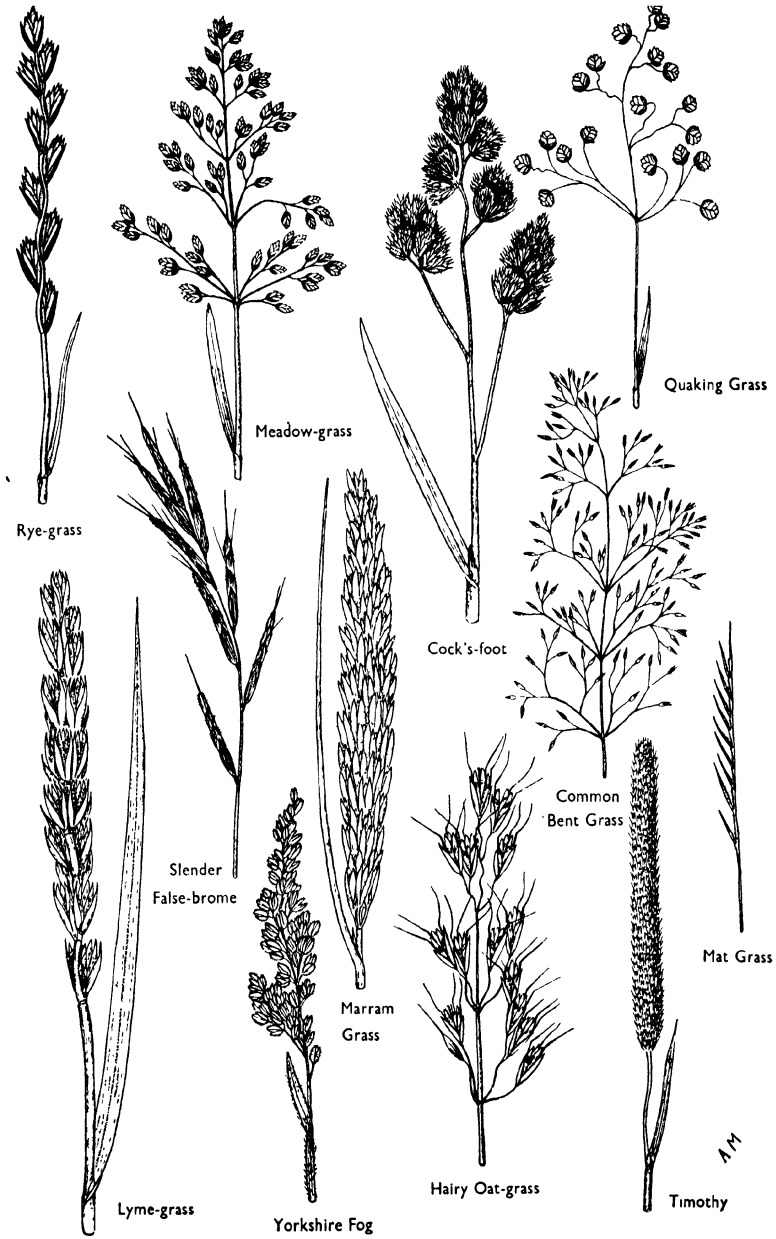
HELICTOTRICHON

MEADOW OAT *Helictotrichon pratense*

A perennial, 1–2 feet, on calcareous soils in short turf, flowering in June and July. It is tufted, with an erect stem bearing stiff, somewhat channelled, narrow leaves, with hairless sheaths and long, pointed ligules. The narrow inflorescence has rather large spikelets. The narrow, pointed glumes are nearly as long as the spikelet and are translucent round the edges. The narrow lemma, leathery below and rounded on the back, has the long, bent awn of the ' oats '. Name *Helictotrichon*, from *helictos*, twisted, and *trichon*, a hair, in reference to the bent awn ; *pratense*, of meadows.

HAIRY OAT *Helictotrichon pubescens*

Differs from *H. pratense* in growing on rougher turf, sometimes off the chalk, and in having hairy lower sheaths, looser inflorescences, and longer hairs at the base of the lemma. *pubescens*, downy, softly hairy.


