FAVOURITE FLOWERS

OF

GARDEN AND GREENHOUSE
TREE PEONY
(PÆONIA MOUTAN)

4/8 Nat. size

VOL. I.—Front.
FAVOURITE FLOWERS
OF
GARDEN AND GREENHOUSE

BY
EDWARD STEP, F.L.S.

THE CULTURAL DIRECTIONS
EDITED BY
WILLIAM WATSON, F.R.H.S.
ASSISTANT CURATOR, ROYAL GARDENS, KEW

ILLUSTRATED WITH
Three Hundred and Sixteen Coloured Plates
SELECTED AND ARRANGED BY
D. BOIS
ASSISTANT DE LA CHAIRE DE CULTURE AU MUSÉUM D'HISTOIRE NATURELLE DE PARIS

VOL. I.

Mo. Bot. Garden,
1897.

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1896

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FAVOURITE FLOWERS
OF
GARDEN AND GREENHOUSE

INTRODUCTION

From the earliest periods of which we have any records, flower gardens have constituted a source of pleasure and a means of recreation to the human race. In the older civilisations, as in the new, wealth and taste have been lavished upon gardens, and we are bold to say the investment has been remunerative in the best meaning of the word. The aesthetic sense that finds an outlet in the creation and maintenance of a garden, is itself stimulated and strengthened by its own offspring; and this is true not merely of the garden of one or many acres, but equally so of the tiny plot attached to the humble suburban dwelling of the city clerk or the mechanic. In many of these restricted areas the amateur gardener finds serious difficulties in his way, in the shape of a crude clay or gravel earth deficient in humus, obstacles to light and air, and so forth; yet these difficulties may be, and often are, overcome by perseverance and the determination to succeed.

So widespread is now this desire for a plot of ground whereon to cultivate the beautiful among plants,—a desire restricted to no particular class or condition of society,—that the present might well be termed the age of gardens. There are quite a large number of admirable periodicals devoted to gardening, both professional and amateur; and there is an extensive literature of modern books on gardens and gardening of all kinds, but there appears to be no valid reason why a few more should
not be added to the list. The present work differs from all others with which we are acquainted in several important particulars. It treats not so much upon gardens and gardening as upon the plants which give brilliance and charms to the garden. Its object is, primarily, to present reliable portraits of the representative or type plants of the principal genera that find favour in horticulture. In many cases these are of chief interest because they are the parental stocks from which, by cultivation, selection, and cross fertilisation, horticulturists have evolved the endless improved varieties that we now possess. To the comprehensive floral portrait gallery or album thus constituted is added a brief description of the principal species grown in gardens, their horticultural history, and hints as to the treatment they should receive to enable them to thrive in our borders and greenhouses.

The method adopted is thoroughly popular so far as consistent with accuracy. Popular treatment of such a subject is worthless unless based upon scientific principles; whilst, therefore, we have been careful not to introduce little-known technical terms unnecessarily, we have not hesitated to do so where precision called for them. A few of these words, accurately denoting the parts of a flower, must be used on every page, but these are now so familiar to all interested in garden or wild flowers, that we do not anticipate they will cause the slightest inconvenience to the merest novice in botany. Should, however, any difficulty arise, we must ask the puzzled reader to refer to the Glossary of Terms, which will be found in its appropriate place in the work.

The knowledge of the parts of a flower is a fragment of elementary botany which every person interested in plants and gardens must possess, for without it all descriptions, however simple, are unintelligible. It is principally upon this bit of science that all the wonderful work of the hybridiser, the maker of floral novelties, is built up; and in order that this flower structure may be perfectly understood, we give in most cases a vertical section showing the relative positions of the different parts of the flower, which will also make clear the methods of fertilisation in each, to which we have frequently called attention in the text. These dissections, together with the picture of the plant itself, will also render the work helpful to students of botany, who will find in it representatives of almost every one of the Natural Orders of flowering plants.

In the case of plants—such as annuals and biennials—that are chiefly grown from seed we have in many cases given drawings of the seeds and the young seedlings, to aid in their ready identification, and to make it easy to distinguish between the young plants and the weeds that threaten to destroy them in the seed-beds.
INTRODUCTION

Without exception the whole of the three hundred and sixteen plates illustrating this work have been drawn and coloured direct from Nature; and we think we may justly claim for the artists engaged that they have succeeded admirably in giving not merely shape and colour, but expression also—the characteristic pose of each plant.

The plan adopted in the work may be briefly stated. The principal genera cultivated in gardens are represented, and these genera are grouped under the Natural Orders to which they belong. They are also introduced to readers in the sequence generally adopted by botanists, beginning with Ranunculaceae and ending with Ferns. Each genus is described and its name explained, the prevailing characteristics are noticed and its horticultural history briefly sketched. Then follow a description of the principal species known in gardens and a selection of the best varieties to serve as a guide to the amateur. These descriptions have been extended to allied species and genera which are not illustrated, so that the complete work will constitute a general treatise upon the plants chiefly cultivated in gardens and greenhouses. Directions are given for the cultivation and propagation of the species and varieties, with hints as to the appropriate soils, situations, times for planting, sowing, striking, grafting, and so forth. It should be understood that in most cases these directions apply generally to the species and their varieties included in one genus; where it is necessary to treat certain varieties differently, special instructions are given.

The system of classification is that of the "Genera Plantarum" of Bentham and Hooker. Tables illustrating that system so far as it applies to this work will be found in succeeding pages.

It is only necessary to add a few words as to the responsibility to be attached to those to whose literary care this work has been intrusted. The original scheme was suggested by Mr. D. Bois' Atlas des Plantes de Jardins, but the plan has been considerably amplified, to make it useful to English readers. Mr. Edward Step, F.L.S., has provided the text, including the lists of varieties and also the cultural directions; the latter have, however, been revised by Mr. W. Watson, F.R.H.S., assistant curator of the Royal Gardens, Kew.
FLOWERS OF GARDEN AND GREENHOUSE

CLEMATIS

Natural Order Ranunculaceae. Genus Clematis

Clematis (Greek, klema, a vine-branch or tendril). A genus of about one hundred species, occurring in warm and temperate regions. They are woody or herbaceous climbers with opposite leaves, divided into three or more leaflets, with twining tendril-like petioles. The flowers are borne in panicles or (rarely) solitary, and are usually long-stalked. The sepals are large and petal-like, in a natural state four in number, but garden varieties have often a much greater number; colour, white, yellow, red, or purple. The petals are absent, or very small and gradually passing into stamens. Stamens numerous, often brightly coloured. Carpels (fruits) many, one-seeded and usually bearing long feathery styles, which increase in size and become ornamental after the sepals have fallen away.

History.

The Clematis has been a favourite garden plant from an early period, C. Viticella having been introduced from Spain in 1569. A considerable number of the species are decidedly ornamental in a natural state, but the popular garden sorts are the results of cross-breeding and selection within the last sixty years or so. The oldest recorded hybrid is C. Hendersoni, said to have been raised in 1835 from C. Viticella and C. integrifolia. The principal raisers of large-flowered Clematis were Mr. G. Jackman, nurseryman, Woking; Mr. J. Anderson-Henry, an amateur, of Edinburgh; Mr. Townshend, nurseryman, Hornsey; Messrs. E. G. Henderson & Sons, nurserymen, St. John's Wood; and Mr. C. Noble, nurseryman, Bagshot. French and Belgian nurserymen, also, have raised many fine varieties. Many of the species are cultivated, and among those frequently found in gardens are:

Principal Species.

Clematis cocinea (red). Introduced from Texas about twenty-five years ago. Stems climbing; leaflets oval, shining, lobed. Flowers singly on long slender stalks; urn-shaped, fleshy, coral red, 1½ inch long; July. Should be planted where its thin stems can trail over a bush. It requires the shelter of a wall except in the warmer parts of this country. Messrs. G. Jackman & Son have lately crossed this with a large-flowered variety named Star of India, and produced a new race with handsome fleshy flowers.

C. Flammula (flame), a native of Europe, has small, white, scented flowers in clusters, appearing from July to October. It is a well-known
hardy plant, from which florists have obtained a large number of handsome varieties and hybrids. The deservedly popular *Jackmannii* is one of these.

C. *FLORIDA* (florid). Introduced from Japan one hundred and twenty years ago. Flowers large, solitary, pure white, from the ripened wood in spring and summer. The leaf is divided into from three to nine oval leaflets, hairy on both surfaces. There is a double form (*flore pleno*), besides several ornamental varieties and hybrids.

C. *INDIVISA* (undivided) was introduced from New Zealand nearly fifty years ago. Flowers creamy or white, in panicles; April. Leaves leathery, smooth, of three entire-margined, oval leaflets, each ending in a hard point. A rapid grower, but as it is only half-hardy it should be restricted to conservatory decoration. There is a variety, *C. indivisa lobata*, differing from the type only in that the leaflets are lobed.

C. *LANUGINOSA* (downy). A native of China (introduced 1851). Leaves broad, heart-shaped, smooth above and woolly below; the lower ones divided into three leaflets. It has magnificent pale blue flowers, sometimes exceeding 8 inches across, appearing from June to October. The var. *pallida* has even larger flowers.

C. *MONTANA* (mountain). Native of the Himalayas (1831). Flowers smaller than in the preceding species, white, and in their form and size suggestive of Anemones; borne in clusters from the axils of the ripened wood. It attains a height of 20 feet, and flowers from May to July.

C. *PATENS* (spreading). Native of China and Japan (introduced 1836). Stems wiry, free growing. The leaves are divided into three leaflets, smooth above and hairy beneath. Flowers, pale violet-blue, 6 inches across, springing from the ripe wood in June and again in autumn. It is one of the parents of many fine hybrids. Other names for it are *caerulea* and *azurea*.

C. *VITALBA* (white vine) is our own native Old Man's Beard or Traveller's Joy, so plentiful on English hedges. The flowers are only an inch across, of a greenish white colour, slightly fragrant; July to September, followed by the more conspicuous greybeards produced by the development of the feathered styles.

C. *VITICELLA* (vine bower), already referred to as the earliest exotic species introduced. It is very strong and hardy, and therefore is often selected as a stock upon which to graft less vigorous sorts. Leaves undivided, or with three to twelve leaflets. Flowers smaller even than those of *Vitalba*, blue, purple, or rosy, drooping, produced throughout the summer. This has been frequently used by the hybridisers, and its crossed progeny are mostly large-flowered.
The hybrids that have been raised by crossing and recrossing some of the above are very numerous, and we cannot do more than give a short selection of good forms:

**Garden Varieties.**

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albert Victor</td>
<td>Deep lavender, with paler stripe.</td>
</tr>
<tr>
<td>Alexandra</td>
<td>Pale reddish violet.</td>
</tr>
<tr>
<td>Anderson Henryi</td>
<td>Creamy white.</td>
</tr>
<tr>
<td>Beauty of Worcester</td>
<td>Single and double flowers, bluish violet, white stamens.</td>
</tr>
<tr>
<td>Countess of Lovelace</td>
<td>Bright bluish lilac, with yellow anthers.</td>
</tr>
<tr>
<td>Duchess of Edinburgh</td>
<td>Double, white, fragrant.</td>
</tr>
<tr>
<td>Duke of Edinburgh</td>
<td>Large, rich violet-purple.</td>
</tr>
<tr>
<td>Earl Beaconsfield</td>
<td>Rich purple.</td>
</tr>
<tr>
<td>Enchantress</td>
<td>Very double, white, outer sepals rosy.</td>
</tr>
<tr>
<td>Fair Rosamond</td>
<td>Rosy white, with red stripe.</td>
</tr>
<tr>
<td>Fairy Queen</td>
<td>Very large, flesh tint with pink stripe.</td>
</tr>
<tr>
<td>Gipsy Queen</td>
<td>Rich velvety purple.</td>
</tr>
<tr>
<td>Grand Duchess</td>
<td>Rose-tinted white.</td>
</tr>
<tr>
<td>Jackmanni</td>
<td>Deep violet-purple, flowers in masses.</td>
</tr>
<tr>
<td>Jackmanni alba</td>
<td>Paper white.</td>
</tr>
<tr>
<td>John G. Veitch</td>
<td>Double, large, lavender-blue.</td>
</tr>
<tr>
<td>Lady Bowill</td>
<td>Large, greyish blue.</td>
</tr>
<tr>
<td>Lady C. Nevill</td>
<td>Blush, with mauve stripe.</td>
</tr>
<tr>
<td>Lady Londenborough</td>
<td>Silvery grey, with paler stripe.</td>
</tr>
<tr>
<td>Louis van Houtte</td>
<td>Deep violet-purple, with darker veins.</td>
</tr>
<tr>
<td>Lucy Lemoine</td>
<td>Double white.</td>
</tr>
<tr>
<td>Madame Edouard Andre</td>
<td>Velvety bright crimson.</td>
</tr>
<tr>
<td>Madame van Houtte</td>
<td>White.</td>
</tr>
<tr>
<td>Miss Bateman</td>
<td>Sepals thick, white, chocolate anthers.</td>
</tr>
<tr>
<td>Mrs. James Bateman</td>
<td>Pale lavender, with darker veins.</td>
</tr>
<tr>
<td>Standishii</td>
<td>Bluish lavender.</td>
</tr>
<tr>
<td>Star of India</td>
<td>Reddish violet-purple, with red stripe.</td>
</tr>
<tr>
<td>Venus Victrix</td>
<td>Double, delicate lavender.</td>
</tr>
</tbody>
</table>

**Cultivation.**

The Clematis is most valuable in all gardens, large and small, for producing richness of bloom in beds or for rapidly covering walls, trellis-work, arbours, or old tree-stumps. Any soil will suit it, provided it be deep and well-drained; but a rich loam well-manured gives the best results, and in dry weather liquid manure should be given liberally. Care should be taken in cutting back during winter, for spring bloomers may in this way be deprived of their flowers. Those of the *Lanuginosa* type, and others that regularly die back, need only to have the dead wood cut away; other varieties should only be cut back where growth has been too great to be convenient, as the process retards the period of flowering. Propagation may be effected by cuttings, layering, grafting, or from seed. Cuttings are made from the young shoots, inserted in sandy soil and placed in gentle heat. Layering can be successfully practised out of doors at any time. The bark of the joint should be scraped slightly before being covered with soil, and should be kept watered. Before the new growth starts in the spring the layers, which should now be well-rooted, should be separated and planted where required. In grafting, which is done in early spring, a young shoot is inserted in the cleft root of some such species as *C. Flammula*, tied up with bast, potted in small pots, placed in a propagating frame and kept warm and moist. They soon unite, and are then gradually hardened off.
CLEMATIS—Garden varieties

(1) Aureliana    (2) Sophia, fl. pl.

$\frac{2}{3}$ Nat. size

PL. 1
MEADOW RUES

Natural Order Ranunculaceae. Genus Thalictrum

Thalictrum (the classical name), a genus of about fifty species, widely distributed in the temperate and colder regions of the Northern Hemisphere; three species being British. They are perennial herbs distinguished by their graceful much-divided (compound) leaves, with stipules, the absence of petals, and the great development of the stamens in proportion to the size of the four or five sepals. The carpels each contain a single ovule, and develop into a miniature nut, called an achene; a number of these gathered into a head constitute the fruit. The flower-cluster is a panicle or raceme. It is to the great number and large size of the stamens that the feathery appearance of the flower-cluster is due in certain species. As the pollen is shed it is borne by the wind to the stigmas of other flowers, and this method of fertilisation explains why the sepals are not showy, and why the flower produces no honey. The stigmas come to maturity before the anthers shed their pollen, so that self-fertilisation is not likely to occur.

History.

Thalictrums have been cultivated in gardens for nearly two centuries, T. cornuti being apparently the first foreign species to be introduced. T. aquilegfolium, the best known of the cultivated kinds, was introduced from the Continent in 1731. Owing to the smallness of the flowers, the species are esteemed chiefly on account of their light and elegant, much-divided foliage, in which respect some of them rival maidenhair ferns.

Species and Varieties. The most popular of the species in gardens to-day are T. aquilegfolium, T. alpinum, T. anemonoides, T. Delavayi, T. flavum, T. tuberosum, and T. minus.

Thalictrum alpinum (Alpine Meadow Rue) is a native, not more than a foot high, with unbranched wiry stem, and a few purplish flowers, at first drooping, erect later; July and August. Leaflets almost round, bluntly lobed. Often increases by means of runners. Wild in northern mountain bogs.

T. anemonoides (Anemone-like). Rue Anemone. A native of
North America (1768). It is but a few inches high, with whorled leaves and white flowers, produced in May. There is a variety with double flowers.

**T. aquilegifolium** (Columbine-leaved). Feather Columbine. Grows to a height of 3 or 4 feet with a slender stem, and glaucous wedge-shaped leaflets frequently tinged with purple. Flowers yellowish white, produced in masses; stamens purple; May to July. The following varieties are also in cultivation:—Var. *atropurpureum* has dark purple stems and stamens; var. *formosum*, also with dark purple stamens, but with dilated tips; var. *roseum*, with rosy-red sepals; var. *rubrum*, with red stamens.

**T. Delavayi** (Delavay’s). Introduced from China in 1890. It has slender stems, 3 or 4 feet high, blue-green, much-divided leaves, and loose panicles of pale purple flowers; midsummer. A very handsome plant for the herbaceous border or rock-garden.

**T. flavum** (yellow). Fen Rue. Our second British species has a creeping yellow rootstock, stout furrowed stem, 2 to 4 feet; small pale yellow sepals and bright yellow anthers; July and August. There are several natural varieties, but they are of interest only to botanists.

**T. glaucum** (glaucous). A native of South Europe (1798). A robust species, 4 or 5 feet high, with blue-green foliage, and yellow flowers in an erect dense panicle; June and July.

**T. minus** (lesser) is also a native, of similarly robust habit with *T. flavum* (1 to 4 feet), but with yellow-green sepals, and drooping flowers; July and August. There are several good garden varieties, such as var. *adiantifolium* with maidenhair-like leaves.

**T. tuberosum** (tuberous).Introduced from Spain 1713. Grows to a height of 9 feet, and has large panicles of creamy flowers.

**Culture and Propagation.** Any good soil will suit these plants. A border that is backed by a shrubbery or wall is a good place for them; the taller-growing, of course, being planted in the rear. The coarser sorts are useful for the wild garden. *T. flavum, T. minus,* and its varieties, succeed best in chalky or limestone soil. All the species are hardy perennials, and may be propagated by division of the rootstock in autumn or spring. They may also be raised from seed sown in pans in a frame in February, or in the open border in April or May. The seedlings should be transplanted as soon as they are large enough to be handled, or they may be thinned out if in the position they are intended to occupy permanently.

**Description of Plate 2.** The species figured is the so-called Feathery Columbine, *Thalictrum aquilegifolium*; and in Fig. 1 a single blossom is drawn larger than the natural size, in order to show the structure more clearly.
THALICTRUM AQUILEGIFOLIUM

Nat. size

PL. 2
ANEMONES

Natural Order Ranunculaceae. Genus Anemone

Anemone (Greek, anemos, the wind). Perennial herbs with leaves all radical, lobed or divided. Flowers mostly solitary, on scapes provided with an involucre of three-parted leaf-like bracts. Sepals, petal-like, coloured blue, purple, red, yellow, white (rarely yellow), varying from four to twenty. Petals absent, but the outer row of the numerous stamens are sometimes partially developed into petals. The fruit is a head of achenes, sometimes with bearded styles. There are about seventy species, distributed over the cold and temperate regions, chiefly of the N. Hemisphere.

History. Anemones have had their place in English gardens for three hundred years, for A. coronaria was introduced from the Levant in 1596. A. hortensis followed from South Europe in the ensuing year. For a considerable portion of this long period these species have enjoyed great popularity, but of late years the more recently introduced (1844) A. japonica has been in greater favour. Still, the old Poppy Anemones and Garden Anemones, as A. coronaria and A. hortensis are respectively called, have many admirers, and are likely always to keep a place in herbaceous gardens. Anemones contribute largely to the beauty of our gardens from early spring, when the Hepaticas are in bloom, to late in the autumn, when A. japonica and its varieties are at their best. Much has been done to improve and vary the most popular of the species, particularly by the French and Dutch gardeners, especially among the Hepaticas, the Japanese, the Poppy and the Star Anemones.

Principal Species. Anemone coronaria (garland). The Poppy Anemone. South Europe. Tuberous rooted, 18 inches high, with ternate leaves, the segments minutely divided. Flowers with great range of colour variation, from white through pink, rose, scarlet, purple to blue, as well as variegated colours. Sepals, six, oval, in contact. The exceedingly numerous florists' varieties are all beautiful. Flowers, March to May.

A. hortensis (garden). Star Anemone. South Europe. Similar to coronaria, but the leaves are tougher and the segments not so finely divided as in that species; the sepals are more spreading, and there is a distinct "eye" of a second colour in the centre of the flower. Certain well-defined forms, such as stellata and Pavonina, are regarded by some botanists as distinct species, by others as mere varieties. A well-known variety is fulgens, the Scarlet Anemone, with brilliant vermilion sepals, which are rendered all the more dazzling by contrast with the mass of
black stamens. All the forms of this species rank among the most beautiful of hardy spring flowers.

A. ALPINA (alpine). Europe. A handsome plant, 12 to 24 inches high; sepals varying white, cream, yellow, with backs pale or purple; May; suitable for rockery or border, requiring good, deep soil. Var. sulphurea, cup-shaped, yellow, 18 inches.

A. APENNINA (apennine). Europe. 6 inches; bright blue; March; requires light sandy loam sheltered by trees. Vars. alba, pure white; blanda, deep blue, early flowering, wants shelter. One of the best for the rockery or wild garden.

A. JAPONICA (Japan). 2 to 3 feet; rosy carmine with yellow anthers; autumnal. Vars. alba (Honorine Jobert), pure white; elegans (rosea), very large, pale rose, broad leaves; rubra, deep red.

A. MULTIPLA (many-slits). 6 to 12 inches; pale yellow, citron or red; June; border or rockery.

A. NARCISIFLORA (Narcissus-like). 1 foot; creamy, purplish at back, variable; May; rockery.

A. NEMOROSA (wood or grove). 6 to 8 inches; our native Wood Anemone, which does well in a shady border; white or purplish, roots creeping; March. Vars. flore pleno, double pure white; f. p. rosea, rose-coloured; Robinsoniana (carrula), bright azure.

A. PALMA (palmate). The Cyclamen Anemone. 9 inches; golden-yellow, narrow sepals; May; suitable for damp rockery, Var. alba, pure white, very early.

A. POLYANTHE (many-flowered). 12 to 18 inches; white; May.

A. RANUNCULOIDES (Ranunculus-like). 3 inches; golden-yellow, hairy at back; April.

A. SYLVESTRIS (wood). The Snowdrop Anemone. 12 to 18 inches; white satiny flowers, nodding on tall scapes above foliage; April; roots creeping. Damp, shady position in leaf mould.

There are two distinct sections of Anemones which gardeners have long treated as belonging to separate genera—the Pasque-flowers and the Hepaticas. They all really belong to the genus Anemone, but we have here kept them distinct.

A. PULSA (Pulsa). A British species, forming tufts 6 inches to 9 inches high, with finely-divided leaves and well furnished with elegant flowers, which appear in April. These are dull purple in colour, covered with silky hairs. There are several varieties:—dahurica, more erect than type, very dwarf; lilacina, dwarf with lilac flowers; rubra, dwarf with red flowers.

A. VERNALIS (spring). The Shaggy Pasque-flower. A European
POPPY ANEMONE
(ANEMONE CORONARIA)

Nat. size
PL. 3
ANEMONES

species. 6 inches; flowers white within, bluish purple without, thickly covered with downy hairs; April.

A. PRATENSIS (meadow). 6 to 12 inches; differs from A. Pulsatilla in its smaller, darker flowers and narrower sepals; May. There are several named varieties.

With few exceptions the Anemones are spring bloomers, but by a little method in planting the roots a succession of flowers may be kept up. A rich, well-drained, sandy loam suits most of them. A. coronaria and its varieties are rather gross-feeders, and for these the soil should be made very rich, but fresh manure should never be given to Anemones. In heavy soils they should not be planted deeply, the danger of damping off being then greater; for, although most of the species like a damp situation, excessive or stagnant wetness is the Anemone-grower's principal difficulty. Sometimes the flowers are spoiled by late frosts in April or May, but if these are feared, the beds must be protected at night, when the plants begin to show bloom. Some of the species, such as apennina, fulgens, and sylvestris, do best in the partial shade of trees, or in a shrubbery border.

A. japonica and its varieties are excellent plants for furnishing moist tree-shaded corners, and they grow equally well in full sunshine. In some gardens they form a feature when planted together with Kniphofias. They are also happy when planted on the margin of lakes or streams.

Most of the Anemones may be grown in pots, and so treated they may be used to make the greenhouse brilliant through the winter. For this purpose they should be potted in autumn in a compost of turfy-loam, sharp sand, and well-decomposed manure, and given the protection of a cold frame, where they will come on nicely for winter and spring flowering.

After flowering the foliage begins to turn yellow, and the material that has been accumulated by the vital activity of the leaf is gradually transferred to the roots. This process is not complete until the whole of the plant above ground has withered. Then the roots may be taken up and divided, care being taken to have an "eye" or incipient shoot on every portion that is separated, or growth will not take place. Some species do not succeed so well as others, if so divided. A. japonica cheerfully submits to the process, as do the various forms of A. nemorosa, but others like A. narcissiflora do not make headway under it. The best method for increasing stock is by raising new plants from seed, except in the case of A. fulgens, which is best propagated by division in July or August. Really double flowers
do not produce seeds, the essential organs having been converted into petals by the doubling process. The single and semi-double flowers are the seed-producers, and only the finest of these in form and colour should be allowed to mature their seed vessels. It should be remembered that it is from seed that variety is obtained. If you have a pet strain you wish to propagate you can be sure of doing so only by root-division. On the other hand, if you are ambitious to raise new varieties you must select plants of good habit, with well-formed and finely-coloured flowers, and by means of a camel-hair brush convey the freshly shed pollen from the anthers of one plant to the stigmas of another. The seed may be sown in a moist warm bed outside, prepared as if for onions, and the soil should be covered with slates or mats till the seeds germinate; or in seed-pans, filled with light sandy soil, and placed in a cold frame. When the leaves of the seedlings have withered at the end of their first season, sift fresh earth over the bed to the depth of a quarter-inch, and leave them. At the end of their second summer they will be large enough to take up and plant out where they are intended to flower in the following spring. Most of the seedlings will be ordinary varieties, but in all probability new forms will be found. These, of course, should be marked and placed apart at the resting-season.

Description of Plate 3, Anemone coronaria, showing variation in Plates 3 and 4, form and colour of the flowers. The flesh-tinted specimen has had the stamens developed into very slender petals. In the lower left-hand corner is a stamen removed and enlarged. Fig 1 is a vertical section through the flower after removal of the sepals. The carpels are crowded upon a hollow cone-like receptacle, and surrounded by a great number of stamens. Fig. 2 shows the carpels more clearly after removing both sepals and stamens. Fig. 3 is one carpel detached, showing the style with its stigmatic tip. It develops into a fruit called an achene, which is like a little nut, with a solitary seed within.

Plate 4, Anemone hortensis, showing a few of the variations in form and number of the floral leaves. It will be seen that the broadest of these is very narrow when compared with those of A. coronaria. Fig. 1 represents the tuberous rootstocks with their leaves; Fig 2 is a section through the receptacle corresponding with Fig 1 of Plate 3.

Anemone Hepatica and a few allies constitute a kind of sub-genus or section of Anemone so far as the cultivated species are concerned, but the groups are connected by species not in cultivation. Formerly they were regarded as a distinct genus (Hepatica), the characters relied upon for the separation being found in the carpels lacking the tails found in
FLAME ANEMONE

(ANEMONE HORTENSIS—var. futgens)

Nat. size
other Anemones, and the character of the involucre. In *Hepatica* this consists of three simple leaves near the flower, so that it resembles a calyx; but it is sufficiently remote from the flower to make it clear that the involucral leaves are not sepals. The sepals indeed are coloured and petal-like, as in those other species of Ranunculaceae we have already described. The rootstock is not so tuberous as are those of *A. coronaria* and *A. hortensis*, but more like that of *A. japonica* and our native *A. nemorosa*. The leaves are divided into lobes; they are glossy, dark-green above, reddish beneath, and persist for two seasons, so that the plant is always in leaf.

**Anemone Hepatica** (liver: supposed cure for liver-complaints) was introduced from Europe in 1573. It is from 4 to 6 inches high, with the leaves in three almost equal lobes, with clear cut margins free from indentations; the leaf stalks hairy. The flowers are solitary on the hairy scape, and consist of from six to nine sepals; the normal colour is blue or purple, paler beneath. There are numerous varieties, from white to flowered. They are all worth growing either in the rock-garden, or in the front of a sunny border. The flowers first appear in February, and a succession is maintained until April.

**A. angulosa** (angled). The Large Hepatica, from Eastern Europe. Whole plant as large again as *A. Hepatica*; 8 to 12 inches high, with leaves divided into five-toothed lobes. Flowers, 2 inches across, with black anthers and yellow carpels, appearing in February.

**Cultivation.**

The cultural directions for Anemones in general apply equally to this section, but a few lines may be devoted specially to them. Both *A. Hepatica* and *A. angulosa* may be propagated by root-division in autumn, but this method should be practised with caution, for the great thing to aim at with Hepaticas is to get large clumps bearing a great number of flowers. This can be achieved only by allowing the plants to remain undisturbed for several years, for their roots do not increase rapidly. In this case seed-sowing is the better method for increasing our stock; in truth, by allowing the clumps to remain undisturbed, we shall probably get abundance of seedlings round the old plants without any trouble. The appearance of these tiny plants will suggest to us that the seed should be sown as soon as ripe. We have our choice, however, of sowing at once in the border, or holding it over the winter, and sowing it in March in seed-pans. If the latter course be adopted the seedlings will be up in April or May. They must be kept free from weeds, and watered when necessary, till September, when they may be planted out in a sunny border, where they will flower
sparingly the following spring. After their second blooming they will have attained to a fair size, and may be shifted to their permanent quarters. Frequent shifting, even unaccompanied by root-division, prejudicially affects their freedom of flowering.

Description of Plate 5. The central group represents the type form of A. Hepatica. B is the double form of the var. rubra. Fig. 1 is a vertical section through the flower. At the left-hand side of A there is a flower from which the sepals and stamens have been shed, showing the maturing carpels.

**RANUNCULUS**

Natural Order Ranunculaceae. Genus Ranunculus

Ranunculus (Latin, rana, a frog, from certain species affecting swampy places). Acrid herbs, annual or perennial. Leaves entire, lobed, or compound; the root leaves often differing from the stem leaves. Flowers in terminal panicles or solitary from the axils; white, yellow, or red. Sepals, three to five, falling off early. Petals usually five, sometimes absent; with honey glands near base. Stamens numerous; carpels many, with short style, and one ovule. About one hundred and sixty species distributed throughout the temperate regions of the world.

History.

The present year is the tercentenary of the Anemone and the Ranunculus in English gardens; but the Ranunculus had been largely cultivated in the East during periods long anterior to the year 1596, when it was brought from Constantinople. Even at that early date two tolerably distinct races of Ranunculus asiaticus were known as Old Turkey and Persian. Horticulturists have produced from some of the species a considerable number of varieties, many of which are hybrids between the Persian and some other species.

Principal Species.

Ranunculus asiaticus, the Garden Ranunculus, varies from 8 to 12 inches in height. Its root is a bunch of little claw-like tubers, joined to the stem by their upper and thicker ends; these increase in number with the age of the plant. It lacks the easy grace of the Garden Anemone, but has a neater, more stately, and more brilliant appearance. In cultivation there is a tendency for some or all of the stamens to have the course of development diverted, and the opening bud reveals them not as stamens but as petals. The whole of the floral organs may be thus developed, with the result that the flower is as double as a rose. At first the green sepals spread widely, but afterwards turn down towards the stem, and fall off.
COMMON HEPATICA
(ANEMONE HEPATICA)

Nat. size
PL. 5
RANUNCULUS

RANUNCULUS ASIATICUS, var. sanguineus, is the Turkey or Peony Ranunculus, and has unbranched stems, leaves divided into threes, the segments toothed and blunt. The flowers range in colour through all shades of purple, orange, and yellow, self-coloured or variegated. As they are always double and consequently sterile, sub-varieties can only arise by perpetuating "sports"; they are therefore few in number. R. asiaticus, var. vulgaris, is the Persian Ranunculus, and its stem branches from the base. The three main divisions of the leaf are again divided into minor threes with acute tips. The flowers have a far greater range of colour than those of the last mentioned, all shades excepting blue being found in one or other of them. They are single, double or semi-double, and may be selfs, or streaked, striped, edged, or shaded with some other colour or tint. They thus present the most bewildering variety. It would be hard to say how many exist in the catalogues of the bulb-growers and florists, but so far back as 1778, Mawe, in his Universal Gardener and Botanist, declared that over a thousand varieties were named in florists' lists. Many of these must have been rediscovered and renamed since then, but by considering the many colours that vulgaris exhibits, and the possible changes that may be rung upon them, it will be seen that a very long list is the natural result of such ancient cultivation.

R. ACONITIFOLIUS (aconite-leaved). White Bachelor's Button. From Central Europe (1596). Plant from 6 to 24 inches, with branching stems and three- to five-lobed, toothed leaves. Flowers white, petals variable in form; May and June. The double varieties are known as Fair Maids of France.

R. CORTUSÆFOLIUS (cortusa-leaved). From Teneriffe (1826). 2 feet. Stem branched. Root-leaves, kidney-shaped, slightly lobed, with large rounded teeth (crenate); stem-leaves almost stalkless, five-parted. Flowers yellow; sepals spreading, petals lance-shaped; May.

R. LINGUA (tongue). Spearwort. A native plant growing in marshy ground; 2 to 3 feet; the stem hollow, lower portion rooting at the joints. Leaves lance-shaped, 6 to 10 inches long, stalkless, clasping stem. Flowers yellow, 2 inches across; July to September. Should be planted on the edge of water.

R. LYALLI (Lyall’s). New Zealand Water-lily. From New Zealand (1879). Stem branched, erect, 2 to 4 feet. Leaves round, concave, 1½ foot across, leathery; the leaf-stalk attached to centre of underside (peltate). Flowers white, 4 inches across. Requires the protection of a frame, except in the warmer parts of the country, where it thrives in a deep soil in a partially shaded position and flowers in summer.
Cultivation. All the forms of *R. asiaticus* (Persian, Turkish, etc.) like good rich loam, mixed with the well-rotted remains of a hot-bed, or equally well-rotted cow-dung, and some sharp sand. The beds should be in neither too sunny nor too shady a position. The soil should be dug out to a depth of eighteen or twenty inches, and care taken to secure good drainage, for though these plants love plenty of moisture, they cannot endure a water-logged soil. The prepared compost should now be laid in, and the claw-like roots planted, four or six inches apart. They should then be covered with fine soil. If planted in October or November, the roots should be three and a half inches beneath the surface of the finished bed, and protected from frost by a layer of leaf-mould, straw-litter, or fern, which should be removed when the severe weather is past, and before the tender shoots appear above ground. If the roots are held over till February, they should not be planted deeper than two inches. Water should be given if the soil gets dry, but if the foliage turns yellow before the flowers appear, you may conclude the drainage is deficient. Propagation of the double sorts must be effected by root-division, or separating the offshoots; these generally flower the first season after separation, and this plan leaves the parent root intact, which is desirable. The division should take place when the roots are lifted for drying after flowering. New varieties are raised from seed as in the case of Anemones. The seedlings flower in their second or third year. Sowing may take place in autumn, protecting the young plants under glass during the winter; or the seed may be sown in a cold frame in January.

The figures of *R. asiaticus* give a slight idea of the variation in form and colour of the flowers. Fig. 1 shows the carpels arranged on the conical receptacle, and surrounded by the numerous stamens.

**MARSH MARIGOLDS**

*Caltha* (Greek, *kalathos*, a basket or cup). Five or six species of marsh herbs, with stout creeping rootstocks, and heart-shaped, glossy leaves, chiefly from the root. Flowers few at ends of branches, white or yellow. Sepals, five or more, petal-like, not remaining long after the flowers open. Petals absent. Carpels many, developing into many-seeded follicles. Distribution, temperate and cold regions.
RANUNCULUS ASIATICUS

3/4 Nat. size

PL 6
The genus Caltha has no horticultural history in the sense that the preceding genera have, for it is no exotic. The Marsh Marigold of the gardener is merely a double-flowered variety of our native C. palustris, which has sacrificed its sexual organs to his demand for a brave show, and has converted them into a dense mass of petals.

**Principal Species.**

Caltha palustris (marsh) in the single state has five, six, or seven unequal, broad, golden sepals and yellow stamens. The leaves enlarge greatly after flowering, and their stalks lengthen. Sometimes the stem rises in a sub-erect manner to a height of 3 feet; at others it rambles along the ground. The flowers are 2 inches across; March to May. There are several natural varieties, of no horticultural interest, save that one, var. guerangerii, is thought to be the progenitor of the double-flowered form. It differs from the type in its more erect habit, the smaller and more numerous flowers, and the remoteness of the sepals form each other when expanded. Two varieties of C. palustris have been introduced from North America: var. biflora, shorter than the type, but with larger flowers in pairs; var. parnassifolia, with longer, more oval leaves, and several flowers on each stalk, 3 or 4 inches high. Then there is a var. purpurascens from South Europe, of more erect and branching habit, with purplish flower-stalks.

C. leptosepala (slender-sepaled), 1 foot, is an introduction from North-West America, with slender white sepals and heart-shaped leaves, whose margins are almost free from anything in the nature of teeth. Flowering in May and June.

Under cultivation C. palustris has branched off into two distinct double varieties: the dwarf nana plena, and the larger monstrosa plena.

No special instructions are needed for the successful cultivation of Caltha in any of its forms, for it is perfectly hardy and will do well anywhere, if liberally watered. In its wild state it is found in marshes, bogs, and by the sides of rivers and streams, and this fact suggests that it will succeed best where similar conditions prevail. It should at least have the dampest spot in the garden, and should the soil be naturally light and dry, we would advise the sinking of a tub, filled with soil, in the border, into which Caltha may be planted. By this plan, sufficient moisture may be assured to it. Propagation of the double varieties must be effected by dividing the roots early in the year, before the buds have appeared, or in summer, after the flowering is past. The single forms may be treated in this way also, but these may be raised from seed in addition. This should be sown in soil kept damp by
an admixture of cocoa-nut fibre refuse, say one part of fibre to two parts of the garden soil, to which has also been added a little sand.

Description of Plate 7. *C. palustris flore pleno*; and of the subordinate figures—1 is a section through the flower showing the arrangement of stamens and carpels; 2 shows the carpels alone. In Fig. 3 these carpels have developed into ripe seed vessels—open follicles containing two rows of seeds.

**GLOBE FLOWERS**

Natural Order **Ranunculaceae.** Genus *Trollius*

*Trollius* (Old German, *trol*, a globe). A small genus consisting of nine species distributed over the north temperate and Arctic regions. They are erect perennials with palmately lobed leaves, and large terminal globular flowers, yellow or lilac. Sepals, petal-like, five to fifteen; petals small, narrow, five to fifteen. Stamens numerous. Carpels, five or more, ultimately becoming follicles.

Principal Species.

*Trollius europaeus* (Europe), the Globe-flower, is a native of Britain; $\frac{1}{2}$ to 2 feet high, with leafy stems and pale yellow globose flowers; June to August.

*T. asiaticus* (Asia), a Siberian species, 1 to 1½ foot, is similar to *europaeus*, but the larger, dark orange flowers are solitary; May and June. Petals longer than stamens.

*T. caucasicus* (Caucasus). Yellow flowers; stamens longer than petals, otherwise similar to *asiaticus*.

Cultivation.

In a natural state *Trollius* likes a rather heavy moist soil, but under cultivation it will thrive in any fairly good garden soil. It is a suitable subject for the mixed border. Propagation is effected by root-division in autumn; and by seed, which takes a year to germinate.

**FENNEL FLOWERS**

Natural Order **Ranunculaceae.** Genus *Nigella*

*Nigella* (from Latin, *niger*, black: the colour of seeds). Fennel-flowers. A small genus of erect annuals with alternate compound leaves, the divisions cut into thread-like segments, perhaps suggesting the popular name. The flowers are white, yellow, blue, or purple, terminal
on the branches, consisting of five regular and petal-like sepals, five to ten petals, small and inconspicuous, beneath the numerous long stamens; carpels, five to ten, more or less united from the base, and surmounted by long simple styles. Natives of the Mediterranean region and West Africa.

History.  

*Nigella sativa* was introduced from Egypt to English herb-gardens as far back as 1548; its seeds being in request as a spice or seasoning. In the East this species appears to have been cultivated for ages before its introduction to Britain; the spicy seeds being used to sprinkle over the tops of cakes, as we do comfits. Canon Tristram is of opinion this is the “fitches” (*Ketzach*), whose seeds are “beaten out with a staff,” as stated in Isaiah xxviii. 25, 27. But the species chiefly grown in the flower-garden are *N. damascena* and *N. hispanica*, introduced in 1570 and 1629 respectively, and both popularly known by the somewhat incongruous titles of “Love-in-a-mist” and the “Devil-in-a-bush.”

Principal Species.  

*Nigella hispanica* (Spanish). 1 to 2 feet; flowers large, blue, white, lilac, or purple, with dark red stamens; no involucre. The large size and profusion of the blossoms contrast well with the fineness of the foliage, and make the plant a highly ornamental one; it is therefore surprising that it is not more generally grown. It flowers from June to August. Plate 8.

*N. damascena* (Damascus). 1 to 2 feet; flowers pale blue, smaller than hispanica. Involucre finely divided and moss-like. Seed vessel bladder-like, and seeds wrinkled. There is a var. *alba* (white), and another with double flowers (*flore pleno*). Flowers June to August.

*N. sativa* (cultivated) is the *Nigella* of commerce. Height, 18 inches; bluish flowers; no involucre; July. Seed-vessels connected almost throughout their length, and covered with hard raised points. Leaf divisions shorter and broader than in the foregoing kinds.

The seeds are much esteemed by French cooks as a flavouring and condiment. They are hot and pungent to the taste, and are said to form a considerable portion of the powder sold as pepper; but this practice may be obsolete in these days of just dealings and adulteration penalties. The Egyptian fellahin cultivate the plant for the sake of these seeds, which they scatter over their bread before baking it, as caraway and poppy seeds are used in Europe.

*N. nigellastrum* (Star-nigella). Height, 1 foot; flowers brown and green; carpels, two or three only, with short styles. Leaves very slender. Flowers solitary; July.

*N. orientalis* (Eastern). Height, 1½ foot; small yellow flowers spotted with red; July. Leaves divided into long narrow segments.

Cultivation.  

Of the foregoing species, the first two are the most suitable for cultivation in the flower-garden, as they require
no greater care than is involved in the culture of hardy annuals generally. Ordinary garden soil that is neither too poor nor too heavy will suit them. The seeds should be sown thinly in the open border, any time from March to May; the seedlings being thinned out until only the best plants are left at intervals of seven or eight inches. They do not succeed so well if transplanted.

Description of Plate 8.

The species represented is *N. hispanica*. Fig. 1 is a vertical section through the flower, showing the interior of the carpels with their double rows of ovules and the singular petals below the stamens. One of these petals greatly enlarged is shown in Fig. 2: there are two lips and a hollow spur within which honey is secreted. Fig. 3 depicts the smooth black seeds, which are acrid and aromatic; they are shown of the natural size and much enlarged. Fig. 4 represents a seedling.

**WINTER ACONITES**

Natural Order Ranunculaceae. Genus Eranthis

ERANTHIS (Greek, *ear*, the spring, and *anthos*, flower). A genus containing two species of tuberous-rooted perennials, with radical palmate leaves; and flower scapes bearing a solitary flower, surrounded by an involucre cut into many narrow segments. The flowers appear before the leaves, and consist of from five to eight coloured sepals, and a similar number of short, tubular, inconspicuous petals. Natives of Europe and N. Asia.

**E. hyemalis** (winter). Well known in gardens as the Winter Aconite, because of the resemblance between its foliage and that of *Aconitum*. The cup-shaped golden yellow blossoms appear in January or February with those of the Snowdrop. It has from six to eight sepals, and as many petals. It seldom exceeds 5 or 6 inches, so that it is very suitable for a front position in the border.

**E. sibiricus** (Siberian) is much smaller (3 inches), and blooms a little later. It has only five sepals.

Aconites succeed in any soil, and if left undisturbed soon become naturalised. They are increased by root-division, and are suitable for the rockery, wild garden, or a slope partially shaded by trees. They are very effective when planted thickly in shrub-beds on lawns, etc. A pretty spring effect is produced by planting Eranthis under the Siberian Dogwood (*Cornus sibirica*).
SPANISH FENNEL FLOWER

(NIGELLA HISPANICA)

3/4 Nat. size

PL. 8
COLUMBINES

Natural Order Ranunculaceae. Genus Aquilegia

Aquilegia (Latin, aquila, an eagle). Erect perennial herbs distributed over the north temperate zone; species generally considered numerous, but reduced by Sir Joseph Hooker to five or six. Leaves alternate, twice or thrice divided. Stems leafy, branched, 1 to 4 feet. Flowers solitary or panicled; stamens maturing before pistils. Sepals, five, coloured, petal-like. Petals, five, curved in front and extended backward as hollow spurs in which honey is secreted. Stamens numerous; carpels, five, with many ovules. In cultivation the flowers occur double, and in some of these the spurs are suppressed, when the flower has a flat, starry appearance.

History.

The genus furnishes a large number of the most graceful and showy plants for the hardy garden, and yet they may be said to be quite modern as garden flowers. Some of them, it is true, are merely cultivated forms of our native Columbine (A. vulgaris), and this and A. canadensis were practically the only two known to gardeners a hundred years ago, although two others had lately been introduced to England. A. canadensis came from North America as far back as the year 1640, A. alpina from Switzerland in 1731, and A. viridiflora from Siberia in 1780. The others came during the present century, the popular A. chrysantha so recently as twenty-three years ago. A large number of the garden Aquilegias are hybrids between some of these species. There is probably no group of plants that are so difficult to keep distinct in a garden; they hybridise so freely without the gardener's aid. It is almost impossible to get seedlings true unless the parent plant has been kept in a kind of quarantine by covering it with muslin during the flowering period. For our present purpose we shall ignore Hooker's reduction of the genus, and speak of the sorts by the names they commonly pass under.

Principal Species.

Aquilegia vulgaris (common). The Common Columbine. 2 to 3 feet. This is the species most frequent in gardens. Its flowers are normally purplish blue, but they vary from dark blue to dull red, and to white. The spurs are curved inwardly, hooked and knobbled at the extremity. It flowers from April to October, though the principal display is over by July. The principal varieties of vulgaris are the following:

<table>
<thead>
<tr>
<th>Variety</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alba</td>
<td>flowers pure white, single and double forms.</td>
</tr>
<tr>
<td>Carulea nana</td>
<td>deep blue, double, of dwarf habit.</td>
</tr>
<tr>
<td>Hybrida</td>
<td>sepals lilac-purple, short, broad</td>
</tr>
<tr>
<td></td>
<td>portion of petals white, spur almost straight.</td>
</tr>
<tr>
<td></td>
<td>Vervaineana, leaves mottled with yellow.</td>
</tr>
<tr>
<td></td>
<td>Wittmanniana, like hybrida, but finer flowers, very large, spur curved.</td>
</tr>
</tbody>
</table>

1.—6
From other well-known species grown in gardens we select the following:

A. CÆRULEA (sky-blue). 2 to 3 feet; large flowered, sepals long, dark blue; petals pale blue, almost white; spur long, slender; April to July. From Rocky Mountains (1864).

A. CANADENSIS (Canadian). 1 to 2 feet; small, narrow flowered, brick-red, spur straight, short; April to June.

A. CHRYSANTHA (Golden-Flower). 3 to 4 feet; sepals pale yellow, spreading; petals richer yellow, with very long diverging spurs; May to August.

A. FORMOSA (handsome). 2 to 4 feet; very showy; sepals vermilion with greenish tip; petals red with mouth of tube yellow; spurs rather short, straight; May to September. The var. californica hybrida originating from formosa has the flower orange-yellow with long orange-red spurs. Native of West North America.

All the foregoing do well in the border; the following are well suited for the rock-garden, being more alpine, and dwarfish in habit:

A. ALPINA (alpine). 8 to 12 inches; flowers large, deep blue or blue and white; spurs short, slightly incurved; May. Swiss Alps (1831).

A. GLANDULOSA (glandular). 8 to 12 inches; showy spring bloomer; sepals lilac-blue, petals white, spur very short, incurved. The var. jucunda is smaller, and shortlived. Siberia (1822).

A. PYRENAICA (Pyrenean). 9 to 12 inches; bright lilac-blue; spur long, slender, slightly incurved; leaves small; June to August. Pyrenees (1818).

A. SIBIRICA (Siberian). 12 inches; lilac; petals sometimes white near edges; spur stout, strongly incurved; June to August. Siberia (1806).

The dwarf form of A. vulgaris, already mentioned, also makes a good plant for the rockery.

Cultivation.

All these species, their varieties, and the endless and nameless hybrids that arise in every garden where several species are grown openly, are plants suited for ornamental gardening. The free and elegant manner in which the flowering stems rise above the light leafy base renders them graceful objects wherever placed. They thrive in any fairly good soil, though the delicate kinds require for successful treatment sandy loam, manure or leaf-mould. They like a sunny position, and a fair amount of moisture, but the drainage must be good. Special sorts should be propagated by root-divisions in February. Seed should be sown, as soon as it is ripe, thinly in pans. The seedlings may be planted out where they are to flower as soon
LARKSPURS

as they have four leaves. They should be placed nine or ten inches apart.

The three purplish flowers (A) are those of *A. vulgaris.* Two examples of the long-spurred *A. chrysanthum* are given at BB, whilst C depicts *A. formosa.* The open follicles with their ripe seeds are sown to the right of C, and the seeds, natural size and enlarged, are depicted at the foot of the Plate (1).

LARKSPURS

Natural Order Ranunculaceae. Genus Delphinium

Delphinium (Greek, delphin, a dolphin). A genus of about forty species of erect annual or perennial herbs, natives of the north temperate zone. The leaves are alternate, lobed or cut into fine divisions. The flowers are borne in racemes, or panicles, each flower starting from the axil of a slender bract. The five coloured sepals cohere below, the upper one produced as a long spur behind. The petals two or four, the two upper with spurs which lie within the spur of the sepal; the lateral ones, when present, small and spurless. Stamens numerous; follicles, one to five.

History. Delphinium Ajacis, the common garden Larkspur, appears to have been introduced from the Continent in 1573, and in several places garden escapes have become naturalised; especially is this so in the cornfields of Cambridgeshire. At the end of the sixteenth century two other species were introduced, *D. elatum* (now recognised as a synonym for *D. exaltatum*) from Siberia, and *D. staphisagria* (Stavesacre) from South Europe. During the last and present centuries a number of beautiful species have come from Siberia, America, and our Indian Empire, and many fine hybrids and seedlings have been produced from them. Messrs. Kelway & Sons of Langport are the principal breeders and growers of the best of garden Delphiniums.

Principal Species. Delphinium Ajacis (Ajax's) is an erect, hairy plant, about 18 inches high, with finely-divided leaves, and long racemes of white, pink, or blue flowers, which appear in June and July. Follicles hairy. Most of the Rocket Larkspurs are descended from this species.

D. Consolida (joined in one). 12 to 18 inches; more branched, racemes shorter, petals joined, follicles smooth; June.
D.cardinale (cardinal-red). 3 or 4 feet; erect spikes, bright scarlet sepals, yellow petals; August. A native of California.

The foregoing species are annuals; the following are perennials:

D. azureum (sky-blue). 3 feet; large sky-blue flowers in erect racemes; petals with bearded tips; July. North-West America (1805).

D. cashmirianum. 3 feet; abundance of large violet-blue flowers, an inch or two across; broad sepals joined at apex to form hood; July. Cashmir (1875).

D. dasycarpum (hairy follicles). 4 to 6 feet; large blue flowers, dark brown petals; June.

D. exaltatum (exalted). 3 to 5 feet; medium flowers in upright racemes, blue or white; June to September. Caucasus (1819).

D. formosum (beautiful). 1½ to 3 feet; long spikes of sky-blue flowers shaded with indigo; spur long, violet, two-cleft; June to September. Armenia.

D. grandiflorum (large flowered). 1 to 2 feet; flowers few, large, varying blue to white, with intermediate shades; June. Siberia (1816).

D. nudicaule (naked stem). 1 to 1½ foot; stems almost leafless, flowers few, sepals scarlet, petals yellow, spur very long; June to September. California (1869).

Cultivation. Delphiniums are among the most valuable of hardy garden plants, owing to the brilliant appearance of their stately flowers. They are by no means fastidious as to soil or situation, provided it be not too damp; yet few plants so well repay a little care and attention in preparing good accommodation for them, and in watering them in dry weather. They thrive best in a deep soil, into which a liberal supply of thoroughly well-rotted manure has been dug. Those sorts that are of medium height make fine displays when beds are filled entirely with them, and for this purpose the plants should be put in at distances of three feet all round. The taller kinds, like exaltatum and dasycarpum, should be planted at the back of borders, or in front of shrubberies, singly, and at intervals of eight or ten feet.

The annual kinds must be grown from seed, which should be sown thinly, where the plants are to flower, in March or April, and thinned out, as they do not succeed so well with transplantation. The perennials may be increased by seed, by dividing the roots, by offsets, or by cuttings. The seeds of these should be sown as soon as ripe, or in February, for they do not germinate rapidly. They should be sown in beds, the seedlings thinned out, and in the autumn the plants all lifted with a fork, and planted in the borders, or flower-beds. In those cases where seed is not desired, the capsules should not be allowed to develop, and the plant
LARKSPURS

(A) Delphinium ajacis   (B) Delphinium orientale

\(\frac{2}{3}\) Nat. size

PL. 10
in consequence will have more vigour to put into offshoots from the base. As soon as the stems have died off in autumn the plants may be taken up, the offshoots picked off, and the root divided. The offshoots, if rooted, may be planted out permanently at once, or they may be put into pots until they are well furnished with roots. In autumn or spring cuttings may be taken from the new growths and struck singly in pots without any difficulty. They should be placed in a cold frame, and planted out when they show signs of being well established; they will flower in the following summer.

Hybridisation.

The plants that figure in florists’ catalogues as named Delphiniums are mostly hybrids obtained by crossing the finest of the perennial species. Like Aquilegias, the Larkspurs take very kindly to this treatment, and the amateur gardener may be confidently invited to try his skill in this direction. There are, of course, certain rules to be observed, which we shall endeavour briefly to indicate. Already it has been made plain to the reader that the stamens and the pistil (including ovary and stigma) are the all-important organs of the flower; the stamens producing the fertilising pollen (male element) in their anthers, which is to be absorbed by the stigma and conducted to the seed-eggs (ovules) in the ovary or carpel. Now, for success in hybridising, one must be acquainted with the natural history of the species to be operated upon, for in some the pollen is shed before the stigma is ripe and receptive, in others these conditions are reversed. In Delphinium the anthers ripen successively and shed their pollen before the female organs are mature, so that the fertilisation of the ovules by pollen from the same flower is all but impossible. In this case, having selected a suitable plant for our purpose to act as seed-bearer, we must carefully cut out the anthers and wait until the stigmas erect themselves vertically. They are now ripe, and we must at once select the plant suitable for crossing, and from a newly-opened flower delicately pick up some pollen by means of a camel-hair pencil, and as carefully and lightly deposit it upon the stigmas of the seed-bearer. The flower so operated upon should be at once covered with a bag of fine muslin to prevent the access of insects, who may carry pollen that would vitiate our experiment.

Selection.

In hybridising, some point should be kept in view other than the mere prospect of getting a strain different from those already existing. We should seek to improve the form we have selected as seed-bearer by crossing it with pollen from a plant with desirable qualities such as the seed-bearer does not possess, but which, to our fancy, would considerably improve it. If we aim at securing a
double form, the seed-bearer should be the most perfectly formed single flower we can find, and the pollen should be provided by a semi-double possessing the desired points. By this method we are likely to secure seedlings with double flowers. In raising plants from hybrid seed, it should be remembered that for the after propagation of any specially good sort so obtained, root-division and cuttings must be relied upon. Seed from such plants must not be expected to produce a similar progeny, whilst, of course, if the hybrid is a double it will most probably produce no seed at all.

**Hybrid Varieties.**

Most of the Named Delphiniums are the result of crossing *D. exaltatum, D. formosum, and D. grandiflorum.*

It would be foreign to the purpose of this work to attempt to give anything like a complete list of these, but the following selection is calculated to fully meet the requirements of our readers:

- *Alopecuroidea,* dark blue.
- *Amphitrite,* bright blue with lilac-mauve centre.
- *Andrew Grey,* semi-double blue.
- *Ben Davies,* dark purple and violet.
- *Cantab,* pale blue, very fine.
- *Céto,* sky-blue, double.
- *Comet,* sky-blue and purple.
- *Diomedes,* violet, semi-double.
- *Dr. Morgan,* purple with white centre, very large.
- *Finale,* violet with white eye.
- *Hermann Stenger,* violet-blue with rosy centre, double.
- *Horus,* cobalt-blue with white centre, semi-double.
- *Ivanhoe,* light blue, white centre, semi-double.
- *Ketelcorri,* lavender-blue, tinged reddish, double.
- *Leon Dubois,* rosy violet and blue, double.
- *Life Guardsman,* bluish purple.
- *Lord Mayor,* blue.
- *Madame Henri Jacotot,* bright sky-blue, rosy-tinted, double.
- *Madame Richelieu,* cobalt-blue tipped with rosy violet, white centre.

**Mento,** violet, petals plum-coloured with white centre.

**Midas,** bright blue, rosy veined.

**Miss Macintyre,** heliotrope, edged with blue, very large.

**Mons. Barral,** bright blue tipped and tinged with crimson, brown centre.

**Nahamot,** dark blue.

**Nuphar,** deep blue, petals plum-colour, white centre.

**Prince of Naples,** dark blue, petals plum-colour, white centre, semi-double.

**Prince of Wales,** azure blue, white centre, double.

**Puck,** bronzy purple.

**Rêve d’Or,** light blue, petals light pink.

**Robin Adair,** dark blue, tinted purple, dark centre.

**Royalty,** rich dark blue.

**Salamander,** light blue and rose, white centre.

**Seaman,** sky-blue, petals mauve pink.

**Sea Spray,** sky-blue, petals lavender, white centre.

**Susan,** deep blue and plum-colour, white centre.

**Ustava,** light blue, petals rosy mauve, dark centre.

**Description of Plates 10 and 11.**

Plate 10 illustrates the annual division of the genus. Both *D. Ajacis* (A) and *D. orientale* (B) are tall-growing kinds, and each has single and double flowers. The double form of *Ajacis* is shown in three colours as well as the single rose. The carpels do not greatly differ from those of *Aquilegia,* but, as will be noted on the fruiting stalk in the background, they do not all mature, so that the
HYBRID LARKSPUR
(DELPHINIUM)

3/4 Nat. size
PL. 11
Follicles are frequently solitary. Fig. 1 is a section through flower; Fig. 2 shows the curiously ribbed seed, natural size and enlarged; and Fig. 3 is the seedling.

Plate 11 is an example of the garden hybrid forms.

MONKSHOODS

Natural Order Ranunculaceae. Genus Aconitum

Aconitum (the classical name). A genus of about twenty species of erect, perennial, poisonous herbs, natives of the mountains of the north temperate zone. Leaves palmately lobed and divided, alternate. Flowers white, yellow, purple, blue, in racemes or panicles, the anthers maturing before the stigmas. Sepals, five, large, coloured; the upper one developed into a great vaulted hood. There are nominally five small petals, of which the two upper ones are hammer-shaped; these are hidden within the hood, but the three lower and smaller ones are entirely wanting in some species. The follicles vary from three to five.

History. Whether Aconitum napellus, the common Monkshood, be really a native of Britain or not, it appears certain that the large clumps sometimes met in woods and plantations are descendants of garden escapes. From the end of the sixteenth century several species and varieties have been introduced from abroad, and during the present century many more. Of the sixteenth century importations, which were brought from the mountainous districts of Europe, several have continued to hold a place as favourite border plants, such as A. Anthora, A. lycoctonum, A. napellus, and A. variegatum. It must be admitted that their presence in English gardens has not been an unalloyed pleasure, for they are among the most virulently poisonous of plants, and many deaths have occurred through eating the rootstock in mistake for horse-radish. It is not easy to understand how any person could make such a mistake, but the evidence that it has been done is conclusive. It should, therefore, only be planted where there can be no possibility of such an error being repeated; it should never find a place in those gardens where culinary vegetables hob-nob with ornamental flowering plants.

Principal Species. In the general appearance of the Aconitums there is much to remind one of the Delphiniums: the stately habit, the divided leaves, the distinct form of the flowers, and the erect racemes. Like those, the Aconitums make fine imposing masses for beds or shrubbery borders, and they continue in blossom for six or eight weeks.
Aconitum napellus (little turnip), 3 to 4 feet, is the best-known species, and its flowers are both large and numerous, of a very deep blue. The hood at first covers the other sepals. May to July. There are many varieties and hybrids of this species; two may be mentioned: *album*, white; and *pyramidalis*, with pyramidal racemes.

A. Anthora (flowery). 1 to 2 feet; flowers pale yellow; leaves cut into very narrow segments; July. There are several varieties: *decan-dolii*, leaves with large lobes; *grandiflorum*, large flowers; *nemorosum*, leaves with broad lobes. Pyrenees (1596).

A. Autumnale (autumn). 3 to 4 feet; bluish purple, hood closed; July to September.

A. Barbatum (bearded). 3 to 6 feet; cream colour, middle sepals bearded; leaves divided into narrow segments; flowers July. Siberia (1807).

A. Chinense (Chinese). 4 to 6 feet; very bright blue; June to August. China (1833).

A. Gmelini (Gmelin’s). 2 feet; cream colour; July. Siberia (1817).

A. Heterophyllum (vari-leaved). 2 feet; large, pale yellow at back, deep blue in front; leaves broadly heart-shaped, with toothed edges. Alone in the genus this is said not to be poisonous. August. Himalaya (1874).

A. Japonicum (Japanese). 6 feet; flesh colour, conical hood; July to September. Considered one of the best. There is a var. *caeruleum* with blue flowers. Japan (1790).

A. Lycoctonum (Wolf’s-bane). 4 to 6 feet; large, purplish yellow; leaves seven-lobed; flowers July. Europe (1596).

A. Paniculatum (panicled). 2 to 3 feet; large, violet, conical hood; June to September. Europe (1815).

A. Variegatum (variegated). 2 to 6 feet; large, blue; hood bent forward; July. Europe (1897). There are several varieties: *albiflorum*, small white flowers; *bicolor*, white tinged with blue, blue margins.

Cultivation.

There is little difficulty in growing Aconitums, as any ordinary garden soil suits them, but they should be planted in quantity where they can remain undisturbed for years, as they look best in large clumps. *A. Paniculatum* should have leaf-mould. If there is a choice of soil for the other species, they will be found to do best in one that is rather heavy. Aspect, again, is of secondary importance to them, as they do perfectly well in the shadow of trees—even in plantations; therefore (except in the case of *A. Chinense*, which needs warmth and protection) it is unnecessary to give them the sunny position that is
MONKSHOOD
(ACONITUM VARIEGATUM)

Nat. size
PL. 12
more required by some other plants. At the same time it should be stated that the Aconitums will do well in a hot, sunny border, for their thick fleshy rootstocks hold a good store of moisture. If an increase of flowering stock is desired the roots should be divided before the crowns have begun to shoot in early spring.

They produce an abundance of seed, and this should be sown as soon as it is ripe, in beds, or in pans placed in a cold frame. The seedlings, when large enough to handle, should be pricked out into boxes, to remain until the following spring, when they may be planted out in their permanent positions, nine or ten inches apart.

Description of Plate 12. Fig. 1 is a section through the flower, showing the hammer-shaped petal within the hood.

PEONIES

Natural Order Ranunculaceae. Genus Paeonia

Paeonia (the classical name used by the Greeks, who are said to have named the plant in honour of Paon, a physician who used it medicinally), a genus of herbaceous and shrubby perennials, including about two dozen species distributed over Central Europe, temperate Asia, and North-West America. They are distinguished by the large, alternate, lobed or finely-divided leaves, and the very large and showy regular flowers. There are five green sepals, persistent; petals, five to ten in the single flowers, white, pink, crimson, or purple. Carpels, two to five.

History. The Peony, as a cultivated plant in this country, dates from the year 1548, when Paeonia officinalis was introduced from Southern Europe, probably more for medical use than for the beauty of its flowers. It spread widely, and may now be found in most cottage gardens, whilst its modified varieties have their place in all sorts of gardens. P. peregrina, which is also commonly cultivated, appears to have been the next introduction (1629), also from Europe; and a few years later (1633) the dwarf P. humilis came from the South of France. It was not until a hundred and thirty-two years after that P. tenuifolia was brought from Siberia, followed at a distance of nineteen years by P. albiflora from the same regions, the parent of an enormous number of fragrant varieties and hybrids. P. Moutan, the only species with shrubby habit, was introduced from China in 1789, and of this also our gardens have produced many beautiful varieties.
Most of the species are very suitable for cultivation and large as the number of garden varieties is, there is little room to doubt that many more will be produced. The great number of stamens, and the fine colours of the petals, render the manufacture of good doubles a comparatively easy matter, and the greater the number of original species that are brought into general cultivation, the larger will be the list of varieties produced by cross fertilisation.

**Paeonia albiflora** (white-flowered). 2 to 5 feet; the long smooth stalks are often branched towards the summit, and bear from two to five flowers. The leaves are of a brighter hue than usual in the genus, and sometimes the veins and the edges of the leaflets are tinged with red. The leaflets are 3 or 4 inches long, often running together at the base. There is usually a simple leaf a little below the flower, and immediately beneath the calyx a couple of leafy bracts. The flowers are from 4 to 6 inches across, fragrant, normally white, but under cultivation they exhibit various degrees of coloration in yellow, rose, crimson, and purple; some self-coloured, others streaked or striped. Flowers May and June. The follicles in this species are not more than an inch long, smooth and recurved. The natives of Mongolia use its tubers and seeds as food, hence one of its synonyms is *P. edulis*. Plate 13.

**P. Corallina** (coral-red). 2 to 3 feet; stem unbranched, bearing one flower; leaves smooth; flowers 3½ to 4 inches across, crimson-rose; May. Tubers spindle-shaped. Long known to grow on Steep Holmes Island in the Severn, but introduced, not native. Known in gardens as the Male Peony. Europe.

**P. Decora** (comely). 2 to 3 feet; stem smooth; leaves hairy beneath; flowers solitary, purple; May; follicles, woolly, two or three, spreading. Thrace.

**P. Humilis** (lowly). 1½ to 2 feet; stem hairy near top; leaves dark green and smooth above, downy beneath; flowers solitary, bright red; May. Europe.

**P. Moutan** (Chinese Meu-tang—King of Flowers). 3 to 5 feet; stems much branched, woody, forming a shrubby bush, with flowers much larger than those of any other Peony, pure white, pink, rose, crimson, purple, single, double or semi-double. The parent of all the garden Tree Peonies. Flowers May. See Frontispiece to present volume of this work.

**P. Officinalis** (of the shops). 2 to 3 feet; stems stout, smooth; leaves smooth, dark, paler beneath, lobes unequal; flower solitary, with unequal sepals, petals deep crimson; carpels, two or three, densely woolly; flowers May. Much cultivated in gardens (especially the double form) under the name of Female Peony. Europe. Plate 14.
WHITE PEONY
(PÆONIA ALBIFLORA)

2/3 Nat. size
PL. 13
PEONIES

P. PARADOXA (paradoxical). 12 to 18 inches; leaves glaucous above, hairy beneath, divided into thirty or forty small and narrow segments; flowers solitary, 4 inches, crimson or purple, single or double; May. Mr. Baker considers this a natural variety of the next species. Native of the Levant.

P. PEREGRINA (stranger). 1½ to 2 feet; stem downy towards top; leaves smooth, dull green above, paler and velvety beneath; flowers solitary, bright crimson; May; follicles, two or three, erect. Much cultivated. Levant (1629.)

P. TENUIFOLIA (narrow-leaved). 1 to 1½ foot; stems smooth, densely leafy from base to summit; leaves excessively dissected into many alternated segments; flowers solitary, 2½ to 3 inches across, crimson, or purple-red; June; follicles small. The Adonis Peony of gardens. Tubers in bunches, with runners. South Europe (1765). Plate 15.

P. WITTMANNIANA (Wittmann’s). 2 feet; a species rarely cultivated, but distinct from all others by reason of its solitary, bright yellow flowers, which appear in April. Caucasus (1842).

Garden Varieties. These, as we have already indicated, run into many hundreds, and from them we can do no more than select a few names; but it must not be supposed that these have very special claims to be considered before the others. They are all good, and whether the amateur selects from subjoined list or another, he is almost certain to be satisfied with his choice. These garden varieties and hybrids may be divided into three sections—Chinese, European, and Tree Peonies.

CHINESE; scented, flowering in June and July—

I. WHITE.
Alba plenissima.
Blanc.
Candidissima, with primrose inner petals.
Duke of Wellington.
Duchesse de Nemours.
Duchesse de Theba, inner petals edged with crimson.
Edulis.
Festiva maxima.
Lady Godiva, flesh centre.
Madam Collot.
Madame Serret.
Papaverasflora, centre primrose.
Snowball.
Sulphurea, tinged yellow.
Viscountess Folkestone.
Whiteo, tinged rose.

II. BLUSH.
Agnes Barr.
Carnea elegans.
Caroline Allain, centre sulphur.
Charlemagne, laced rose.
Formosa, primrose centre.
Lady Ardilaun.
Lord Fauntleroy, white centre.
Madame Vilmorin.
Madonna.
Marie.
Marie Lemoine.
Noemi.
Reevesii.
Virginie.

III. ROSE.
Augusta van Geert.
Comte de Paris.
Decaisne.
Decandolle.
COMMON PEONY

(PAEONIA OFFICINALIS)

Nat. size

PL. 14
for the hardening of its wood. The mistake, however, should not be made of giving it winter shelter, and thus inducing it to break earlier than it otherwise would. *P. Moutan* may also be treated as a pot-plant for flowering early under glass; it is sometimes forced, to obtain flowers in February, but this is an exhausting treatment, which necessitates a couple of years for recuperation before the plant is again subjected to forcing. The compost for Peonies in pots should be made very rich. The herbaceous species and their varieties do well and look well almost anywhere in a garden. Their stems and foliage die down completely in winter, the entire life of the plant being withdrawn to the thick underground rootstock. Propagation is chiefly effected by the division of the rootstock, but if good results are desired, this should be done sparingly. It is better to leave the greater portion of a plant for flowering, and be content with separating the offsets for increasing the stock. The secret for obtaining large clumps is to well manure, and leave undisturbed for several years. Tree Peonies are increased by taking suitable cuttings in August, and grafting them upon the rootstocks of seedlings of *P. Moutan, albiflora*, or *officinalis*, the former for choice. The single and semidouble kinds may also be grown from seeds, sown soon after they are ripe in autumn, or held over till March. They should be allowed to remain in the seed bed for two seasons, and in their first autumn the bed should have an inch of light earth sprinkled over it for protection through the winter. In the September of the following year they may be transplanted to their permanent positions.

**Description of Plates.** We have devoted no less than four Plates to the illustration of this important genus, of which one serves as frontispiece to this volume. It represents the flower and upper leaves of *P. Moutan*, drawn about one-fifth less than the natural size. Plate 13 shows *P. albiflora* and the details of flower-structure, including the unopened bud with its crimson-edged sepals, and the opening flower with the sepals turning back. Fig. 1 has the petals removed to show the stamens and carpels. Plate 14 presents the natural form and size of *P. officinalis*; the stamens and carpels so clearly seen that no extra figure is needed. Plate 15 is also a natural-sized representation of *P. tenuifolia*, and an extra figure showing the short carpels, the slender stamens with their long filaments, and the persistent sepals.

There are several genera of the Order Ranunculaceae not represented in this work by illustrations, but as they contain cultivated species, a brief reference is necessary.

**Adonis** (name classical). A genus of three or four annual or
perennial herbs, with much-divided leaves; petal-like sepalas, five to eight; and from five to sixteen red or yellow petals; there are many carpels (achenes), each with a solitary ovule. One species, *A. autumnalis*, the Pheasant's-eye, is naturalised in parts of Britain, and this and several other species are grown in gardens. *A. aestivalis* (summer) is an erect annual (1 foot), with deep crimson or orange flowers an inch across, with black spot at base of petals; June. *A. autumnalis* (autumn) is of similar height, with branched stems, and globose blood-red flowers, with black centre; May to September. *A. pyrenaica* (Pyrenees), 1 foot; flowers yellow, almost stalkless; July. *A. vernalis* (spring), 9 to 12 inches; flowers yellow (2 inches diameter), with ten or twelve slightly toothed petals; March. The first three species are annuals, the last is a perennial, suitable for the rock-garden, and requiring rich, sandy loam and undisturbed occupation.

**Helleborus** (the old Greek name) contains ten species of coarse perennial herbs, natives of Europe and Asia. They have thick root-stocks and handsome palmate leaves, five petal-like sepals, small, tubular petals, and many stamens. Several species have been much cultivated, notably *H. niger* (black), the Christmas Rose, with large white or pinkish flowers, which appears between December and March; *H. olympicus* (Olympian), with many rosy or purplish flowers, appearing in early spring. There are a number of hybrids in cultivation, the result of crossing various species little known in gardens. They thrive well in most garden soils, but the best results are attained from rich, moist, but well-drained loam. They are very impatient of disturbance at the root. *H. niger* is an excellent plant for the wild garden. It is also a good pot-plant, if allowed plenty of root-room, good soil, a position out of doors during summer, and in the cold frame during winter. All the Hellebores thrive under deciduous trees. They should be somewhat shaded, and before the buds open they should be covered with a hand-glass to preserve the purity of the petals, which are easily soiled. If cut just as they begin to open, the buds will expand in full beauty when placed in water indoors. Propagation is chiefly effected by root-division.

**W A T E R - L I L I E S**

Natural Order *Nymphaeaceae*. Genus *Nymphaea*

*Nymphae* (classical, the Greeks having dedicated these plants to the water-nymphs). A genus of handsome aquatics, with fleshy or tuberous
NARROW-LEAVED PEONY
(PÆONIA TENUIFOLIA)
Nat. size
PL. 15
surface. The var. *rubra* (see Plate 16) has red or rose-tinted flowers. The species is a native of the Old World tropics, and requires stove treatment.

*N. odorata* (sweet-scented) is very similar in proportions, colour, and appearance to *N. alba*, yet quite distinct. It opens in the morning and exhales its delicious perfume, but closes its rose-tinged petals soon after midday. Hardy.

*N. scutifolia* (shield-leaved). A blue fragrant-flowered species, with peltate toothed leaves, smooth on both sides. Stove. Cape of Good Hope (1792).

*N. stellata* (starry). Blue, fragrant, similar to *scutifolia*, but distinguished by its smaller size and few petals. Stove. There are several varieties of this species; one (*versicolor*) opens with white flowers, which afterwards change to red.

*N. zanzibarensis* (Zanzibar) is the largest and handsomest of all the Stellata group, having flowers 9 inches in diameter and coloured rich blue-purple. It was introduced to Kew by Sir John Kirk in 1880.

A number of beautiful hybrids, all of them hardy, have recently been raised by a French nurseryman, Marliac, among them being yellow, pink, and crimson flowered sorts. These are certain to become popular wherever Water-lilies are grown. The best of them are *ignea, Robinsoniana, carnea, rosea, chromatella*, and *Leydekeri*.

**Cultivation.**

The stove species should be potted, or placed in tubs, the hardy sorts placed in wicker baskets, and both should be sunk until the crowns are about a foot below the surface of the water. The soil should be a compost of turfy loam and sharp sand with an admixture of well-rotted manure. The hardy species will soon send their roots through the basket and into the bottom of the lake or pond, thereafter needing little attention. The stove species require to have their water maintained at a temperature of 70° Fahrenheit, though this may be reduced to 60° after the leaves have ripened. The tubers of the tropical kinds should be repotted in February. If not convenient to keep them in water all winter, they should be taken out of the soil in November and kept in moist sand in a warm house. Propagation is effected by dividing the rootstock, and by sowing seed in spring. The seed-pot should be submerged in the stove-tank, where germination takes place rapidly, and the young plants come on so well that they will probably flower the same year.

*Nuphar* (Arabic, *naufar*) is a closely allied genus containing three or four species of Water-lilies, distinguished from *Nymphaea* by their always yellow globose flowers with five or six large coloured sepals and small numerous petals, and by the stigma having lobed margins. They are natives of the north temperate zone.
EGYPTIAN WATER-LILY
(NYMPHAEA LOTUS—var. rubra)

1/4 Nat. size
PL. 16
NELUMBIA

N. LUTEUM (yellow), our common native species, may be taken as the type; and for cultivation they may be treated in the way prescribed for the hardy species of Nymphaea. The other species are N. advena, from North America, with red anthers; N. pumilum, similar to luteum but smaller, with more rounded petals; native of Europe, and occurring in Scotland and Shropshire.

The Order Nymphæaceæ also includes the genera Euryale and Victoria, the noblest aquatic plants known. Euryale ferox, a native of India, has floating leaves as much as 4 feet in diameter, and purple flowers; the calyx and stalk covered with sharp spines. Victoria regia has leaves from 6 to 8 feet across, with turned-up edges, and of great buoyancy; the flowers more than a foot across, with red sepals and white petals, the inner series rosy. Native of tropical America. Both these species are stove plants.

Description of Nymphaea lotus, var. rubra, is here shown about one half of the natural size; with upper and under surfaces of the leaf. Fig. 1 is a section through the flower deprived of sepals and petals, showing how the carpels are sunk in the receptacle. Fig. 2 represents two stamens, to show the petal-like character of the outer series, and how the filaments are narrower as they are placed nearer to the carpels.

NELUMBIA

Natural Order Nelumbiaceæ. Genus Nelumbium

NELUMBIA (Nelumbo, the Cingalese name). A genus of two species of aquatics, one a native of the southern parts of North America, the other distributed throughout Asia and found in Australia. They have a horizontal rootstock from which spring the large peltate leaves, at first floating but afterwards borne clear above the surface by the lengthening of the long cylindrical leaf-stalks. The flowers are also large and raised on long stalks; the petals in several series, the stamens very numerous in several series. The receptacle is greatly extended and expands into a top-shape with hollow summit in which the carpels are embedded, and to whose base the petals and stamens are attached.

History. Nelumbium speciosum, the Asiatic species. It was the Sacred Bean of the early Egyptians, and is believed to have been introduced to Egypt at a very early date. Four thousand years ago it was the emblem of sanctity among the priests of Isis; and it is described by
Herodotus, Strabo, and Theophrastus as a native of Egyptian waters. It is abundantly represented in the sculptures of Egyptian temples, and is still venerated throughout India, Tibet, China, and Japan, though it has for a very long period entirely disappeared from Egypt. It was introduced to England from India in the year 1787; and *N. luteum* was brought from Carolina in 1810.

**Nelumbium luteum** (yellow) has fragrant yellow flowers exceeding a foot in diameter. The connective tissue of the anther-cells is drawn out into a narrow appendage extending some distance beyond them. The blue-green leaves are a foot or more in diameter. Flowering in July.

**N. speciosum** (showy). Sacred Bean. The fine rosy flowers are very fragrant, about a foot in diameter, consisting of about twenty petals; the appendages to the stamens, club-shaped. The leaves are from 1 to 2 feet across, peltate, margins wavy, the upper surface clothed with an almost imperceptible down; ultimately raised a couple of feet above the water. Each carpel contains one ovule, and about twenty carpels are embedded in the receptacle. When these are ripe the entire head bears some resemblance to the rose of a watering-can, and when shaken the loose seeds make a noise like a child’s rattle.

The particulars given for the cultivation of *Nymphaea* also apply to *Nelumbium*, so far as soil and method of planting is concerned. They require bright sunshine, a rich deep soil, and, when grown under glass, a stove temperature. In the United States and Japan, where the summers are hot, they are grown in tubs, tanks, and ponds in the open air. They may also be grown in the South of England in outdoor tanks, over which frames can be placed to protect them during the winter and early spring. Over the glass some further protection in the shape of straw, fern, or matting should be placed, and in spring this can be moved first, then the glass partially lifted, and finally taken right away when all danger of frosts has passed. Propagation is effected as in *Nymphaea* by division of the rhizomes, and from seeds.

**Explaination of Plate 17.** *N. speciosum* is the species selected for illustration, and the figure of the flower is about half the natural size. Whilst, of course, the same scale of reduction has been adopted for the leaf, it will be understood that the leaf selected by the artist was a small one; the true dimensions are given above. It will be noted that the margins are entire—devoid of teeth, and that the centre is marked by a pale spot from which the air-channels radiate to the circumference. This spot exactly corresponds to the point of attachment of the leaf-stalk on the under surface. It is a singular fact that
SACRED BEAN
(NELUMBNIUM SPECIOSUM)

1/2 Nat. size
PL. 17
the breathing pores of the leaf (*stomata*), instead of being well distributed over the surface, as in most plants, are here confined to this pale patch, where they communicate directly with the air-passages. The rolled-up leaf is a young one, and the figure shows the manner in which it first makes its appearance at the surface of the water. Fig. 1 shows the receptacle and inner row of stamens, after clearing off the floral leaves and outer stamens, the scars of their attachment being seen below. Fig. 2 is a single stamen showing the club-shaped appendage more clearly.

**Poppies**

**Natural Order Papaveraceae. Genus Papaver**

Papaver (the classical Latin name). The typical genus of the extensive Natural Order Papaveraceae, which includes no less than sixteen other genera. The species of *Papaver* are about a dozen, erect annual or perennial herbs with milky juice, cut or lobed leaves, and honeyless flowers on long stalks, whose anthers mature before the stigmas. Sepals, two, falling when the bud opens; petals, four. The ovary is one-celled, but divided into several compartments by the growth of partitions (*placentas*) from the walls. The stigmas are united into a flat or pyramidal rayed disk. They are natives of Europe, North Africa, and North Asia; one only is South African and one Australian.

History. *Papaver somniferum*, the Opium Poppy, was first introduced to Britain; but we may be sure it was at an early date, for it was cultivated by the early Greeks for medicinal purposes, and they were acquainted with the production of opium from it. It is believed to have been originally a native of the Levant, but it is now very widely distributed. There are several places in this country where it is quite naturalised. *P. orientale* was introduced from Armenia in 1714; *P. nudicaule* came from Siberia in 1730; *P. setigerum* from South Europe in 1825, and *P. horridum* from New Holland a year later. By the crossing of certain of these, and by long cultivation and selection, many fine varieties, doubles and hybrids, have been obtained.

Principal Species. Most of the species of *Papaver* are annuals, and a few perennials. The latter are not so desirable from a horticultural point of view, for though they make a rich blaze of colour during their flowering season, this is so brief that we are apt to grudge the large amount of room occupied by them during the greater part of the year. For this reason we will keep the two sections distinct.
I. Perennials:—

**Papaver nudicaule** (naked-stemmed). 9 to 18 inches; flowers large and showy, sepals hairy, petals nearly round, white, yellow or orange. Leaves finely cut, pinnate, glaucous. Summer-flowering.

**P. alpinum** (alpine). 6 inches; really a dwarf form of *nudicaule*, but treated as a separate species by gardeners. Flowers commonly citron-yellow, less frequently white or rose-tinted. Summer. There is also a var. *croceum*, the Saffron Poppy, of dwarf habit (8 to 12 inches), with saffron or orange-yellow flowers.

**P. orientale** (Eastern). The Oriental Poppy. 2 to 3 feet. The glowing deep scarlet flowers measure 6 inches across, the petals crumpled, and having a very dark purple spot at the base of each. A singular point in this species and its varieties is the possession of three sepals, whereas the other species have but two. It flowers in early summer. A well-marked form of this species, with bracts on the flower-stalks, is usually given specific rank in gardens, under the name of *P. bracteatum*. It is taller-growing and has flowers even larger than the type. There are several other varieties, including *triumphans*, of dwarfer habit and producing a greater abundance of flowers.

II. From the annual species we select the following:—

**P. Hookeri** (Hooker's). 3 to 4 feet; an Indian species introduced a dozen years ago, and closely resembling our common *P. Rhaes*, or Corn Poppy, but forming a bushy clump. The flowers vary from pale rose to rich scarlet, the base of each petal marked with a white or black patch. Flowers in autumn.

**P. Rhaes**. 1 to 2 feet; flowers large (3 to 4 inches), brilliant scarlet, the four petals in two unequal pairs; stems with spreading bristles; leaves pinnatifid, bristly; June to August. Under cultivation numberless varieties have been produced; the double forms are known as Carnation Poppies, Picotee Poppies, and Ranunculus Poppies. The var. *umbrosum* has a black patch at the base of the petal.

**P. somniferum** (causing sleep). 3 to 4 feet; the Opium Poppy, with large flowers, 5 or 6 inches across, of various colours and shades, white, lilac, rose, blue-purple; petals usually with dark base; leaves large, glaucous, clasping the stem (*amplexicaul*). It is usually quite smooth and free from hairs or bristles, but occasionally one develops a few scattered hairs. Flowers July and August. Some of the double garden forms are very fine; one of these is named *paeoniaflorum*, from the approach to the double Peonies in the form and size of its flowers; another is var. *Murselli*, with fringed petals like that shown on Plate 18. *P. danеброг* is a single garden variety of *P. somniferum*. 
OPIUM POPPY
(PAPAVER SOMNIFERUM)
\[\frac{2}{3} \text{ Nat. size}\]
PL. 18
Cultivation.

Poppies do well anywhere; but they do better in a gritty loam than in any other soil. The annual species are good border plants, but the perennials are best relegated to the wild garden or the plantation; in the latter situations they scarcely need more than an introduction, and they will become naturalised. The Shirley Poppies pay for good cultivation. The seeds should be sown in autumn on a bed or border of good well-manured soil. In early spring the seedlings should be thinned to three inches apart. They all come freely from seed, which they produce in abundance—someone has calculated that a single capsule or poppy-head of *P. somniferum* contains about thirty-two thousand seeds. These should be thinly sown where desired, in March or April, and the young plants thinned out to a foot apart. The perennial species may also be propagated by taking up the parsnip-like root, and cutting it into transverse sections an inch long. These inserted in a pan of sandy loam and placed in a frame will all root and shoot.

**Explanation of Plate 18.** To the left is a figure of the young capsule showing the low pyramidal stigmas; and the Fig. marked 1 represents the seeds of the natural size and greatly enlarged. Fig. 2 is a seedling.