Rye-grass
Meadow-grass
Quaking Grass
Cock's-foot
Slender
False-brome
Common
Bent Grass
Mat Grass
Marram
Grass
Lyme-grass
Yorkshire Fog
Hairy Oat-grass
Timothy
AM

ARRHENATHERUM

OAT-GRASS, FALSE OAT — *Arrhenatherum elatius*

An erect perennial, 2–4 feet, found in hedges and rough grassy places, flowering in June and July. The stem, which may be swollen at the base, has flat, narrow leaves, with a very short ligule. The narrowish, lax, nodding inflorescence looks like that of an oat, as the lower lemma of the two-flowered spikelet bears a long, bent awn from near its base. The second floret may bear a shorter awn from the tip of its lemma, or have no awn. The glumes are narrow and pointed. Name *Arrhenatherum* from *arren*, male, and *ather*, awn, referring to the long-awned floret, which is male; *elatius*, tall.

HOLCUS

YORKSHIRE FOG — *Holcus lanatus*

An erect perennial, characteristically soft, 1–2 feet, of fields, woods, waste places and bombed sites, flowering June to September. The stems have hairless nodes and flat, narrow, downy leaves with downy sheaths, the upper inflated, and short, truncate ligules. The inflorescence is a longish, lobed oval, bearing strongly compressed 2-flowered spikelets, jointed beneath the glumes. The glumes are almost equal and longer than the spikelets. The lemmas are leathery and shining, that of the lower floret awnless, of the upper with a hidden awn. *Holcus* is the old Latin name for a kind of grain; *lanatus*, woolly.

CREEPING SOFT-GRASS — *Holcus mollis*

Not so common as *H. lanatus*, usually on sandy soil and avoiding chalk. It is also a stiffer plant, with hairy nodes, and the awn is visible beyond the glumes. *mollis*, soft.

DESCHAMPSIA

TUFTED HAIR-GRASS — *Deschampsia caespitosa*

A perennial, up to 5 feet, growing in dense tufts on clayey soils, in damp, rough pastures and fields, flowering from June to August. The tall, stout stem has narrow, flat leaves, rough on the upper surface, with smooth sheaths and long, blunt ligules. The inflorescence is typically large and loose, with long slender branches bearing small silvery or purplish spikelets. The nearly equal glumes are firm, narrow and translucent, about the same length as the spikelet. The narrow, translucent lemma has a straight awn from near its base, not obvious as they are of the same length. Named after M. H. Deschamps, famous French naturalist; *caespitosa*, tufted.

WAVY HAIR-GRASS — *Deschampsia flexuosa*

Found on heaths and moors, this rather slender ally of *D. caespitosa* differs in its bristle-like leaves, shorter, truncate ligule, conspicuous awn and the flexuous branches that give it its name. *flexuosa*, wavy.

AIRA

EARLY HAIR-GRASS — *Aira praecox*

A small, low-growing annual, seldom reaching 6 inches, flowering in the spring, found on heaths and in dry fields or rocky slopes. The leaves are

short, narrow and almost thread-like. The contracted inflorescence has short branches, with small, 2-flowered spikelets. The nearly equal glumes are boat-shaped, pointed, and as long as the spikelets. The lemma, rounded on the back, tapers into 2 slender teeth ; a slender, bent awn, arising from below the middle of the lemma, is usually visible. *Aira* is an old Greek name for a weed ; *praecox*, early.

AMMOPHILA

MARRAM GRASS — *Ammophila arenaria*

A maritime perennial of coastal dunes, 1–3 feet, flowering from July to August. Its erect, stout stem creeps extensively, acting as a sand-binder. The leaves are tightly rolled, sharp-pointed and rigid like thorns, and they possess very long and pointed ligules. The inflorescence is dense, cylindrical and whitish in colour, with 1-flowered spikelets. The glumes are longer than the floret ; the lemma has a very short awn in addition to 2 apical teeth. A distinctive and somewhat formidable grass. Name refers to its habitat. *Ammophila* from *ammos*, sand, and *philos*, loving ; *arenaria*, of sand.