**ESCHSCHOLTZIA**

Natural Order Papaveraceae. Genus *Eschscholtzia*

*Eschscholtzia* (named after Dr. J. F. Eschscholtz, an eminent botanist, 1793–1831). A genus of one or four hardy perennial herbs, smooth and glaucous, low-growing, much branched. The leaves are bi-pinnate and much divided into exceedingly slender segments. The flowers are similar to those of *Papaver Rhoeas*, though more cup-shaped and rich yellow. The sepals are joined in an extinguisher-like cap, which is thrown off by the opening flower. Receptacle fleshy with expanded margin. Petals, four, with the stamens attached to their base. Seed-capule a two-valved siliqua, with the seeds attached to edges of valves. Native of North-West America only.

**History.**

As a garden-plant *Eschscholtzia* has a brief record. It is one of the many beautiful additions to the garden that we owe to David Douglas, the intrepid collector sent out by the Royal Horticultural Society to find new species suitable for culture. *Eschscholtzia californica* was sent home in 1826, and has been in most British gardens ever since. In some it has responded so kindly to the
hospitality offered, that it is now regarded as a troublesome, but still beautiful, weed.

There are four forms of *Eschscholtzia* that are commonly regarded as distinct species, but most botanists regard them as mere varieties of—

**ESCHSCHOLTZIA CALIFORNICA** (Californian). 18 inches; flowers large, bright yellow, deeper tinted in the middle; the long pods resembling the seed-vessels of a Cruciferous plant. Flowering throughout the summer.

**E. CAESPITOSA** (tufted). 6 inches; a dwarf compact variety, branched from near the base, but with less disposition to occupy a large area; leaf-segments very slender and thread-like. Flowers smaller, sometimes called *tenuifolia*.

**E. CROCEA** (saffron). 1 foot; flowers of a rich saffron tint.

**E. COMPACTA** (compact). 1 foot; like *caespitosa*, small flowered, yellow and orange.

There are a great number of undoubted varieties produced by cultivation, with flowers white, pale yellow, pinkish, rosy, red, orange-crimson; single and double.

**Cultivation.** *Eschscholtzia* is as easy of cultivation as *Papaver*. It flourishes in any soil, even in sea-sand, but it will not open its flowers except in the sunshine. We have stated that all the kinds are perennial, but as they bloom the first year it is the fashion to call and treat them as annuals, pulling them up when they have done flowering, and sowing fresh seed. Personal preference can be followed in this matter. It may be argued that when a plant has been flowering all the summer it is better to clear it away, and start afresh; on the other hand, plants that have been trimmed up after flowering, and have recuperated during the winter, are in a better position as well-established individuals to put forth a good display of blossoms. We should advise the adoption of both courses, and the comparison of results in *your* particular locality, to be followed later by adherence to the plan that succeeds most. The seeds may be sown either in the autumn or in the following February or March. We think autumn-sowing is the better mode, the young plants having had a longer preparation for flowering. The seed should be sown thinly where they are to bloom, as the seedlings do not bear transplanting well, unless it be done on a wet day.

**Description of Plate 19.** One branch of *E. californica* is here depicted, showing leaves, unopened bud with its completely-joined sepals, open flower with essential organs, and a developing pod. Fig. 1 is a petal with a bundle of stamens attached to its base; 2, a receptacle from which both petals and stamens have been detached; 3, a reduced drawing
CALIFORNIAN POPPY

(ESCHSCHOLTZIA CALIFORNICA)

Nat. size

PL. 19
of the ripe seed-vessel, dehiscing, and showing the rounded seeds within; 4, a seed enlarged; 5, a seedling.

**Platystemon** (Greek, *platus*, broad, and *stemon*, a stamen) is an allied genus of Papaveraceae, containing but one species, a hairy annual spreading plant with lance-shaped entire leaves, arranged in threes, and solitary, stalked, yellow flowers. There are three sepals, six petals, numerous stamens with dilated filaments (whence the generic name), and many carpels, at first partially connected, but separating as they mature. Flowering in July and August.

**Platystemon Californicus**, the Californian Poppy, is the only species; a hardy annual, 1 foot high, with yellow flowers, and hairy capsules and leaves. There is a variety *leiocarpus*, from Siberia, which has yellowish-white flowers and smooth capsules, and which is frequently accorded specific rank.

The remarks respecting the cultivation of the annual Poppies apply equally to Platystemon.

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**ARGEMONE**

**Natural Order Papaveraceae. Genus Argemone**

**Argemone** (*argema*, cataract of the eye). A genus consisting of half a dozen annual glaucous herbs with yellow juice. Leaves pinnatifid, the lobes usually with spiny teeth. The flowers are similar to those of *Papaver*, with two or three concave sepals, each ending in a hard point; petals, four to eight; stamens numerous; stigmas, four to seven, radiating. The seed-vessels are oval capsules, opening at the top by little valves; the seeds are acrid, narcotic, and purgative, and have been used as a substitute for ipecacuanha. The yellow juice has been used in ophthalmic medicine, hence the name of the genus. Natives of America, but they have become widely distributed.

**History.**

*Argemone mexicana*, the Devil's-fig, appears to have been introduced to England so far back as the year 1592, probably with a view to its use medicinally. It was not until 1820 that a second species—*A. albiﬂora*—was introduced, and seven years later two others were added—*grandiflora* and *ochroleuca*. The large-flowered *A. hispida* did not make its appearance in Britain until 1872.

**Species.**

**Argemone Albiflora** (white flowered). 1 foot; petals, three, white; flowers July and August.
A. grandiflora (large flowered). 3 to 4 feet; flowers panicled, large (3 inches in diameter), white, with yellow stamens; leaves smooth, with spiny teeth, nerves whitish; July. See Plate 20.

A. hispida (bristly). 2 feet; flowers pure white, larger than grandiflora (3 to 5 inches); leaves bristly; September.

The disadvantage of bestowing such names as *grandiflora*, *majus*, *minus*, and so forth, is seen in this case. *Grandiflora* was so called because it was the largest flowered species known, but years after *hispida* was discovered with much larger blossoms, yet *grandiflora* will continue to give the impression of having the largest flowers.

A. mexicana (Mexican). The Devil's-fig. 2 feet; flowers yellow, solitary; petals, four to six; leaves blotched with white, spiny; June.

A. ochroleuca (yellow-white). 1½ feet; flowers pale yellow, solitary; petals, six; stem prickly; leaves with white blotches, nerves with prickly bristles; August.

**Cultivation.**

All the species are hardy, and will succeed in almost any garden soil. Not only for their fine flowers are they worthy of cultivation, but their foliage and habit render them ornamental. The larger kinds, however, are not quite suitable for small gardens; especially does this apply to *A. grandiflora*, but where there is a shrubbery border of moderate extent, with light soil and sunny aspect, its presence will be appreciated. The seeds should be sown thinly where they are to bloom, at the end of March or during April, and the seedlings afterwards thinned out to sixteen or eighteen inches apart.

**Description of**

The species represented is *A. grandiflora*, and its flowers are shown in all their stages. The horned sepals separate, and are thrown off completely by the expansion of the crumpled petals. In the fully open flower the numerous stamens are seen surrounding the ovary, and the successive stages in the development of this organ after fertilisation are shown until the full-sized, ribbed, and spiny capsule is formed. Fig. 1 is a section through the flower and ovary; Fig. 2, the large pitted seed, and an enlarged view of it; Fig. 3, a seedling.

**Sanguinaria** (Latin, *sanguis*, blood). A one-species genus of Papaveraceae, which consists of *S. canadensis*, the Puccoon, Blood-root or Blood-wort, of the United States and Canada. It is about 6 inches high, herbaceous, with a thick creeping rootstock, filled with a blood-red acrid juice. From each branch of the rootstock rises a single leaf and a solitary flower-scape, the leaf at first wrapped round the scape. The form of leaf is roundly heart-shaped, the margin broken into seven palmate lobes, and the surface netted with nerves. The flower consists of two smooth sepals, which drop away as the white petals expand; eight petals in two series, about twenty-four stamens and two carpels.
MEXICAN POPPY
(ARGVEMONCE GRANDIFLORA)

1/2 Nat. size

PL. 20
The flowers are from 1 to 2 inches across, and appear in April and May. Introduced to England in 1680.

*Cultivation.* Its lowly stature entitles it to front rank in the border, but it should be given a sunny position, for it is only in sunshine that it opens its flowers. It is propagated by division of the rootstock, or by sowing the seed as soon as ripe in the open border. It is perfectly hardy.

Bocconia (named after Dr. P. Boccone, a Sicilian botanical author) is another genus of this order. There are several species, of which the most frequently cultivated is *Bocconia cordata*, a stately plant growing to a height of from 5 to 8 feet, well-covered with boldly cut, deeply veined leaves, and small reddish-yellow flowers. These consist of two petal-like sepals, and a number of stamens, individually not at all striking, but they are combined into a very large pyramidal panicle, which has a fine striking effect. It is seen to most advantage when planted in groups in wide borders, or in a bed on a large lawn. It is also a most valuable plant for what is termed sub-tropical gardening. It flowers from May to July; but its appearance is by no means what one expects from a Papaveraceous plant. *B. cordata* was introduced from China in 1795. It is propagated by cuttings or suckers, and likes a rich loamy soil.

**DICENTRA**

*Natural Order* Fumariaceae. *Genus* Dicentra

*Dicentra* (Greek, *dis*, two, and *kentron*, a spur or goad). A genus of about a dozen species of hardy herbaceous plants, natives of North America and North-West Asia. They are all perennials, and have tuberous, fleshy, or fibrous roots. The leaves are much divided, and the flowers of singular form borne in racemes. The sepals are mere minute scales that drop off before the flower opens. There are four petals in two quite dissimilar pairs; the outer, concave, swollen at the base, and spreading acutely at the apex; the inner, slender, clawed, keeled at the back, and cohering at their tips. Stamens, six, in two bundles of three; ovary, one-celled.

*History.* This genus of handsome plants is of comparatively recent introduction to the gardener. One species, *Dicentra Cucullaria*, was brought from the United States in 1731, but does not appear to have been at all widely grown; *D. formosa* was introduced
from North America in 1796; *D. spectabilis*, the finest and best known, was brought from Siberia in 1810; *D. eximia* from North America in 1812; *D. canadensis* in 1822; *D. thalictrifolia* from the Himalayas in 1831, and *D. chrysantha* from California in 1852. The genus is, perhaps, more popularly known as *Dielytra*; but it appears to have been originally *Dicentra*, then to have been misprinted *Dielytra*, and to make sense of this it was deemed that the *c* was a mistake for *e*; and so the etymology of this new word was explained as *dis*, two, and *elytron*, a sheath,—a derivation sufficiently backed up by reference to the outer petals of the flower.

**Species.**

*Dicentra canadensis* (Canadian), 6 inches, is the Squirrel Corn of the Americans. It has glaucous leaves divided into very slender segments, and bears few flowers. These are white, with short blunt spurs, and appear in May.

*D. chrysantha* (gold-flowered), 3 to 5 feet, has finely-divided glaucous foliage, and erect racemes of bright yellow flowers, which are produced in September. The flower-stem is leafy.

*D. Cucullaria* (hooded). 3 to 6 inches; a very dwarf species, with smooth, slender leaves, and flowers white, with yellow tips. Flower-stem leafless. This species is known in the United States as the Dutchman's Breeches, from the shape of the flowers, which appear in May.

*D. eximia* (unparalleled). 1 to 1½ foot; leaves small and few, with oblong lobes; flower-stem leafless; flowers reddish purple, drooping, in compound racemes; June and July.

*D. Formosa* (beautiful). 6 inches; very like a dwarf form of *eximia*, but the flowers are broader, and of a brighter red; May.

*D. spectabilis* (worthy of notice). 2 to 3 feet; with handsome foliage and leafy stems. The rather flexuous flower-stem bears from eight to twelve, or more, large rose and white flowers, an inch long. Flowers spring and summer. The popular names of Lyre-flower and Heart-flower have been applied to it. There is a var. *alba*, with flowers entirely white.

*D. thalictrifolia* (thalictrum-leaved). 3 feet; with alternate, glaucous decompound leaves; flowers fragrant, yellow, with reddish mouth; August to October.

**Cultivation.** All the species being quite hardy, and succeeding in any moderately rich, light soil, there is little difficulty in their cultivation. They should certainly find a place in the herbaceous border, and the larger kinds look well backed by a shrubbery. This last is especially the position for *D. spectabilis* and *D. chrysanthana*; the dwarf kinds will, of course, come more to the front. *D. spectabilis* is used as a pot-plant for gentle forcing very early in the year. For
DICENTRA SPECTABILIS

Nat. size

PL. 21
propagation the crowns are separated early in the year; or the fleshy rootstock may be cut into short lengths, and potted in sandy loam. They will soon send out fresh root-fibres and leaves.

Description of A portion of the flowering-stem, with a few leaves, of Plate 21. *Dicentra spectabilis* are here represented of the natural size, giving side and edge views of the buds and flowers in various stages. In the smallest of the buds the sepals will be seen still attached. Fig. 1 has had half of each petal cut off to show the interior of the flower and the arrangement of the organs.

*Corydalis* and *Fumaria* are other genera of the Order *Fumariaceae*, which resemble the genus *Dicentra* in the character of their foliage and the general structure of their flowers, which, however, are smaller. *Corydalis* differs from *Dicentra* in having but one of its outer petals spurred or inflated. They are mostly yellow-flowered. One species, *C. claviculata*, is a native of Britain, and two others—*C. lutea* and *C. solida*—are naturalised, the descendants of garden escapes.

*C. nobilis* (noble), from Siberia, is probably the best in cultivation. It is less than a foot in height, with long-spurred yellow flowers, which appear in May. A moist, shady nook at the foot of rock-work suits this species.

*C. solida* (massy), 6 inches, is also a hardy species that likes a moist situation; flowers rosy purple, in one-sided racemes; April and May.

**STOCKS**

Natural Order *Cruciferae*. Genus *Matthiola*

*Matthiola* (named after Dr. P. A. Matthioli, an Italian botanist, 1500–1577). A genus of about thirty species of herbaceous or sub-shrubby plants, with entire or waved-margined leaves, alternate on the stem, and downy with starry hairs. Flowers in terminal racemes, honeyed. Sepals, four; petals, with long claws, four; stamens, six. The sepals are always erect, so that with the claws of the petals they form a kind of tube round the stamens and pistil. The two carpels are united to form a nearly cylindrical pod. The species are natives of Europe, North Africa, West Asia, and (one species) South Africa.

**History.** *Matthiola incana* is a British plant, although now probably extinct in the wild state except in the Isle of Wight, where it grows on the cliffs. It is the parent of all the cultivated
varieties known as Brompton Stocks and Queen Stocks. We have another native species, *M. sinuata*, the Great Sea Stock, now restricted to the seashores of Wales, Devon, Ireland (South-East and South-West), and the Channel Islands. *M. annua*, the Ten-week Stock, was introduced from South Europe in 1731. *M. odoratissima*, a very fragrant, evergreen species, came from Persia in 1795. *M. fenestrates*, which was introduced from Crete in 1759, is the Great Cape Stock, and believed by some authorities to be a mere form of *incana*. *M. graca*, from South Europe, is the parent of the Wallflower-leaved Stocks, and probably only a form of *incana*. The gardeners of a hundred years ago called these plants Stock Gilliflowers, and regarded them botanically as of the same genus as the Wallflower (*Cheiranthus*), with which they also associated the Virginian Stock (*Malcolmia*).

**Species.**

**Matthiola annua** (annual). 1 to 2 feet; with blunt-pointed, lance-shaped, hoary leaves, a smooth upright stem, branching upwards into a bushy head and numerous racemes of purple, crimson, lilac, and white flowers.

**M. fenestrata** (window). 1 foot; with crowded downy leaves, the edges rolled backward; flowers crimson or pale purple; July and August; stem erect, unbranched, sub-shrubby.

**M. incana** (hoary). 1 to 3 feet; a sub-shrubby biennial, with lance-shaped hoary leaves, and large white, crimson, or purple, double or single flowers, summer and autumn.

**Garden Varieties.**

The above are the principal species from the horticulturist's point of view, as the parents of the garden varieties. The latter may be divided into two great sections—Summer Stocks and Winter Stocks, these terms implying that the first section are annuals, blooming their first summer; the second, biennials, blooming after their first winter.

**Summer Stocks** include the many varieties of Ten-Week Stock and the hybrids most nearly approaching it. They are almost without number, and it is unnecessary to give a selection of names, for they are almost without exception good, flowering profusely and sweet-scented. Most of the seed is raised on the Continent, where the cultivation of the Stock is an important branch of horticultural industry, and special attention has been paid to getting seeds that will produce a very high percentage of double-blooms. Summer Stocks are not so suitable for pot cultivation as for beds and borders.

**Winter Stocks.** Under this head are classed the Brompton, the Perpetual, the Giant Cape, the Intermediate, and the East Lothian Stocks. The Brompton are very robust, branching Stocks, well-suited for "bedding
TEN-WEEK STOCK
(MATHIOLA ANNUA)
- Nat. size
PL. 22
out.” They flower in May and June. The Perpetual or Emperor Stock is also vigorous and branching, about 18 inches high; it forms a good subject to follow on after the Brompton, as it flowers in autumn, if sown in March; in the ordinary way it is sown in June, and blooms a year later. The Giant Cape is esteemed for its immense pyramid of bloom. The Intermediate and the East Lothian are dwarf and bunchy, with a profusion of flowers, and are therefore very suitable subjects for pot-culture and for filling beds for an early summer display.

Cultivation.

It should be borne well in mind that the Stock is a gross feeder, and it is well-nigh impossible to have a soil too rich for it. The ground should be light, in a sunny position, dug deeply and plenty of manure incorporated with it, and top-dressings of half-rotted stable manure added in dry weather, when it should also be liberally supplied with water. The seeds of the Summer Stocks should be sown in pans at the beginning of March, and placed on a gentle hot-bed. As soon as fit, the seedlings should be pricked into boxes of light rich soil at a distance of two or three inches apart. Plenty of air must be given at this stage, or the young plants may damp off. By the middle of May you should have nice compact dwarf plants, ready for planting out into beds and borders. To carry out this operation with a prospect of success, you must wait for a mild, showery day when the soil will readily adhere to the young roots. Should there be reasonable fear of frost at this time, some provision must be made for slightly sheltering the tender plants. The Winter Stocks should be sown in July in pans, and these put into frames without heat. When large enough they should be potted singly in “thumbs,” and plunged into ashes in a cold frame. Late in autumn or early in spring these will want more room, and should then be shifted into five-inch pots. At this period it will be possible to distinguish between the single and double forms by paying attention to the following points: the doubles have very long leaves of a light green colour, hairy and with curled edges, the cluster of buds being enclosed in incurved whitish leaves; the singles, on the contrary, have leaves of a deeper colour, with rounded ends, and the leaves enclosing the flowering heart are arranged shuttlecock-fashion. Winter Stocks should never be placed outside to pass the winter unless the situation is very dry and sheltered. Damp is far more to be dreaded for them than frost.

Description of Plate 22. Here are represented four of the double forms of \textit{Matthiola annua}, the Ten-week Stock, in various tints. The garden name for this species is due to the fact that from the time of sowing to the time of flowering is about ten (ten to twelve) weeks.
CHEIRANTHUS (Greek, cheiros, hand, and anthos, flower). The botanical characters of this genus differ but slightly from those of Matthiola, but whereas all the sepals in that genus are green and alike, in Cheiranthus they are coloured and the two lateral ones are bulged (saccate) at the base, the leaves are sometimes toothed, and the hairs on the plant are forked. It is not an extensive genus, only about twelve species being known, and these are natives of the north temperate and polar regions.

History. Cheiranthus Cheiri, the Wallflower, has been so long naturalised in this country that those persons may be pardoned who regard it as indigenous, when they behold old ruins ablaze with its yellow blossoms. It was introduced from the Continent in 1573, and has been in our gardens ever since, getting improved both in colour and form, and even escaping to adjacent old walls, to lead a more natural existence, and to defy the fury of the roughest gales. It is never found thus growing away from the present or former habitations of man. Many varieties, double and single, have originated in gardens partly from selection, partly as the result of hybridisation. In 1777, C. mutabilis was introduced from Madeira, whose flowers, at first cream-coloured, change to purple. C. scoparius, from Teneriffe (1812), similarly changes from white to purple. (Probably forms of the same species.) C. semperflorens, which may be found in bloom any day in the year, came from Morocco in 1815. All these are evergreen.

Species. Cheiranthus alpinus (alpine). 6 inches; leaves distinctly toothed; flowers pale yellow, abundant; May to July. North Europe (1810).

C. Cheiri (hand-flower). 2 feet; leaves lance-shaped, entire; flowers in wild condition always yellow, but varying, light brown, red, or dark brown, under cultivation; fragrant. Chiefly spring flowering.

C. Menziesii (Menzies'). 6 to 8 inches; a Californian perennial with long branching rootstock, radical woolly leaves, and purple flowers, appearing in spring. Half hardy.

Garden Varieties. These are numerous, but are chiefly distinguished by gradations of colour, and each tint has its doubles and its singles. Of these, the double yellow, double light brown, and double dark brown are to be recommended, whilst from the singles should be selected Blood-red, Belvoir Castle, yellow, Tom Thumb, orange, and Harbinger.
WALLFLOWER
(CHEIRANTHUS CHEIRI)
Nat. size
PL. 23
Wallflowers

C. Marshallii (Marshall’s), 1 to 1 1/2 foot, with orange flowers, is thought to be of garden origin—a hybrid between C. Cheiri and C. alpinus. From the fact that Wallflowers do so well in unpromising situations in the wild state, it would be evident that their cultivation was no difficult matter; and horticultural experience proves this to be so. The amateur may have his house surrounded with a blaze of refined colour and the atmosphere laden with delightful fragrance with little trouble and cost if he will grow Wallflowers in plenty. Light, well-drained soil and a sunny aspect are the chief essentials for success. Dig your bed or border in May, and on the fresh earth sow your seeds. By the middle of July you will have nice sturdy little plants, and when the rains of that month come, as they rarely fail to do abundantly, plant the seedlings out a foot apart. There let them stay until September or October brings another few days of wet, and then finally place them where you wish them to provide their sweetness and light in the following spring. If your packet of seed is from a good strain, you are almost sure to get a percentage of double-flowered plants, and if you wish to propagate these you must do so by taking cuttings. These should be taken from young but fully-grown—not woody—plants, inserted in sandy soil under a hand-glass, where they soon become rooted. If thought desirable, any of the shrubby singles may be propagated in the same manner; the half-hardy kinds having the additional protection of a cold frame outside the hand-glass, where they may be kept through the winter. They will succeed well on a rockery, and an unsightly old wall-top that gathers all kinds of vagrant weeds may be made beautiful by the judicious dropping of a few Wallflower seeds in suitable chinks and covering them with light, dry soil, leaving the rest to the sun, rain, and dews. It is marvellous what toughness and vigour these plants develop in such situations. Quite recently we watched some Wallflowers on the top of a wall, during a gale of wind. They appeared to be fixed by double-acting hinges, so that the wind could throw them down, now this way, now that, flat to the wall-top. The bruises they received must have been sufficient to entirely destroy most plants, to say nothing of the complete demoralisation of the root-fibres. A few days later we again looked at them, and found them erect and firmly rooted, flowering freely and bearing no signs of their rough treatment.

Description of A couple of single plants, red and yellow, of Plate 23. C. Cheiri occupy the central position; and these show the stalkless leaves, the coloured erect sepals, and how the sepals, petals, and stamens drop off, leaving the enlarged siliqua—which is the type of
seed-vessel throughout the Order Cruciferæ, though varying in size and shape. Fig 1 is a section through the flower, showing arrangement of organs. Fig. 2, the two-celled ovary and stigmas; 3, the ripened silqua or pod opening by two valves to discharge the red seeds; 4, a seed, natural size, and the same enlarged.

**ROCK-CRESS**

Natural Order Cruciferæ. Genus Aubrietia

**AUBRIETIA** (named after M. Aubriet, a French botanical artist). A genus of half a dozen species of dwarf evergreen trailing plants, with hairy, entire or toothed leaves, and few, comparatively large purple or violet flowers. They are natives of the Mediterranean region.

History.

There is little of historical interest concerning this genus. The British gardener knew it not until 1710, when *Aubrietia deltoidea* was introduced from Naples. Its very low stature and neat habit made it welcome as a rock-plant, for bordering and for carpet-bedding, and under cultivation it has produced a number of varieties and several hybrids. Respecting certain of these forms there is considerable disparity of opinion as to whether they should be ranked as separate species or as varieties of *deltoidea*.

**Species and Varieties.**

**AUBRIETIA DELTOIDEA** (shaped like the Greek letter Δ). 4 inches; the name is supposed to refer to the shape of the leaves, but it is a misnomer: they are nearer oval, with one or two teeth on either side and rough with branched hairs. The outer sepals have saccate bases as in Cheiranthus, but they are green; the petals are purple, the yellow stamens contrasting prettily with them; flowers, March to May.

A. PURPUREA (purple), 4 inches, is somewhat larger of stature and has larger, deeper flowers; stems more leafy, and leaves broader with more teeth; whole plant more erect; March to May.

The principal varieties and hybrids are the following:

- **Bougainvillei** (Bougainville’s), very dwarf, owing to shortness of flower-stalks; flowers light violet-purple, petals overlapping.
- **Campbelli** (Campbell’s), also known as **Hendersoni**; larger, deep violet-blue flowers; more vigorous.
- **Croatica** (Croatian), more compact, flowers large.
- **Eyreí** (Eyre’s), free branching habit, with large flowers of rich violet-purple.
- **Grandiflora** (large flowered), similar to Campbelli.
- **Græca** (Greek), vigorous grower of com-
ROCK-CRESS

(AUBRIETIA DELTOIDEA)

Nat. size

PL. 24
pact habit, with light purple flowers; a form of this with flowers of a deeper colour is known as superba. 
Leichtlini (Leichtlin’s), dwarf, flowers large, rich crimson. 
Purpurea variegata (variegated), pleasing and effective; suitable for edging and for carpet-bedding. 
Rosca (rosy), flowers soft rose-pink, of neat and compact habit. 
Violacea (violet), finest of all; flowers large deep violet-purple.

Cultivation. 
The Aubrietias, or Rock-cresses, are all hardy perennials, and may be reproduced either by seeds or cuttings. It is not difficult to please them in an ordinary garden where there is no wide choice of soils. They will do well in the rock-garden, or in a sunny border where the soil is deep and rich. Seeds should be sown in April or May in the open air, and the seedlings planted out in the shade. The young plants may be transplanted to their permanent quarters in autumn, and will flower in the following spring. Cuttings should be taken in the spring and struck in gritty loam. The plants from which the cuttings are to be taken should first be placed in a frame to induce new growth of tender shoots, these being better for the purpose than the harder outside growths. They should be kept rather close after insertion, and when well-rooted and hardened off, they should be planted in a shady border, and in autumn placed finally where they are to bloom. A third method of propagation is to layer the stems of older plants after flowering, covering them with soil. They freely root, and send up numerous shoots which develop into new plants, though at present connected with the old. They will produce fine masses of bloom in the spring, after which the new plants may be separated by cutting through the layers.

Description of Plate 24. 
An entire plant of A. deltoidea is here depicted, of the natural size, and showing the habit of the species. Fig. 1 shows the interior of the flower, and the dilated filaments of the stamens. Fig. 2 is the short siliqua opening, and 3 is an enlarged view of a seed.

ALYSSUM

Natural Order Cruciferæ. Genus Alyssum

Alyssum (Greek, α, privative, and lussa, rage, frenzy, from a former belief in its power to cure madness). A genus of about ninety species, of which some are annuals, others dwarf shrubby perennials, more or less hoary from a clothing of stellate hairs. Radical leaves tufted, usually entire, the stem-leaves distant and alternate. Flowers small, four-parted, white or yellow; sepals equal, petals entire or notched.
Pods short, variable in form. The species are chiefly from Europe and the Mediterranean region.

**History.** Alyssum spinosa appears to have been introduced from South Europe in 1683 as a curious greenhouse plant on account of the thorny character of its old wood and its flower-stalks. *A. maritimum* appears to have been cultivated at an early date, for it has become thoroughly naturalised in waste places near the sea in England and the Channel Islands. *A. olympicum* came from Northern Greece in 1700, and ten years later the well-known *A. saxatile* was introduced from South-East Europe; *A. montanum* from Germany in 1713, and *A. calycinum* from Austria in 1720. This last species is found occasionally about cultivated fields in this country. *A. alpestre* came from South Europe in 1777. A considerable number of other forms have been introduced during the present century, but those mentioned are the principal ones in cultivation.

**Species.**


*A. atlanticum* (atlantic). 3 to 12 inches; yellow-flowered, shrubby-based, erect. Leaves, lance-shaped, velvety hoary; flowers May and June. Perennial.

*A. macrocarpum* (large-fruited). 8 inches; white-flowered, shrubby, spiny-branched. Leaves oblong, silvery white; flowers May to July. Perennial.

*A. maritimum* (maritime). Sweet Alyssum. 6 to 9 inches; white-flowered, with wiry, much-branched trailing stems and very narrow lance-shaped leaves. There is a pretty form with the green leaves streaked yellow. Flowers, sweet scented; May to July or July to September, according to period of sowing. Frequently named Koëniga maritima. Annual or perennial.

*A. montanum* (mountain). 2 or 3 inches; yellow-flowered, scented; somewhat glaucous; leaves oval (lower) or oblong (upper), downy; flowers May to July. Perennial.

*A. olympicum* (Olympian). 2 to 3 inches; deep yellow flowers; leaves small, greyish, spoon-shaped; June to August. Perennial.

*A. orientale* (eastern). 12 inches; yellow-flowered, somewhat shrubby at the base, leaves lance-shaped, downy, waved, with distant teeth; May. Perennial.

(A) GOLD DUST  (B) SWEET ALYSSUM
(ALYSSUM SAXATILE)   (ALYSSUM MARITIMUM)

Nat. size
PL. 25
The species of *Alyssum* are favourite plants for rockwork, dry borders, and edging. Most of them produce an abundance of small but bright blossoms, at a period when garden flowers are not very plentiful. They are of easy cultivation, and will succeed in any well-drained soil, especially if it be of a stony character and in a sunny position. They may be raised from seed sown in the open border during March or April. The perennial species may also be propagated by dividing the roots, or by taking cuttings from the young growths in August or September, and striking them in sandy loam in a frame or shady border. These will form neat little plants for blooming in the following spring.

**Description of Plate 25.** Fig. A represents the upper and lower portions of a branch of *A. saxatile*. Fig. 2 is an enlarged flower showing the form of the petals and other organs and their disposition. In Fig. 3 two of the petals have been taken away to give a clearer view of the interior. Fig. 4 is the orbicular pod with narrow wings, and the persistent style. Fig. B shows a division of the stem of *A. maritimum*, and Fig. 1 is an enlargement of one flower.

**Bitter Cress**

**Natural Order Cruciferae. Genus Cardamine**

*Cardamine* (Greek, *kardamon*, cress). A genus of about fifty annual or perennial herbs, natives chiefly of the temperate and colder regions. The leaves are generally pinnate; flowers white, creamy or purple. Sepals with equal bases; petals clawed. Pods long and narrow, compressed, with flat, elastic valves which, when the seeds are ripe, spring open from the base and discharge the seeds. The flowers are borne in terminal, bractless racemes.

**History.** The species of *Cardamine* are not in general cultivation, though a few of the Continental species were introduced in the seventeenth century. *Cardamine trifolia*, for instance, was brought from Switzerland in 1629, *C. latifolia* from Spain in 1710, *C. chelidonia* from Italy in 1739, and *C. macrophylla* from Siberia in 1824. *C. pratensis* is our own native Cuckoo-flower, the Lady's Smock of Shakespeare's well-known lines. Of this species there is a natural double variety occasionally found, as also several varieties with single flowers. *C. pratensis* is plentiful in damp meadows, and swampy places on commons. Its flowers are white or pale pink. *C. amara*, another
native, has creamy white flowers rather smaller than the last named; it grows by river sides, but is scarce. The other native species have very small flowers.

**Cultivation.**

There is no difficulty in the cultivation of these plants, provided they be planted in a moist, shady situation. Moisture is of more importance to them than any special kind of soil. Given that, they will propagate themselves freely, *C. pratensis* in a peculiar and interesting manner in addition to its production of seed like the others. If growing on wet soil, as when it is naturally growing amid Sphagnum-moss, its radical leaves when spread out flat put out slender rootlets from the base of each leaflet, and from its axil arises a bud, which soon develops into a complete little plant that may be separated from the parent and transplanted.

**HONESTY**

Natural Order **Cruciferae**. Genus *Lunaria*

*Lunaria* (Latin, *luna*, the moon, from the shape and colour of the disk-like partition of the seed-vessel). A genus consisting of but two species of erect-growing herbs with branching stems and large, rough, heart-shaped leaves, toothed and stalked. The flowers are in terminal and axillary racemes, each with the four petals arranged cross-wise, and the two outer sepals bulging at the base. The remarkable feature of the genus is the extraordinary degree to which the seed-vessel (*siliqua*) is compressed. It varies between oval and orbicular in outline, and when the valves drop off the seeds remain attached to a thin pearly membrane, which has earned for the plants two of their popular names, Moonwort and Moneywort, though they are more frequently known as Honesty. They are natives of Central and Southern Europe, and Western Asia.

**History.**

Both species have a record of three centuries of cultivation in this country. *Lunaria biennis* appears to have been introduced from Sweden in 1595, and to have been followed in the succeeding year by *L. rediviva* from Germany. They have been, and remain, general favourites in old-fashioned gardens, more especially *L. biennis*, on account of its larger flowers and seed-vessels.

**Species.**

*Lunaria biennis* (biennial). Honesty. 1½ to 3 feet, with large violet-purple flowers appearing in April and continuing till July. The large leaves and pyramidal habit give this plant a handsome appearance in leaf and flower; and this is not less so
HONESTY
(LUNARIA BIENNIS)
\( \frac{2}{3} \) Nat. size
PL. 25
when the flowers have passed and the pearly lustre of the seed-bearer is uncovered by the falling of the valves. There is a white-flowered variety (*albiflora*).

**Lunaria rediviva** (renewed). 1 to 3 feet; a perennial with smaller, bluer flowers, fragrant, and a smaller seed-vessel, which is lance-shaped, pointed at each end, and not nearly so conspicuous or pretty as that of *L. biennis*. Flowers May and June.

**Culture.** *Lunaria* succeeds in almost any garden soil, but it will do especially well if the soil is of a sandy nature. It may be increased by division, but usually it is propagated by sowing the seeds as soon as ripe, which would be about July or August. These may be sown in the open border, where they will soon make nice bushy plants, and flower soon after setted; mild weather comes in the following spring. They thus come in nicely at a time when there is no superabundance of the warmer colours among the flowers; whites and yellows being then the prevailing hues. They also thrive under the shade of trees, and are admirable for producing bold colour effects in the wild garden. When the seeds are all but ripe the raceme should be carefully gathered and stood indoors to dry. The valves of the siliqua will then readily part, the seed may be secured, and the dividing pellicle attached to the oval framework be preserved for filling vases when there is a dearth of cut flowers.

**Description of Lunaria biennis**, upper portion of stem, with flowers; also a single leaf from the lower part of plant, Fig. 1 is an enlargement of the flower; Fig. 2 the same with the petals and two of the sepals removed, and the ovary cut through. It will be seen that the long style remains attached to the growing pod, and in Fig. 3 it is still a prominent feature. In this figure the valves of the pods have been removed to show the seeds adhering to the central partition.

**Schizopetalon**

Natural Order Cruciferae. Genus *Schizopetalon*

Schizopetalon (from Greek, schizo, to cut, and petalon, a petal). A genus of five or six Chilian species of Cruciferae remarkable for the fact that their petals are cut up or lobed in a pinnate manner. They are all half-hardy annuals with erect, slightly branching stems, and alternate wavy-toothed or pinnatifid leaves. The flowers are purple or white, in terminal racemes with leafy bracts; sepals erect as in *Lunaria*, almost equal at the base; petals with a claw, pinnately lobed.

1.—15
Schizopetalon Walkeri (Walker's) is the only species cultivated in this country, where it was introduced seventy-five years ago. It is about 2 feet high, covered with down, the individual hairs of which are branched. The flowers are white in long racemes, each footstalk furnished with a long slender bract. The seed-pod is extremely slender. The seedlings are as remarkable as the cut petals, for they are provided with no less than four spirally twisted cotyledons. The flowers appear from May to August.

The seeds should be sown in spring, in pots filled with a compost of peat, loam, and sand; raised in the greenhouse, and afterwards carefully planted out in a sunny border. To ripen seeds a few plants should be grown in the greenhouse, but even there they will not be produced in great number. In the warmer parts of the country the seeds may be sown in February on a sunny border, where they will readily germinate and produce good plants by midsummer.

VIRGINIAN STOCK

Natural Order Cruciferae. Genus Malcolmia

Malcolmia (name commemorative of William Malcolm, a London nurseryman of the last century). A genus of about twenty herbs, mostly hardy annuals, of varying habit. They have branching stems, with alternate, roughish, toothed or sinuate leaves, and flowers destitute of bracts, disposed in racemes; purple or white. They are distinguished from their nearest allies by having an awl-shaped stigma, and a roundish seed-pod thickened at the base. The species are mostly natives of the Mediterranean and Caspian regions, but few of them are cultivated.

Malcolmia littorea has been known in our gardens for a longer period than M. maritima, for the former was introduced from South Europe more than two hundred years ago, whilst the latter was not brought from the same neighbourhood until early in the last century, and was followed about twenty years later by M. chia from Greece. M. maritima has long been a favourite in gardens, from the ease with which it is grown, its disregard of poverty of soil, and its suitability as an edging for beds and borders.

Malcolmia chia. Native of Chio, Greece. Stems branching, 6 to 12 inches; radical leaves egg-shaped or spoon-shaped; stem leaves narrower and more pointed, mostly entire, downy beneath. Flowers purplish lilac, about three-eighths of an inch across; June.
VIRGINIAN STOCK
(MALCOLMIA MARITIMA)
Nat. size
PL. 27
ROCKETS

M. LITTOREA (of the seashore). 6 to 12 inches, with very narrow, lance-shaped, almost entire, hoary leaves. Flowers large pinkish purple, distinguished from the following species by the lack of veining on the broad portion (limb) of the petals; June to November; succeeded by hoary seed-pods.

M. MARITIMA (of the sea). Virginian Stock. Stems erect, branched, 6 to 12 inches. Leaves narrow, oval or elliptical, much narrowed at the base, grey-green. The flowers are from ½ to 1 inch across, of various colours; white, pink, lilac, rosy-red becoming tinged with violet; spring to autumn according to date of sowing the seed.

Naturally these are plants of the seashore, and used to a poor, light soil; there is therefore no need to prescribe special composts for them in the garden. The almost universal mistake made by amateurs is in sowing the seed with a too lavish hand—lavish, that is, not in the sense of sowing broadcast, but of dropping too large a quantity of seed into too restricted a space. They desire thick lines of flowery edging, but defeat their own purpose. One-sixth of the quantity usually sown would give more robust, longer-lived plants, that would give a better and more continuous floral display. Overcrowding of the seedlings means semi-starvation and a short display, to be followed by a weedy-looking edging in which dead plants are as numerous as the living ones. If sown where they are to flower, the seeds should be sprinkled sparingly but evenly. A better plan is to sow in a seed-bed in September, and thin the seedlings out to a couple of inches apart as soon as possible. Then early in March transplant to the bed or border where they are desired to bloom, keeping them about eight inches apart, and in lieu of the usual wiry, weedy specimens you will have thick bushy plants that will produce abundance of large flowers for a long period. A succession may be kept up by later sowings.

Description of M. maritima, the Virginian Stock. White and pink flowered specimens are shown, with the leaves and seed-pods. Fig. 1 is an enlarged section of the flower, showing disposition of the parts. Fig. 2, a seed, natural size, and much enlarged. Fig. 3, a seedling.

ROCKETS

Natural Order CRUCIFERÆ. Genus Hesperis

HESPERIS (Greek, 'esperos, the evening, bestowed because some of the species are only fragrant in the evening). A genus of about twenty
erect, biennial or perennial herbs with branching leafy stems. Leaves alternate. Flowers large, numerous, in terminal or axillary racemes. The sepals erect, side ones enlarged at base; petals clawed; stigma lobes almost erect. Pods roundish, seeds in a single row, valves keeled. Natives of Europe and Western Asia.

_Hesperis matronalis_ has been so long cultivated in gardens that the date of its introduction is not known. Its native countries are known to be in Southern Europe and Russian Asia, and it has been included in the British floras of various authors, but it is now well understood that the specimens occasionally found growing wild are the descendants of garden Rockets. This species was described by an old horticultural writer as "so remarkable for imparting a most fragrant odour, that the ladies were fond of having them in their apartments. Hence derived the name Dame's Violet, and bearing some resemblance to a Stock-gilliflower, were sometimes also called Queen's-gilliflower; but are now most commonly called Rocket." _H. tristis_, the Dull-flowered Rocket, was introduced from Eastern Europe two hundred and sixty years ago. Of _H. grandiflora_, another cultivated species, the native country is unknown. _H. matronalis_ is the species most commonly grown, and even that is more frequently seen in cottage gardens than in large spaces; but it is certainly as deserving of more general cultivation as the Stock.

**Species.**

_Hesperis matronalis_ (matronly). Common Rocket, Dame's Rocket, Dame's Violet. Stems erect, 2 to 3 feet. Leaves oblong, lance-shaped, with long narrow points, and finely-toothed. Flowers \( \frac{3}{4} \) of an inch across, white, lilac, red, purple or variegated, fragrant in the evening, probably because chiefly fertilised by night-flying moths. There are many double and single varieties. Flowers from May to August.

_H. tristis_ (dull). Dull-flowered Rocket, or Night-scented Stock. Stems much branched near the top, 1 to 2 feet high. Radical leaves stalked, upper stalkless; egg-shaped with long points, entire or toothed. Flowers ranging in colour from white or cream to brownish-red or dark purple; May to August. Biennial.

**Cultivation.**

The double forms of _H. matronalis_ are most worthy of recommendation, but the single forms are well worth growing. They will grow almost anywhere, but they prefer a moist sandy loam, that has been well worked, and is in a shady position. The single kinds are most readily increased by seed, which may be sown in March or April in a border of light earth. The seedlings should be thinned out to a couple of inches apart, and when these have become
ROCKET

(HESPERIS MATRONALIS)

Nat. size

PL. 28
nice plants about three inches high they should be transplanted, allowing an interval of six inches between the plants. Here they may remain till late autumn or early spring, when they must be removed to their flowering stations. Very few doubles will be obtained from seed, and in order to maintain and increase our stock of these we must propagate by dividing the root or by taking cuttings. For this purpose plants should be set aside, and before the flower-buds have increased much in size the stem should be cut off near the ground, divided into two or three lengths, the flower-buds picked off, and lengths used as cuttings. The plant thus treated will throw out off-sets all round, and in September the clump so formed may be broken up, and each off-set planted separately. They will flower in the following spring.

Description of Plate 23.

The ordinary form of *H. matronalis* is shown, with the flowers in various stages, and the young seed-vessels. Fig. 1 is an enlargement of a flower, showing the swollen base of the lateral sepals; Fig. 2 is a section of the same, showing arrangement of parts.

CANDYTUFTS

Natural Order Cruciferae. Genus Iberis

Iberis (from Iberia, an ancient name for Spain, and derived in turn from the river Iberus). A genus of about twenty species of smooth, low, branching herbs, frequently with a shrubby base. Leaves entire or cut pinnately, sometimes fleshy. The flowers are borne in racemes or corymbs, but sometimes, by an after development of the stem, the flower-cluster in some species resembles a spike. The sepals are all equal at the base, less erect than in *Hesperis* and other genera. Sepals unequal, the two outer being longer and larger than the inner. Stigma notched. Seed-pod much compressed, the valves keeled or winged, each cell containing but one seed. The species are chiefly natives of the Mediterranean region; one British.

History. Iberis amara, the only native species, has long been known as a garden plant, but it was upon *I. umbellata* that the name Candytuft was originally bestowed. The seeds were brought three hundred years ago from the Island of Crete, at that time better known as Candia, consequently the plant became known as Candy Mustard, afterwards improved into Candytuft. It was more than a hundred and thirty years later when we became acquainted in this country with an evergreen species, by the introduction of *I. sempervirens*
FLOWERS OF GARDEN AND GREENHOUSE

from the same locality; and soon after another perennial, *I. gibraltarica*, was imported. More recent introductions have given a greater variety of species of differing habits and suited for different situations, but the older forms have continued to be the most widely cultivated.

It may be more convenient to separate the annual or biennial from the perennial species. The following are annuals or biennials:

**I. amara** (bitter). Stems erect, ribbed, branched, 6 to 12 inches. Leaves oblong, lance-shaped, stalkless, sparingly toothed. Flowers white or purplish; June. The flower-cluster begins as a corymb, but finishes as a raceme.

**I. ciliata** (ciliated). A biennial, 9 inches high, with very slender entire leaves, fringed with fine hairs at the base. Flowers white; June and July. A native of Italy (1802).

**I. coronaria** (garland-bearing). Rocket Candytuft. A plant of doubtful relationship and origin; probably a form of *I. umbellata*. It is about a foot high, with leathery, lance-shaped, entire leaves, and pure white flowers clustered in long dense racemes at the top of the stems. July.

**I. NANA** (dwarf). About 3 inches high, with fleshy, spoon-shaped, entire leaves, and purple flowers. June and July. A native of France and Italy.

**I. odorata** (perfumed). A foot or more high, with very slender toothed leaves, broader at the top and ciliated at the base. Flowers pure white, sweet scented, in racemes; May to August. Introduced from Crete (1806).

**I. umbellata** (umbelled). Purple Candytuft. This is the most frequently cultivated kind, and grows to a height of about a foot. Leaves narrow, lance-shaped, the lower ones saw-toothed. Flowers variable, white, lilac, crimson or purple, forming terminal umbels. It flowers throughout the spring and summer.

There are several recognised colour varieties to which distinctive names have been attached; var. *carnea*, is pale flesh coloured; *purpurea lilacina* is lilac purple, of dwarf habit; *atro purpurea*, dark crimson; and *nana-purpurea* deep purple, dwarf.

Of the perennial species we may mention the following as specially worthy of cultivation:

**Iberis correæfolia** (Correa-leaved). An evergreen hybrid of garden origin, and one of the finest of this section. Its stems are woody, slender, and bend to the ground. Leaves spoon-shaped, entire, smooth. Flowers large, pure white; at first in close flat corymbs, but afterwards elongated, spike-like; May and June.

**I. gibraltarica** (of Gibraltar). A shrubby, half-hardy species,
GIBRALTAR CANDYTUFT

(IBERIS GIBRALTARICA)

Nat. size

PL. 29
growing to a foot or two feet high, with wedge-shaped leaves toothed near the top. Flowers large, white tinged with lilac, pink or red; early spring. Native of the south of Spain and Morocco. The var. \textit{hybrida} is an improvement upon the type, being of more compact growth, and even more closely covered with blossoms; white tinged with rosy purple.

\textbf{I. Pruiti (Pruit's).} A shrubby species, nearly a foot in height, well covered with dark green spoon-shaped leaves, and bearing compact heads of flowers almost as large as those of \textit{I. gibraltarica}, but pure white. Flowering in May and June. A native of Sicily.

\textbf{I. saxatilis (living among rocks).} Rock Candytuft. Shrubby stems lying along the ground, with very narrow evergreen leaves, and flat corymbs of pure white flowers; spring and summer. Very useful for the rock-garden or border. Introduced from South of Europe (1739).

\textbf{I. sempervirens (evergreen).} Evergreen Candytuft. Stems much branched, shrubby, 9 to 12 inches. Leaves oblong, blunt, narrowed at the base. Flowers pure white in abundant racemes, appearing in May and continuing through the summer. Native of South Europe (1731). This is the most commonly grown of the shrubby kinds, and deservedly popular. There is a var. \textit{garrexiana}, somewhat dwarfer in habit, with smaller white flowers, the racemes gradually lengthening. Also a var. \textit{flore pleno}, dwarf and compact.

\textbf{I. tenoreana (Tenore's).} Stems nearly shrubby at base, ascending; 6 inches. Whole plant hairy. Leaves somewhat fleshy, with rounded teeth; lower ones egg-shaped, narrowing to the base; upper ones much narrower. Flowers in umbels, white at first, changing to purple; May. Native of South-West Europe (1822).

\textbf{Cultivation.} All the species mentioned above are very desirable garden plants, being easy of cultivation, of neat habit and free-bloomers, but they like plenty of sunshine and an open position. The annual sorts come freely from seeds, which should be sown in a light sandy soil in early autumn, if the species selected is a spring bloomer; if a summer bloomer, the seed should not be sown until March or April. They are plants that do not succeed well when transplanted; therefore it is advisable to sow the seed where the plants are to flower and then to thin out the seedlings to not less than six inches apart. Autumn-sown plants endure the winter better if they have been sown on a dry soil, but the spring-sown plants require a moister soil, as well as sunshine. The perennial species may also be grown from seed, but in their case this is not very desirable, for they are so readily propagated by means of cuttings. These should be taken from the young shoots immediately
they are mature, and before the wood has begun to harden. Insert them in sandy soil, either in a frame or under a bell-glass in the open-air, and they will soon send forth roots. It is advisable to leave them where they are until the spring, when they may be planted out into permanent positions in the herbaceous border, or in the very forefront of the shrubbery. Such of the shrubby forms as have a tendency to trail may also be increased by layering. Certain of these—*I. gibraltarica* and *I. saxatilis*, for example—sometimes get untidy from this trailing habit, and must either be pegged down or cut back. *I. gibraltarica* does best on a well-drained rock-garden in light soil, where its struggling propensity is no disadvantage. *I. tenoreana* likewise demands a well-drained soil and a sheltered position, otherwise it will die off in winter. *I. gibraltarica* var. *hybrida* makes a capital bedding plant.

Description of Plants 29 and 30. Plate 29, the branches in their natural sub-erect attitude, the leaves and flowers of the natural size. Fig. 1 is an enlarged drawing of a single blossom, to show more clearly the disparity in the size of the petals, their characteristic direction, and the half-erect attitude of the sepals. Fig. 2 is a section of the enlarged flower, and Fig. 3 is the ovary and style. Plate 30 represents the annual species (A) *I. umbellata* and (B) *I. amara*. The figures of the details are drawn from *I. umbellata*, and depict: (1) a flower from the centre of the corymb; (2) one from the circumference with the larger petals more spreading; (3) a section of the same; (4) the seed-vessel with its horned wings; (5) the same enlarged and opening to discharge the seed; (6) the seed, natural size and enlarged; (7) the seedling. On comparing 4 or 5 with B, considerable difference in the form of the seed-vessel will be seen to exist between the two species.

**MIGNONETTE**

**Natural Order Resedaceae. Genus Reseda**

Reseda (Latin, resedo, to quiet, the plant having formerly been thought to act as a sedative). A genus of about twenty-six alternate-leaved herbs, natives of Europe, Western Asia, and North Africa, including the British species. The flowers are irregular, and the stamens more conspicuous than any other part. The calyx is from four to seven-parted, irregular, remaining attached to the seed-vessel. The petals vary from four to seven, attached beneath the ovary (hypogynous), and are cut up into a number of segments, the upper one with a membranous
(A) PURPLE CANDYTUFT
(IBERIS UMBELLATA)

(B) COMMON CANDYTUFT
(IBERIS AMARA)

Nat. size
PL. 30
expansion on its upper surface. The stamens vary from ten to forty; the carpels, two to six, their edges joined, open at the top, the opening bounded by stigmatic lobes. The disc is broad, dilated at the upper side of the flower into a perpendicular yellowish plate, secreting honey at the back. Seeds numerous, kidney-shaped.

History. Few of the species have any interest as garden plants. Our native Reseda Luteola, or Dyer's Weld, was formerly extensively cultivated as a dye-weed, for it produced a beautiful yellow dye, and from its juice the artist's colour known as Dutch Pink was obtained. R. alba, introduced from South Europe at the end of the sixteenth century, is occasionally seen in cultivation, and has established itself in waste places near our coasts after being turned out of gardens. R. odorata, the fragrant Mignonette, was introduced from Egypt less than a hundred and fifty years ago, but the country of its origin is quite unknown. It is probably the most popular of all garden plants, and the number of gardens in this country in which it is not grown must be an exceedingly small percentage of the whole. Its growth in the South of France for the purpose of supplying winter bouquets to Paris and other large cities has assumed vast proportions, and it is stated that, in the neighbourhood of Nice and Hyères, a little more than two acres of land sown with Mignonette will yield from £400 to £600 per annum.

Species. Reseda Alba (white) grows to a height of 2 feet, and has pinnate glaucous leaves, the leaflets lance-shaped. Flowers, with a five- or six-parted calyx, as many white petals each cut into three filaments, stamens twelve or fourteen, brownish; in dense spikes, May to September. A biennial.

R. Luteola (yellowish). Weld, Dyer's Weed. A striking plant with erect branching stems, 2 or 3 feet high, and narrow, lance-shaped undivided leaves. The flowers are yellowish green, in long spike-like racemes. Flowers June to August. Annual or biennial.

R. Odorata (perfumed). Sweet Mignonette. Stems diffuse, of varying height, clothed with bluntish, lance-shaped leaves, entire or three-lobed. Flowers in long, loose, terminal racemes; calyx, six-parted; petals creamy, finely cut into numerous divisions. Anthers red. June to October, or later. Annual or perennial.

Garden Varieties. Under cultivation R. odorata has produced many varieties, of which we will mention some of the most desirable:

Crimson King, dwarf, pyramidal, with bright red flowers. | Garaway's White, thick long racemes of white flowers.
Giant Pyramidal, plant of pyramidal form, very large racemes of reddish flowers: Miles' Hybrid Spiral, dwarf, branching, racemes dense, a foot long, flowers white.

Golden Queen, dwarf, dense-growing, flowers golden yellow.

Parson's White, long racemes of whitish flowers.

Machet, dwarf, but robust, broad racemes of bright red flowers. Queen Victoria, dwarf, branching, flowers deep red in profusion.

What we have said concerning seed-sowing under the head of Malcolmia applies with equal force to Reseda, and indeed to all annuals: amateurs make the mistake of sowing the seed far too thickly. The huge trusses of bloom one sees on pot-plants of Mignonette in the florists' shops are obtained by giving the roots sufficient room to develop, and so provide the plant with plenty of food. To crowd the plants so closely as is usually done must prevent root-development, and so starve the plant. A hundred years ago, when R. odorata was not so extensively grown in this country, and the seed less plentiful, it was customary to raise it on a hot-bed as a tender annual, and to transplant with a ball of earth round the roots. This plan at least ensured proper space being given to each plant when at last it was planted out in the bed or border. Another error often committed is to grow it in a position too fully exposed to sunshine, which results in a rapid running up to seed and exhaustion of the plants. The seeds should be sown sparingly in April or May, and light soil sifted over them. Even so, they are likely to come up too thickly, and quite early the seedlings must be carefully looked over and thinned out. In June or July another sowing should be made, to ensure autumnal bloom. The soil should be rich and rather heavy, and the situation such that it is shielded from the midday sun. During dry weather the young plants must be watered.

Pot-Culture. R. odorata is much grown in pots for spring-blooming. For this purpose seed of a good sort should be selected, such as Crimson King, Garaway's White, or Machet. Five- or six-inch pots should be filled with a compost of loam, dried cow-manure, old mortar finely broken, and a little soot. Late in August a few seeds should be sown in each pot, covered lightly, watered, stood in a cold frame, and given plenty of air. The seedlings should be thinned out to at least an inch apart, the most robust being left, and a stick inserted for each. During winter they should have a temperature of from fifty to fifty-five degrees, and should not be allowed to get dry, though water must be given with caution until growth becomes more active in the New Year, when a good supply will not hurt the plants. Artificial manure sparingly applied when the flowers begin to appear will tend to
MIGNONETTE
(RESEDA ODORATA)

Nat. size

PL. 31
large trusses. Plants grown on singly in a greenhouse in a mixture of good loam, bone dust, and sand pressed firmly into the pots will form little shrubs in about two years, or they may be grown into little standards. In sub-tropical countries the Mignonette forms a large perennial bush.

Description of Plate 31. A stem and branch of *R. odorata*. Fig. 1 is an enlarged flower; 2, a section of the same showing the ever-open capsule; 3, is the ripe capsule; 4, a seed, natural size, and enlarged; 5, a seedling.

**VIOLETS AND PANSIES**

Natural Order Violaceae. Genus *Viola*

*Viola* (the old Latin name for the flower). A genus of about a hundred species of low herbs and a few shrubs. In most cases the leaves are all radical, but where a stem is present the leaves are alternate; the flowers produced from the axils on one-flowered (occasionally two-flowered) stalks. The sepals, five in number, remaining attached to the seed-vessel, are nearly equal, their bases extended a little beyond their attachment to the receptacle. Petals five, unequal, erect or spreading, the lowest one largest (by the bending over of the tip of the stalk this appears to be the upper petal), spurred at base. Style swollen at the tip; stigma often cup-shaped. Seed-vessel three-valved, elastic. The petals are often suppressed, and the calyx in such flowers remains closed, but the resulting capsules produce good seed. The species are distributed throughout the temperate regions of the globe.

History. Seven species of *Viola* and several sub-species are indigenous to Britain, among them the *Violet, V. odorata*; it therefore appears to be very probable that the Sweet Violet would be among the plants to be found in the first gardens made in this country. Many species of *Viola* have been introduced from abroad, but most of these are of botanical rather than horticultural interest. *V. suavis*, the Russian Violet, however, is commonly cultivated; it was introduced from Tauria nearly eighty years ago. *V. bland*, which is only faintly sweet-scented, came from North America in the first years of the century. Others have been introduced and cultivated on account of their large flowers in spite of their lack of sweet odour. Such a species is *V. cucullata*, from North America (1762). *V. cornuta*, a native of the Pyrenees, introduced a hundred and twenty years ago, has been crossed with the sub-species *lutea* of our native *V. tricolor*, and has produced
the now favourite Bedding Violas. Whether the magnificent Garden Pansies have been produced solely by selection from *V. tricolor*, or whether that species has been crossed with *V. altaica* and *V. rothomagensis*, are open questions. *V. tricolor* had long been grown in gardens, but nothing appears to have been done in the way of improving it until early in the present century, when Lady M. Tennet and her gardener, Mr. Richardson, effected considerable improvement by selection. To-day the varieties are simply innumerable, and they are exceedingly popular, and deservedly so.

Species.

*Viola altaica* (native of the Altaian mountains) has a slender creeping root, and oval leaves with wedge-shaped, toothed stipules. The flowers are large, yellow, with a spur, and appear from March to June. The plant was introduced from Siberia in 1805.

*V. blanda* (alluring) is a North American species (1802), with creeping rootstock and kidney-shaped leaves, covered with delicate down. The flowers are small, white, faintly scented, short spurred; the lateral petals veined with lilac. Flowers in early spring.

*V. calcariata* (spurred) has short, unbranched, tufted stems, and roundish spoon-shaped leaves with rounded teeth; stipules cut into three, or in a palmate manner. Flowers large, purple-violet, spur slender, as long as the petals; the sepals oblong with glandular teeth. March to July. Introduced from Austria nearly one hundred and fifty years ago. There are several varieties: *albiflora*, with large white flowers; *Halleri*, similar to *albiflora*, but with blue flowers; *Zoysii*, with smaller yellow flowers.

*V. cornuta* (horned) is a tufted plant with diffuse, ascending stems, and heart-shaped leaves whose edges have rounded teeth and are finely fringed. The stipules are irregularly heart-shaped, toothed and fringed. Flowers lilac-blue, with long slender spur, and awl-shaped sepals. May to July. The var. *alba* has white flowers. Many forms of this species are in cultivation as bedding plants, and valued on account of the profusion of their blooms, which, though pale, are of a deeper tint than those of *V. calcariata*. Both these species resemble the Pansy in the flatness of their flowers.

*V. cucullata* (hooded), with heart-shaped leaves on long stalks, erect, with blunt teeth. Flowers varying from pale violet-blue (nearly white) to deep purple, with short, thick-spur; on long scapes. Early spring. There is a var. *palmata*, with some of the leaves cut up into from three to seven parts.

*V. odorata* (perfumed). Sweet Violet. Rootstock short, covered with the scars of last year's leaves, and sending off runners. Leaves
PARMA VIOLET

(VIOLA ODORATA—var. parmensis)

Nat. size

PL. 32
broadly heart-shaped, stipules glandular, leaf-stalk covered with hairs pointing downward; leaves enlarging after flowering. Flowers fragrant, with nearly straight, short spur; varying in colour, blue, reddish purple or white. Style hooked, stigma oblique. Flowers from March to May. Several natural varieties occur, of which the white form *alba* is one. In some districts all the wild Sweet Violets are white, those of the usual colour to be seen only in gardens. Var. *permixta* has pale scentless flowers, and the runners do not root; var. *sepincola* is more hairy, has dark scentless flowers, and its runners do root. By some authors these two are regarded as distinct species, but Hooker thinks they are probably hybrids of *V. odorata* and *V. hirta*.

*V. pedata* (footed—the form of leaf) differs greatly in the character of its leaves from the forms usual in the genus. It has a thick creeping rootstock, and leaves divided into six or seven narrow, lance-shaped segments, arranged like the toes of a bird's foot. Some of the segments may be divided at their extremity into three teeth; the others entire. Flowers large, varying in colour, white, pale blue or (usually) bright blue; none of the petals bearded. May and June. A native of North America, introduced nearly one hundred and forty years ago. In addition to the white-flowered form, which is known as var. *alba*, there is the var. *bicolor* with the upper petals of a velvety deep violet and the lower petals blue.

*V. Rothomagensis* (Rouen) is a European species (introduced one hundred and fifteen years ago), to which we have referred as a suspected factor in the evolution of the Garden Pansy. Stems branched, zigzag. Leaves egg-shaped, the lower ones tending to heart shape; with rounded teeth and fringed edges. Flowers bright blue, the lip and lateral petals with black streaks; spur, short, tubular. April to August.

*V. suavis* (sweet). The Russian Violet. With creeping and rooting offsets, broad, heart-shaped downy leaves, and pale blue flowers; lowest petal broader than the others; fragrant. March to May.

*V. tricolor* (three-coloured). Heartsease or Pansy. Stem branched, wavy, angular. Leaves ovate-oblong, with distant, rounded saw-teeth. Petals spreading, longer than sepals, pale yellow or lilac; variable in size. May to September. The sub-species *V. arvensis* has erect white or yellowish petals, shorter than the sepals. Sub-species *V. Curtisii* has a branched rootstock giving off runners. The petals spreading, longer than sepals, blue, purple or yellow. Sub-species *V. lutea* has also a branched rootstock, short stems and underground runners; petals spreading, much longer than the sepals, blue, purple, or yellow.
FLOWERS OF GARDEN AND GREENHOUSE

Garden Violets.

These are very numerous, and are being constantly added to. The following selection includes some of the best:

| **Argentaeflora**, white tinged with purple; small flowers, very fragrant, strong grower. |
| **Belle de Chatenay**, large, pure white, fragrant, double flowers. |
| **Comte Brazza**, a white form of the Neapolitan, double and fragrant. |
| **Czar**, large blue; an albino form is known as **White Czar**. |
| **De Parme**, lavender-purplish, double, free bloomer; suitable for producing cut flowers in frames. |
| **Devoniensis**, deep purple, fragrant. |
| **Double Red**. |
| **Duchess of Edinburgh**, mauve edged with azure; double. |
| **King of Violets**, dark blue, very large and double. |
| **Marie Louise**, large fragrant flowers, lavender-blue with white centre; free bloomer. |
| **Mlle. Bertha Barron**, fragrant, double, indigo-blue flowers; compact and vigorous. |
| **Neapolitan**, double, fragrant flowers, pale lavender with white centre. |
| **Odoratissima**, large, round, fragrant, blue. |
| **Parmensis**, double flowers (see Plate 32), fragrant; leaves small, flower-stalks long. |
| **Queen of Violets**, double, white tinged with rose, large and fragrant. |
| **Russian**, large, blue, free bloomer; leaves small, runners abundant. |
| **Venice**, double, rosette-like mauve flowers. |
| **Victoria Regina**, double, large, blue, fragrant flowers. |

BEDDING VIOLAS.

| **Accushla**, white, with broad purple margin. |
| **Alpha**, bluish purple. |
| **Ardfell Gem**, light yellow. |
| **Beauty**, dwarf, crimson. |
| **Black Douglas**, dark purple. |
| **Blue Bell**, bluish violet, dwarf. |
| **Bluestone**, rich blue. |
| **Brilliant**, rich yellow. |
| **Bullion**, deep yellow. |
| **Canary**, yellow. |
| **Champion**, white. |
| **Colleen Bawn**, large white, purple laced. |
| **Criterion**, violet. |
| **Dickson's Golden Gem**, golden yellow. |
| **Goldfinder**, yellow edged with lilac. |
| **Holyrood**, indigo-blue with darker blotch. |
| **Lord Elcho**, dwarf, deep orange. |
| **Mrs. C. Turner**, purple self. |
| **Paragon**, rich dark blue. |
| **Pilrig Park**, large, pure white, yellow centre. |
| **Rothes**, large, deep yellow, fragrant. |
| **Snowflake**, pure white with yellow centre. |
| **Skylark**, white, blue edged. |
| **Souvenir**, bright mauve, very large, very free. |
| **Vestal**, white. |
| **Tory**, pale indigo. |
| **York and Lancaster**, white, striped with rosy purple. |

Garden Pansies.

These are divided into three groups, Fancy, Show, and Bedding Pansies; the Show section being again divided into classes founded upon the ground colour of the flowers. The Bedding Pansies really run into, and can with difficulty be separated from the Bedding Violas.

FANCY PANSIES.—The full catalogue of these is of great length, and it may be said with truth that all are good and worth growing. The following brief list does not pretend to be more than a guide to a fairly representative selection.

| **Agnes Mabel**, immense flowers with circular purple blotch, laced pinky white; upper petals white and rose. |
| **A. H. Murray**, black blotches laced rosy white; upper petals crimson, pencilled white. |
PANSY
(VIOLA TRICOLOR—*var. maxima*)

\[\frac{2}{3}\] Nat. size
PL. 33
All the species may be readily propagated by seeds, cuttings, or root-division; but the varieties of course must be increased by cuttings or divisions. Sweet Violets should not be placed in a position that is hot and dry. Sandy loam and leaf-mould is
the soil that suits them best, and during hot weather they should receive a mulching with well-rotted short manure, to keep the soil cool and prevent excessive evaporation. The young runners should be nipped off as soon as they appear, unless they are required for propagation; in that case not more than three should be left on a plant, and these should be pegged down. For winter flowering they are grown in frames or pits. These should have a south aspect, and be filled to a depth of half a foot with a mixture of leaf-mould and stable manure. The plants should be put in during the latter half of September, and well-watered; then the frames should be kept closed for a week, after which period the lights should be removed during mild weather and sunshine. Among the best varieties for this treatment are Comte Brazza, Marie Louise, and Neapolitan, all doubles. They will flower from November till April. The best method for the propagation of Pansies and Bedding Violas is to take off the side-shoots from the old plants, with the roots just pushing out. These, taken off late in summer and inserted in a north border, in sandy soil, soon become well-rooted, and may be planted out the same autumn to bloom early in the following season. Should the variety it is desired to increase be one that produces side shoots shyly, recourse must be had to the layering process, or cuttings may be taken from the stems. In August or September the old plants may be taken up, and the division of their roots will give you a larger number of already rooted plants. Provided Pansies are planted in a cool, moist, but well-drained position, they will do well in most soils; but for keeping up a profusion of large blooms, a border should be specially prepared by digging in to a good depth fibrous loam, road-scrapings, and well-rotted cow-manure. The roots, too, should be placed in the ground as deeply as possible without crowding them together; and in the flowering season the surface should be protected by mulchings. Spring planting should be done at the end of February or beginning of March, or the plants will be insufficiently established when the hot weather comes. The popular bedding varieties are increased by means of cuttings taken off in August and September and planted in light sandy soil on the north side of a hedge or wall. They are covered with hand-lights or cloches, and kept close and moist till they are rooted and start into growth.

Description of

V. odorata var. parmensis is shown in Plate 32; Plates 32 and 33. V. tricolor var. maxima in Plate 33. In the latter, which is not intended to represent the enormous Show varieties, an attempt is made to give an idea of the way in which a few colours are variously disposed to produce great variety; 1 is a section, to show structure.
GYPSOPHILA ELEGANS

Nat. size

PL. 34
GYPSOPHILA

The swnollen seed-vessel is shown towards the lower right-hand corner, and nearly below it, at 2, is a seed, of the natural size, and greatly enlarged; 3 is a seedling.

GYPSOPHILA

Natural Order Caryophyllæ. Genus Gypsophila

Gypsophila (Greek, gypsos, chalk or lime, and phileo, to love). A genus of about fifty species of mostly low-growing annual or perennial herbs with small, usually flat, and often glaucous leaves and small flowers. These are white, pink, or red, usually in light diffuse panicles. The calyx is bell-shaped, five-lobed, the petals five, stamens ten, ovary one-celled, with two styles stigmatic on their upper surface. The stems are thickened at the nodes, where the leaves are given off in pairs with their bases connected (connate). This character of stem and leaves belongs to the whole of the Natural Order Caryophyllæ. The species are mostly natives of South Europe and Asia. Few of them are cultivated to any extent, and only in dry borders and on rockeries.

Species.

Gypsophila cerastoides (Cerastium-like) grows to a height of 3½ feet, with erect stems. The leaves are velvety and fringed at the edges; those from the root are spoon-shaped on long stalks, those from the stem egg-shaped. The flowers are white, veined with red, and clustered in corymbs; May. Native of the Himalayas. Perennial.

G. elegans (elegant) is about 2 feet high, with white and pink flowers in extensive panicles, appearing from June to September. Leaves lance-shaped. Introduced from the Crimea (1828). Annual.


G. paniculata (panicled). Stems 2 to 3 feet, forming a light elegant bush. Flowers small, white, numerous in widespread panicles. Leaves narrowly lance-shaped, rough. Flowers June to August. Europe
FLOWERS OF GARDEN AND GREENHOUSE

(1759). Perennial; well suited for cutting for bouquets, and succeeding best when treated as an annual.

G. PROSTRATA (prostrate). A trailing plant about 1 foot high, with pink or red flowers, and narrow glaucous leaves. Flowering from July to September. Native of Central Asia (1759). Perennial.


Cultivation. The lightness of the flower-clusters makes these plants desirable for cut flowers. In flower-beds and borders the same character is valuable as affording a contrast with plants of stiffer and more compact habit. Seed may be sown from April to June, or the perennial species may be increased by cuttings, and division of the old plants. For successful culture, chalk, lime, or old mortar rubbish should be freely incorporated with the soil of a somewhat dry border.

Description of Plate 34. The upper part of a plant of G. elegans, showing the diffuse nature of the panicles. Fig. 1 is an enlarged flower, and Fig. 2 a section of same, giving details of structure.

PINKS AND CARNATIONS

Natural Order Caryophyllaceae. Genus Dianthus

DIANTHUS (Greek, Dios, divine, and anthos, flower—Jove's-flower). A genus of about seventy tufted herbs, mostly with a shrubby base. The leaves are opposite, more or less connate, as in Gypsophila, and of narrow, grass-like shape. The flowers are dichogamous, that is, though they each contain stamens and pistil, they are incapable of self-fertilisation, because one set of these organs does not mature until the other set has passed maturity. In Dianthus the stamens mature first, and the flowers are therefore proterandrous. The calyx is tubular, with five teeth at the top, and overlapping bracts at the base. Petals five, with a long narrow claw concealed within the calyx tube. Stamens ten, of which five ripen at one time and five later. Ovary one-celled, styles two. The species cultivated are mostly hardy perennials. They are distributed throughout Europe, temperate Asia from the Atlantic to Eastern China, North and South Africa, and North-West America.

History. The genus Dianthus includes all those garden plants that go by the name of Pinks, Carnations, Picotees, and Sweet Williams. When it is said that the name Jove's-flowers was
SWEET WILLIAM
(DIANTHUS BARBATUS)

Nat. size

PL. 35
given to them by the old Greek philosopher Theophrastus in the fourth century B.C., it will be understood that their beauties were appreciated at an early date. Four of the species are natives of Britain—D. armeria, the Deptford Pink, D. prolifer, Proliferous Pink, D. deltoides, Maiden Pink, D. caesius, Cheddar Pink; and in addition D. Caryophyllus, the Clove Pink, and D. plumarius, the Wild Pink, have become naturalised on old walls. All these must have had their place in gardens from very early days, and D. Caryophyllus is supposed to have been cultivated in ancient times by the Mussulmans of Africa, and to have been introduced to Europe from Tunis in the thirteenth century. This may be true of a cultivated form of the plant, but in its wild state it is now considered to really be a native of Europe. Gerarde, writing in 1597, was of opinion it had been introduced to Britain from Poland. Until recent times it was known in gardens as the Clove Gillyflower, later as Clove Pink, and the more highly-developed forms as Carnations and Picotees. The beginnings of the Carnation’s history may be obscure, but the results of its cultivation as seen in the magnificent varieties of modern gardens, are wonderful; for not only is the improvement one of size or form, but there is a most remarkable colour development also, with hues that are never seen in the original form. D. sinensis was brought from China by a French missionary named Bignon at the beginning of last century, and has been much improved by cultivation.

Several species are grown occasionally in gardens which have no claim to floral excellence above the general run of the genus, but probably these will in time be more earnestly taken in hand by the horticulturist, and by judicious selection and crossing produce results as fine as those achieved with D. Caryophyllus. We propose to confine our notice of the genus to those species that are very widely and generally cultivated.

Dianthus barbatus (bearded). Sweet William. Stems from 12 to 20 inches high. Leaves lance-shaped, leathery, evergreen. Flowers small, but very numerous, in large dense corymbs. There is enormous variation in colour. Flowers from early summer to autumn. It is said to have been introduced from the Continent in 1575, but probably it was in English gardens at an earlier date than that. It is only during the last seventy years that it has been much improved. The flowers may be white or any shade of red almost to black, and upon such a ground lighter or darker tints are arranged in a circle of dots or streaks. Perennial, but usually treated as a biennial. Among the recognised garden varieties are: Auricula-eyed, each flower with a distinct eye; Dark crimson; Doubles, of various tints; White, with large heads of entirely white flowers.


D. Sinensis or chinensis (Chinese). Chinese Pink, Indian Pink. Stems branched, 6 to 12 inches; leaves lance-shaped, glaucous. Flowers very variable in size and colour; petals toothed, usually some tint of red with darker rings. June to August. Biennial, but usually grown as an annual. There are single and double varieties. Plate 37.

The named sorts of Carnations are now so very numerous that it has been found necessary to divide them into classes, as is done with the Pansies. We can only give a few illustrative names in each group. Bizarres have a clear ground, variously marked with the colour denoting the section, and with other colours in lesser degree.

**SCARLET BIZARRES.**

| Admiral Curzon. | Fred. |
| Alfred Hudson. | Gilbert. |
| Albert Whitham. | Guardsman. |
| Chas. Turner. | Lord Napier. |
| C. H. Herbert. | Mars. |
| Dandy. | Mr. Fawcett. |
| Dr. Wilson. | Robert Lord. |
| Fanny Gardiner. | Tom Brown. |

**PINK AND PURPLE BIZARRES.**

| Falconbridge. | Mrs. Barlow. |
| James Taylor. | Princess Beatrice. |
| Lord Clifton. | T. S. Ware. |

**CRIMSON BIZARRES.**

| A. D. Southgate. | Lord Milton. |
| Black Diamond. | Major Drage. |
| Capt. Preston. | Marguerite. |
| Eccentric Jack. | Rifeeman. |
| J. D. Hextall. | Squire Dodwell. |
| John Cliff. | Thomas Moore. |
| John Simonite. | William Slack. |

**PURPLE FLAKES—**

Pure ground flaked with purple.

| Agricola. | Juno. |
| attraction. | Mayor of Nottingham. |
| Beauty of Woodhouse. | Mrs. Douglas. |
| Earl Stamford. | Squire Whitbourne. |
| Florence Nightingale. | Squire Trone. |
| | Young Meynell. |

**ROSE FLAKES.**

| Crista Galli. | Jessica. |
| Delicate. | Lily Cannell. |
| Dorothy. | Mary. |
CARNATION
(DIANTHUS CARYOPHYLLUS)

Nat. size
PL. 36
<table>
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<th>PINKS AND CARNATIONS</th>
<th>77</th>
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</table>

| Mrs. Byass. | Rose Cannell.  |
| Mrs. Gunn.  | Sybil.         |
| Rachel.     | Thalia.        |
| Robin Hood. | Tim Bobbin.    |
| Rob Roy.    | Tom Wood.      |

**SCARLET FLAKES.**

| Annihilator.  | Matador.  |
| Friar Tuck.   | Robert Cannell. |
| Joe Edwards.  | Sportsman.  |
| John Ball.    | Waterloo.   |
| John Payne.   | Wm. Lang.   |

**SELFs—**

One or more shades of the same colour.

| Albert Turner, purple.                |
| Arcthusa, magenta.                   |
| Bride, pure white.                   |
| Cynthia, bright rose.                |
| Gertrude Teignor, pink.              |
| Gloire de Nancy, pure white.         |
| King of the Yellows, rich sulphur.   |
| Lady Rosebery, fine yellow.          |
| Mary Morris, large, salmon rose.     |
| Vivid, brilliant scarlet.            |
| W. P. Milner, pure white.            |

**TREE CARNATIONS.**

| A. J. Balfour, orange and red.       |
| Alegatiere, bright scarlet.          |
| Boule de Feu, scarlet.               |
| Charles I., rosy fawn.               |
| Dragon, scarlet.                     |
| Duke of York, velvety crimson.       |
| Jean Sisley, yellow, red edged.      |
| Juliette, deep rose.                 |
| Maiden's Blush, blush white.         |
| Mrs. G. Hawtrey, bright yellow.      |
| Mrs. A. Hemsley, rich crimson.       |
| Mrs. Hamlet Riley, pale flesh.       |
| Mrs. F. Mangold, salmon.             |
| Mrs. Moore, pure white.              |
| Oriflamme, salmon, edged red.         |
| Rembrandt, crimson.                  |
| Souvenir de Malmaison, blush white.  |

**BORDER CARNATIONS—**

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| Abigail.          | Cynthia.       |
| Amethyst.         | Duchess of Teck. |
| Ariadne.          | Eurydice.      |
| Captain Cuttle.   | Fedora.        |

**SCARLET.**

| Aline Newman.   |
| Brilliant.      |
| Cantab.         |
| Cardinal.       |
| Danger.         |
| Defiance.       |
| Gaiety.         |
| Horace.         |

| Joe Willett.     |
| Jupiter.         |
| King of Scarlets.|
| Meteor.          |
| Oriflamme.       |
| Sandringham Scarlet. |

**BLUSH.**

| Alba perfecta.   |
| Blushing Bride.  |
| Dot.             |

| Hebe.            |
| Lady Nina Balfour.|
| The Governor.    |

**YELLOW.**

| Annie Ross.      |
| Esmark.          |
| Germania.        |
| Goldfinder.      |
| Lady Edwards.    |
| Leander.         |

| Madame Van Houtte.|
| Monte Christo.   |
| Mrs. Bright.     |
| Mrs. Hooper.     |

**WHITE.**

| Albino.          |
| Annie Lakin.     |
| Avalanche.       |
| Emma Lakin.      |
| Empress.         |
| Gloire de Nancy. |
| Lord Salisbury.  |

| Mrs. Frank Watts.|
| Mrs. Fred.       |
| Mrs. Jack.       |
| Niphetois.       |
| Sensation.       |
| Snowden.         |
| Waverley.        |

**GARDEN PINKS.**

| Ada Louise, rosy purple. |
| Annie Boleyn, pink, dark centre. |
| Ascot, pink.              |
| Attraction, ruby.         |
| Bertram, red.             |
| Carnea, flesh.            |
| Clara, red.               |
| Denise, bright purple.    |
| Emerald, red.             |
| Ernest, ruby.             |
| Eurydice, rosy.           |
| Fimbriata major, white.   |
| Galopin, rosy.            |
| Geo. White.               |
| Hercules, purple.         |
| Her Majesty, white.       |
| Lord Lyons, rosy purple.  |
| Malcolm Dunn, white and maroon. |
Modesty, rosy purple.
Mrs. Lakin, white.
Mrs. Pettifer, white.
Mrs. Sinkins, white.
Newmarket, pink.
Pilrig Park, white, pink, and crimson.
Reliance, red.
Robusta, pink.
Shirley Hibberd, rosy purple.
The Rector, reddish purple.
Snowdon, white.
Volunteer, rosy purple.

Propagation. The type forms of all the species of Dianthus named may be raised from seed, cuttings, or layers, but the named varieties, of course, must be propagated only by cuttings or layers. Sweet Williams are mostly grown from seed, which should be sown as soon as ripe, the seedlings pricked out early, and planted out in the autumn. Thus treated they flower the following summer. Chinese Pinks may be treated in the same way, but they are usually grown as annuals, the seed being sown in the open border in March, and the plants flowering a few months later. Seeds of Garden Pinks and Carnations are sown in pans and germinated in the greenhouse or on a gentle hot-bed. A packet of good mixed seed from one of the best houses will ensure a variety of singles and doubles. Good forms of the latter may thus be obtained, and afterwards multiplied by layers or pipings. It is a good plan to cover the seed-pan with a sheet of glass, as this ensures regular moisture and the conditions favourable to germination. But as soon as the seed-husk has been thrown off, the glass should be removed, or the seedlings will become weak or damp off. A bed should now be prepared for their reception, and should contain a liberal admixture of loam and well-rotted manure. When the seedlings are sufficiently firm, they should be pricked out in this bed and allowed to remain until the autumn. In dry weather they will require water, and late in September, or at the beginning of October, they will be sturdy little plants, and should then be finally placed in the flowering beds or borders, provided these are sufficiently well-drained or of light soil. Where the soil is damp or heavy many plants are lost in winter, and if there is any danger of this happening they must be wintered in cold frames. With choice kinds, even where the situation is favourable, this course should certainly be adopted to avoid risk of loss; advantage being taken of fine weather to give as much air as possible, and taking care not to water too freely, until growth commences again in March.

The most popular method of propagation for Carnations is by layering. This process is carried out in summer—about the end of July—and consists in pegging down the shoots, and covering a portion with soil. By this treatment roots are induced at the part pegged down, and when these are sufficiently developed the new plant thus formed is separated from the old and transplanted. First of all, the surroundings
CHINESE PINK
(DIANTHUS SINENSIS)
- Nat. size
PL. 37
of the plant selected for the operation are prepared by loosening the surface and adding to it a couple of inches of a special compost consisting of equal parts of leaf-mould, sand, and loam. This mixture is specially favourable to the emission and development of roots. Now suitable shoots should be selected, and where the new wood joins the old the leaves should be detached, for this is the point to be operated upon. With a sharp knife make a clean cut half through the shoot, from the under side, commencing a little below the joint, then running along the centre of the wood, upwards, and through the joint. In the slit thus made a splinter of wood or a morsel of clay should be placed to prevent contact and probable healing of the cut surfaces; for the success of the operation it is essential the cut should remain open. It should now be pegged down to the special compost, covered with the same to the depth of an inch, and watered. This operation requires care, as the shoots easily break off. Thereafter the compost must not be allowed to get dry; and in about a month the tongue will be found to be well furnished with roots. Pot-plants may be treated in similar fashion, but they must be turned out of doors until well-rooted. There should be no haste in separating new plants thus formed; better to leave them a few weeks longer than is necessary, rather than move them a few days before the proper time.

Another method is by means of pipings (cuttings), and this is the way in which Pinks are chiefly propagated. With some specimens of Carnation from which it is desired to obtain a good number of young plants, there will not be sufficient room to make many layers. In such a case layering may be supplemented by pipings; and where accident causes broken shoots or stems the detached portions may be utilised for pipings. They should be cut on the slant through a joint, and inserted one inch apart, in several inches of light sandy soil on a gentle hot-bed. The soil should be pressed firmly round them, and well watered; then the lights must be put on, and kept close and shaded until the roots are formed, when air should be admitted in gradually increasing quantities.

Hybridising.

The genus Dianthus is a very suitable one for the amateur to experiment upon in the way of hybrids, for not only will the different cultivated forms of one species—as the Carnation—cross-fertilise, but good seed may be obtained by fertilising, say, Sweet William with pollen from the Carnation, or either with that of the Chinese Pink. In attempting hybridisation, regard should be paid to the suggestions made on page 25 in this connection; the principles involved are the same in each case.
For outdoor gardening the principal species of *Dianthus* described are almost invaluable, and some very fine effects could be obtained from a border filled with these alone. *Dianthus sinensis* and its var. *Heddewigi* grown in masses produce very rich colour effects. *D. barbatus* looks well in clumps of about a dozen plants at distances of five inches apart. *D. plumarius* spreads in all directions from the centre, and should be planted a foot apart, and *D. caryophyllus* a foot or a foot and a half apart. The small-growing species are grown on rockeries, or even on old walls where a little soil can be supplied. Planted at the edge of a large stone, the stems soon spread over it, and in time form a thick covering. In such a position the plants are healthier, and flower with greater profusion than when grown on a flat border. Such species as *D. callizonus*, *D. alpinus*, and *D. glacialis* should always be grown in a sunny position on the rockery. The flowering stems of Carnations are very long, and careful staking and tying are necessary to keep them neat and obtain the full value of their flowers. Much labour will be saved in this respect if wire supports are used. They may be purchased ready-made, or may be easily prepared at home from lengths of galvanised iron wire of sufficient thickness to prevent bending under the weight of the flowering stem. They are fashioned in this wise: a length of thirty inches is coiled in a loose spiral round a rake-handle and then slipped off. By fixing this upright in the ground beside the flowering stem, and twining the latter once round, it will be retained erect without stiffness, and without being tied, whilst the wire support will be practically invisible. Where large blossoms are desired the buds must be thinned out before they attain any size. A rich loamy soil suits both Pinks and Carnations, but it should not be stiff; if so, it should be lightened by well-working in leaf-mould and sharp sand. Tree Carnations may be grown in pots either in the greenhouse or out of doors. If the latter, it is well to take them up at the end of September, and pot them; keeping them in a shady place outside for a week or so, and then removing them to a cool greenhouse or to the house-windows, where they can be kept through the winter at a temperature of 50° or a little over.

**Description of Plates.**

- **Plate 35.** *D. barbatus*, or Sweet William, giving characters of upper leaves and flowers. The three varieties illustrated show the general arrangement of the tints, but these vary to a very great extent. Fig. 1 is a flower separated from the cluster, and showing the long slender bracts at the base of the calyx; 2 is a section through the same.
- **Plate 36.** *D. Caryophyllus*, or Carnation, with a few examples of
PINK
(DIANTHUS PLUMARIUS)

3/4 Nat. size
PL. 38
colour-disposition. Fig. 1 is the natural form of the flower as found naturalised on old walls occasionally. Fig. 2 is a section.

Plate 37. D. sinensis, or Chinese Pink. The same general form is observable, but the limb of the petal is more round and full. Fig. 1, a section through flower; 2, a seed, natural size and enlarged; 3, a seedling.

Plate 38. D. plumarius, or Common Pink. Those figured may be regarded as typical forms, upon which gardeners have made many and considerable improvements. Fig. 1, section through flower.