CALAMAGROSTIS

BUSHGRASS, WOOD SMALLREED — *Calamagrostis epigejos*

An erect perennial, 2–5 feet or more, found in open woods, ditches and fens. It flowers from June to August. Its stout, tall stem has long, flat, pointed, rough leaves, with very long ligules. The spreading inflorescence is usually purplish brown with spikelets of only 1 floret. The glumes and lemmas furnish important recognition features. The former, long, awl-shaped and keeled, are two or three times as long as the florets. The latter, narrow, with 2 teeth at the apex, and an awn from near the base, have at their base hairs twice their length. Name *Calamagrostis* from *kalamos*, a reed, and *agrostis*, kind of grass ; *epigejos*, on the earth (because it may grow in much drier ground than the other Smallreeds).

PURPLE SMALLREED — *Calamagrostis canescens*

A more local plant than the preceding and not attaining the same height. It is also separable by its leaves, downy above, and with shorter, blunter ligule, and particularly by the floret hairs, which are only slightly longer than the lemmas. *canescens*, whitish, in reference to the floret hairs.

AGROSTIS

BROWN BENT-GRASS — *Agrostis canina*

A tufted perennial, 1–2 feet, flowering June and July, on heaths and grassland. The stem is shortly creeping, by runners or rhizomes, and has flat, narrow leaves. The ligule, important in this group of delicate-looking, 'feathery' grasses, is long, pointed and somewhat torn ; other British species of *Agrostis* have blunt ligules. The inflorescence is pyramidal and diffuse, with 1-flowered, small spikelets. The narrow, pointed, keeled glumes are longer than the spikelets. The lemma is ovate, truncate and usually bears from its middle a bent awn twice its length ; other species are usually awnless. The palea is minute, less than a quarter the length

of the lemma ; other species have paleas about half the length of the lemmas. *Agrostis* is the name for a kind of grass, derived from *agros*, a field ; *canina*, of dogs (see *Agropyron caninum*).

COMMON BENT-GRASS, FINE BENT-GRASS *Agrostis tenuis*

This grass, allied to *A. canina*, spreads by rhizomes, has ligules shorter than they are broad and spreads its inflorescence more openly after flowering. *tenuis*, fine.

COMMON BENT-GRASS *Agrostis gigantea*

Differs from *A. tenuis* mainly in its taller growth, up to 4 feet, and in having ligules as long as, or longer than broad. *gigantea*, tall.

FIORIN *Agrostis stolonifera*

This *Agrostis* spreads by stolons or overground runners, not by underground rhizomes ; it differs from all except *A. gigantea* in the shape of ligule and from *A. gigantea* in that its inflorescence is contracted after flowering, whereas that of the former spreads in flower and fruit. *stolonifera*, having stolons.

PHLEUM

CAT'S-TAIL *Phleum nodosum*

A slender perennial, 6–18 inches, common in dry grassy places, flowering in June and July. The stem has a swollen or bulb-like base. The leaves are flat and rather broad, with a short, blunt ragged ligule. The inflorescence is dense, cylindrical, with smooth branches bearing small, crowded, compressed, 1-flowered spikelets, and thus resembles a cat's tail. The shortly-awned glumes have short hairs on the keels and are longer than the florets. The lemmas are translucent, toothed and broadly truncate. *Phleum* from *phleas* or *phylos*, an old Greek name for a marsh grass ; *nodosum*, knotty, referring to the swollen stem-base.

TIMOTHY *Phleum pratense*

An erect perennial, up to 4 feet, common in pastures and meadows, stouter and taller than *P. nodosum*, from which it also differs in having larger spikelets and very rough inflorescence branches. *pratense*, of meadows.

ALOPECURUS

MEADOW FOXTAIL *Alopecurus pratensis*

A stout, erect perennial, 1–3 feet, found in damp, grassy places, flowering from April to June. The stem is bent at the lowest node. The leaves are short and rough, with inflated upper sheaths and longish, blunt ligules. The cylindrical inflorescence is crowded with 1-flowered spikelets. The pointed, translucent, almost equal glumes are longer than the floret. The lemmas are pointed, with a longish bent awn from near their base, giving the spike a different aspect from that of a Cat's-tail. Name *Alopecurus*, from *alopex*, a fox, and *oura*, a tail, refers to the shape of the inflorescence ; *pratensis*, of meadows.