CATCH-FLIES

Natural Order Caryophylleæ. Genus Silene

Silene (from Greek, sialon, saliva, in allusion to the stickiness of certain species). A large genus of annual and perennial herbs having many of the characters of Dianthus. They have the sepals joined into a tubular calyx, more or less inflated, with five teeth and ten nerves. The petals are five in number, each with a long narrow claw; the blade with two scales at its base, which produce a crown-like effect at the mouth of the tube in some species. Stamens ten; ovary one- to three-celled; styles usually three, occasionally two or five. There are about eight hundred known species, distributed over the north temperate zone, of which number, eight are natives of Britain.

History.

The species of Silene at present found in our gardens do not appear to have a long horticultural record, unless such belongs to S. Armeria and S. nutans. S. Armeria, a Continental species, appears to have been in our gardens for so long a period that the date of its introduction is not recorded; in fact, it is regarded in the old gardening books as though it were a native. Even so recently as in Loudon's Hortus Britannicus, it is described as a plant of British cornfields. It was formerly called Sweetwilliam, and the monkish Latin name Armeria given to it, a name that also does duty to distinguish a genus of plants. S. muscipula was introduced from Spain three hundred years ago, but is not now a well-known garden plant. Similar remarks apply to S. fruticosa, from Sicily (1629), and S. viridiflora, from Spain (1739), which were among the few species formerly grown in gardens, but do not appear to be cultivated now. A hundred and twenty years ago the list of Silenes cultivated consisted of seven kinds, i.e. those already named, with the addition of S. quinquevulnera (a var. of S. gallica) and S. bupleuroides, of which Loudon fixes the date of introduction
from Persia twenty-three years later. We shall here mention only those species that are chiefly grown in our gardens to-day.

**Species.**

*SILENE ACAULIS* (stemless). Moss Campion, or Cushion Pink. A densely-tufted, moss-like perennial, about 2 inches high, with closely-set bright green awl-shaped leaves, and solitary pink flowers, \( \frac{1}{2} \) inch in diameter. Petals and scales notched. Flowers June to August. There is a white-flowered form (var. *alba*). It occurs wild on British alpine rocks.

*S. ARMERIA* (Sweetwilliam). Lobel's Catchfly. An annual with branching stem, 12 to 18 inches high, and lance-shaped leaves. Flowers in panicles, with long club-shaped calyx, petals pink with long scales; July to September.

*S. ATOCION* (Atocion-like). An annual with branched downy stems (6 to 12 inches) and broad, egg-shaped leaves; the lower stalked, the upper stalkless. Flowers in erect panicles. Calyx long, club-shaped; petals heart-shaped, pink. June and July. Introduced from the Levant (1781).

*S. COMPACTA* (compact). Similar to *S. Armeria*, but larger, prettier, and more leafy; yet less hardy. A smooth, glaucous annual or biennial, with erect, branching stems (18 inches) and dense corymbs of pink flowers. A native of Asia Minor (introduced 1823). This must not be confounded with the var. *compacta* of *S. pendula*. See below.

*S. ELIZABETHI* (Elizabeth's). A dwarf perennial with tufted, more or less erect stems (9 inches), covered with sticky down. Leaves lance-shaped, sticky. Flowers large (1½ inch across), in terminal panicles. Calyx with purple margins; petals rosy. July. A native of the Tyrol (introduced 1863).

*S. MARITIMA* (maritime). A native perennial with a fleshy rootstock and many spreading stems. The leaves are long, egg-shaped or oblong lance-shaped, glaucous. Flowers white, an inch across; two to four in a cluster; petals cleft, with white scales at the base of the limb; calyx much inflated, bladder-like, with strongly marked network of nerves. April to August. There is a double var. *flore pleno*, in cultivation.

*S. ORNATA* (adorned). A strong-growing downy annual or biennial with erect, branched stems, 2 feet high, and blunt lance-shaped leaves. Flowers in panicles; the calyx cylindrical, striped and veined; petals dark purple, two-cleft, with broad lobes. May to September. A greenhouse plant, introduced from South Africa a hundred and twenty years ago.

*S. PENDULA* (flowers hanging down). A downy annual about 1 foot high, with branched trailing stems and oval lance-shaped leaves. The rosy-purple, white, or flesh-coloured flowers are produced solitarily from
CATCHFLY
(SILENE ARMERIA)

Nat. size
PL. 39
the axils of the leaves. The calyx is somewhat inflated and ribbed; the petals notched, with the usual scales. Flowers May to August. A native of the Mediterranean region (introduced in 1731). There is a var. compacta—the S. compacta of most gardeners—of very dwarf habit, only 2 or 3 inches high, but forming dense cushions a foot in diameter, well covered with pink blossoms. A favourite spring-bedder.

S. pusilla (small). A charming little rock-plant, about a couple of inches high, introduced less than ten years ago. The white flowers (¼ inch diameter) are so freely produced on short slender stalks that they nearly hide the foliage. Perennial.

S. Schafta. A neat little perennial about half a foot in height, with a number of erect, unbranched stems. Leaves egg-shaped with acute points. Flowers purple, solitary or in twos; the calyx club-shaped; petals wedge-shaped, toothed. June to October. A native of the Caucasus (introduced about fifty years ago).

Cultivation. Silenes are plants that all may grow, for they are accommodating in the matter of soil, but light loamy ground suits them best. The dwarf kinds noted above are suitable for the rockery, or for the front of the border. The annuals must be grown from seeds, the perennials from seeds, cuttings, or division of the old plants. Those that bloom in spring or early summer should be sown out of doors between July and September; the seedlings pricked out and transplanted before winter, or as early as possible in spring. Or if the seed is held over the winter and sown in March or April, the plants will flower in July and August. A deeply-dug and well-drained border in a sunny position will produce the best results with these plants.

Description of Plates. Plate 39 represents S. Armeria of the natural size, together with an enlargement of the flower (1); a section of the same (2); a single petal (3), showing the horn-like scales; the seed (4); and a seedling (5).

Plate 40 shows S. pendula; with an enlarged section (1), the seed (2), and seedling (3).

CAMPIONS

Natural Order Caryophylleæ. Genus Lychnis

Lychnis (Greek, luchnos, a lamp). A genus of about thirty herbs, similar to Silene, the chief difference consisting of the possession of five styles by Lychnis, whilst in Silene they are usually three in number. The petals are notched in a similar manner, and have a simple or two-
cleft scale at the base of the blade. Natives of the north temperate zone; six British.

The species of *Lychnis* are familiarly known as Campions. They have been in gardens for a long period. *L. chalcedonica*, from Russia, and *L. coronaria*, from South Europe, were introduced three hundred years ago, and these with our native species have formed the principal representatives of the genus under cultivation. To these were added *L. pyrenaica*, from the Pyrenees, in 1819; the popular *L. fulgens*, from Siberia, three years later; and *L. Lagasca*, from Spain, about thirty years ago. *L. Haageana*, from Japan, was until recently thought to be a garden hybrid between *L. fulgens* and *L. Sieboldi*. Cultivation and selection have produced varieties of most of our native species.

**Principal Species.**

*Lychnis alpina* (alpine) has a branching rootstock and tufts of slender lance-shaped radical leaves, from the centre of which rise the flowering stems (4 to 8 inches). The rosy flowers are about ¼ an inch across, on short footstalks, and disposed in compact cymes. June and July. Native perennial.

*L. chalcedonica* (like chalcedony). A favourite perennial, 2 to 3½ feet high, with lance-shaped, hairy leaves and dense clusters of bright scarlet flowers; calyx club-shaped, ribbed. Flowers throughout summer. There are several varieties, single and double, red and white.

*L. coronaria* (crowned). A silvery-haired perennial, about 3 feet high, with tough, thick, woolly, lance-shaped leaves, and large rose or purplish flowers—sometimes white—on long footstalks. Calyx strongly ribbed; petals entire. Flowers June and July. Plate 42. There are several varieties; one with double purple flowers. *L. hybrida* is said to be a hybrid between *L. coronaria* and *L. Flos-jovis*; it has its flowers—usually crimson or scarlet—in dense heads.

*L. diurna* (day-flowering). Red Campion, Bachelor's Buttons. A native perennial of damp hedgebanks, with erect, soft hairy stems, 2 or 3 feet high, and rosy flowers in loose cymes. Calyx reddish; petals cleft into two lobes, with lance-shaped scales. Flowers April to September. Although a common weed in some districts, it lends itself to cultivation, and there is a large double-flowered var. *rubra*.

*L. Flos-cuculi* (cuckoo-flower). Ragged Robin. A pretty native perennial weed of moist meadows and bogs, with slender stems and nodding rosy flowers in loose cymes. Calyx purple veined; petals divided into four long and slender segments. May and June. There is a double-flowered variety.

*L. fulgens* (shining). A perennial with hairy stems about a foot
DROOPING CATCHFLY
(SILENE PENDULA)

Nat. size

PL. 40
CAMPIONS

high, hairy lance-shaped leaves, woolly calyx, and brilliant scarlet velvety petals. These are cleft into two broad lobes, each having on its outer edge an awl-shaped filament. The flowers are clustered in erect corymbs, and appear in spring and summer. There are varieties with orange, salmon, and white flowers. Plate 41.

*L. haageana* (Haage's). With shaggy stems, 2 feet high, and large, hairy, lance-shaped leaves. The handsome flowers are 2 inches across, brilliant scarlet, pink, orange-red, salmon, or white. The calyx is angular and shaggy; the petals similar to those of *L. fulgens*, but fuller.

*L. Lagasca* (Lagasca's). A tufted dwarf perennial, about 3 inches high, with oblong, somewhat leathery leaves. The bright rosy flowers are an inch across, with white centres. April to July. A suitable plant for a sunny place on the rockery.

*L. pyrenaica* (Pyrenean). A fit companion to the last-mentioned for the rock-garden. It is somewhat taller, with smaller flowers (¼ inch). The radical leaves are spoon-shaped; those of the stem heart-shaped; glaucous. The flowers are on long footstalks, in clusters; calyx bell-shaped; petals notched, flesh-coloured; summer.

*L. vespertina* (evening flowering). White Campion. This is a native plant very similar to *L. diurna*, with which it was amalgamated by Linnaeus under the name of *L. dioica*. The calyx is greenish, with long teeth; the petals white, opening in the evening, when it becomes fragrant. It flowers from June to September, and is frequent in fields and hedgerows. It is the double form that is mostly cultivated.

*L. Viscaria* (sticky). German Catchfly. Another perennial native, though very local in this country. Its stems are from 6 to 12 inches high, stout, sticky at the joints. Leaves narrow, lance-shaped. Flowers almost stalkless, in few-flowered cymes, densely panicked. Calyx purple, with short teeth; petals rosy purple, notched, with short scales. Flowers June to August. The best varieties are *pallida* and *splendens flore pleno*.

**Cultivation.**

All the species described are desirable garden plants, as they bloom freely for a long period, and are easily cultivated in ordinary garden soil. A light sandy loam enriched with well-rotted manure will give the best results. The taller species are very suitable for the shrubbery border; the dwarf kinds for the rockery and alpine garden.

Propagation is easily effected by division of the roots in spring; or by seed sown in March or April on a border of light soil. The seedlings will be up in a fortnight or three weeks. They should be pricked out in a nursery bed, in June, and planted out where required to flower, in October or March. The double kinds may be increased by cuttings made from the stems before they flower. Three or four joints should be
allowed to each cutting, and of these, when inserted, only one joint should be above ground. Put them in so that a batch may be covered with a hand-glass, and keep moist. They will be strong plants in autumn, when they should be planted out.

**Description of Plates.** Plate 41 exhibits the upper portion of *L. fulgens* with some of its colour-variations; fig. 1 being a section of the flower.

Plate 42 shows a similar portion of *L. coronaria*, slightly reduced in size, with the white-flowered form. Fig. 1, a seedling; 2, a section through flower; 3, the seed-capsule with the mouth split into five strong teeth; 4, a section through the same, showing the stalked seeds; 5, a seed of the natural size, and the same enormously enlarged, to show form and sculpture.

Among other plants of the Order Caryophylleæ cultivated in gardens we may briefly mention the genera *Saponaria* and *Cerastium*.

*Saponaria* (Latin, *sapo*, soap; a decoction of the plant having formerly been used as soap). A genus of annuals and perennials differing from *Silene* and *Lychnis*, chiefly in having only two styles. There are about thirty species distributed over Southern Europe and temperate Asia. The best known of these are *S. calabrica*, a hardy annual, from Calabria (1830), with erect, fork-branched stems (6 to 12 inches), and beautiful rosy flowers, produced solitary from the axils. It flowers in August. *S. caespitosa* and *S. lutea* are dwarf species from 3 to 6 inches high; the former with rosy, the latter with yellow flowers. They are perennials, bloom from June to August, and are very suitable for rockwork; so also is *S. ocyoides*, the Rock Soapwort, with red or pink flowers in bundles. This species is a trailer of perennial duration, and blooms from May to August. *S. officinalis*, the Common Soapwort, or Bouncing Bet, is a Continental plant that has been naturalised in this country for centuries. It has a straight stem from 1 to 3 feet in height, and large white or lilac flowers (1 inch diameter). There are several varieties, including a double form; one of these, var. *hybrida*, has all the petals joined. The cultivation of all these species is unaccompanied by difficulty, and they may be treated as directed for *Lychnis*.

*Cerastium* (Greek, *keras*, a horn, from the form of the seed-vessels). A genus of about forty downy herbs, with small leaves and white flowers. Eight of the species are native weeds, not suited for horticultural purposes. That most frequently grown is *C. tomentosum*, a very downy evergreen, introduced from the Continent about two hundred and fifty years ago, and largely used for edgings to beds and borders. It
CAMPION

(LYCHNIS FULGENS)

Nat. size

PL. 41
is about 6 inches in height, and flowers in early summer. *C. Biebersteinii*, from Asia Minor (1820), is similar to the last, but its leaves are less silvery. *C. grandiflorum* is of similar stature, with larger flowers in conspicuous clusters; but it is not evergreen. It is strong-growing and requires plenty of room. They are all of easy culture, being suited by ordinary garden soil, and readily propagated by division of the roots, or by cuttings taken in late summer, after the flowering period. It will be found that where the stems of the growing plant come in contact with the soil they readily root, and these may be advantageously used as rooted cuttings. They also come readily from seed.

**PURSLANES**

Natural Order *Portulaceae*. Genus *Portulaca*

*Portulaca* (a modification of Pliny's name—*Porcilaca*—for these plants). A genus comprising about sixteen species of widely distributed fleshy herbs with alternate, or irregularly opposite leaves, often with tufts of bristles in their axils. The upper leaves form a kind of involucre to the ephemeral flowers, which are purple, rosy, or yellow. They only open in direct morning sunshine, and then close finally. There are two sepals, four or five petals, and many stamens. Ovary of three united carpels with several stigmas. The species are chiefly natives of South America and South Africa, inhabiting dry, parched places. *P. oleracea* is naturalised in most of the warm parts of the world.

The history of *Portulaca* as a garden plant begins with *P. oleracea*, which was cultivated as a pot-herb in very ancient days, and consequently got well distributed over the tropics and the temperate regions. We introduced it from Southern Europe in 1582 as a culinary plant, but it appears to be little used now in this country, though the young shoots may occasionally be encountered in the salad bowl. In Holland it is still cultivated extensively for this purpose, and for pickling. Several species and varieties have been introduced at different periods, but those now cultivated for the sake of their brilliant flowers have come to us within the present century. Of these, *P. foliosa* came from Guinea in 1822; *P. Gilliesii* from Mendoza in 1827, and in the same year the subject of our illustration (Plate 43) from Brazil. This species, *P. grandiflora*, is the one now chiefly grown, and it has produced several good varieties in cultivation, all having the brilliant characters of the type.
PORTULACA FOLIOSA (leafy) is a half-hardy annual, about 6 inches high, with awl-shaped leaves and yellow flowers. Calyx hairy, and involucre many-leaved. Flowers June.

P. GILLIESII (Gillies'). Stems branching from the base, somewhat erect, 6 inches; leaves cylindrical with flattened sides, blunt tips, and bunches of hairs in the axils. Flowers red or purple, at the ends of the branches, usually solitary; June and July.

P. GRANDIFLORA (large flowered). Sun Plant. Stems fleshy, at first reclining then more erect, 6 inches high, with short branches, each terminating in three or four flower-buds. Leaves somewhat cylindrical, flattened. Flowers about $1\frac{1}{2}$ inch across, of the most brilliant tints of yellow, orange, red, purple, and white; June to August. Involucre of many leaves. A rather tender perennial, but best grown as a half-hardy annual. The var. thellusoni has scarlet flowers with white centre, and taller stems; var. splendens has purple or crimson flowers.


Cultivation. The sunniest, driest spot in the garden is the proper situation for the species of Portulaca. They prefer a light, porous soil, but unless in full sunlight they will not open their flowers. In such soil and situation as we have indicated, the large size and brilliance of their flowers, combined with their lowly habit, render them valuable plants for edging to beds or borders. The double varieties must be treated as perennials and propagated by cuttings. These readily root, but require to be housed in heat during the winter. The single forms should be grown as half-hardy annuals, sowing the seed in a sunny border in May, or on a hot-bed early in April. It is best to make the May sowing a permanent one, leaving the plants, after thinning out, to flower where they germinated. The April sowing, of course, will need transplanting, and this should be done as soon as the seedlings have several leaves. They are useful for furnishing beds containing spring flowering bulbous plants which are left in the ground all summer. The seeds of the Portulacas should be sown as soon as the bulbs have gone to rest. P. grandiflora makes a charming pot-plant. When grown in the greenhouse great care must be taken to keep the pots fairly dry; they should have a high and light position.

Description of Plate 43. Three separate pieces of P. grandiflora are shown, each with flowers of different colour. Fig. 1 is a section; 2, the seed, natural size and greatly enlarged; and 3, the seedling soon after its first appearance.
ROSE CAMPION

(LYCHNIS CORONARIA)

$\frac{3}{4}$ Nat. size

PL. 42
CALANDRINIAS

Natural Order Portulaceae. Genus Calandrinia

Calandrinia (named by Humboldt and Bonpland in honour of J. L. Calandrini, a botanist of Geneva). A genus of about sixty species of smooth fleshy plants with many of the characters of Portulaca, but differing in respect of the two sepals, which are not united at their base, and which are persistent, wrapping round the seed-vessel after the petals have fallen. The petals are from three to five in number, usually five; attached like the stamens below the ovary. In Portulaca these spring from the sides of the ovary. The style ends in a three-branched stigma; and the fruit is one-celled, splitting into three valves when ripe. They are natives of Australia and America. But few of the species described have been introduced as living plants, and still fewer are cultivated. These are all of recent introduction, that is to say, within the present century, and there is nothing of special interest in their garden history. Like Portulaca, they require bright sunshine to encourage them to open their flowers, so that they are unsuitable for places that have not a sunny aspect.

Species.

Calandrinia discolor (two-coloured). Stems, 12 to 18 inches. Leaves oblong or lance-shaped, glaucous, mostly from the root, green above, purplish beneath. The flowers are large (1½ inch diameter) with broad rosy-purple petals, and numerous bright orange stamens. The two sepals are broad, concave, spotted with black. The flowers, which appear in July and August, are combined in a loose raceme. The species is a native of Chili, whence it was introduced little more than sixty years ago.

C. grandiflora (large flowered) closely resembles C. discolor, but the flowers, in spite of the name, are slightly smaller, and of a darker hue. The stems are partly shrubby, and about a foot in height; and the leaves are fleshy, rhomboid, more tapering at each end, and green on both sides. Flowers June to August. Native of Chili (introduced seventy years ago).

C. Menziesii (Menzies') has much-branched, prostrate stems, about 9 inches high, with spoon-shaped leaves, and deep purple-crimson solitary flowers, nearly an inch across, produced chiefly from the axils. It flowers from June to September, and is a native of California (1831).

C. nitida (shining). A neat little tufted species, 6 inches high and
the tufts as broad. Leaves similar to those of C. Menziesii, smooth. Flowers 2 inches in diameter, rosy, in leafy many-flowered racemes; June to August. A native of Chili (introduced 1837).

C. UMBELLATA (umbelled) is also a tufted form. Its stems (6 inches) are shrubby, and well-clothed with long slender leaves with fringed edges. The flowers are carmine with a tinge of violet, the yellow anthers showing conspicuously in the centre; they are associated in cymes at the extremity of the stems, several of them producing the appearance of an umbel. Flowers June to September. Introduced from Peru seventy years ago. Plate 44.

Cultivation. Of the species described, some are annuals, others perennials, in their native country; but owing to the difficulty of keeping them through our winters it is customary to treat them as half-hardy annuals. An exception to this treatment may be made in the case of C. umbellata, which, though really a perennial, is generally grown as an annual, but may be treated as a biennial. In some districts on a dry, well-drained soil it endures our winters; and where this hardiness is considered probable it will be wise to give it a trial as a perennial, or at least as a biennial. For this purpose the seed should be sown in a frame in May or June, and transplanted when sufficiently large. The other species which are to be treated as annuals do not often succeed when transplanted, and these should be sown where they are to flower. They require a light sandy soil and a sunny aspect; and in such a situation the seed should be sown thinly in May, the young plants being thinned out to allow for the prostrate growth in the case of certain of the species indicated.

Description of C. umbellata is here shown of the natural size. Plate 44. The section of flower (Fig. 1) should be compared with the similar figure of Portulaca grandiflora (Plate 43), as showing at a glance the principal differences between the genera. Fig. 2 is the ripe seed-capsule, invested by the persistent sepals, and splitting into three valves to liberate the seeds.

ST. JOHN'S WORTS

Natural Order HYPERICINEÆ. Genus Hypericum

HYPERICUM (the old Greek name used by Dioscorides, but of obscure derivation). A genus comprising about one hundred and sixty species of herbs, shrubs, and small trees, popularly known as St. John's Worts.
Purslane

(Portulaca Grandiflora)

3/4 Nat. size

PL. 43
The leaves are opposite, stalkless, often dotted with raised glands or with pellucid glands looking like pinholes when the leaf is held up to the light. Almost without exception the flowers are yellow, and consist of five sepals, five petals, ovary of three, four, or five carpels and as many styles; stamens, a large but indefinite number, combined in several bundles by being connected at their base. The species are distributed throughout the temperate regions of the world, and eleven of them are indigenous to Britain.

History.

St. John's Wort, in addition to its real or supposed medicinal qualities, had long been an important ingredient in Midsummer Eve spells and incantations, and in warding off the evil powers of witches and warlocks! It is probable, therefore, that our native species—notably Hypericum Androsænum—were the first to be cultivated, and not alone for their floral beauty, but for their reputed supernatural powers. H. calycinum, a native of the Orient, has been naturalised in Britain for a long period, and H. Coris and H. hircinum were introduced to our gardens more than two hundred and fifty years ago. H. hookerianum (formerly oblongifolium), however, is the most ancient introduction of which we have record; it was brought from Nepal as far back as 1523. Many others have been introduced at different periods—as H. olympicum from Cyprus in 1706, H. balearicum from Majorca in 1714, H. kalmianum from North America, 1759, H. elegans from Siberia, 1817, and others during the present century—but very few of them are found frequently in cultivation. We shall therefore name only a few of the most desirable kinds.

Species.

Hypericum Androsænum (man's blood—colour of juice). Tutsan, Sweet Amber. Stems shrubby, erect, four-angled, 2 feet. Leaves oval or oblong, with close minute glands. Flowers about ⅛ inch in diameter, clustered in corymbose cymes. Sepals glandular, petals oblique, styles three, curving outward. Flowers June to August. Native.

H. calycinum (large calyxed). Rose of Sharon, Aaron's Beard. Stems shrubby, 1 to 2 feet, four-angled, rising from an extensively creeping rootstock. Leaves leathery, oblong, 2 to 4 inches long, pitted with large, scattered, pellucid glands; nearly evergreen. Flowers 3 to 4 inches, terminal and solitary; July to September. Plate 45.

H. elegans (elegant). Stem erect, 1 foot, winged and dotted with black glands. Leaves oval, lance-shaped, with pellucid dots. Flowers in racemes; June to August.

H. hookerianum (Hooker's). A half-hardy evergreen shrub, with round stems, 2 feet high; crowded with lance-shaped leaves, which are
dotted thickly with pellucid glands, and the edges turned back slightly. Flowers large and few; June to August.

H. **patulum** (spreading). Stems herbaceous, round, purplish, 6 feet high. Leaves lance-shaped, with edges rolled back; not dotted with glands; tapering to the base. Flowers in corymbs, June to August. Native of India and China (introduced 1823). *H. moserianum*, a hybrid of garden origin obtained by crossing *H. patulum* and *H. calycinum*, is one of the most beautiful of dwarf summer-flowering shrubs. There is a variety of it called *tricolor*, with small leaves coloured white and rose.

H. **perforatum** (perforated). Stems erect, 3 feet, slender, branched, two-ridged, brown. Leaves narrow oblong, 1 inch, with pellucid veins and glands. Flowers, 1 inch, in many-flowered corymbose cymes. Sepals with black glandular lines or dots; persistent. Petals also marked with black glands. July to September. Native.

**Cultivation.**

With the exception of *H. hookerianum*, all the species mentioned are quite hardy, and will succeed in ordinary garden soil, if not very poor and light. Sandy loam is the soil that appears to suit them best. *H. calycinum* does well in the shade of trees, and is often planted as a cover for game. They produce great quantities of seeds, and may either be propagated by this means—the seed being sown in the borders in autumn—by cuttings, which readily root, or in the case of those with a creeping rootstock, by cutting this up and allowing a stem to each portion. These last quickly establish themselves and grow freely. The operation should be performed early in spring. *H. moserianum* should be planted in a large bed in a conspicuous place on a lawn. It is not hardy in the North of England. *H. patulum* is almost as effective. *H. sinensis* is a useful plant to grow in pots for the greenhouse.

*Description of Plate 45.*

*H. calycinum* is the species represented, with leaves, bud, and flower. Fig. 1 is a section of the essential organs only.

**CAMELLIAS**

Natural Order **Ternstræmiaceæ. Genus Camellia**

Camellia (after Father Kamel, a Jesuit missionary and traveller of the seventeenth century). A small genus of shrubs and trees which includes the Tea plant. They have thick, leathery leaves, and generally large handsome flowers which exhibit no very sharp division between sepals and petals. The sepals are usually five or six, but there is a gradual
CALANDRINIA UMBELLATA

Nat. size

PL. 44
transition from bracts to sepals and from sepals to petals. The petals agree in number with the sepals, and cohere slightly at their base; stamens numerous. They are hardy, or nearly hardy, evergreens, natives of China, Japan, Borneo, and India.

**History.**

The cultivation of the Camellia in this country dates back to less than one hundred and sixty years. It is said that the first plants were introduced in 1739 by Lord Petre—natural single red forms of *C. japonica* as shown in Plate 46. More than half a century passed before the introduction of the double white and double striped from China, and soon after that the double red came. Early in the present century *C. sasanqua* was introduced from China; *C. oleifera* in 1819, *C. reticulata* in 1824. These are the principal garden species. They are usually treated as greenhouse plants, but some of the forms of *C. japonica* can endure the outdoor climate of the South-West of England in fairly sheltered positions. It is interesting to learn that the first two plants of *C. japonica* introduced were sold for a considerable sum of money, and, as seemed fitting for such expensive things, they were taken great care of, by being placed in a hothouse. Here probably their roots got dry—the principal danger in growing Camellias—and they died. Some years later, James Gordon, a nurseryman, attempted to grow a plant in the cooler, moister air of an orangery, and succeeded not only in flowering it, but also in propagating it.

**Species.**

*Camellia euryoides* (Eurya-like). A shrub about 4 feet high, with hairy branches, lance-shaped leaves which are silky beneath, and toothed. The white flowers are borne on scaly stalks, and appear from May to July. A native of China (introduced 1822).

*C. japonica* (Japanese). The Common Camellia. Stems, 20 feet; leaves, egg-shaped with long narrow points, and toothed edges, leathery, varnished. The flowers are produced in the axils of the leaves, stalkless, and are variously coloured, white, red, blush, flesh, yellow, streaked, etc.; they appear from October to July. This is the parent of the multitudinous forms of Garden Camellias raised in Europe, chiefly in Belgium and France. A large number have also been introduced from China and Japan.

*C. drupifera* (bearing fruit like cherries). Stems, 4 feet; leaves lance-shaped, with long points; flowers small, white, fragrant, May to July. Seeds yield a medicinal oil. Native of East Himalaya.

*C. oleifera* (oil-bearing). Stems, 6 feet; leaves elliptic-oblong; flowers solitary, white, numerous, and fragrant, May to July. Native of China.
C. reticulata (net-veined). Stems, 10 feet; leaves oblong, with veins forming a network pattern, flat. Flowers large, rosy, semi-double (also a form with fully double flowers); April to June. Native of China.

C. sasanqua (Japanese name). Stems, 4 feet; leaves ovate-lance-shaped; flowers small, white, scentless; February to November. Native of China and Japan (introduced 1811).

C. theifera (Tea-bearing). Tea shrub. Stems, 2 to 6 feet; leaves narrow-oblong, saw-toothed; flowers, axillary, white, drooping; sepals and petals five, spreading; November to May. Native country uncertain, but probably India, whence introduced to China and Japan. The Chinese plant, now called var. chinensis, differs from the Indian plant, or type, in having narrower, more pointed and thicker leaves.

The list of Garden Camellias is now so long, that a short selection is the most serviceable to those amateurs who can grow but a few plants. The names we give are among the best.

**Whites.**

*Alba plena*, double.
*Candidissima*, imbricated.
*Fimbriata alba*, outer petals notched.
*Mathotiana alba*, large, imbricated.
*Montironi."
*Myrtifolia alba."
*Unica."

**Whites, flaked or striped.**

*Bonomiana*, flaked and striped carmine.
*Countess of Orkney*, striped carmine.
*Jenny Lind*, striped and marbled rose.
*Jubilee*, marbled rose.
*Madame A. Verschaffelt*, shaded blush, dotted red.
*Mrs. Cope*, striped crimson.

**Crimsons and Reds.**

*Archiduchesse Marie*, bright red, banded white.
*Augustina superba*, clear rose.
*Chandleri elegans*, light rose, large.
*Comte de Gomer*, soft rose, crimson striped.
*Donnelaevii*, rich crimson, marbled white.
*Imbricata*, deep carmine.
*Mathotiana*, brilliant red, very fine.
*Princess Bacciocchi*, rich carmine.
*Rubens*, deep rose, striped white.
*Thomas Moore*, very large, rich carmine.

**Culture.**

In the South of England, the Camellia may be grown in the shrubbery border, provided the soil is not too light and dry, and the position not too hot. A northern aspect is the best, and if against a north wall, all the better. For Camellia-growing out of doors the ordinary soil of the border should be removed to a depth of two feet, and the space filled with a compost of peat, loam, and cow-manure, with a little silver sand and leaf-mould. In severe winters the plants may need a little protection, and this may be secured by sticking in a few branches of fir around them. They must never be allowed to suffer from drought, and after flowering, they should be liberally supplied with manure-water. But the Camellia succeeds most when grown in pots—or if the plants are large, in tubs—in the greenhouse or
ROSE OF SHARON
(HYPERICUM CALYCNUM)

2/3 Nat. size
PL. 45
TREE MALLOWS

They should be potted in a compost of peat, loam, and leaf-mould, with a little silver sand added; and should be placed near the glass. During their growing period they should be kept at a temperature of from 55° to 60° Fahr., frequently syringed, given plenty of water, and air whenever the outside temperature will permit. Dryness of the roots causes the buds to drop—the chief difficulty of the amateur Camellia-grower. The plants should not be crowded together; and should "scale" appear, it must be picked off at once. When the buds are well-formed the plants should be gradually removed to a cold house or pit, first moving them from the glass to the back of the greenhouse. At the end of May they may be removed to a cool but sheltered position out of doors, and watered alternately with clean water and weak manure-water. In October, move back into the greenhouse, where they will flower during the winter; after which they may be repotted if necessary.

Propagation.
Camellias are usually increased by layering or cuttings; the rarer kinds by grafting and inarching. The single red is also propagated from seed, and the resulting plants used as stocks whereon to graft the doubles. For cuttings, the new shoots that are thoroughly ripened should be taken off in August, and dibbled in pans of the peat, loam, and sand compost, then placed in a cold frame and shaded from strong sunshine. There kept until spring, they should be moved into gentle heat as soon as they begin to grow, and in the autumn following they will be ready for potting. Grafting and inarching are effected early in spring.

Description of Plate 46. The branch figured is from the natural plant of C. japonica as found wild in its native country. Fig. 1 is a section through the flower showing the several parts, the petals cohering at the base, etc.

T R E E  M A L L O W S

Natural Order Malvaceae. Genus Lavatera

LAVATERA (named in honour of the brothers Lavater, Swiss physicians and naturalists). A genus of about eighteen tall herbs or shrubs, one of which is British. The leaves are angled or lobed, hairy or cottony. The calyx is five-lobed, and below it there are three little bracts, joined at their base to form an outer calyx (epicalyx). There are five petals, and the numerous stamens have the greater portion of their filaments combined to form a tube, surrounding the styles, and to which the petals are joined. The styles are thread-like, stigmatic on their inner surface. Natives
chiefly of the Mediterranean region, one Australian, and two indigenous to the Canaries.

*Lavatera arborea* being found wild on our coasts where there are rocky cliffs, we may suppose that it got transplanted to neighbouring cottage gardens, where we constantly find it. In some districts the converse of this is true: the plants growing wild on the cliffs are really escapes from the cottage gardens. But we may feel sure that *L. arborea* was the first member of the genus to be cultivated in our gardens. Of the exotic species, *L. Olbia* came first, having been introduced from South Europe three and a quarter centuries ago; *L. trimestris* reached us from the same quarter in 1633. Others followed at later dates, but those mentioned are the most important from a horticultural point of view, and practically the only ones at all widely-grown to-day.

**LAVATERA ARBOREA** (tree-like). The Tree-Mallow.

Species.

Downy; stems, 3 to 6 feet, stout and erect. Lower leaves with five to nine short broad lobes and long stalks; upper more entire; edges round-toothed. Flowers purple, glossy, 2 inches diameter; July to Sept. Biennial. The garden var. *variegata* has strikingly mottled leaves.

*L. Olbia* (rich). Stem shrubby, rough, 6 feet. Leaves woolly; lower five-lobed, upper three-lobed. Flowers, reddish purple, solitary; June to October.

*L. trimestris* (three-monthly). Spanish Lavatera. Stem herbaceous, rough, 3 to 6 feet; leaves heart-shaped, somewhat smooth. Flowers rosy; June to August. Hardy annual (Plate 47).

For cultivation see remarks on *Malope* below.

**MALOPES**

Natural Order *Malvaceae*. Genus *Malope*

*Malope* (Greek, *mallos*, woolly). A genus containing two or three species in many respects similar to *Lavatera*, with entire or three-lobed leaves, and large showy violet or rosy flowers. The three bracts of the epicalyx are heart-shaped and distinct throughout, not coherent as in *Lavatera*.

Species.

*Malope malacoides* (Mallow-like). Stems prostrate, branching, hairy; plant 1 foot high. Leaves oblong egg-shaped with rounded teeth, or deeply cut lobes, on footstalks. Flowers large, axillary, rosy pink with purple tinge; June. A South European biennial (introduced 1710).
CAMELLIA
(CAMELLIA JAPONICA)

\( \frac{2}{3} \) Nat. size

PL. 46
M. trifida (thrice-cleft). Stem erect, 3 feet, with small, slightly three-lobed leaves and rosy-purple or white flowers. July to September. The plant usually grown in gardens is the var. grandiflora, taller, more robust, and with larger flowers (Plate 47). There is also a var. alba. An annual, native of Spain and North Africa, introduced 1808.

Culture. The species of Malope and Lavatera will succeed in any ordinary garden soil, but they will do best where that soil is of a sandy nature, and in a sunny position. Seeds may be sown in the open border in April or May and the young plants thinned out to ten inches apart. Their proper station is at the back of the border, where they make a good background for smaller subjects.

Description of M. trifida, var. grandiflora, is shown at B. A represents Lavatera trimestris, and the figures of details also relate to this species. 1 shows the cohesion of the filaments to form the staminal tube; 2, a section of the flower after removal of the petals; 4, the seed, natural size and enlarged; 5, a seedling. Fig. 3 is the seed of Malope.

ROSE MALLOWS

Natural Order Malvaceae. Genus Hibiscus

Hibiscus (hibiskos, the old Greek name for the Marsh Mallow). A genus of about a hundred and fifty showy herbs, shrubs or trees, chiefly natives of the tropics. Its characters are in the main similar to those of the allied genera Lavatera and Malope, but the staminal tube does not bear anthers fully to the upper extremity, the style is five-branched, and the epicalyx consists of many bracts, rarely so few as four or five. The fruit is five-celled with more than one seed in each cell.

History. The cultivation of Hibiscus in our gardens extends back for fully three hundred years, and appears to have begun with H. syriacus, introduced from Syria, and H. trionum, from Italy. Nearly a century later (1690) H. mutabilis came from the East Indies; and among other of the numerous species cultivated to-day, H. rosa-sinensis was introduced from the East Indies in 1731, the var. palustris of H. roseus from North America in 1759, and its var. militaris in 1804. H. coccineus came from Carolina about a hundred and twenty years ago, H. elatus from Jamaica in 1790 and H. marmoratus from Mexico in 1854. Some of the species were imported, not alone or chiefly on account of their showy flowers, but because of some medicinal or commercial use. Thus from the inner bark of H. elatus and others, "Cuba-bast" is
FLOWERS OF GARDEN AND GREENHOUSE

obtained; a kind of Jute is prepared from *H. cannabinus*, and this species, as well as others, is used as a pot-herb. Chinese ladies dye their hair by rubbing it with the bruised flowers of *H. rosa-sinensis*, and in Java these flowers are used for blacking shoes!

**Species.**

**Hibiscus coccineus** (scarlet). A greenhouse perennial, from 4 to 8 feet high; the long-stalked leaves of five lance-shaped, toothed lobes. Flowers brilliant scarlet; July and August.

**H. rosa-sinensis** (China Rose). Stem tree-like, 10 to 20 feet. Leaves oval, smooth, coarsely toothed towards smaller end; persistent. Flowers large, 4 inches or more in diameter; variable in colour,—white, yellow, brilliant red, purple or variegated,—single, or more or less double. Summer. A warm greenhouse perennial requiring heat for its successful treatment. There are several varieties in cultivation; among them—

*Brilliantissimum*, with spreading crimson flowers, 5 or 6 inches in diameter.  
*Calleri*, with flowers of a buff yellow deepening to red at the centre.  
*Cooperi*, with scarlet flowers and variegated leaves of greens, crimsons, and white.  
*Fulgidus*, flowers carmine with deeper centre, 5 inches across.  

**H. roseus** (rosy). Stem herbaceous, about 3 feet high; leaves oval-lance-shaped, lower ones heart-shaped at base, cottony beneath. Flowers, 4 inches diameter, rose-coloured; August to October; hardy perennial. Plate 48. The var.—

*Militoris* has stems from 2 to 4 feet high; heart-shaped leaves, tending to be three-lobed, toothed, downy beneath; flowers rosy; June to August.

**H. schizopetalus** (cut-petaled). Flowers drooping, bright orange; edges of petals deeply cut; style projecting far beyond mouth of flower. A hothouse perennial; native of Zanzibar (introduced 1881).

**H. splendidens** (shining). Stems, 12 to 20 feet high, shrubby and cottony, branches prickly. Leaves very large, heart-shaped, or with three or five lance-shaped lobes. Flowers very large, rosy; May. Native of Australia (introduced 1828). Greenhouse shrub.

**H. syriacus** (Syrian). Stems, 6 feet. Leaves wedge-shaped, three-lobed, toothed. Flowers large, single or double, and varying in colour from white to red and purple, appearing in August and September. It is a hardy deciduous shrub, with many varieties catalogued by the nurserymen, and more highly esteemed than the type. Often known in gardens as *Althaea frutex*.

**H. trionum** (ploughing oxen). Bladder Ketmia. Stems hairy, 2 feet high, with linear-lobed, heart-shaped leaves, and purple-centred
(A) SPANISH LAVATERA  (B) LARGE-FLOWERED MALOPE

(LAVATERA TRIMESTRIS)    (MALOPE TRIFIDA — var. grandiflora)

Nat. size

PL. 47
ABUTILONS

yellow flowers; June to August. Calyx swells into a bladder-like covering to the fruit. Hardy annual.

Culture.

The species of Hibiscus have a liking for a soil that is sandy, but they are not hard to please. Many of them, as already indicated, require greenhouse protection, and even stove treatment. Such is the case with H. rosa-sinensis and its beautiful varieties. H. trionum, on the other hand, is a perfectly hardy annual, and may be raised from seed sown in the open border in March or April. Cuttings of the perennial kinds should be taken in spring, and should be struck in a close frame. Those requiring hothouse treatment may be grown either in pots or in the hothouse border; the compost most suitable for them being a mixture of equal parts peat and fibrous loam, with a little charcoal added. If H. rosa-sinensis or its varieties should be treated in this way, the plants will flower through the winter; but if kept dry and in a restful condition during winter, they may be utilised for beds outside during the summer. For this purpose they should be potted, and at the beginning of June, or later, according to the prevailing temperature, the pots may be plunged in the beds, and removed to winter quarters again at the end of September or beginning of October. H. syriacus is a handsome, hardy shrub, which prefers a light rich soil and a sunny position; it is propagated by cuttings inserted in autumn.

Description of Plates 48 and 49. The upper part of a branch of H. roseus is shown in Plate 48 reduced by one-third from the natural size. The epicalyx, so characteristic of the genus, is clearly represented in several of the figures. Fig. 1 is a section through the flower after the petals have been removed. The staminal tube with its spreading anthers is seen to be somewhat similar to those of Lavatera and Malope. Plate 49 represents H. rosa-sinensis, reduced by one-fourth. The section shows the great length of the staminal tube, which bears anthers only towards the extremity, so that when the petals are expanded this portion extends far beyond the mouth of the flower.

ABUTILONS

-Natural Order Malvaceæ. Genus Abutilon

Abutilon (an Arabic name for a species of Mallow). A genus of about seventy shrubby and herbaceous plants, with similar flowers to those of Hibiscus, but wanting the epicalyx. The staminal tube bears stalked
anthers to its very tip, and in the petals there is a nearer approach to a claw. Ovary of five carpels inseparably adhering by their edges, but opening at the top. Natives of the warmer regions of the globe.

History.

The name *Abutilon* was formerly bestowed upon a section of the genus *Sida*, but on the discovery during the present century of several American species the genus was revised, and certain species were separated under the name *Abutilon*. To these others have been added in recent years, but very few of the species are of interest to gardeners, the forms generally grown and so deservedly popular being hybrids of garden origin. The objection chiefly made to the natural species is that they do not bloom freely enough for garden purposes; but in this respect the hybrids are quite satisfactory. The history of *Abutilon* as a garden plant may almost be said to have begun with the introduction of *A. striatum* from Brazil in 1837, though several others might occasionally have been found in greenhouses at an earlier date. *A. vitifolium* was introduced from Chili in the same year, and *A. insigne* from Colombia in 1851. *A. megapotamicum* came from the Rio Grande in 1864 and *A. Darwini* from Brazil in 1871. These with *A. venosum* practically complete the list of the natural forms recently grown in gardens, but even these are mostly obsolete now, except as stocks with which to experiment in cross-fertilisation and the raising of improved hybrid forms. Of these there are now a very large number catalogued by the florists, and every year sees considerable additions to the list.

We give the characters only of those original species that are still of garden-interest as the parents of the popular hybrids, and we would say on their behalf that they do not deserve to be let fall into utter neglect.

**Abutilon Darwini** (Darwin’s). One of the parents of many of the popular garden hybrids. Stems about 4 feet, with large broad leaves. Flowers cup-shaped, bright orange veined with a deeper tint; April.

**A. insigne** (remarkable). Stem covered with short hairs; about 6 feet high. Leaves large, heart-shaped, wrinkled. Flowers large, produced from the axils, in hanging racemes; petals broad with edges turned back, purple-crimson with darker veining; winter. Sometimes called *A. igneum*.

**A. megapotamicum** (from the big river). Stem, 3 feet, with small pointed leaves, and small drooping flowers. These are very freely produced, of a fine bell-shape, and of handsome appearance owing to the colour-contrasts: the sepals dark red, petals pale yellow, and the stamens dark brown. Flowering in autumn and winter.
HIBISCUS ROSEUS

\[\frac{2}{3} \text{ Nat. size}\]

PL. 46
A. striatum (channelled). Stems of great length, twining round rafters of cool greenhouse or conservatory. Leaves large, three- to seven-lobed, wrinkled, on long footstalks. Flowers on long, curved footstalks; petals dull orange, veined with thick streaks of deep blood-red. Blooms continuously.

A. venosum (veined). Stems about 10 feet, with large, palmately lobed, vine-like leaves. Flowers solitary, bell-shaped, 3 inches long, orange veined with crimson, similar to those of striatum, but much larger; footstalks a foot long. Flowering in July.

A. vitifolium (vine-leaved). Stems about 30 feet high. Leaves heart-shaped, with five to seven palmate lobes. Flowers large, bluish white; May.

The following selection includes some of the best of the garden varieties—mostly hybrids:

Anna Crozy, dwarf, deep pink with white veins.
Aureum globosum, deep orange, shaded with red.
Boule de Niece, pure white.
Brilliant, dwarf, bright red, paler outside.
Calypso, large, pure white.
Canary Bird, tall, primrose.
Caprivi, large, deep red.
Clochette, dwarf, deep rose-pink, crimson veined.
Couronne d’Or, bright yellow.
Crismom Banner, dwarf, rich crimson.
Darvini majus, bright orange.
Darvini tessolatum, foliage mottled green and yellow.
Emperor, large, claret-crimson.
Fire King, bright orange-red, crimson veined.
Grandiflorum, large, orange-red, red veined.
Igneum, variegated foliage.
King of the Roses, dwarf, deep rose.
Lady of the Lake, rosy pink.
Lustrous, dwarf, large, brilliant crimson.
Miss L. Powell, dwarf, yellow.
No Plus Ultra, intense crimson.
Premier, large, rosy purple.
Prince of Orange, orange.
Princess Marie, rich rose-lake.
Purity, pure white.
Purpurea, purple-lake.
Queen of the Yellows, large, lemon yellow.
Rosaformum, salmon-rose, veined crimson.
Royal Scarlet, rich scarlet.
Scarlet Gem, dwarf, brilliant scarlet.
Sellowianum marmoratum, leaves mottled yellow and green.
Seraph, dwarf, white.
Thompsoni, leaves blotched with yellow.
Violet Queen, bright violet-purple.
Wissmann, orange-buff, crimson veined.
Yellow Prince, rich golden yellow.

Culture.

The treatment required for Abutilons is practically the same as for Fuchsias. A. vitifolium and A. striatum are almost hardy in sheltered places in South-West England and in Ireland, but they need protection from frost. They may be grown as wall-plants in mild situations where they can be covered in winter. All of the species and varieties described are satisfied with greenhouse protection in the winter, and in early summer they may be turned outside for bedding purposes, for which they are greatly esteemed. A. megapotamium is hardy in the South of England if planted against a south wall
where it flowers freely until winter. The most suitable compost for them consists of equal parts of peat, loam, and leaf-mould, with the addition of a little sharp sand. They require abundant water when growing, but the drainage of pots must be perfect or they will quickly suffer. They need little water in winter if the house is cool. Should they be required to flower at this period, they must be placed in a warm house. They may be trained either as standards, bushes, or pillar-plants. When trained along the rafters of a conservatory, where the pendulous blossoms can hang freely, they become very ornamental. Cuttings should be taken from the young hard wood either in early autumn or early spring, inserted in pans of the compost recommended, and placed in the greenhouse or frame; September is the best period. Seeds may be sown in pans as soon as ripe. The shoots of most species require to be freely pinched back, which causes them to break more luxuriantly into flower.

The Abutilon figured is a hybrid of garden origin, the result of a cross union between A. venosum and A. striatum. Fig. 1 is a section illustrating the structure of the parts as explained in giving the characters of the genus.

HOLLYHOCKS

Natural Order Malvaceae. Genus Althaea

Althaea (Greek, 'althoe, to heal: some of the species having been used medicinally). A genus consisting of a dozen species of hairy or woolly herbs with lobed or divided, alternate leaves. The flowers are produced solitarily from the axils or in terminal racemes. Attached to the calyx is an epicalyx divided into from six to nine lobes, though the calyx itself is but five-parted. The staminal tube is long, the filaments distinct at its summit. The ovary many-celled, the styles thread-like, their inner surfaces stigmatic. The species are distributed throughout the warm and temperate regions of the earth.

With the exception of Althaea rosea, the Hollyhock, the genus can scarcely be said to be known in flower gardens. A. officinalis, the well-known Marsh Mallow, has long been esteemed in domestic medicine, a demulcent drink being prepared from its roots. This and A. hirsuta are natives of this country, but they are not commonly cultivated. A. rosea was introduced from China more than three hundred and twenty years ago. A. cannabina came from
SHOE FLOWER
(HIBISCUS ROSA-SINENSIS)

$\frac{3}{4}$ Nat. size

PL. 49
South Europe just upon three centuries since, and *A. ficifolia*, the Antwerp Hollyhock, from Siberia in the same year. *A. narbonensis* is another South European species introduced to this country in 1780. In the endeavour to improve *A. rosea* the other species appear to have been forgotten; but we are of opinion that several of these would repay a little care bestowed upon them, just as *A. rosea* has done. The double varieties of this produce magnificent blossoms, that would perhaps be more highly esteemed if they occurred singly, their individual beauty being to some extent lost in the closely-packed spike-like raceme.

**Species.**

*Althaea cannabina* (hemp-like). Stems, 5 or 6 feet; leaves compound, of coarsely-toothed, narrow lobes, and downy. Flowers rosy, in axillary racemes; June. Perennial.

*A. caribèa* (Caribbean). Stems bristly, 3 feet. Leaves roundish-heart-shaped, lobed, and toothed. Flowers solitary, almost stalkless, rose-coloured with yellow centre; March. A biennial, introduced from the Caribbees in 1816.

*A. ficifolia* (fig-leaved). The Antwerp Hollyhock. Stems, 6 feet; leaves with seven oblong, irregularly-toothed lobes. Flowers large, axillary, yellow or orange; June. Biennial. There is a form with double flowers.


*A. officinalis* (of the shops). Marsh Mallow. Stem, 2 to 3 feet. Leaves shortly stalked, of varied form: heart-shaped or nearly round, entire or three- to five-lobed, toothed, softly downy. Flowers in axillary cymes, of a delicate rosy tint, 2 inches across corolla; July to September. Perennial.

*A. rosea* (rose). Hollyhock. Stem straight and hairy, 6 to 8 feet. Leaves rough, heart-shaped, with five to seven angles, and rounded teeth. Flowers axillary, almost stalkless, rosy or purple; July. Perennial, but usually treated as a biennial. Plate 51.

**Varieties.**

The natural single form of *A. rosea* has been all but superseded in cultivation by the more popular double forms, exhibiting an extensive series of gradations in colour from pure white through yellows and rosy reds to violet and purple of the deepest shades. It is of little practical value to give a list of named varieties, for though large numbers have been raised by selection and hybridising, their culture and even existence has been seriously threatened by the appearance, within the last quarter of a century, of a parasitical fungus (*Puccinia malleacearum*), which has ruined many splendid collections, and taken away much of the popularity of the plant, because
of its uncertainty. Plants raised from seed appear to have more power
to resist the attack of the disease than those propagated by cuttings or
divisions. A large proportion of the seedlings raised from seeds saved
from double-flowered varieties will be single flowered.

The seed may be sown as soon as ripe either in pans or
gentle bottom heat, or in the open air. The seedlings will
require winter protection, and as soon as they are large enough for
removal from the seed-pans they should be potted separately in three-inch
pots, and removed to a cold frame or house. Or the seed may be held
over until the beginning of April, and sown in a seed-bed previously
prepared by deep trenching and manuring. The seed should be sown
thinly to allow plenty of room to the young plants, which will be ready
in June for removal to a nursery bed, where they should be planted,
each half a foot clear of its nearest neighbours. In autumn they may be
placed where intended to flower in the beds or borders. Here they must
have plenty of room, for experience shows that the disease causes far
greater havoc where the plants are grown closely together. Three or
four feet should be allowed between the plants; and stakes for tying
should be inserted when they are about a foot in height, two stakes
being allowed for each plant. Of the choice double varieties only two
stems should be allowed to grow; they should be tied at intervals to the
stake as they grow, to prevent any injury from the wind. Where they
are likely to experience heavy frosts, it is better to remove the young
plants in autumn to cold frames, planting them out about the middle of
April, after previously hardening by gradual removal of the lights.
Protect during cold nights until well established, and see that they have
plenty of water during the time they are making growth, as much of
the success in flowering will depend upon this. At this period also they
will be greatly benefited by a top-dressing of well-rotted manure.

Cuttings are prepared from the young shoots taken from near the
rootstock at almost any time; a fact that may be taken advantage of to
maintain a succession of bloom, for those cuttings that were established
early will bloom in July, whilst those taken later will flower as late as
November. A similar difference will be observed between autumn-sown
and spring-sown seedlings. Cuttings are placed singly in small pots of
sandy soil, and kept in a close frame until rooted. The rootstock may
be divided after the flowering period. The single-flowered varieties are
practically disease-proof. They are much more ornamental in the border
than the double-flowered forms. They are perennial, ripen seeds freely,
grow to a height of 8 feet, each clump producing about a dozen stems,
every one of which flowers profusely.
HYBRID ABUTILON

(ABUTILON VENOSO X STRIATUM)

$\frac{1}{3}$ Nat. size

PL. 50
Several colour varieties of *A. rosea* are here shown, about half the natural size. The leaves figured are only the small ones from near the summit of the flowering stems. Fig. 1 is the staminal tube, removed from the flower, the stigmas showing above it. Fig. 2 is a single seed, and Fig. 3 a seedling.

Among other plants of the Order Malvaceae grown in gardens, brief reference may be made to the genus *Callirhoe*, of which several members admit of easy cultivation in rich sandy loam. *C. pedata*, an erect, branching annual with pedately-lobed leaves, and flowers 3 inches across, cherry-colour with white centre, appearing in August. *C. involucrata* is of more straggling habit, with lobed heart-shaped leaves, and light-centred purple flowers, 2 inches in diameter; a summer-blooming perennial.

**FLAX**

**Natural Order Linaceae. Genus Linum**

*Linum* (Greek, *linon*, flax, thread, fishing-line, etc.; such articles being made from the fibres of these plants). A genus of about eighty species of herbs or small shrubs, characterised by their narrow, entire, usually alternate leaves, and five-parted flowers. The sepals are quite entire; the petals distinct or joined below, falling away early. Ovary five-celled, styles five. The species are distributed over the temperate and warm regions of the earth.

**History.**

The story of the cultivation of *Linum* is so exceedingly ancient that no one knows its beginning. Linen cloth, flax threads, and the stone spindles for spinning it are found in the Swiss Lake-Dwellings of the Stone Age, where there is no sign of the use of cereals having yet commenced. The cloth used by the Egyptians at a very early period for embalming their dead was of coarse linen, and the word *linon* was used by the Greeks for a number of articles, including sails and fishing-nets, which were evidently woven from flax-fibres. And yet, we believe, *Linum usitatissimum*, which has been so long cultivated to provide flax, is not known to occur truly wild anywhere. Three species are natives of Britain—*L. catharticum*, *L. perenne*, and *L. angustifolium*; other species occasionally found in gardens, or deserving a place there, are of comparatively recent introduction. *L. alpinum* was brought from Austria in 1739, *L. arboreum* from Crete in 1788, *L. flavum* from Austria in 1793; but *L. grandiflorum*, the only one
that is widely grown for ornamental purposes, was not seen here until seventy-six years ago, when it was introduced from Algeria.

**Principal Species.**

**Linum alpinum** (alpine). A dwarf perennial, about 6 inches high, with awl-shaped leaves, covered with pellucid dots. Flowers few, large, blue; July and August.

**L. angustifolium** (slender-leaved). Stems many, 1 foot high. Leaves narrow, lance-shaped. Flowers pale lilac-blue; May to September. Annual or perennial.

**L. arboreum** (tree-like). A dwarf shrub, about 1 foot high, with wedge-shaped, recurved leaves. Flowers few, yellow, large and handsome; May and June. Rather tender, requiring a sunny position, with slight winter protection.


**L. grandiflorum** (large flowered). Stems slender, erect, 6 to 18 inches. Leaves slender, lance-shaped. Flowers, 1 inch in diameter, crimson, with dark radiating streaks at the base of the petals, borne in panicles; June to August. Hardy annual. Plate 52.

**L. perenne** (perennial). Stems nearly erect, 12 to 18 inches, wiry and slender. Leaves very slender, smooth. Flowers bright blue, 1 inch diameter; June and July.

**L. usitatissimum** (most-used). Common Flax. Stems erect, smooth, branched above, 18 inches high. Leaves lance-shaped, upper very slender. Flowers large, blue, in corymbose panicles; June and July. Hardy annual.

**Cultivation.**

Most of the above-mentioned species are very free bloomers, whether annuals or perennials; and with the two exceptions mentioned, are sufficiently hardy to make their cultivation easy. Even in these cases the only protection needed is the shelter of a bush or two in the hardest part of the winter. Linums like a well-drained sandy soil, and if to this is added a little peat or leaf-mould, they enjoy it the more. The dwarfer forms make good subjects for the rock-garden. Seeds may be sown out of doors in April, or in the case of the annual species, such as *L. grandiflorum*, in March, where they are to flower, thinning out the seedlings to a distance of six inches apart. The perennial species may also be propagated by means of cuttings, taken from the hardened young growths in summer, and struck under glass in the shade.

Under the names of *L. trigynum* and *L. tetracygnun* two useful
HOLLYHOCK
(ALTHÆA ROSEA)

1/2 Nat. size

PL. 51
stove or warm greenhouse plants are cultivated in gardens. They are now removed to the genus *Reinwardtia*. They form compact shrubs a foot high, and bear numerous bright yellow bell-shaped flowers 2 inches across.

The showy *L. grandiflorum* is shown of the natural size. Fig. 1 is an enlarged section of the flower; 2, the seed, natural size and enlarged; 3, a seedling.

**GERANIUMS**

**Natural Order Geraniaceae. Genus Geranium**

*Geranium* (Greek, *geranos*, a crane, from the form of the fruit). Crane’s-bill. A genus of about one hundred species, chiefly herbs with swollen joints—a few shrubs. Leaves usually cut or lobed, with stipules. Flowers regular, of five sepals, five petals, stamens ten, disc of five glands, ovary five-celled, style with five stigmas. The stamens are in two sets of five, one set maturing before the other. The five one-seeded carpels of the fruit have long tails by which they are attached to the style. Each carpel and tail is thus said to resemble the head and bill of the crane. The species are distributed throughout the temperate regions of the world.

**History.** There are no less than eleven species of *Geranium* indigenous to Britain, some of which have insignificant flowers or a weedy habit, which renders them undesirable as garden plants; but most or all have pretty foliage. Several of the larger-flowered natives may be found in modern gardens, and doubtless they were more in evidence in our borders before we were acquainted with so many exotic plants. *Geranium macrorhizon* was introduced from Eastern Europe three hundred and twenty years ago, and *G. tuberosum* from the Mediterranean region twenty years later. *G. striatum*, which is frequently found growing almost wild in plantations, came from Italy in 1629; *G. argenteum* from the Alps in 1699, *G. maculatum* from North America thirty-three years later, *G. anemonasfolium* from Madeira in 1778. *G. ibericum*, of which the var. *platypetalum* is shown on Plate 53, is a native of the Caucasus, and was introduced from the Levant in 1802. Among the more recent introductions have been *G. wallichianum* from Nepal (1819), *G. dahuricum* from Dahuria (1820), *G. atlanticum* from Algeria (1878), *G. Endressi* from the Pyrenees. The so-called Geraniums with thick fleshy or shrubby stems, so extensively used in modern gardens, are really Pelargoniums (see page 109).
Geranium atlanticum (Atlantic). Stems, 12 to 18 inches high. Leaves round in general outline, but deeply cut up into radiating segments, which are again cut into narrow lobes. Flowers pale purple, streaked with red, 1½ inch in diameter; on two-flowered hairy stalks; June.

G. Endressi (Endress'). Stems, 12 inches; leaves opposite, palmate, with three or five toothed lobes. Flowers, pale rose with darker veins, on twin-flowered stalks from the axils; June to August.

G. ibericum (Iberian). Stems, 12 inches; leaves divided into five or seven segments, again cut into toothed lobes. Flowers large, violet-blue, with heart-shaped petals; June to October. Whole plant hairy; perennial. The var. platypetalum is somewhat taller-growing, the petals broader, of a more purplish tint, with reddish streaks; usually of a brighter blue than the specimen figured.

G. macrorhizon (large rooted). Stems, 12 inches, sub-shrubby at the base. Leaves of five toothed lobes. Flowers carmine; calyx inflated slightly; May to July. Perennial.

G. phœum (dusky). Stems many, 18 inches, erect, hairy. Leaves round, 4 or 5 inches broad, cut into five or seven toothed lobes. Flowers, dusky purple, ¾ inch across; May and June. Naturalised in British woods. Perennial.

G. pratense (meadow). Stems erect, 3 to 4 feet, branched above. Leaves round, 4 to 6 inches diameter, with seven to nine divisions, ragged and toothed. Flowers numerous, purple-blue, 1¼ inch across; June to September. Whole plant downy; perennial.

G. sanguineum (blood-red). Stems, 1 to 2 feet, with spreading hairs. Leaves round, 1 to 2 inches across, with five to seven lance-shaped divisions deeply cut. Flowers, 1 to 1½ inch diameter, crimson, on long stalks; July and August. Perennial. There are two natural vars.—prostratum, with shorter, less erect stems and pinkish flowers; lancastriense, with flesh-coloured, purple-veined flowers. Lancastriense is the form most frequently found in gardens.

G. striatum (channelled). Stems tufted, 12 inches high. Leaves with three to five toothed lobes. Flowers pinky-white, with delicate streaks of rose-colour; May to October. Perennial.

G. tuberosum (tuberous-rooted). Stems, 9 inches. Leaves cut into many segments which are lobed pinnately. Flowers large, rose-purple; May. Perennial.

culture. Geraniums are of easy cultivation, and succeed in any well-drained garden soil. They are specially suited for growing in the rock-garden, the herbaceous border, and on banks. They are
GARDEN FLAX
(LINUM GRANDIFLORUM)
Nat. size
PL. 52
PELARGONIUMS

readily propagated by division of the plants in spring; or by sowing seed at the same period on a shady border. When the seedlings are about three inches high they must be pricked out to a distance of six inches apart, and in the autumn following transplanted to their permanent positions.

The plant figured is the var. platypetalum of G. ibericum, and Fig. 1 is a section of the flower.

PELARGONIUMS

Natural Order Geraniaceæ. Genus Pelargonium

PELARGONIUM (Greek, pelargos, a stork; from the supposed likeness of the carpels to a stork's head). Stork's-bill. A genus of about one hundred and seventy species of perennial herbs, shrubs, or sub-shrubs, similar in many respects to Geranium, but differing in the irregular petals, the absence of glands, and in the upper sepal being furnished with a spur, which, however, is not very evident owing to its growth to the footstalk. There are ten stamens as in Geranium, but of these from three to six are always without anthers. The genus is divided into a number of sub-genera. The flowers are borne in umbels; the leaves usually opposite, and the umbels axillary on long stalks. The species are nearly all natives of the Cape of Good Hope, the exceptions being two or three indigenous to North Africa, two or three to Australasia, a couple to St. Helena, and one to Asia Minor. None are really hardy in Britain, though some will survive ordinary winters out of doors in sheltered places in the south.

History.

The first species of Pelargonium to be introduced to the notice of the English gardener appears to have been P. triste, brought from the Cape in 1632. (It should be understood that, to avoid much needless repetition, all the species mentioned are from South Africa, unless otherwise stated.) Not many other species were introduced in the seventeenth century, but towards its close P. capitatum (1690), P. cucullatum (1690), P. alchemilloides (1693), and P. myrrhifolium (1696) first made their appearance here. It was during the eighteenth century that most of the important species were made known, such as P. peltatum (1701), P. zonale (1710), P. gibbosum (1712), P. inquinans (1714), P. angulosum (1724), P. quercifolium and P. graveolens (1774), P. lateripes (1787), P. grandiflorum (1794). P. endlicherianum is of quite recent discovery, having been introduced from the Taurus in 1855. For a period of about one hundred and
seventy years gardeners have been experimenting with some of these species, selecting, crossing, intercrossing, and recrossing, and producing such an enormous number of hybrids that it is now impossible in most cases to say what relationship exists between these and the original species. Every year sees considerable additions to the list of these garden varieties, and there is no probability of an immediate stoppage of the production of new sorts. The result is that the original species have been elbowed out of our gardens and greenhouses by the improved strains, and these the horticulturists have had to separate into sections according to certain marked characters. For long lists of these sections we must refer the reader to the most recent florists' catalogues; all that we can attempt here is to give the characters of the few original species from which all these varieties have been produced, and to add to these a very brief selection of named varieties in each section.

Principal Species.

Pelargonium angulosum (angled). Stems, 3 feet, forming a large bush. Leaves with from three to five shallow, angled lobes, toothed and with short stalks. Flowers purple with darker streaks; petals twice the length of the hairy sepals. One of the parents of the ivy-leaved section.

P. capitatum (growing with heads: large flower-heads). Stems shrubby, branching, 3 feet high. Leaves heart-shaped, but with from three to five obtuse, toothed lobes. Flowers rosy purple, in dense many-flowered umbels.

P. cucullatum (hooded). Stems, 3 feet; leaves kidney-shaped, concave, toothed, of soft texture. Flowers purple; petals as long again as sepals; footstalks and sepals covered with silky hairs.

P. endlicherianum (Endlicher's). Stems erect, unbranched, 2 feet. Leaves chiefly radical, heart-shaped, with slight indication of five lobes. Flowers large, deep rosy; the two larger petals each with fine purple streaks; umbels many-flowered.

P. gibbosum (swollen). "Gouty Geranium." Stems shrubby, soft, joints much swollen, 2 feet. Leaves, glaucous, smooth, cut in three or five wedge-shaped segments. Flowers greenish yellow on very short stalks.

P. grandiflorum (large flowered). Stems, 3 feet high. Leaves with from five to seven deeply-cut lobes arranged palmately. Flowers white or red, streaked with deeper red; two upper petals broader, marked in centre with a dark red or purple patch. Plate 57. One of the parents of the Large-flowered Show and Fancy Pelargoniums.

P. graveolens (strong-smelling). "Oak-leaf Geranium." Stems, 3 feet, slender. Leaves heart-shaped, deeply-cut into seven to eleven
BROAD-PETAL ED CRANE'S BILL
(GERANIUM IBERICUM—var. platypetalum)

3/4 Nat. size

PL. 53
segments, which are again deeply lobed; giving out a strong, sweet smell when touched. Flowers small, rose-purple. Plate 56.

**P. inquinans** (stained). Stems branched, 3 feet; younger branches velvety. Leaves round kidney-shaped, with slight indications of lobing; downy, with short stalks. Flowers almost regular, varying from white and rosy pink to scarlet; petals, short and broad; footstalks (*pedicels*) very short, flower-stalk (*peduncle*) very long. One of the parents of the "Scarlet Bedding Geraniums."

**P. lateripes** (side-foot). "Ivy-leaved Geranium." Stems slender, angular, reclining, 2 feet. Leaves thick, with five angled lobes, the margins entire and clean-cut. The flowers vary in size and colour—white, pink, or red—the flowerstalks very long. Plate 55.

**P. quercifolium** (oak-leaved). "Oak-leaf Geranium." Stems shrubby, much branched, 3 feet. Leaves with short stalks, heart-shaped at base, with wavy margins and rounded teeth, hairy; giving out strong scent when touched. Flowers purple or pink, on short footstalks.


All these species in a natural state are summer bloomers, but with our indoor treatment they flower at all seasons.

**Hybrids and Garden Varieties.**

As already indicated, these are so exceedingly numerous and their relationship so involved, that growers have divided them into sections. These are as follows:—Show Pelargoniums, Regal Pelargoniums, Decorative Pelargoniums, Fancy Pelargoniums, Zonal Pelargoniums, Ivy-leaved Pelargoniums, Variegated Pelargoniums. The Show, Regal, Decorative and Fancy varieties are chiefly the results of intercrossing with descendants of *P. grandiflorum*, *P. cucullatum*, and *P. capitatum*; the Zonal or Bedding, including the "tricolor" and "bicolor" races, such as Mrs. Pollock, are principally derived from *P. zonale* and *P. inquinans*; the Ivy-leaved from *P. lateripes* and *P. angulosum*.

**Show Pelargoniums.**

_Achievement_, bright orange-scarlet, upper petals darker, white centre.

_Amethyst_, rich purple, upper petals deep maroon.

_Blue Beard_, light purple, upper petals dark, white centre; very large.

_Chief Secretary_, rosy crimson, shaded maroon, white centre.

_Conspirator_, rosy salmon, upper petals dark maroon, light edges and centre.

_Digby Grand_, blush-white, with veined blotch.

_Duke of Clarence_, scarlet, upper petals maroon.

_Florence_, rich crimson, light centre.

_May Queen_, salmon rose, dark crimson blotch in upper petals.
FLOWERS OF GARDEN AND GREENHOUSE

Retreat, deep rose, maroon spot, white centre.
Sappho, cherry-rose suffused with purple, white centre; dwarf.
Wrestler, orange, maroon spot, white centre.

REGAL PELARGONIUMS.
( Hybrid Semi-doubles. )

Bush-hill Beauty, very large, rosy mottled.
Cannell’s Double, a sport from the white form of Volonté Nationale.
Duke of Fife, clear lake with pure white margins and centre.
Fimbriata alba, white dwarf.
M. Balbomont, bright scarlet, crimped edges.
Mrs. Innes Rogers, rosy carmine, blotched with maroon, crimped edges.
Mrs. Harrison, pink ground, netted white, white centre and margins.
Madame Thibaut, white, blotched and marbled with rose and crimson-maroon; petals undulating.
Volonté Nationale, white, blotched rosy carmine.

DECORATIVE PELARGONIUMS.

Eclipse, salmon-red, darker blotches; dwarf.
Harry Buck, upper petals crimson, blotched maroon.
Princess Maud, crimson blotches on white ground.
Radiant, red, feathered crimson, darker blotched on upper petals.
The Bard, rosy crimson, dark blotched; dwarf.

FANCY PELARGONIUMS.

Ambassador, lilac-rose, white centre.
Atlantic, rich crimson and purple.
Bridesmaid, pale lavender, edged white.
Cherry Ripe, rosy crimson, white centre.
Deliatum, white, pale rose blotched.
Lord of the Isles, deep rosy purple, white centre and edges.
Miss Emily Little, rosy purple, white margin.
Mrs. Mendal, white spotted with rosy lilac.
Princess Teck, white, carmine spots.

ZONAL PELARGONIUMS—
DOUBLE SCARLETS.

Californie. | F. V. Raspail.
Double Guinea. | Ludwig Ferehl.
Gripper Banks. | Raspail Improved.

CERISE-SCARLET.

Althaea. | Mathias Sandorf.
Australian Gold. | Mrs. Corden.
Danae. | President L. Simon.

PINK.

Aimé Henriot. | H. M. Stanley.
Duc de Mortemart. | Lord Derby.
Earl Granville. | Madame Barny.
Girore. | Madame De la Rue.

SALMON.

Diego Podda. | Louis Argens.
Gloire de France. | Miss Floss.
Lady Candahar. | Picotee.
Lord Tennyson. | Ruy Blas.

CRIMSON AND PURPLE.

Alsace-Lorraine, deep purple.
A. Rouillard, magenta.
Boule Noir, intense purple.
Cardinal Lavergue, magenta.
Charles Lalande, intense crimson.
Colossus, rich crimson.
Crimson Velvet, dwarf.
Edison, magenta.
Grand Chan. Faidherbe, intense crimson.
G. Caillebotte, rich magenta.
Rafael Garreta, rich crimson.

DOUBLE WHITE.

Boule de Neige. | Mrs. Gladstone.
Hermine. | Rosée.
Heroine. | Snowdrop.
Leon Xandrov. | Swanley Double.
Madame L. Dalloy. | White Abbey.

BEDDING ZONALS—
SCARLET AND CRIMSON.

Cannell’s Dwarf. | King of the Bedders.
Corsair. | M. Myriel.
Henry Jacoby. | Triomphe de Stella.
Her Majesty. | Vesuvius.

SALMON.

Lucy Mason. | Omphale.
Mrs. Holford. | Surprise.
ZONAL GERANIUM

1. (PELARGONIUM ZONALE)  2 & 3. HYBRIDS

\(\frac{3}{4}\) Nat. size

PL. 54
PELARGONIUMS

Pink.

Beckwith's Pink. | Mrs. Turner.
Lady Bailey. | Mrs. W. Browne.

Ivy-Leaved Doubles.

Alice Cousse, rich magenta.
Beauty of Castle Hill, rosy, with dark blotch.
Candeur, pure white.
Cuvier, light magenta.
Galilee, rosy pink.
Giroflée, magenta-purple.
Liberty, light magenta.
Marillo, rich crimson.
Ryecroft Surprise, salmon-pink.
Sorcorf, deep pink.
Souvenir de Charles Turner, pink feathered with maroon.

Ivy-Leaved Singles.

Bridal Wreath, pure white, pink centre.
Colonel Roudaire, scarlet.
La France, light rose.
Masterpiece, magenta-crimson.
Mrs. H. Cannell, mauve-purple.
Multiflore, bright pink.
Victoria, rose-pink.

Variegated-Leaved Pelargoniums—Golden Tricolors.

Countess of Craven. | Lady Cullum.
Enchantress. |

Macbeth. | Peter Grieve.
Marie Stuart. | Prince of Wales.
Mrs. Pollock. | Sir R. Napier.

Silver Tricolors.

Charming Bride.
Dolly Varden.
Empress of India.
Eva Fish.
Lady Dorothy Neville.

Golden Bronze.

Best Bronze.
Black Douglas.
Black Vesuvius.
Bronze Queen.
Distinction.
Effective.
Golden Harry Hie-over.

Her Majesty.
Jubilee.
King of the Bronze.
Maréchal Mac-mahon.
The Shah.
White Distinction.

White-Edged.

Boule de Neige.
Brilliantissimum.
Dandy.
Flower of Spring.
Little Trot.

Mangle's Variegated.
Miss Kingsbury.
Viscountess Cranbrook.

Yellow-Leaved.

Creed's Seedling.
Crystal Palace Gem.

International.
Robert Fish.
Verona.

The favourite method of propagating the Pelargonium is by cuttings, because this is the simplest plan, and by following it we know exactly what result we are to get. But the various kinds produce seed freely, and these readily germinate and may be grown into flowering plants without any special difficulty. The drawback to this method is found in the naturally strong tendency of the seedlings to revert to the ancestral forms. Still, it is by this means that the enormous number of garden varieties have been raised, and a little care in the cross-fertilisation of the parents may reward the amateur with a new variety. The seed may be sown as soon as ripe, but growers generally prefer to save it until the following spring, as by this practice the young plants have a greatly lengthened growing period before encountering their first winter. The seed should be sown in a pan of light, fine soil, and slightly covered. In gentle heat they rapidly germinate. When large enough to handle, the seedlings should be transplanted to pots
or pans where they can have sufficient room for growth without being drawn up at all. At a more advanced stage they must be potted separately. Five-inch pots are sufficiently large until after their first flowering, when they must be carefully scrutinised. All plants that show inferiority to the parent form should be remorselessly consigned to the rubbish-heap, and only those that show an advance, or are at least as good, should be preserved. These selected ones should be grown on as directed under the head of Cultivation below, and the stock increased by cuttings made at any time from shoots of firm substance; spring and late summer are, however, the most profitable periods, for they then root more readily. The nurserymen not only use the shoots for this purpose, but also cut the more vigorous roots into pieces an inch or two long, and plunging them in pans of sand, with their tops just showing, keep them in a temperature of about 60°. The sand is merely kept from getting absolutely dry, and as soon as a couple of leaves appear the cuttings are potted singly, and accustomed to a lower temperature. In taking cuttings from shoots of most of the sorts, it will be found they are very juicy and have a tendency to bleed. It is, therefore, well to leave them lying on the potting-board for twenty-four hours, during which period the cut portion will dry up. The cuttings should be inserted in sandy soil, and arrangements should have been made previously to ensure the perfect drainage of pans or pots. If they exhibit a tendency to become tall, the top of the stem should be taken off, and they will then shoot lower down and become nice bushy plants. Cuttings of the varieties used for summer bedding should be planted in boxes of sandy soil, and placed in a sunny sheltered position in the open air, or in a light frame. They do not require much water until they show that they have rooted by starting into new growth. The cuttings of the show and fancy varieties are usually inserted in sandy soil in small thumb-pots, and placed on a shelf in a greenhouse till rooted.

Cultivation.

All the sections of Pelargoniums will succeed in a compost, of which turfy loam is the predominating ingredient, with the addition of thoroughly decayed manure to the extent, say, of one-fourth of the whole, and a little sand. This should be well mixed some little time before it is required for use; and in potting, the plants should be firmly fixed. Abundant bloom is secured by stopping the most vigorous shoots, and under-potting. The fine regular form and dwarf habit, combined with profuse flowering, so noticeable in the pot-plants supplied by the professional growers, is attained by these means, and the training of the tender shoots before they have attained any firmness. This is especially a point to be aimed at in the production
IVY-LEAVED GERANIUM
(PELARGONIUM LATERIPES)

1/2 Nat. size
PL. 55
of fine Show and Decorative Pelargoniums. The cuttings have been taken in August from specimens specially prepared by full exposure to the sunshine, so that the shoots made earlier in the season may be fairly hard. To bring these cuttings on more rapidly they are put in a frame fully exposed to the sun, and, when rooted, potted in 3-inch pots, returned to the frame, and kept close. Soon after growth has recommenced the point of the stem must be picked out, with the result that several side-shoots will appear which must not be allowed to grow upward, but must be brought and kept close to the pot. This is effected by tying a string under the rim of the pot, and to this short lengths of bast may be tied, the free ends then passed round the young shoots and slightly strained until the new wood has become firm, when the bands and the string should be cut away. By such means it is possible to greatly modify and improve the natural form of these plants, which always have a tendency towards lankiness. The shoots so trained will with further growth take an upward direction away from the centre of the pot; but by their natural branching they will soon fill the central space, and become of fine bushy form. If larger plants are desired, to bloom at a later period, these shoots also may be stopped. During winter they should be kept near the glass in a cool house, where, however, a temperature above freezing point is maintained. If they are desired for early flowering in spring the winter temperature must be higher to keep them growing, though slowly. When the buds are swelling, and during the time they are expanding, weak manure water should be given, or a little dry guano stirred into the surface of the soil. After flowering, the plants should be fully exposed to sunshine outside for four or five weeks, cut back, and allowed to grow again.

The smaller-flowered "Fancy Pelargoniums," are less robust, and consequently require more care. The cuttings of these are taken from the hardened new shoots in spring. In winter they will require a higher temperature, and even more careful watering than the show varieties. Where zonals have been used for bedding purposes, and are required again in larger numbers for the following year, numerous cuttings may be taken from the beds in August, struck in boxes outside, and removed into a dry warm place by the beginning of October. Very little water should be given until February, when they should be potted and grown on, ready for bedding-out in May.

In stopping Pelargoniums care should be taken to do so back to a joint from which a growth shoot is breaking. If there should be only a flower-bud there, the result will be to increase the ungainliness of the plant and check its development unduly. Ivy-leaved Pelargoniums are
best used for ornamental garden vases, baskets, window-boxes, and especially for the decoration of the greenhouse or a conservatory. Most of them are of trailing habit, and unless they can hang down the sides of their receptacle they must be trained and tied to pyramidal "ladders," or balloon-shaped frames of wicker or wire. They require more water than the other kinds, and occasional syringing is desirable. Cuttings may be taken at any time other than winter, when the plants should be allowed to rest in a cool place.

**Description of Plates 54 to 57.**

Plate 54.—Fig. 1 represents *Pelargonium zonale*, the leaves exhibiting the characteristic girdle, that varies in breadth and intensity in different individuals. Figs. 2 and 3 are hybrids partially descended from *P. zonale*. Fig. 4 is a section of the flower, showing, besides the arrangement of organs, the hidden spur of the calyx.

Plate 55 is a form of *P. lateripes*, the Ivy-leaved Geranium; Fig. 1, a section of the flower.

Plate 56 shows one of the so-called Oak-leaved Geraniums, *P. graveolens*, in which there is little resemblance to an oak-leaf unless the segments are taken separately.

Plate 57 represents *P. grandiflorum*, one of the parents of the Show and Fancy Pelargoniums; Fig. 1, section of flower.

**NASTURTIUMS**

*Natural Order Geraniaceae. Genus Tropaeolum*

*Tropaeolum* (Greek, *tropaion*, a monument or trophy; the round leaves of certain species being thought to resemble bucklers and the flowers helmets—therefore the growing plant mimicked a pile of such things). A genus of annual or perennial herbs, mostly climbers. About thirty-five species are known, all natives of South America, but some perfectly hardy in this country. The stems are soft and succulent; the leaves alternate, more or less round, palmately-lobed or dissected, on long leaf-stalks which twine round twigs or branches for support. The flower is somewhat similar to that of *Pelargonium*, irregular. The five sepals are conjoined towards their base, and continued backwards in a long, hollow, honeyed spur. They are coloured like the corolla. The petals are five in number—yellow, orange, purple, or blue; the two upper differing from the others. Stamens eight, unequal. Fruit usually of three one-seeded fleshy carpels.
OAK-LEAF GERANIUM
(PELARGONIUM GRAVEOLENS)

1/2 Nat. size

PL. 56
History. Just three hundred years ago when Drake was fighting the Spaniards in their South American settlements, and Raleigh was seeking El Dorado, *Tropaeolum minus*, the Dwarf Nasturtium of our gardens, was introduced to English gardens from Peru. Its seeds were to be pickled whilst still green and juicy, its leaves and flowers to be eaten in salads, and its flowers for the garnishing of the same also. From the resemblance in flavour between its hot, pungent juices and those of the Water-Cress (*Nasturtium officinale*) it got the popular name of Nasturtium (*nasi torsionis*, nose-torturing); and also Indian Cress. About ninety years later *T. majus* was brought from the same country and dubbed Great Indian Cress. The next species to be introduced was *T. Smithii* from New Granada in 1775, and thirty-five years after that, there came from South America *T. perigrinum*, the Canary Creeper. From that date other species have been introduced at intervals, among them *T. tuberosum* (Peru, 1827), *T. tricolorum* (1828), *T. edule* (1841), *T. azureum* (1842), all from Chili; *T. Lobbianum* (Columbia, 1843) and *T. speciosum* from Chili in 1846. In spite of the fact that all these plants are strictly South American in their distribution, we fear that popular names still produce erroneous notions in the minds of many gardeners, amateur and professional. *Indian Cress* implies that the plants came from some portion of our Indian Empire. The name Canary Creeper was originally given to *T. peregrinum*, in consequence of a fancied resemblance in form and colour between the flower in certain aspects and a canary-bird with extended wings. But the prosaic gardener, who has no eye for images of this sort, regards the name as indicating the Canary Islands as its place of origin, and persists in calling it *canariense*.

Principal Species.

*Tropaeolum azureum* (azure-blue). Tuberous-rooted greenhouse perennial. Leaves five-lobed, peltate. Flowers azure-blue, faintly scented; petals with long, greenish white claws, and deeply notched at the apex; October.

*T. JARRATTI* (Jarratt's). Tuberous-rooted greenhouse perennial from Santiago (1836). Leaves six- or seven-lobed. Sepals orange-scarlet spotted with yellow; petals bright yellow, the two upper ones with deep brown markings. Flowers June.

*T. Lobbianum* (Lobb's). Greenhouse perennial. Leaves round, peltate, slightly lobed. Flowers orange; upper petals entire, lower three smaller, deeply-toothed and fringed. The var. *fimbriatum* is a garden hybrid. *Maye's Seedling* is a form used for summer bedding.

*T. Majus* (greatest). Great Indian Cress; Major Nasturtium. Too familiar to need description. Leaves round, peltate. Flowers orange, two upper petals marked with purple-brown; May to October.
There are many varieties in cultivation with crimson, scarlet, yellow, striped and spotted flowers, single and double; some with compact dwarf habit making them suitable for bedding. The var. *atropurpureum nanum* has long been favourably known as Tom Thumb. Var. *atrosanguineum* has dark blood-coloured flowers; *coccineum nanum* is a scarlet dwarf. *Bedfont Rival, Empress of India, Golden King, King of Tom Thumbs, King Theodore, Pearl, Ruby King, The Moor, and Vesuvius* are other desirable garden varieties.

**T. MINUS** (lesser). Small Indian Cress, Minor Nasturtium. Similar to *T. majus*, but smaller and weaker; edges of the leaves slightly curled back. Flowers of a more reddish orange in the type, but varying much in gardens; petals ending in a bristle-like point; June to October.

**T. PENTAPHYLLUM** (five-leaved). Tuberous-rooted, half-hardy perennial. Leaves composed of five distinct digitate leaflets. Sepals purple and green, the spur bright red; petals two, small, greenish and inconspicuous. Flowers June and July.

**T. PEREGRINUM** (foreign). Canary Creeper, or Canary-bird flower. Leaves in general outline somewhat kidney or broad-heart shaped, but divided into five or seven lobes. Flowers yellow; spur of calyx very long and hooked; greenish; two upper petals lobed and toothed; three lower ones small, slender, fringed; June to October. Grown in a greenhouse this is a perennial, but out of doors it is rightly treated as a hardy annual, the first touch of frost killing it.

**T. SPECIOSUM** (showy). This species and the next are tuberous-rooted perennials. Leaves nearly peltate, with six lobes. Flowers scarlet, long spurred; upper petals narrow wedge-shaped; lower, almost round; June. Hardy.


**Cultivation.** As a rule *Tropæolums* do not require a rich soil; *T. majus* in fact seems to do well in the poorest, driest, hottest garden. Luxuriance of growth, such as will follow upon generous treatment, will be attended with poverty of flowers. *T. majus* and some of the hardy tuberous-rooted section are extremely useful for rapidly covering a trellis; the dwarf forms make admirably compact bedding plants. If too luxuriant, some of the leaves may be picked off with advantage, and as a rule this treatment will encourage more flowers; but the mistake must not be made of picking too many leaves and thus starving the plant. The seeds of the hardy species may be sown in the open border in April; or in pots or boxes, whence they are readily and successfully transplanted when their first leaves are as large as a threepenny piece. The double varieties must be propagated by cuttings, of course. These must have bottom heat, upon which they will root
PELARGONIUM GRANDIFLORUM

$\frac{1}{4}$ Nat. size

PL. 57
readily. The tuberous-rooted species come readily from seed, or they may be increased by striking young shoots from the old tubers. Plants of this section should be grown in a cool greenhouse in pots, with a compost of sandy peat and leaf-mould or turfy loam; given plenty of water whilst growing and kept perfectly dry when at rest. *T. speciosum* is a beautiful summer climber in some counties, especially Yorkshire, where it is grown against the walls of cottages. It does not thrive so well in the south. It prefers a deep cool soil and dislikes drought. *T. tuberosum* has edible potato-like tubers and is grown in some countries as a field vegetable. The tubers are frequently offered by dealers in Covent Garden.