MARSH FOXTAIL *Alopecurus geniculatus*

A shorter, more slender and later flowering perennial than *A. pratensis*, from which it also differs in its stem, conspicuously bent at many nodes, more or less creeping and rooting at the nodes, ultimately ascending. *geniculatus*, kneed, bent.

MILIUM

WOOD MILLET *Milium effusum*

An erect, tufted perennial, 2–4 feet, of damp woods, flowering in June and July. The thin leaves are flat and broad, the ligule ragged and somewhat pointed. The main feature is the very loose, slender inflorescence of thread-like branches, bearing small, 1-flowered spikelets. The membranous glumes, rounded on the back, exceed the floret. The bluntish lemma, also rounded on the back, becomes very hard and shining in fruit. *Milium* is the old Latin name for Millet ; *effusum*, effuse, very loose.

ANTHOXANTHUM

SWEET VERNAL-GRASS *Anthoxanthum odoratum*

A tufted perennial, 6–18 inches, found in meadows, on heaths and moors, flowering from April to June. The flat, narrow leaves have smooth sheaths, the upper with long, pointed, and the lower with truncate ligules. The brownish-yellow, compact inflorescence stands well above the leaves. The downy, short-awned glumes are longer than the spikelet, which has 2 sterile florets and a terminal fertile one. The fertile lemma is brown, smooth and shining ; 1 sterile lemma has a short awn from near the tip, the other has a long bent awn from near the base, both have short, golden hairs. The palea is shorter than the lemma. Name *Anthoxanthum* from *anthos*, flower, and *xanthos*, yellow ; *odoratum*, sweet-smelling, as it smells of new-mown hay.

PHALARIS

REED-GRASS *Phalaris arundinacea*

A perennial, 2–5 feet, growing in wet places and flowering from June to August. The tall, stout, erect stem has far-creeping rhizomes, broad, flat leaves with long, blunt ligules. The inflorescence is narrowly oblong and lobed. The keeled glumes are almost equal. The compressed, light-purplish spikelets have 1 terminal fertile floret and 2 minute, rudimentary sterile florets. The leathery lemma is pointed, silky-hairy, somewhat shining. *Phalaris* from *phaleris*, an old name for a grass (possibly connected with *phalaros*, shining) ; *arundinacea*, reed-like.

NARDUS

MAT-GRASS *Nardus stricta*

A wiry, densely-tufted perennial, up to 1 foot, abundant on heaths and poor or peaty soils, flowering from June to August. The leaves are very hard and bristle-like, with a very short ligule. The meagre, inconspicuous, spike-like inflorescence bears the small, narrow, pointed, 1-flowered

spikelets on one side only. The floret is subtended usually by only 1 small glume. The lemma is awl-shaped, with a short awn at the tip. *Nardus* from *nardos*, the Greek name of an aromatic Indian plant; *stricta*, narrow, constricted.

SPARTINA

CORD-GRASS *Spartina maritima*

A somewhat local perennial, 1–2 feet, of tidal mud-flats and estuaries, flowering in late summer. The stout, erect stem has a creeping rootstock. The leaves are flat or may be somewhat rolled, with a very short, truncate ligule. The inflorescence consists of 2 or 3 erect spikes arranged as branches on a central axis. The spikelets are 1-flowered, unstalked, much compressed and overlapping one another against the axis. The hairy, keeled glumes are longer than the floret. The lemma is awnless. Name *Spartina* from *sparton*, a Greek term for various fibrous plants; *maritima*, maritime.

CORD-GRASS, TOWNSEND'S CORD-GRASS *Spartina townsendii*

A perennial, taller (up to 4 feet), stouter than *S. maritima*, and a hybrid between it and an introduced American species, *S. alterniflora*. It normally has 4–5 spikes and the axis of the spikes is prolonged as a bristle-point beyond the spikelets. The glumes, lemma and palea are larger than those of *S. maritima*. The hybrid arose in Southampton Water, but has been extensively planted as a mud-binder and is now abundant and spreading in many coastal areas. *townsendii*, named after Frederick Townsend.

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