**Description of**

*Tropaeolum peregrinum*, the Canary Creeper. Upper portion of plant only, natural size. Fig. 1 is a section through the flower.

**WOOD SORRELS**

**Natural Order Geraniaceae. Genus Oxalis**

*Oxalis* (Greek, *oxys*, sharp; all the species having acid juices). A genus comprising about two hundred and twenty species of herbs and (a few) dwarf shrubs. Leaves usually trefoils, radical, or alternate. Flowers regular, from the axils, on one- or more-flowered stalks. Sepals and petals five each; stamens ten; ovary five-celled, stigmas five. Capsules elastic-valved, irritable, discharging their seeds with considerable force. The bulk of the species are confined to South Africa and South America, but a few are very widely distributed.

**History.**

The Wood Sorrels are among the most elegant of plants, but the introduction and cultivation of the exotic species is comparatively modern. Our native *Oxalis acetosella* is exceedingly plentiful in some woodland districts, and no doubt it would be grown in gardens at quite an early date; and *O. corniculata* which is believed to be indigenous in the south-west counties only, is frequent in gardens. But the first introduced species of which we have record is *O. stricta* from North America, in 1658. This is so near *O. corniculata* that some botanists regard it as possibly a sub-species; it has become quite naturalised in parts of this country. The next record is of *O. speciosa*, in 1690, from the Cape of Good Hope; but this has since turned out to be a variety of *O. variabilis*, of which the type was not introduced till a hundred years later. A great number of species were introduced from the Cape at the close of the 18th century, chiefly within the last decade; and to those a good many others have been added in the present
century. One of the prettiest and most interesting, viz. *O. enneaphylla*, is a native of the Falkland Islands, from whence it was introduced to Kew about twenty years ago. It has pure white flowers an inch across, and is quite hardy. The American species were chiefly introduced a little more than seventy years ago. The genus is a very interesting one to botanists, certain of the species producing flowers that never open, and which are entirely without petals, but which produce seed abundantly. Then there is the elasticity and irritability of the seed-capsules, to which reference has been made, and the habit of folding each leaflet in the middle, and bringing the three close down to the stalk at nightfall.

**Species.**

*Oxalis acetosella* (little sorrel). Common Wood Sorrel. Rootstocks knotted, creeping, pink. Leaves, trefoils, all radical; edges and under-side covered with scattered white hairs. Flowers solitary, white, delicately veined with pink; April. Height, 3 inches. Perennial.

*O. Bowiei* (Bowie's). Flowering stem 6 to 8 inches. Leaves radical, large trefoils, with fringed edges, and slightly downy beneath. Flowers, rich rose-red with yellowish centres, in umbels; August. Half-hardy. Perennial from South Africa, 1824. The handsomest of all the cultivated sorts.

*O. corniculata* (horned). Stems, 6 to 20 inches, trailing, branched, downy. Leaves, trefoils, all from the stems. Flowers yellow, in umbellate cymes; April to October. Annual or biennial. The var. *rubra* has bronze-purple leaflets.

*O. floribunda* (abundant-flowered). Stems 6 to 12 inches, erect, fleshy and leafy. Leaves, trefoils. Flowers numerous, rosy or white, in corymbose-racemes; May to September. Perennial. Native of South America (introduced 1823). (Also known as *O. rosea.*) Plate 59.

*O. stricta* (upright). Much like *O. corniculata*, but stem erect, with many runners from its base, and more flowers in a cluster; April to December. Hardy annual or biennial.

*O. tetraphylla* (four-leaved). Rootstock tuberous, with numerous scaly bulbs produced at the summit. Leaflets four, large, on short stalks. Flowers large, lurid red, produced throughout the summer. A Mexican perennial, hardy.

*O. Valdiviensis* (Valdivian). Flowering stems 6 to 8 inches. Leaves, smooth trefoils. Flowers deep yellow streaked with red, in many-flowered, long-stalked umbels; June to August. Hardy annual. Native of Chili (introduced 1862).

*O. variabilis* (variable). Flower stems, 3 inches. Leaves, trefoils; side leaflets roundish, middle one wedge-shaped at base. There are
CANARY CREEPER

(TROPÆOLUM PEREGRINUM)

Nat. size

PL. 56
several forms; var. albiflora has white flowers, July; var. rubra, flowers red, September to November; var. speciosa, flowers rosy purple; September to November. Half-hardy perennial.

Cultivation. The Wood Sorrels are cultivated with ease. They like a light sandy soil and a warm, dry situation. The dwarf habit of most species makes them very desirable plants for rockeries, ferneries, and so forth. *O. Acetosella* does admirably in a fernery made of old stumps and roots, luxuriating in decayed wood and leaf-mould. They are useful for borders, and most of them make good pot-plants. Where once established there is little need to sow seed; the elastic capsules provide for the efficient distribution of these. The tuberous-rooted species may also be propagated by dividing the roots. *O. tetraphylla* produces an abundance of small bulbs which readily separate and grow. *O. crenata* is cultivated in the West Indies for the sake of its potato-like tubers, coloured crimson and yellow. They do not find much favour as a vegetable in this country.

The Cape species should be grown in pots in light loam, re-potting them in September and placing them in a cool frame. In winter when they are growing they require all the sunlight possible. They flower in spring and early summer. After flowering they should be stood out of doors in the sun and allowed to bake.

Description of Oxalis floribunda, leaves and flowers. Fig. 1 is a section through an enlarged flower.

BALSAMS

Natural Order Geraniaceæ. Genus Impatiens

Impatiens (Latin, impatient, in allusion to the irritable seed-capsules). A genus of about one hundred and thirty-five species of herbaceous (rarely shrubby) plants. Flowers irregular on axillary footstalks. Sepals three, very rarely five; coloured, the posterior one large, produced into a hollow spur. Petals three. Stamens five, filaments short and distinct; anthers cohering. Ovary five-celled, stigma five-toothed. Capsule with elastic valves, which distribute the seeds with great force. The species are chiefly natives of the mountainous regions of Tropical Asia and Africa, but a few species are found in North America, North Asia, South Africa, and Temperate Europe.

History. In that wonderful year 1596, that saw so many good things first introduced to British gardens, Impatiens
Balsamina was brought from Tropical Asia, and has held a good place in the gardener's esteem ever since. There is a native species, Impatiens noli-me-tangere, the Yellow Balsam or Touch-me-not, which is thought to be only truly wild in the mountains of Westmoreland and North Wales, but which is now naturalised in many other districts. Then *I. fulva*, the Jewel-weed of North America, has become naturalised on some of our river banks within the last sixty or seventy years. The much finer *I. Roylei* figured in Plate 60 was introduced from the Himalayas in 1838. These, with the addition of *I. sultani*, of recent introduction from Zanzibar, are the principal species grown in gardens, many of the others being of weedy habit, which renders them unsuitable. Quite recently two welcome additions to the group have been made in *I. auricoma* and *I. Hawkeri*.

**Impatiens Balsamina (Balsamine).** Common Balsam.

**Species.**

- Stem 1 to 2 feet. Leaves lance-shaped, toothed; lower ones opposite. Flowers, normally rosy red; but under cultivation it produces very double and regular blossoms of every shade between white, yellow, and dark crimson; self-coloured, striped, and spotted. Growers distinguish different sections such as Rose-flowered, Camellia-flowered, etc. They are half-hardy annuals, and flower throughout the summer.

- *I. fulva* (tawny). Stem 2 to 4 feet. Leaves oval, coarsely toothed. Flowers orange spotted with reddish brown; the posterior sepal greatly swollen and ending in a hooked spur. Its singular and handsome appearance is increased by the light manner in which the flowers are suspended; June to September. Hardy annual.


- *I. Roylei* (Royle's). Stem 5 to 10 feet. Leaves lance-shaped, with sharp saw-teeth. Flowers purple or rosy in racemes; August. Hardy annual. A noble plant for the wild garden, where if once established it will look after itself.

- *I. sultani* (Sultan of Zanzibar's). Stem 1 to 3 feet. Leaves oval-lance-shaped. Flowers scarlet, the petals spreading flat; spur long and slender; almost continuous bloomer. Stove perennial.

**Cultivation.**

The hardy annual species and their varieties are easily raised from seed sown in the open border in April or May. The half-hardy annuals like *I. Balsamina* should be sown in pans or boxes of rich sandy soil, at the beginning of April or a little earlier, and placed on a gentle bottom heat, or in a warm frame, or near the glass in a sunny greenhouse. They should be kept moist; and the young plants will soon appear. They must be pricked out into more roomy boxes, at
OXALIS FLORIBUNDA

Nat. size

PL. 59
a distance of four inches, grown on in the greenhouse where they can have plenty of air and water, or they may be potted in small pots (thumbs), and shifted on into larger pots (3-inch) before they are pot-bound; then into 8-inch pots, giving them rich soil and abundant moisture all the time, and frequently turning them to prevent one-sided growth. Those that are wanted for outside must be gradually hardened, and planted out in June, if the weather is favourable. See that the pots have perfect drainage, for so much water must be given that unless the surplus can run away freely the plants will be ruined. The stove species are easily propagated from cuttings. *I. sultani* seeds freely, and there are now several distinct colour varieties of it.

**Description of Impatiens Roylei.** A portion of a flowering branch showing leaf and flowers. Fig. 1 is a sectional view of flower; 2, the cohering stamens.

**BURNING BUSH**

**Natural Order Rutaceae. Genus Dictamnus**

**Dictamnus (Diktamnos, the classical Greek name for the plant).** A genus consisting of a solitary species whose characters are given below. The Natural Order Rutaceae to which it belongs contains about eighty-three genera and six hundred and fifty species, including *Ruta* (Rue), *Citrus* (Orange, Lemon,) etc., mostly shrubs and trees that are dotted with glands, usually containing a fragrant essential oil. They are distributed over the warm and temperate regions of the earth, particularly in South Africa and Australia. The flowers are in fours or fives, the inflorescence variable, but usually an axillary cyme. The fruit most frequently a capsule or berry, occasionally a drupe. Leaves simple or compound, usually opposite.

**Species.**

**Dictamnus albus** (white). Burning Bush; Fraxinella; Dittany. A sub-shrubby perennial, growing to a height of about 2 feet, with pinnate leaves of three to five pairs of finely-toothed leaflets, the latter full of pellucid glands. The petals are white, four of them erect, the fifth distant from the others, and turned downwards; the ten stamens longer than the petals. Fruit consisting of five beaked carpels, opening by two valves. Flowering from April to June. The whole plant when gently rubbed emits an odour similar to that of lemon-peel, from the rupture of the oil glands with which the plant is more or less covered. This oil is inflammable, and if a lighted match is
placed against the upper part of the stems, the plant is immediately more or less enveloped in flames. Hence the name, Burning Bush. The species was introduced from South Europe just three hundred years ago, and is one of the plants peculiar to "old-fashioned" gardens. There are varieties with rosy and bright red flowers.

Cultivation.
As implied in the statement that *Dictamnus* is a plant of old-fashioned gardens, its culture is a simple affair. It is easily satisfied with ordinary soil, but likes a dry position. Seed should be sown in the border as soon as ripe; or the roots may be divided in early spring.

**Description of**

The upper portion of *Dictamnus albus*. Fig. 1 is a section of the flower.

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**SKIMMIAS**

*Natural Order Rutaceae. Genus Skimmia*

Skimmia (Japanese, *skimmi*, noxious fruit). A genus of three or four hardy evergreen shrubs, with green smooth branches, and alternate, leathery, lance-shaped, entire leaves, full of pellucid glands. The flowers are whitish, in terminal panicles, and consist of a four- or five-lobed calyx, and four or five oblong petals. Fruit, egg-shaped or globular drupes. The species are natives of Japan, China, and Himalaya.

*Skimmia japonica* (Japanese) is the principal species in cultivation. It is a very handsome, dwarf, holly-like shrub when in full berry; seldom more than 4 feet in height. The berries are bright red, and afford a good contrast with the dark shiny leaves. The fragrant flowers appear in March, and even then the shrub is not unlike some varieties of Holly. This species was introduced about fifty years ago, and was the first to become known. Several other species have been introduced during the last thirty years, those known as *S. fragrans*, *S. fragrantissima*, *S. intermedia*, *S. oblata*, *S. ovata*, *S. Foremani*, and *S. Rogersi*, are merely seedling varieties or sexual forms of *S. japonica*.

*S. Fortunei* (Fortune's) has elliptic lance-shaped leaves, and greenish white flowers, the unopened buds being tinted with red; hence it has been called *S. rubella*. Introduced from China 1874.

*S. Laureola* (Laureola-like) is a pretty Citron-scented shrub, with oblong lance-shaped leaves, yellow beneath, and pale yellow fragrant flowers. It is a native of Himalaya.
ROYLE'S BALSAM
(IMPATIENS ROYLEI)

Nat. size
PL. 60
The species are propagated by cuttings struck in gentle heat, or by seeds sown as soon as ripe. Peat and sandy loam form the most suitable compost in which to grow Skimmias. They are also useful evergreens for pots and window boxes, as they form compact little bushes, and bear a profusion of bright red berries which remain on the plant a long time. Of course the berries are only borne by the female plants.

Natural Order Rutaceae. Genus Citrus

Citrus (Greek, kitron, the Citron). A genus of five or six species of shrubs or trees having alternate dotted leaves on winged footstalks, to which the blade is jointed. The flowers are white, and deliciously fragrant. The calyx is a five-lobed shallow cup; the petals long and thick; stamens numerous, their filaments united into several bundles. The fruit pulpy with a spongy rind—a fact that is probably as well known as any in popular botany. There are several species from Tropical Asia, and many varieties; but as to which are species and which varieties there is considerable divergence of view among authorities.

History.

Citrus Aurantium (the Sweet Orange), originally a native of China, from whence it was introduced into India and other tropical countries towards the beginning of the Christian era, is said to have been introduced to Britain by Sir Walter Raleigh in 1595. Bishop Gibson mentions that from these Sir Walter's kinsman, Sir Francis Carew, grew several trees at Beddington, Surrey, which lived to be 18 feet high, with stems 9 inches in diameter; but they were destroyed by the great frost of 1739-40. Its cultivation in Europe is, however, a much more ancient thing, for oranges were being grown at Seville in the twelfth century, and at Palermo in the thirteenth; and the tree at the convent of St. Sabina at Rome is said to have been planted by St. Dominic in the year 1200. It is not quite hardy in any part of England, but fine fruit has been obtained in Devonshire from trees planted against a wall outside, and covered in winter with a movable wooden shelter. The orange was more frequently seen as a conservatory plant in the earlier part of the century than it is to-day. The Lemon (C. medica), supposed to be of eastern origin, was cultivated in Europe (Italy, etc.) in the fifth century. Its variety, the Lime (C. Limetta), said to be Indian, is largely cultivated for the oil contained in the rind of its
fruits. *C. decumana* (the Shaddock, Pomello or Forbidden Fruit), sometimes produces its enormous fruits in the conservatories of this country. The Bitter Orange (*C. Aurantium*, var. *Bigaradia*) is supposed to be a seedling sport from the Sweet Orange, or *vice versa*. It is wild or naturalised in most tropical countries, and is the stock upon which choice varieties of orange are grafted.

**Species and Varieties.** We do not propose to give descriptions of the species of this genus, but to confine our attention to the Orange and its varieties.

**Citrus Aurantium** (golden). A tree 20 to 30 feet high. Leaves oval-oblong; flowers white. Fruit, rich golden-yellow, the seeds embedded in juicy pulp, enclosed in a rind. Flowers May to July. The following varieties and sub-varieties are in cultivation:

Var. *Bigaradia* (the Seville, Bitter Orange, or Bigarade). Fruit, round, dark; rind uneven, bitter. Runs into many sub-varieties, several of which are grown for the superior fragrance of their flowers.

Var. *nobilis* has two sub-varieties: *mandarinum*, the Mandarin Orange of China, chiefly employed for presenting to the Mandarins. The fruit is small, flattened, and deep in colour, very rich and sweet. *Tangierina*, the Tangierine, is still smaller and richer than *mandarinum*. In both these forms the rind is edible.

*C. decumana* is the Shaddock, producing enormous fruit, often over 10 lbs. in weight, of a greenish yellow colour. It is the so-called Forbidden Fruit or Adam’s Apple, with deep yellow rind, smooth, thick, soft, and sweet. Another variety of it is a favourite in the United States, where it is known as Grape-fruit.

**Culture.**

Some attention is now being paid by growers in this country to the production of choice oranges for dessert, but that is a matter beyond the scope of this work, where we can only recognise them as ornamental flowering shrubs. For this purpose they should be grown in pots or tubs, in a compost of somewhat heavy loam, well-rotted manure and sand. This should be thoroughly mixed, and well rammed in about the roots. During the growing season the plant should be kept in a rather close moist atmosphere, and liquid manure should be given freely. This must be reduced as the rate of growth decreases, and the new wood should be well hardened by exposure to the sunshine outside before the cold weather sets in. During the winter they should have a temperature of about six degrees above the freezing point. Propagation is effected by sowing seeds ("pips") on a hot-bed, or by taking cuttings and striking them on a hot-bed, or by grafting. The seedlings cannot be relied upon to reproduce the parent variety; it is therefore necessary that they should be budded or grafted with superior sorts when about a year old.
BURNING BUSH

(DICTAMNUS ALBUS)

Nat. size

PL. 61
PHYLICAS

Description of Plate 62. Upper portion of a branch of *Citrus Aurantium*, with flowers and young fruit; 1, section of pistil with stamens; 2, stamens with filaments joined; 3, calyx and female organs; 4, the ripened fruit.

PHYLICAS

Natural Order **Rhamneae**. Genus *Phylica*

*Phylica* (Greek, *phyllikos*, leafy). A genus containing about sixty-five species of evergreen shrubs, chiefly African, with alternate, thick, leathery leaves, the edges entire and curled back. The flowers small, axillary, or in dense terminal heads. The calyx is pitcher-shaped or tubular, with five lobes; the petals are hood-shaped, bristle-like, or entirely absent. Fruit shaped like a pea, dead black.

The species are not extensively grown in this country, though *Phylica ericoides*, the subject of our Plate (63), was introduced in 1731. This is the best known, and is sold by the French florists as Cape Heath. Its habit is very heath-like, more especially when seen in its native habitat, for it grows in dry sandy ground like some of the real heaths. Among other early introductions of the genus to our gardens was *P. buxifolia* (1759), with tall stems (6 feet) and greenish flowers in terminal clusters.

**Principal Species.**

*Phylica ericoides* (Erica-like). Stems branching upwards, 2 to 3 feet. Leaves very slender, lance-shaped, the edges curled back, downy beneath, smooth above. Flowers pure white, in dense terminal heads; April to September.

*P. plumosa* (feathery). Stems 1 to 2 feet. Leaves hairy beneath, edges curled back. Flowers whitish, with feathery bracts, which give the tips of the branches a plumose appearance; August to November. The var. *squarrosa* has white flowers in round heads; the leaves hoary and shaggy beneath. The bracts are longer than the leaves and outspread, thus giving the squarrose aspect indicated in the name.


**Cultivation.** *Phylicas* are greenhouse plants, and will not do well outside, except in summer. They should be potted in sandy peat, but require no special treatment. Propagation is effected by means of cuttings made from the semi-herbaceous branches. These are inserted in a pan of sandy soil, covered with a bell-glass and kept in a warm greenhouse.
The upper portion of a branching stem of *Phyllica ericoideae*. Fig. 1, a flower head detached; 2, a single flower; 3, a section through the same.

VINES

Natural Order Ampelideae. Genus Vitis

*Vitis* (the old Latin name for the Grape-Vine). A genus comprising about two hundred and thirty species of climbing deciduous shrubs, including the well-known Grape-Vine. They have simple or compound leaves, and tendrils opposite the leaves. The flowers are small and greenish, in panicles, also set opposite to leaves. Their structure is somewhat singular; though in general characters not differing greatly from those of *Phyllica*. The calyx is five-lobed, the five petals distinct at the base but cohering at the tops, forming a cap over the stamens. As the stamens increase in size they push off the petals instead of separating them, and they fall away still united. Occasionally the attachment of the petals to the disc is so strong that they do not fall, and as a result the ovules are not fertilised. The grape may grow, but it will be without seeds. The species are natives chiefly of Tropical and Temperate Asia, and North America. We cannot here deal with the grape-bearing species and varieties, but must be content with reference to three species grown merely for ornament, and usually known as *Ampelopsis*.

Species.

*Vitis aconitifolia* (Aconite-leaved). A slender and elegant climber with reddish branches and handsome leaves much resembling those of Monkshood (*Aconitum*). They are palmately cut into five lobes, which are in turn lobed in a pinnate manner. It is a native of China, and was introduced about thirty years ago. There are several varieties.

V. inconstans (very variable). Veitch’s Ampelopsis. Ivy-like in the closeness of its attachment to walls. Leaves small, variable in shape, divided into three triangular lobes, which are toothed. A native of China and Japan, introduced 1868. Better known as *Ampelopsis Veitchii*.

V. quinquefolia (five-leaved). Virginian Creeper. A very fast-growing climber, with palmate leaves, of three or five stalked and toothed leaflets. The small flowers are greenish purple. A native of North America, introduced 1629.

Cultivation. The species mentioned are very desirable for covering new walls, porches, or other structures, which they render
SWEET ORANGE
(CITRUS AURANTIUM)

Nat. size
Fruit reduced
PL. 62
BAPTISIAS

Natural Order Leguminosæ. Genus Baptisia

BAPTISIA (Greek, bapto, to dip or dye: B. tinctoria having been used as a substitute for indigo). A genus of about fourteen perennial American herbs, of which only two or three are cultivated, and these not frequently on account of their shyness as bloomers. The leaves are divided into three leaflets, or simple. In common with all the plants of the great Order Leguminosæ, the flowers are irregular, the five unequal petals being thus arranged: the upper one broad, and known as the Standard, the two lateral ones (Wings) enclosing the two lower ones, which are more or less united to form the Keel, which curves upwards. In Baptisia the petals are more nearly equal than in most genera. In the majority of Leguminous plants, the stamens are united by their bases into a tube through which passes the ovary, but in Baptisia and allied genera the ten stamens are quite free. The Natural Order Leguminosæ includes about four hundred genera with six thousand five hundred species.

Principal Species.

BAPTISIA ALBA (white). Stems 2 feet, with wide-spreading, straggling branches, and smooth, stalked trefoils of elliptic-oblong leaflets. Stipules oval-shaped. Flowers white in terminal racemes; June. This was the first species introduced (1724).
B. australis (southern). Stems 4 to 5 feet, branches diffuse. Leaflets long, wedge-shaped. Stipules large, lance-shaped, twice the length of the leafstalk. Flowers blue, in few flowered racemes; June. Introduced 1758.

B. tinctoria (dyer's). False Indigo. Stems slender, 2 to 3 feet. Leaves scattered, the leaflets roundish. Stipules reduced to small bristles. Flowers yellow, in loose terminal racemes; June.

Cultivation. *Baptisia* are easily grown in ordinary garden soil, but for successful blooming they require good loam. They may be propagated by division of the roots, but this does not give uniformly good results. They produce abundance of seeds, and these may be sown in spring, in pots filled with leaf-mould and sand, and germinated in a cold frame. The young plants should be transplanted into the border as soon as large enough. It should be noted that seedlings rarely flower before the completion of their third or fourth year.

Description of Plate 64. The upper portion of a stem of *Baptisia australis* is here shown. From portions of the drawing it will be seen that the stamens as well as the petals drop off when their office has been discharged instead of shrivelling away, as more general in the order. The large stipules of this species are well shown near the base of the figure; fig. 1 is a section through the flower with the parts in their natural positions.

**BROOMS**

Natural Order Leguminosae. Genus *Cytisus*

*Cytisus* (etymology of the name obscure). A genus of shrubs, rarely spinous, comprising about thirty-eight species, natives of Europe, North Africa, West Asia, and the Canaries. The leaves are simple or divided into three leaflets; sometimes entirely wanting. Stipules minute. The flowers are white, yellow, or purple; they do not secrete honey. The calyx is two-lipped, of which the upper has two, and the lower three minute teeth. The standard is not fully expanded; wings oblong; keel blunt. Stamens all united by their filaments, forming a complete tube enclosing the ovary; anthers alternately long and short.

History. The cultivation of *Cytisus* in our gardens naturally began with our solitary native species, *C. scoparius*, the Broom, which deserves inclusion in the shrubbery border or plantation. *C. spinosus*, a South European species, was the first to be introduced
from abroad (1596), followed at an interval of thirty-three years by *C. sessilifolius* from Italy, and by *C. triflorus* from Spain in 1640. Of those of more recent introduction, at present found in cultivation, we may mention *C. nigricans*, from Austria in 1730; *C. hirsutus*, from South Europe, 1739; *C. purpureus*, from Austria in 1792; and *C. scoparius*, var. *andrearum*, found wild in Normandy so recently as ten years ago.

**Principal Species.**

**Cytisus canariensis** (Canary). Stems branched, 2 to 3 feet. Leaves small trefoils; the leaflets greyish and shaggy. Flowers, bright yellow, in terminal racemes, fragrant; spring and summer. Canary Islands, 1656.

*C. hirsutus* (hairy). Stems decumbent with round, twiggy branches; covered with stiff hairs when young, smooth when mature; leaves trefoils, the leaflets egg-shaped, hairy beneath. Flowers yellow, footstalks very short; racemes lateral; June. Hardy.

*C. nigricans* (blackish). Stems 3 to 6 feet high, with round, twiggy branches, downy. Leaves stalked trefoils; leaflets elliptic, downy beneath. Flowers yellow in erect terminal racemes, 6 inches long; June and July. Hardy.

*C. purpureus* (purple). Stems smooth, procumbent, 3 feet, with ascending or pendulous branches. Leaflets of trefoils egg-shaped. Flowers white, rosy purple, or dull purple, solitary or in pairs, from the axils; May. This is sometimes grafted upon the Laburnum, when its pendulous branches have a fine effect. There is a hybrid called *Laburnum Adami*, of which the present species and *Laburnum vulgare* are the parents; the flowers of both parents and a hybrid form are produced from the same stem.

*C. racemosus*. This is the common Genista of the florists, hundreds of thousands of it being grown annually for distribution, chiefly by costers, in London alone. It is a native of the Canary Islands, where it forms a big shrub. The plants sold in London for the decoration of rooms, window boxes, etc., are grown in about two years from cuttings.

*C. scoparius* (broom). Common Broom. Stems 2 to 6 feet; branches angular and furrowed. Leaves trefoils; leaflets egg-shaped, silky. Flowers bright yellow, 1 inch long, the style coiled spirally; solitary from the axils; May and June. There are several natural varieties of this hardy shrub, among them var. *andrearum*, which has flowers of a deeper golden colour, with the keels deep maroon instead of yellow.

With the exception of those species described as hardy above, these plants should be grown in pots for greenhouse
or conservatory decoration. For this their bright blossoms admirably fit them, and the simplicity of culture makes them specially desirable. The hardy kinds may be readily propagated by sowing seed in the open border in April. The greenhouse species are usually obtained by taking cuttings from the young ripe wood with a keel. If these are inserted in pots, covered with a cloche and placed in a closed frame they will soon become rooted. They should then be hardened off and potted, and if the shoots are frequently pinched back will make handsome little flowering plants for the next season. The potting compost should consist of turfy loam, to which has been added a little manure and sharp sand. After flowering the plants should be cut back, and new growth induced by placing them in a closed frame again. Then, if necessary, they should be re-potted and returned to the frame, but not kept so close as before. About August they should be turned out to harden off, until there is danger of frost, when they should be removed to the cool greenhouse, specimens being brought into a higher temperature as they may be required. When the flowers begin to open, liquid manure should be given occasionally.

Description of Plate 65. 1 and 2 are different views of the flower; 3 is a section showing the staminal tube through which the style protrudes.

GENISTAS

Natural Order Leguminosæ. Genus Genista

Genista (the classical Latin name used by Virgil). A genus of about seventy species of shrubs with simple leaves (occasionally trefoils), and yellow or white flowers similar to those of Cytisus, but with bell-shaped calyx. The claws of the lower petals are joined to the staminal tube, and the keel usually bent downwards. The species are natives of Europe, North Africa, and Western Asia.

Principal Species. Genista Æthnensis (Mount Etna). Stem erect, much branched, 6 to 15 feet high, sparsely clothed with slender silky leaves. Flowers yellow in terminal racemes; June and July. Introduced from Sicily (1816).

G. Anglica (English). Needle-furze or Petty-whin. Stems branched, 1 to 2 feet high, with simple spines and oval-lance-shaped leaves. Flowers yellow, in few-flowered racemes at the end of spineless branches only; May and June. Native.
BAPTISIA AUSTRALIS

Nat. size

PL. 64
G. hispanica (Spanish). Stems branched, 6 to 12 inches high; barren shoots armed with stiff, branching spines. Leaves lance-shaped, hairy. Flowers yellow, in rather depressed racemes; June and July. Introduced from Spain (1759).

G. sagittalis (of an arrow). Stems trailing, branches more erect two-edged, 6 inches high. Leaves oval-lance-shaped. Flowers yellow, in short, stout terminal spike; May and June. Native of Europe (1570).

G. tinctoria (a dyer). Dyer’s Greenweed. Stems erect with erect branches, 1 to 2 feet high. Leaves lance-shaped. Flowers yellow, in spike-like racemes; July to September. Native. There is a good double variety in cultivation.

G. triangularis (triangular). Stems prostrate three-sided, 2 to 4 feet high. Leaves, lower trefoils, upper simple; hairy. Flowers yellow, in short terminal racemes; May and June. Introduced from Hungary (1815).

For Cultivation, see instructions for Brooms (Cytisus).

GOAT’S RUE

Natural Order Leguminosae. Genus Galega

Galega (Greek, gala, milk; supposed to increase the milk of goats fed upon it). A genus of erect perennial herbs containing only three species. The leaves are divided into eleven to seventeen long, entire leaflets, arranged in what is termed an impari-pinnate manner; that is, with an equal number of leaflets on each side of the midrib and an odd one at the free end. The stipules are large, of arrow-head shape. The flowers are of similar structure to those of Cytisus, crowded in long-stalked axillary and terminal racemes. They are natives of South Europe and West Asia.

History.

In addition to its supposed virtue as a milk producer when eaten by animals, Galega officinalis was once reputed to be medicinal, when administered as a cordial in cases of fever or convulsions. Hence it became officinal—a herb that could be bought in the shops. Hence also it was introduced to our gardens, as long ago as 1568, from Spain. The other species came after a long interval, presumably because they were not officinal. G. orientalis, from the Levant, did not reach us until 1881, and G. biloba until 1823.

Species.

Galega officinalis (of the shops). Stem 3 to 5 feet; leaflets smooth, lance-shaped, ending in a hard point
FLOWERS OF GARDEN AND GREENHOUSE

(mucronate); stipules broad, lance-shaped. Flowers pale blue in long racemes; June to September. There is a white-flowered form, var. albiflora, sometimes known as G. persica.

G. orontalis (Eastern). Rootstalk creeping; stem 3 feet, flexuous, unbranched. Leaflets more ovate; stipules broad, egg-shaped. Flowers violet-blue; June to August.

G. biloba (two-lobed). Stem 3 feet. Leaflets cut at the tip into two lobes. Flowers pale purple; June to September.

Culture. The species of Galega will succeed in any garden soil, but to treat them properly they should be planted in rich loam, in a sunny border where they may remain undisturbed for several years—taking them up only when the clumps have grown too large and division is desirable. Where there is room the large clump should be allowed. Besides division of the roots, the plants may be propagated by sowing seed in the open border in March or April.

Description of Plate 66. The upper portion of a flowering stem of Galega officinalis is shown together with one of the larger lower leaves. Fig. 1 is an enlarged representation of the flower, and Fig. 2 a section through the same.

LUPINES

Natural Order Leguminosae. Genus Lupinus

Lupinus (Latin, lupus, a wolf or destroyer; these plants being supposed to be so ravenous that they exhausted the soil). A genus of which about eighty species have been described, but very few are in cultivation. They are hardy or half-hardy annual or perennial herbs, sub-shrubs and (a few) shrubs. The leaves are compound, of 5 or more leaflets arranged digitately (rarely trefoils). The flowers are of the same papilionaceous type as in the four genera last described, and are usually arranged in erect racemes. The calyx is deeply two-lobed; and the stamens united into a tube. Most of the species are American; a few annuals, natives of the Mediterranean region, being the sole representatives of the genus in the Old World. Under cultivation many beautiful hybrids have been produced which have to a very great extent superseded the original species, though nearly all are worthy of a place in our gardens.

Principal Species. Lupinus arboreus (tree-like). Tree Lupin. Stem shrubby, 6 feet. Leaflets slender, lance-shaped. Flowers yellow, fragrant; throughout the summer. Native of North America (introduced 1793).
**L. Luteus** (yellow). Stem herbaceous, 12 to 18 inches. Leaflets oblong, 7 to 9. Flowers, yellow, fragrant; June to August. Annual species from South Europe (1596).

**L. Mutabilis** (changeable). Stem sub-shrubby, erect, branched; 3 to 5 feet. A strong-growing, though somewhat tender species. Leaflets 7 to 9, lance-shaped. Flowers fragrant, variable; at first nearly white, then becoming tinted with yellow and purple; June to August. Native of the Andes of Bogota (1819); perennial.

**L. Nanus** (dwarf). Dwarf Lupine. Stem 12 inches. Leaflets, 5 to 7, narrow, lance-shaped, hairy. Flowers lilac and blue; June to August. An annual from California (1833). The garden varieties have flowers white, yellow, or various shades of violet and blue.

**L. Polyphyllus** (many-leaved). Stem herbaceous, 5 or 6 feet high. Leaflets, 11 to 15, lance-shaped, hairy beneath. Flowers, dark blue, sometimes with a mixture of white, in immense racemes; spring and autumn. A perennial, commonly found in gardens. Native of Columbia (introduced 1826).

**Cultivation.** Lupines occur in all sorts of gardens they are easily accommodated, and produce fine effects. The annual species must be sown in spring in the open ground, while the perennials may either be propagated in the same way or have their roots divided in spring. Those with shrubby stems, like *L. arboreus*, may also be reproduced by means of cuttings.

**WISTARIAS**

**Natural Order Leguminosae. Genus Wistaria**

Wistaria (name given in honour of Caspar Wistar (1761–1818), Professor of Anatomy, University of Pennsylvania. A genus of tall, climbing, hardy shrubs, comprising only four or five species. The leaves are pinnate, with an odd leaflet at the tip; the leaflets entire. The flowers are very similar to those of Galega, usually of some shade of blue and borne in long terminal racemes. The two upper calyx teeth are shorter than the lower three. Standard large, with two ridges at the base; stamens in two bundles. Natives of North America, China, and Japan.

**History.** The *Wistaria* as a garden flower may be considered quite modern, for though *W. frutescens*, the Kidney-Bean tree, was introduced from North America a hundred and seventy years ago, and grown in shrubberies, it was not widely known. The general
cultivation of *Wistaria* dates from the introduction of *W. sinensis* from China in 1818. Fortune tells us that he has seen this species in its native country with racemes as long as $3\frac{1}{2}$ feet. *W. multijuga* is also a Chinese species, introduced as recently as 1874. When fairly rooted they make rapid growth, and are therefore desirable aids towards hiding the rawness of new houses. In the South of England they will do well around the pillars of a projecting porch or covering a wire-arch; but in the north they require the shelter of a wall. They have been popularly named Grape-flower Vines.

**Principal Species.**

*WISTARIA SINENSIS* (Chinese). Stems from 15 to 40 feet long. Leaflets pointed, egg-shaped, in distant pairs, covered with fine silky down on each surface. Flowers bluish lilac, the racemes produced in such abundance in April and May, before the leaves are fully expanded, that the branches are hidden beneath the flowers. Sometimes there is a second but less abundant flowering in August. There are several varieties: *alba*, with white flowers; *flore-pleno*, double; *macrobotrys*, with large racemes of pale flowers; *variegata*, with variegated leaves.

*W. FRUTESCENS* (shrubby). A much smaller but more hardy species than the preceding. It is, however, not so widely grown on account of its less handsome appearance; though this is to some extent atoned for by the fragrance of its violet flowers. These are in dense, slender racemes, appearing much later than those of *W. sinensis*, and continuing until September. The var. *magnifica* is an improvement upon the type form.

*W. JAPONICA* (Japanese). A smooth twining shrub, with less dense racemes of white flowers; July and August.

*W. MULTIJUGA* (many pairs, leaflets). Leaflets very numerous. Flowers lilac and purple, in racemes that are 2 feet long; June to August.

**Cultivation.**

The principal point for a grower of Wistarias is the avoidance of a wet soil. A fairly well-drained loamy earth suits them best, and as soon as their roots have got good hold of it they grow rapidly, especially if they are given a position with a south or south-west aspect. They are propagated by means of layers or seeds which are not unfrequently ripened in this country. Young shoots from near the base of the shrub are layered during the summer, and allowed to remain undisturbed for a year. They will then be found to be well-rooted and may be separated from the parent, and grown on in pots or planted where they are desired to remain permanently.
GOAT'S RUE
(GALEGA OFFICINALIS)
Nat. size
PL. 66
Description of Plate 47. A reduced representation of a flowering branch of Wistaria sinensis. Fig 1 is a section through the flower, showing the essential organs within the keel.

FRENCH HONEYSUCKLE

Natural Order Leguminosae. Genus Hedysarum

Hedysarum (from the old Greek name for the plant, Hedysaron). A genus comprising about fifty species of hardy herbaceous or sub-shrubby perennials. The pinnate leaves are very similar to those of Wistaria, but the axillary flower racemes are erect instead of drooping. The "standard" petal is egg-shaped or heart-shaped, narrowest at the base; the upper stamen free. The chief point in which it differs from related genera is found in the structure of the seed-pod, which is composed of a number of one-seeded joints which separate when ripe. The species are natives of Europe, North Africa, Temperate Asia, and several are North American.

History. Although the genus includes a number of handsome plants, Hedysarum coronarium is almost the only species commonly grown in gardens. It is one of the many plants first introduced in the year 1596. Even to the most casual reader it is probably unnecessary to explain that this species has no affinity with the Honeysuckle (Lonicera), notwithstanding the popular name. This is a parallel case with the name of Black-beetle, which entomologists are never tired of reminding us is neither black nor a beetle. H. coronarium is neither a honeysuckle nor a native of France; and whilst we call it French Honeysuckle the French people name it Spanish Sainfoin and Sulla. By way of justification, however, it should be explained that Red Clover is often called Honeysuckle, because country children have a trick of pulling off the florets and sucking the honey from the corolla-tube. Therefore Hedysarum may get its popular name on account of its relationship to Trifolium pratense. It is cultivated as a fodder plant in some continental countries, particularly Italy. It is a native of South-West Europe. Several species were introduced in the seventeenth and eighteenth centuries, but as they are practically unknown as garden plants their recital would have little interest. Two or three others are of recent introduction: H. Mackenzii, a North American species, eighteen years ago; H. multijugum from Southern Mongolia in 1883; and H. microcalyx, from Himalaya in 1887.
HEDYSARUM CORONARIUM (garland). Stems diffuse, 3 to 4 feet long, and about 18 inches high. Leaflets varying from elliptical to roundish in four or five pairs, with the usual terminal odd leaflet in addition; edges and lower surface downy. Flowers half an inch long, deep red, on erect spikes 3 to 6 inches long, like glorified clover heads; June to August. There is a white-flowered variety.

H. MACKENZII (Mackenzie's). Stems decumbent. Leaflets oblong, with hoary down on both surfaces. Flowers red, in long racemes; June to August.

H. MICROCALYX (small-calyxed). Stems sub-shrubby, tall-growing. Leaves sometimes as much as a foot long, the leaflets numerous, sixteen to twenty, oblong; from \( \frac{3}{4} \) to \( 1\frac{1}{2} \) in. long. The flowers are as long as the leaflets, bright red with a strong violet tinge, and with a small five-toothed calyx. The racemes are as long as the leaves, on very long stalks, and appearing in June.

H. MULTIJUGUM (many-pairs). Stems perennial, woody, 3 to 5 feet high, branched. Leaves divided into from twenty to forty egg-shaped or oblong leaflets, covered with silky down beneath. The leaf-stalks and branches are also downy. The flowers are bright red, in somewhat sparsely-flowered racemes; June and July.

Given an open, sunny situation, where there is a good and deeply-dug soil, and there you may plant Hedysarums, with fair assurance that they will do well. They die down in winter, but shoot again vigorously in spring. The seeds should be sown in the open border in May or June, pricked out when fit, and removed to their permanent position in the autumn. They will then be well-established before the flowering season comes round. H. coronarium may be treated as an annual. H. multijugum is a useful plant for the shrubbery.

Description of Plate 68. Hedysarum coronarium; Fig. 1 showing a blossom detached, and 2 a section of the same.

CORAL TREES

Natural Order Leguminosæ; Genus Erythrina

ERYTHRINA (Greek, erythros, red). A genus comprising about thirty species of trees and shrubs, with branches and leaf-stalks often prickly. The leaves are trefoils, the two lower leaflets opposite. The
WISTARIA SINENSIS

1/2 Nat. size

PL. 67
flowers are large and showy, in dense racemes, usually produced before the development of the larger leaves. The calyx is very large and almost assumes the character of a spathe, enveloping the base of the corolla. It is usually split into two lips, but occasionally into five nearly equal teeth. The "standard" petal is greatly developed, and much exceeds the wings and keel in size. The species are distributed over the warmer regions of both hemispheres. None of the species are hardy, but if treated as herbaceous plants several of them succeed well in sheltered sunny positions.

**History.**

Coral trees have been grown in our hothouses for the last two hundred years, on account of the beauty and brilliance of their singular flowers. The Cock's-comb Coral Tree, *Erythrina crista-galli*, is a favourite greenhouse plant, and is largely used for sub-tropical bedding in the London Parks. The Coral Tree proper is *E. corallo dendron*, introduced from the West Indies in 1690. *E. picta* was introduced from the East Indies six years later, and *E. herbacea*, which is one of the species most commonly grown here, came from Carolina in 1724. The pink-flowered *E. carneae* came from Vera Cruz in 1733, and the most frequently cultivated *E. crista-galli* from Brazil in 1771. The majority of the species are introductions of the present century. Some of them have important uses in their native countries. *E. caffra*, the Kaffirboom of the African-Dutch, is a native of the Cape, where its trunks are hollowed out for making water-troughs and canoes. Its wood is so light that it is used instead of corks for buoying fishing-nets. It is also planted as a street tree in the towns of South Africa, where it forms a large spreading tree and flowers magnificently. *E. indica* is planted in the East Indies as a support for the Betel-pepper plants. Its wood is largely used in India for the manufacture of toys and lacquered ornaments, and the leaves and bark have medicinal uses. This, as well as the gorgeous flowers, was probably a reason why Krishna's wives desired it, for at their request he stole it from the Celestial Garden, since when it has been under a curse.

**Principal Species.**

*Erythrina caffra* (Kaffir) forms a large tree, and is not therefore a good garden plant for this country. There is, however, a dwarf free-flowering variety of it, called *Humnei*, which grows to a height of 8 feet, and flowers annually if grown in a sunny stove or warm greenhouse.

*E. corallo dendron* (Coral-tree). A tree, 20 feet high, with broadly oval leaflets. Flowers large, deep scarlet, in long racemes, appearing in May and June after the leaves have fallen. Stem prickly.
E. CRISTA-GALLI (Cock's-comb). At home in Brazil this is a tree 40 feet in height, but the yearly shoots put up from the rootstock in this country, out of doors, do not exceed 6 or 8 feet. The slightly glaucous leaflets are egg-shaped or lance-shaped, of a leathery texture; the leafstalk prickly. Flowers large, bright deep scarlet, appearing from May to July. Almost hardy in the South of England.

E. HERBACEA (herbaceous). Rootstock woody; stems herbaceous, annual, unarmored; 2 to 3 feet. Leaflets egg-shaped, inclined towards halbert-shaped. Flowers deep scarlet; racemes long, flowers distant; June to September. The garden hybrid E. Bidwilli is the result of a cross between this species and the preceding one.

E. INDICA (Indian). Stems woody, spiny, 20 to 30 feet high. Leaflets broad-ovate, smooth. Flowers brilliant scarlet. Introduced from the East Indies (1814). There are several varieties; one with white flowers; another (var. marmorata) with white spots and blotches on the leaves; a third (var. Parcelli) with woody stem, and a white branching stripe along the centre of the leaf.

Culture. E. coralloidendron, E. caffra, and E. indica are best grown in the stove, in a humid atmosphere, supplied with abundant water at the roots during the growing period, the amount gradually lessened towards autumn, and entirely withheld when they have entered the resting condition. In spring they should be re-potted in rich loam, and the temperature raised to start them into growth. E. crista-galli and E. herbacea may be grown outside in a sunny spot and loamy soil. In autumn they must be cut back, and the rootstock covered with some protective material, such as dry fern, dead leaves, or cocoa-nut fibre. Except in the warmer parts of the country, however, they are best lifted and stored under a greenhouse stage, or in a dry shed together with the roots of Dahlias, Cannas, etc. Of course, these species may be grown as pot-plants equally well with the woody-stemmed. In that case it is well to turn them out of doors into full sunshine for the summer, taking them in again before the frosts begin. They should be wintered dry in a cool house.

Propagation is effected by taking cuttings in spring. For this purpose the young shoots should be selected, and they should be taken off with a heel. If these are inserted in pots or pans of sandy soil, they will root readily on a little bottom heat, or if covered with a bell-glass and placed in a frame.

Description of Plate 69. A portion of a flowering branch of Erythrina crista-galli is shown, together with a separate figure (1) of a flower in section.
FRENCH HONEYSUCKLE
(HEDYSARUM CORONARIUM)

Nat. size

PL. 68
History.

MIMOSA (Latin, mimos, a mimic; from the leaves of some species mimicking animal movements when touched). A large genus (about 230 species) of herbs chiefly, and a few tall climbing shrubs and trees. They are distinguished by their twice-pinnate leaves— that is, the leaf is broken up into several pinnae, or wings, each of which is again divided into a number of small leaflets. The flowers are small and stalkless, gathered into small roundish heads, or cylindrical spikes. The stamens are definite in number, never more than twice the number of petals; and the pod is of a peculiar pattern, being jointed between each two seeds, and the valves separating from the rim, which is left attached to the stalk. The species are almost all tropical, mostly American, a few only being indigenous to Africa and the East Indies.

The few species of Mimosa that are cultivated in our greenhouses owe their presence there not to any brilliance of colour or choiceness of perfume, but to an interesting irritability of the leaflets. This phenomenon led to the introduction of M. pudica from Brazil in 1638, and the less sensitive M. sensitiva ten years later. All the species are sensitive to light, and in its absence close down their leaves towards the stem. M. pudica, in addition, is so irritable that if any portion of the plant is touched, the secondary leaflets contract closely together, so that a plant which a minute before was well-clothed with foliage, appears to be leafless. Much attention has been paid, by a number of careful investigators, to these peculiar movements; but with little result beyond ascertaining that the cells on opposite sides become alternately turgid by the absorption of fluid from each other, and so produce a different attitude in the leaves and leaflets. The mere sensitiveness to different intensities of light is shared by other plants, such as Oxalis, Phaseolus, Trifolium, Vicia, etc.

Principal Species.

MIMOSA PUDICA (modest). Stem herbaceous, beset with prickles, 1 foot high. Leaf-stalks bristly; leaves divided into two (sometimes three) pairs of pinnae, each with many leaflets (ten to fifteen or more pairs). Flowers small, red, in compact heads; June and July.

M. SENSITIVA (sensitive). Stems twining, prickly, 3 to 6 feet high. Leaflets egg-shaped, hairy beneath, smooth above; there are but two
pairs to each pinna, and but one pair of pinnæ to each leaf. Flowers purplish; June to August.

Cultivation.  
*Mimosas* are greenhouse subjects, and the species mentioned are perennials, but *M. pudica* is usually grown as an annual. The compost that suits them best consists of equal parts of loam and peat with a little sand added. They are propagated by sowing seed in spring on a hot-bed. They are also increased by cuttings struck on a hot-bed. For this purpose young shoots should be inserted in sandy soil. No special instructions are called for.

Description of Plate 70.  
The principal figure represents the upper portion of a stem of *Mimosa pudica* with the leaves expanded. Fig. 1 shows how a leaf is depressed after irritation, the leaf-stalk being deflected close to the stem, and the leaflets closely packed together. Fig. 2 is an unopened bud with its accompanying bract; 3, is the same fully developed, with the long stamens and pistil extruded; 4, is a section of the flower; 2, 3, and 4, of course, enlarged.

**SWEET PEAS**

Natural Order **Leguminosæ.** Genus *Lathyrus*

*Lathyrus* (from the old Greek name for the Pea, *Lathuros*). A genus of about one hundred species of hardy climbing herbs, annuals, or perennials. The stems are smooth, angled, ridged, flattened. Leaves pinnate, certain of the leaflets being reduced to mere midribs which take the character of clasping tendrils; stipules large, shaped like half-arrow heads (*half-sagittate*). Flowers blue, purple, violet, rosy, yellow, or white; from the axils, solitary or in racemes. Petals broad, often very showy. The species are natives of the temperate regions of the Northern Hemisphere, South America, and of mountain regions in the Tropics.

History.  
*Lathyrus odoratus*, the Sweet Pea, that is of so great importance in gardens large and small, is a native of Southern Europe, and appears to have been introduced from Sicily in the year 1700. It has been usually treated as half-hardy in this country, but is really quite hardy. Under cultivation the beauty of the flowers has been much increased by selection. The cheapest seed to be obtained to-day gives fine results compared with the natural type, but the large seed-raisers send out seeds that will produce magnificent blooms. *L. latifolius*, the Everlasting Pea, is also European. By many it is regarded merely as a form of our native *L. sylvestris*, and therefore
CORAL TREE
(ERYTHRINA CRISTA GALLI)

Nat. size

PL. 69
Principal Species.

**Lathyrus grandiflorus** (large flowered). Stems four-angled, winged. Leaves divided into a pair of oval, wavy leaflets. Flowers rose-coloured, large, in twos or threes; June to August. Annual. Native of South Europe (1814).

**L. latifolius** (broad-leaved). Everlasting Pea. Similar to the last but with smaller flowers in abundant racemes, and perennial. Rootstock thick, fleshy; stems broad-winged. Leaves with one pair of elliptic leaflets, and broad oval stipules. Flowers large, rose-coloured, many in a raceme; July to September. There is a form with white flowers. A very desirable, free-growing climber for permanent trellis-work.

**L. magellanicus** (Magellan). Lord Anson’s Pea. Leaflets two, egg-shaped; stipules heart-shaped, broader than the leaflets; tendrils three-branched. Flowers purple-blue, in many-flowered racemes; June to September. Perennial. Introduced from Straits of Magellan (1744).

**L. odoratus** (sweet-scented). Sweet Pea. Stems slightly winged. Leaves divided into a pair of oval leaflets, ending in little rounded points (*mucronate*). Flowers fragrant, two or three on a common stalk, varying in colour—white, rosy or purple, with various combinations of these tints; June to September. There are several distinct varieties grown: Butterfly; Fairy Queen; Scarlet, Black, and Striped Invincible (*coccineus superbus*); Painted Lady; Princess of Prussia; Violet Queen.


**L. sylvestris** (of woods). Rootstock creeping, perennial. Stem winged, 3 to 6 feet. Leaflets sword-shaped, 4 to 6 inches long; stipules sickle-shaped with long ears. Flowers purplish with rosy standard, three to ten in a raceme; June to August.

FLOWERS OF GARDEN AND GREENHOUSE

eared. Flowers large, bright red with purple standard, two or three in a cluster; June and July. Annual.

L. TUBEROSUS (tuberous). Rootstock creeping, perennial; small tubers on the rootlets. Stem angled, 2 to 4 feet. Leaflets, one pair only, oval, with short tendrils. Flowers crimson, large, three to six in a raceme; June to August.

Culture. Sweet and Everlasting Peas should be in every garden. Their cultivation is of the simplest; and if the seed be obtained from one of the best houses a brilliant display is assured in any but the poorest of garden soils. The seeds should be sown early in spring in the open ground, in rows an inch and a half deep, or in circular patches a yard or so in diameter in the herbaceous border, suitable branched sticks being inserted to support the stems. They are frequently sown in pots, germinated under glass and planted out when a couple of inches high; but it is far better to sow where they are to flower. On dry soil they must be watered several times a week in the absence of showers. To prolong the blooming period the dead flowers should be picked off immediately; otherwise the strength of the plant will be exhausted by the swelling pod, and the flowering will cease. The perennial species may also be propagated by division of the rootstock, early in spring. If the seed-bed has been prepared by well digging in manure during the previous autumn, the result will well repay the trouble taken.

Description of Plate 71. A portion of the stem of Lathyrus odoratus is shown, the flowers of the natural size of the type, which is much exceeded by the improved strains now commonly grown. Fig 1 is a section of the flower; 2, a single seed; and 3, a seedling.

PHASEOLUS (the old Greek name). This genus, allied to Lathyrus, includes the Scarlet Runner (P. multiflorus), the Kidney-bean (P. vulgaris), and others that may be used with advantage in covering arbours and trellises. They bloom freely and continuously, and combine usefulness with ornament.

SPIRÆAS

Natural Order Rosaceæ. Genus Spiræa

Spiræa (the old Greek name). A genus of about fifty species of perennial herbs and shrubs, with alternate leaves, and white or red flowers in axillary or terminal cymes. The calyx is four or five lobed;
SENSITIVE PLANT
(MIMOSA PUDICA)

Nat. size
PL. 70
petals four or five; stamens from twenty to sixty; carpels five or more, developing into few-seeded follicles. They are natives of the temperate and colder regions of the Northern Hemisphere.

History.
The plant commonly known as *Spiraea japonica*, and extensively grown as a greenhouse and window-plant, is not a *Spiraea* at all, but an *Astilbe* belonging to the Order Saxifrageæ, which will be referred to in due course. *S. Aruncus*, the well-known Goat's-beard, has been in cultivation in our gardens since its introduction from Siberia in 1633. *S. hypericifolia* came from North America in 1640, *S. lobata* from the same country in 1765, and *S. palmata* from Japan in 1823. *S. Filipendula*, the Dropwort, and *S. Ulmaria*, the Meadow-sweet, are British, and *S. salicifolia* is naturalised in some districts. There are few, if any, more charming native wild flowers than *S. Filipendula* and *S. Ulmaria*, the former upon chalk downs, the latter by stream sides and in wet meadows.

The following list is a mere selection of the most widely-grown species:

## I. Herbaceous Section—

### **Spiræa Aruncus** (goat's beard). The Goat's Beard. Stems slender, 4 feet high. Leaves thrice pinnate; leaflets oblong, lance-shaped, saw-toothed. Flowers whitish, in long compound panicle of slender, drooping spikes; June.

### **S. Astilboïdes** (Astilbe-like). Similar to *S. Aruncus* in general appearance, but even more graceful, though smaller. Flowers white, in panicles of spikes; June to August. A native of Japan. There is a variety *floribunda*, with more abundant blossom.

### **S. Filipendula** (dropwort). The Dropwort. Rootstock short, root-fibres tuberous; stem erect, grooved, 2 to 3 feet high. Leavesinterruptedly pinnate (that is, with a small pinna between each two large ones), chiefly radical, 4 to 10 inches long. Flowers, one-third of inch, white with rosy exterior, in loose cymes; June and July.

### **S. Lobata** (lobed). Queen of the Prairies. Closely resembling *S. Ulmaria* but larger. Stem 4 to 8 feet. Leaves large, interruptedly pinnate, the terminal leaflet very large and divided into from seven to nine lobes; stipules kidney-shaped. Flowers bright rosy red, in large terminal compound panicles; June.

### **S. Palmata** (palmate). Stem crimson, 1 to 2 feet high. Leaves palmately, 5 to 7 lobed, the lobes doubly saw-toothed. Flowers brilliant crimson, in corymbose panicles; June to August. The leaf-stalks are of the same colour as the flower. Var. *alba* has white and var. *purpurea* purple flowers.
S. Ulmaria (elm-grove). Meadow-Sweet, or Queen of the Meadows. Stems erect, furrowed, 2 to 4 feet. Radical leaves, 1 to 2 feet long, interruptedly pinnate. Flowers creamy white in compound cymes; June to August.

II. Shrubby Section—

S. Bullata (blistered). Stems branched, erect, 12 to 18 inches high; branches round and hairy, clothed with reddish down. Leaves almost stalkless, leathery, smooth, upper surface blistered. Flowers dark pink or claret colour, in dense corymbs; June to August. A native of Japan.

S. Canescens (hoary). Stems erect, branched, hoary, 4 to 6 feet. Leaves oval, stalked, entire, covered with weak hairs. Flowers pale pink or white, in crowded corymbs that are clothed with cottony filaments; June to August. Introduced from Himalaya (1879).

S. Japonica (Japanese). This is not the plant usually but improperly known as S. japonica (see Astilbe, page 27, vol. ii.). A greenhouse evergreen, 4 to 6 feet high. Leaves lance-shaped, undivided, smooth, sharply-toothed, teeth with thick tips. Flowers rosy in flat terminal corymbs; June. Native of India, China, and Japan (introduced 1859). There are several varieties, of which the most desirable are var. Bumalda, var. ruberimma, and var. Watereri.

S. Lindleyana (Lindley’s). Stems branching 4 to 8 feet high. Leaves large, unequally pinnate, with from eleven to twelve leaflets; oval, lance-shaped; coarsely saw-toothed. Flowers white, in large terminal panicles; September. Native of Himalaya.

S. Salicifolia (willow-leaved). Stems 3 to 5 feet high, with runners from the base. Leaves oblong, lance-shaped, saw-toothed. Flowers rosy or pink, in dense cymes; July and August. The principal varieties are floribus albis (white-flowered), floribus roseis (rosy-flowered), paniculata (flowers white, in large branched panicles).

Culture.

Ordinary garden soil well manured suits most of the Spiraeas, and they succeed best in loam. S. Filipendula likes a dry situation, whereas S. palmata and S. Ulmaria prefer a wet one, and will do best in a damp hollow or at the very edge of a stream or ditch. Should these conditions not exist in the garden, these species may be accommodated in a tub sunk in a border. The shrubby species are most useful for borders or massive beds on the lawn. S. Lindleyana used to be magnificent at Hampton Court, where it formed elegant shrubs ten feet high. The form of S. japonica known as A. Watereri is one of the most ornamental summer-flowering shrubs of recent introduction. The herbaceous species may be readily propagated by division of the
SWEET PEA
(LATHYRUS ODORATUS)
Nat. size
PL. 71
roots in spring or autumn. Some species produce offsets or runners from the base; these may be detached and potted, when they will soon become vigorous plants. The shrubby kinds are propagated by cuttings from the young wood, rooted in sandy soil, under glass.

The upper portion of a stem of _Spiræa Filipendula_, the separate leaves being from the roots. Fig 1 is an enlarged view of a detached flower, and Fig 2 is a section of the same after taking off the petals.

**ROSES**

**Natural Order Rosaceæ. Genus Rosa**

_Rosa_ (the old Latin name). A genus of erect, trailing, or climbing shrubs, mostly hardy and ornamental, of which about two hundred and fifty forms have been named; but of this number it is considered by authorities most are mere varieties or sub-species, those that are really specifically distinct being less than thirty. They have pinnate leaves, with saw-toothed leaflets and stipules grown to the leaf-stalks. Flowers with five large, showy, equal petals, white, yellow, pink or red; often fragrant, but not honeyed; anthers and stigmas maturing simultaneously. The calyx tube is persistent, fleshy, or leathery; globular, egg-shaped, or pitcher-shaped, with contracted mouth, enclosing the numerous carpels. Stamens many. The fruits are achenes, each containing a single seed, and enclosed in the calyx tube. They are natives of the North Temperate regions (rare in America); Abyssinia, India, and Mexico are the southern limits of their range.

**History.**

The history of the Rose as a cultivated plant goes back to very ancient times. Among the ancient Greeks and Romans it was regarded highly, and the stories of Nero and Heliogabalus causing roses to be showered down upon their guests at banquets are well known. It is even recorded that so abundant was the shower on certain occasions that some unlucky guests were suffocated before they could extricate themselves. Then we are told of the Sybarites, whose name is a synonym for voluptuous extravagance, that their couches were stuffed with the petals of Roses. This Rose of classical times is supposed to be _Rosa centifolia_, the Hundred-leaved, or Cabbage Rose, which is a native of the Orient. This may also be designated the Poet's Rose, for it is the flower of which they have sung the charms from time immemorial. But it must not be supposed that references in
our own early poets are to the big double Roses; they are rather in praise of our native Roses improved slightly by cultivation. *R. centifolia* contributes largely to the supply of Attar of Roses, and has furnished our gardens with an enormous number of varieties and hybrids, during the three hundred years in which we have grown it. From *R. centifolia* have been evolved the Miniature Pompone Roses, the Moss-Roses and the Painter's Rose; and it was held in the highest esteem in our gardens until the introduction of the perpetual-flowering species, since when it has been relegated to a less important position. Equally neglected are now the Damask Roses (*R. damascena*) and the Provence Roses (*R. gallica*, var. *provincialis*), which have been cultivated by us for three hundred years. The former species, which appears to be a native of Eastern Europe and the Orient, is traditionally said to have been brought to Western Europe by a returning Crusader, the Comte de Brie. The Musk Rose (*R. moschata*), so important in the production of perfumes, is a native of the regions from the shores of the Mediterranean to India; it is supposed to have been brought from North Africa in 1590. *R. lutea*, the Eglantine, or Austrian Briar, is another species introduced from the Orient about 1596, but few garden varieties have arisen from it. One of the oldest forms in our gardens is *R. alba*, the old White Rose. It is not an introduced species but a form of garden origin, believed to have been produced by crossing our *R. canina* with *R. gallica*. It has been cultivated since 1597, and has produced several varieties. Up to this period the species introduced were Bush Roses, but in 1629 the first climbing rose, *R. sempervirens*, with clusters of fragrant white flowers, was introduced from South Europe.

Towards the end of the eighteenth century *R. indica* made its appearance in England. The precise year of its introduction is not known, nor the country of its origin, but it appears to have been cultivated in China—which is most probably its real home—from very ancient times, and to have produced varieties there. It was observed in the year 1793 in the garden of an amateur named Parsons, but at various dates since then it has been reintroduced from China by various individuals as a new species. A variety of this species (*R. indica*, var. *diversifolia*) appears to have been introduced in 1771 under the name of *R. bengalensis*, and became known as the Bengal or Perpetual Rose. It is said also to have been brought from Canton in 1780; from this variety our Monthly Roses have originated.

One would have expected that our own native species, such as *R. canina* and *R. arvensis*, would be represented by double flowers in our gardens, rich as they are in stamens, but, except as the partial
DROPWORT

(SPIRAEA FILIPENDULA)

Nat. size

PL. 72
parents of certain hybrids, they have not contributed to the Rose lists of
the florist. Their straight stems, however, have been extensively used
as stocks for Standard Roses. *R. spinosissima*, the Burnet or Scotch
Rose, has been more productive in this respect; the Scotch Roses of our
gardens owing their descent to the wild species. The Ayrshire Rose is
now regarded as a hybrid, claiming *R. arvensis* as one of its parents, but
of which the other is unknown. Several legendary accounts of its origin
are in circulation, but it appears to have been first grown at the beginning
of the present century in the gardens of Loudon Castle, Ayrshire.
*Rosa alpina*, the Alpine Rose, which was introduced from Switzerland
in 1683, has given rise to several varieties, it is believed through crossing
with other species. The Boursaults are among its progeny, *R. indica*
being probably the other parent. The original Boursault appeared in
1821, and has been the source of numerous varieties.

The Bourbon Roses, formerly regarded as a distinct species under
the name of *R. borbonica*, are descended from *R. indica*. It appears
that some travellers returning from China with specimens, and calling at
the Isle of Bourbon, introduced *R. indica* there, where it gave rise to
the Bourbon variety. In 1817 this modified form came under the notice
of M. Bleon, the manager of the Botanical Gardens, and he sent some of
the seeds to M. Jacques, head gardener at the Chateau de Neuilly, who
raised plants from them.

The Noisette Roses (*R. noisettiana*) are the descendants of a hybrid
produced by crossing *R. indica* and *R. moschata*. In the year 1814,
M. Louis Noisette of Paris received seed from his brother Philippe, a
gardener in North America, which produced the first European Noisettes.
In a letter accompanying his gift, Philippe Noisette says he transferred the
pollen of *R. indica* to the stigmas of *R. moschata*. Since that date, by
the intercrossing of its progeny, and cross-fertilisation by other forms, a
large number of variations upon the original Noisette have been pro-
duced, some of them among the most popular Roses now grown. We
need but mention Maréchal Niel and William Allen Richardson as
familiar examples.

The Banksian Rose (*R. Banksiae*), so named by Robert Brown in
honour of the wife of Sir Joseph Banks, was introduced from China in
the first decade of the present century. These were at first treated as
tender greenhouse plants, but on being tried out of doors against a wall,
made such astonishingly rapid progress that it was obvious a mistake
had been made by growing them indoors.

The American species have recently come into prominent notice,
some of them being equal in beauty to the best of the Old World species,
as, for instance, *R. setigera*, *R. lucida*, *R. blanda*, and *R. wichuriana*. About a dozen species are cultivated in English gardens. They are distinguished from the generality of Roses by their long, smooth stems, bearing few spines, and their vigorous habit. American horticulturists have raised some valuable hybrids by crossing the American with Garden Roses and with each other. *R. laevigata*, really a native of China, is naturalised in America, where it is known as the Cherokee Rose.

Principal Species.

One might almost say with safety that all species of Rose are worthy a place in the garden, but then few gardens would be large enough to accommodate them, and, as a matter of comparative value, some species and varieties are much more beautiful than others, or more amenable to the climatic conditions of our country. As we are unable to give anything like a full list, we must be content with a selection of the most suitable forms.


**R. alba** (white). Stems 4 to 7 feet; prickles slender and nearly straight, or stout and sickle-shaped; without bristles. Leaves glaucous; leaflets oblong, saw-toothed. Flowers, white or pale blush, fragrant; the sepals pinnate, turned back; June and July. Fruit oblong, scarlet.

This is a garden hybrid, supposed to be a cross between *R. canina* and *R. gallica*, and has in turn given rise to many varieties.

**R. alpina** (alpine). Stems 3 feet, the young ones prickly, but as the stems increase in age these fall off. Leaves divided into from five to eleven, egg-shaped, doubly-toothed leaflets. Flowers solitary; sepals spreading; petals pink or rosy, heart-shaped, concave; flower-stalks hanging down after flowering; June.

**R. Banksiae** (Lady Banks'). Stems 20 feet, weak and unarmred, climbing. Leaves with one to five flat, often waved, oblong, lance-shaped leaflets, saw-toothed. Flowers nodding, white, faintly scented; small but numerous; June. There is a variety *flora pleno* with very full, double flowers, and a variety *lutea* with yellow flowers.

**R. blanda** (alluring). Stems 1 to 3 feet, sparingly clothed with easily detached straight prickles. Leaves pale on both sides, minutely downy beneath; leaflets five to seven; oval, saw-toothed. Flowers rosy, singly or in clusters of two or three; May and June. Fruit globose. A native of North America.
WRINKLED ROSE
(Rosa Rugosa)
Nat. size
PL. 73
ROSES

R. BRACITEATA (distinguished by its bracts). The Macartney Rose. Stems with erect branches, 2 feet, armed with strong, recurved prickles. Leaflets five to nine, egg-shaped, smooth and shining, toothed. Flowers large, white, solitary; the base of the woolly calyx surrounded by eight or ten large, silky bracts; July. Native of China (introduced 1795). There is a var. flore pleno, with pure white semi-double flowers.

R. CANINA (canine). Dog Rose. A large bush, 6 to 10 feet high, with many stems and long arching branches, armed with stout hooked prickles. Flowers usually pink, solitary, or clustered; June to August. Fruit egg-shaped or nearly round. Native of Britain and the North Temperate zone. An exceedingly variable species, split up by some authors into many. Mr. Baker enumerates twenty-nine British natural varieties; Deseglise (Catalogue of the Roses of Europe and Asia) gives one hundred and fifty forms of R. canina as distinct species.

R. CENTIFOLIA (hundred-leaved). Cabbage Rose. Stems 3 to 6 feet, armed with nearly straight, scattered prickles. Leaves rather limp, velvety beneath, divided into five or seven egg-shaped, saw-toothed leaflets. Flowers large, rosy purple, fragrant; sepals spreading, calyx and foot-stalk glandular; June and July. The fruitful parent of varieties and hybrids innumerable. Var. muscosa is a natural variety with the sepals fringed with moss-like, glandular, sticky growths. It has given rise to the several forms of Moss-Rose grown. Var. parviflora with small, very double flowers is the progenitor of the Pompone Roses.

R. DAMASCENA (Damascus). Damask Rose. Stems 2 to 4 feet high, clothed with unequal broad-based prickles. Leaflets five or seven, egg-shaped, stiff. Flowers large, white or red, fragrant, in clusters; calyx and foot-stalk clothed with viscid, glandular hairs; sepals turned back; June and July. Fruit egg-shaped, soft. The var. versicolor has the leaflets more rounded and variegated with yellow.

R. GALLICA (French). Stems 2 to 3 feet high, clothed with unequal prickles. Leaflets five to seven, stiff, leathery, egg- or lance-shaped. Flowers red or crimson, double or semi-double, erect; sepals spreading, covered (as well as the flower-stalk) with sticky glandular hairs; June and July. Fruit leathery, somewhat globular. Many varieties and hybrids.

R. HEMISPHERICA (hemispherical). Stems 3 feet. Leaflets five or seven, egg-shaped, paler beneath, nerves downy, edges with compound teeth. Flowers solitary, yellow, on short foot-stalks; calyx tube hemispherical; sepals lance-shaped; petals egg-shaped; July. Fruit erect, globular. Introduced from the Levant (1629).
R. INDICA (Indian). China or Monthly Rose. Stems varying from 4 to 20 feet, the stout branches armed with hooked prickles. Leaves smooth, shining; leaflets three or five, dark above, glaucous beneath, elliptical, with roundish saw-teeth; leaf-stalk prickly. Flowers semi-double, red, profuse; petals heart-shaped, concave. Fruit egg-shaped, scarlet. Flowers throughout the year. Native of China (introduced in 1789).

The Bourbon, Noisette, Bengal, and Tea Roses all owe their existence in part or wholly to this species. R. borbonica is probably a hybrid between R. indica and R. gallica; R. noisettiana between R. indica and R. moschata. The variety diversifolia has purple flowers and weak slender branches; it is the parent of our Monthly Roses (formerly called R. bengalensis and R. semperflorens). The variety floriflora is merely a fully double form; it has in turn produced many garden varieties. Variety fragrans possesses a far stronger fragrance than the usual tea-scent of the species. Variety longifolia has almost single rosy flowers; stem with few prickles. Variety magniflora produces bright purple, semi-double flowers of small size, sometimes called Fairy Roses. It was formerly regarded as a distinct species and called Miss Lawrence's Rose (R. lawrenceana).

R. LUCIDA (clear). Stems 1 to 2 feet, armed with prickly bristles, slender and stout, the latter only persistent. Leaves smooth and shining above, the leaflets five, seven, or nine in number; oblong, lance-shaped; saw-toothed. Flowers solitary or in clusters of two or three; calyx lobes covered with glandular bristles; May to July. Fruit globular, flattened at top. Introduced from North America (1724). There is a variety floriflora with double flowers, called by florists the Lucida Rose Button.

R. LUTEA (yellow). Austrian Briar, or Eglantine. Stems, with erect branches and straight prickles, 3 feet high. Leaflets five to nine, egg-shaped with a tendency to roundness, deeply saw-toothed; dark and shining above, downy and glandular beneath. Flowers few and large, cup-shaped, yellow; calyx tube hemispherical or globular, smooth; petals heart-shaped; June. Odour not so pleasant as that of other roses—in truth, it has been compared to the characteristic smell of the bug tribe. The varieties are not numerous, the principal one being that represented in Plate 81 (Vol. II.). This is the variety punicea, with the petals scarlet within and yellow without, and purple stigmas; it is sometimes called the Capuchin Briar. There is also a variety floriflora (Persian Yellow) with double flowers, and variety Harrisoni, also double yellow.

R. MOSCHATA (musky). Stems stout, climbing, 7 to 10 feet high, much branched, and armed with strong hooked prickles. Leaflets 5 or 9, oval, lance-shaped, toothed; glaucous beneath; midrib hairy. Flowers yellowish white, 1½ to 2 inches across, in clusters of about 7; odorous; August. Calyx tube small, egg-shaped; fruit dark red. The sepals, which have their edges lobed in a pinnate manner, fall off soon after the
TEA ROSE—"GLOIRE DE DIJON"

Nat. size

PL. 74
petals. In cultivation it has produced semi-double varieties, among them the Double Musk of old-fashioned gardens. This species is the backbone of the Attar industry, and for a period of unknown duration, but going back very many centuries, it has been extensively cultivated for this purpose in Tunis, the Balkans, Roumelia, and the South of France. So great is the demand for the essence, it is extensively adulterated, and difficult to obtain in a pure state; it realises from £20 to £25 per lb., and an acre of Rose-garden in the Maritime Alps yields from £12 to £18 net per annum.

R. MULTIFLORA (many-flowered). Stems climbing, 10 to 12 feet high, clothed with cottony filaments, and a few slender prickles. Leaflets five or seven, oval, lance-shaped, soft and slightly wrinkled. Flowers small, white, pink, or purple, in clusters; June. Sepals short, entire, falling early; fruit bright red. There is a double variety (flore pleno) resembling the type in all other respects. The variety carnea has double flowers of a pink hue; var. platyphylla has broader leaflets, and large, double, purple flowers. The garden varieties Rose de la Grifferaie, Laura Davoust, and Multiflore de Luxembourg owe their descent to this species.

R. NITIDA (shining). Stems branched, 2 feet, clothed with prickles and bristles. Leaves dark green, very shiny; leaflets three to seven; narrow, lance-shaped; saw-toothed. Flowers solitary, or in small clusters; brilliant red; July. Sepals narrow; petals heart-shaped, concave almost erect; foot-stalks bristly. Fruit globular, depressed at top, bright scarlet, bristly. Native of North America (introduced 1807).

R. POMIFERA (apple-fruited). A native, and described as a form of R. villosa by some botanists. It is grown in some gardens for the sake of its fruits, which are as large as the largest gooseberries, crimson when ripe and covered with long spinous hairs. It forms a handsome bush, and flowers freely in June.

R. RUBIGINOSA (rusty). Sweetbriar; Eglantine. Stems 5 or 6 feet, clothed with prickles, bristles, and glandular hairs. Leaflets smooth above, downy beneath, saw-toothed; densely covered with glands which give out the strong sweet odour so characteristic of the plant. Flowers pink, one to three in a cluster; June. Fruit globular. A native.

R. RUGOSA (wrinkled). Wrinkled Rose. Stems branched, slender, 4 feet high, densely armed with straight prickles. Leaflets oval, five to nine, wrinkled, toothed. Flowers large, solitary, petals notched, red; June. Sepals long and slender, hairy, turned back. Fruit large, from orange to deep red, globose, somewhat flattened, sepals remaining attached. Native of Japan (introduced 1845). Plate 73.
R. SEMPERVIRENS (evergreen). Stems climbing, armed with hooked prickles. Leaves smooth and shining, persistent through winter; leaflets five or seven, oval, lance-shaped, saw-toothed, paler beneath. Flowers white, sweet-scented, in many-flowered clusters; June to August. The var. prostrata has prostrate stems, and red or white flowers.


R. SPINOSISSIMA (very spiny). Burnet Rose; Scotch Rose. Stems much branched, 1 to 4 feet high, crowded with nearly straight but unequal prickles, and glandular hairs. Leaves small; leaflets seven or nine; broad, saw-toothed. Flowers white or pink, solitary or in clusters of two or three; May and June. Fruit short. Indigenous.

Garden Varieties and Hybrids. The garden varieties and hybrids enumerated in the catalogues of growers and florists run into many thousands, and no man knows them all. Of many no scientific descriptions have been made, and it is impossible to identify them; many, there is good reason for believing, bear several different names, according to the fancy of the grower, who cannot always (or often) discover that his new hybrid has already been named by an earlier discoverer of it. We can only give a selection from the best known kinds, classified according to the sections adopted by florists, rather than on scientific lines.

<table>
<thead>
<tr>
<th>I. HYBRID PERPETUALS.</th>
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<tbody>
<tr>
<td>Abel Carrière, purplish crimson.</td>
</tr>
<tr>
<td>Alfred Colomb, light crimson.</td>
</tr>
<tr>
<td>Alfred K. Williams, carmine.</td>
</tr>
<tr>
<td>Baronne de Maynard, pure white.</td>
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<tr>
<td>Barones Rothschild, pink-tinged white, very large.</td>
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<tr>
<td>Beauty of Waltham, rosy crimson.</td>
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<tr>
<td>Boule de Neige, pure white.</td>
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<tr>
<td>Captain Christy, pale rose.</td>
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<tr>
<td>Caroline D’Arden, soft rose, fragrant.</td>
</tr>
<tr>
<td>Charles Lefebvre, velvety scarlet.</td>
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<tr>
<td>Duke of Edinburg, vermilion, large.</td>
</tr>
<tr>
<td>Duke of Teck, bright scarlet, large.</td>
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<tr>
<td>Duke of Wellington, dark crimson, large.</td>
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<tr>
<td>Dupuy Jamain, cherry-red, large.</td>
</tr>
<tr>
<td>Earl of Dufferin, dark velvety crimson, fragrant.</td>
</tr>
<tr>
<td>Dr. Andry, deep carmine, large.</td>
</tr>
<tr>
<td>Duchess of Connaught, crimson-purple.</td>
</tr>
<tr>
<td>Duchess of Leeds, lilac rose.</td>
</tr>
<tr>
<td>Duke of Connaught, velvety crimson.</td>
</tr>
</tbody>
</table>

| General Jacqueminot, glowing crimson. |
| Gloire de Margottin, dazzling red. |
| Gloire Lyonnaise, white, tinged yellow. |
| John Hopper, rosy. |
| La France, lilac rose with white centre. |
| Lady Helen Stewart, crimson-scarlet. |
| Lord Frederick Cavendish, dazzling scarlet. |
| Madame Gabriel Luizet, satiny rose. |
| Madame Victor Verdier, cherry-red. |
| Mlle. Annie Wood, bright red. |
| Marchioness of Dufferin, rosy pink, dwarf. |
| Marchioness of Londonderry, ivory-white, very large. |
| Margaret Dickson, white, flesh-tinted centre. |
| Mrs. R. G. Sharman Crawford, deep rosy pink. |
| Marie Baumann, bright carmine. |
| Merveille de Lyon, pure white. |
| Mrs. John Laing, light pink. |
| Paul Neron, dark rose. |
| Prince Camille de Rohan, brilliant crimson. |
TEA ROSE—"SAFRANO"

Nat. size

PL. 75
Reynolds Hole, deep maroon.
Senator Vaisse, dazzling red.
Sir Rowland Hill, ruby, shaded with maroon.
Ulrich Brunner, red-cerise.
Xavier Olio, velvety purple.

II. DAMASK PERPETUALS.
Madame Hardy, pure white.
Madame Zoutman, creamy white.
York and Lancaster, striped red and white.

III. MOSS PERPETUALS.
Blanche Moreau, pure white.
James Veitch, dark crimson.
White Perpetual.

MOSS SUMMER BLOOMERS.
Alice Leroy, rosy pink.
Baron de Wassenaer, light crimson.
Celina, velvety purple-crimson.
Comtesse de Murinais, pure white.
Cristata or Crested, rosy.
Eugene Verdier, light red, deeper centre.
Lanei, rosy crimson.
Little Gem, small, crimson.
Madame E. Ory, rosy carmine.
Old, delicate rose.
White Bath, white.

IV. CHINA ROSES.
Duke of York, varying rosy pink to white.
Madame Jean Sisley, white.
Madame Laurette Messimy, rosy-shaded orange.

V. BOURBON ROSES.
Lorna Doone, magenta-carmine.
Mrs. Paul, blush white.
Setina, pink.
Souvenir de la Malmaison, blush white.
Plate 77.

VI. TEA-SCENTED ROSES.
Adam, blush rose.
Catherine Mermet, rosy carmine.
Fortune's Yellow, orange, semi-double.
Gloire de Dijon, fawn, shaded salmon, also a pink form.
Homer, white, tinged salmon.
Isabella Sprunt, sulphury yellow.
Ma Capucine, Nasturtium-yellow.
Madame Falcot, buff-yellow.
Maréchal Niel, golden-yellow.

Niphetos, pure white.
Perle des Jardins, pale to deep yellow.
Sappho, yellow, flushed pink.
The Bride, pure white.

VII. HYBRID TEA ROSES.
La Fraicheur, rosy pink.
Lady Henry Grosvenor, flesh.
Mme. Emile Metz, flesh, pink centre.
Princess May, soft pink.
Reine Marie Henriette, reddish cerise.
Safrano, fawn.
W. F. Bennett, red.

VIII. NOISETTE ROSES.
Adelina V. Morel, yellow-tipped.
Fellemberry, bright crimson.
Lamarque, lemon.
M. Pierre Cochet, yellowish white.
Solfaterre, bright sulphur.
William Allen Richardson, deep orange yellow.

IX. PROVENCE ROSES.
Cabbage, rosy pink.
Unique, large white.

MINIATURE PROVENCE.
Burgundy, pale purplish pink.
Pompon, rosy lilac.
Spong, rosy lilac.
White Burgundy, white.

X. FRENCH ROSES.
Boula de Nanteuil, crimson-purple.
Gloire de Colmar, velvety crimson.
Kean, rich purple, crimson centre.
Napoleon, deep rose, shaded purple.
Œillet Parfait, blush white, striped crimson.

XI. HYBRID BOURBON, CHINA, AND NOISETTE ROSES.
Blairi No. 2, pale blush.
Brennus, crimson.
Charles Lawson, bright rose.
Chénédolé, bright red.
Coupe d'Hebe, deep pink.
Fulgens, fine crimson.
Madame Plantier, pure white.
Mrs. W. J. Grant, bright rosy pink.
Paul Ricaut, bright crimson.
Paul Verdier, carmine.
XXII. Austrian Briar Roses.
Austrian Copper, coppery red, single.
Austrian Yellow, single yellow.
Harrisoni, golden yellow.
Persian Yellow, brilliant golden yellow.

XIII. Ayrshire Roses.
Alice Gray, creamy blush.
Bennet’s Seedling or Thoresbyana, pure white.
Dundee Rambler, white, tinged with pink.
Queen of the Belgians, pure white.
Ruga, pale flesh, fragrant.
Splendens, flesh tint.

XIV. Boursault Roses.
Crimson or Amadis, purplish crimson.
Elegans, crimson-purple with white stripes.
Gracilis, bright pink.
Inermis, bright red.
Splendens, rosy blush.

XV. Banksian Roses.
Alba or White, pure white, violet scented.

Lutea, yellow, very double.
Fortuniana, white, large, and sweet-scented.

XVI. Evergreen Roses.
Félicité Perpétuel, creamy white clusters.
Flora, bright rose.
Myrianthes, fine rose.
Princess Marie, crimson.

XVII. Rugose Roses.
America, crimson-lake.
Belle Poitevine, rosy.
Madame Charles Worth, reddish carmine, semi-double.
Madame Georges Bruant, white, double.
Rosa calocarpa, pure rose.

XVIII. Multiflora Roses.
Anna M. de Montravel, white.
Daniel Lacombe, pale yellow turning white.
Floribunda, lilac rose.
Gloire des Polyanthus, deep rose, white centre.
Laura Davoust, pale flesh.

In addition to the foregoing selection, several of the species previously described have run off in cultivation into varieties differing more or less from the type. The names of these may be found in the catalogues of the growers and dealers.

We have now to consider various matters connected with the successful treatment of the Roses we have selected from the foregoing lists.

Propagation.

There are many methods by which Roses are propagated, but we shall see that these methods are not all applicable to every class. We may sow seeds, we may take cuttings, we may separate the suckers from Roses that are upon their own roots; we may layer the lower branches and so get rooted plants; we may divide the old plants, or we may insert buds or grafts upon a wild briar. To take these in order:—

Seeds of garden-roses are usually worthless for propagation, except where special cross-fertilisation has been carried out with a view to the production of new hybrids. This can only be effected in certain cases. In the very double kinds it will be found that the stamens are entirely absent and their place taken by innumerable petals, but the stigmas are probably intact. In such a case pollen must be
HYBRID TEA ROSE—"LA FRANCE"

Nat. size

PL. 76
sought among the single or semi-double kinds, and carefully placed on the stigma. Then, again, many of the introduced species will not ripen their seeds out of doors in this country. To obtain good seeds, the fruit should be allowed to stay on the tree until its fleshy envelope has turned black. The fruit should be dried in the sun after gathering, then broken open, and the seeds rubbed out and cleaned in sand. They should be sown at once in pans of sandy loam and leaf-mould, well mixed, and the pans placed in a cold frame. Germination does not take place rapidly, but in some cases the young plants will show in spring, others not until the following autumn. Those that appear in spring should be allowed to remain in the seed-pans till autumn, when they should be potted singly if of delicate parentage, planting them out in the spring. If, however, they are of a more hardy lineage, they may be put into nursery beds where they will be protected from frost. Some of these may flower in a tentative fashion during their first summer; others take several years in which to prepare for a floral display, but the amateur is warned that he must not judge the quality of his seedlings by this first effort at flower production. These essays on the part of the immature plant are as a rule mere indications of the colour of future flowers, which will probably be entirely different in form and size, and almost certainly superior. Of course the species all come true from seeds. Seedling briars are raised in thousands to serve as stocks for the garden varieties.

Cuttings may be taken at any time except only during the winter months. The summer is a better time than spring for the purpose, as they may then be cut from the partly-ripened new growths; and in autumn the cuttings may be taken from perfectly mature wood. They should be a foot or slightly less in length, and if taken in spring should preferably be contrived with a small base of last year's wood. Care should be taken not to injure the leaves or eyes. Cuttings of Hybrid Perpetuals and other hardy sorts may be struck out of doors, but those of the tender kinds, such as the Tea-scented, must be inserted in pots of sandy soil indoors. For outdoor treatment a bed should be well dug and the cuttings stuck in to half their length, a foot or more apart, and the ground well trodden around each. Patience must be exercised in regard to them, for the parts above ground may wither and die, and yet new shoots may come later from the buried eyes. They should be allowed to remain undisturbed for a year, when they should be well-rooted young plants, that may be removed to their permanent stations. Tender Roses are best struck in pots during the autumn months, and kept under glass; if the business is unavoidably postponed till late in the autumn, the pots containing them must be wintered in a cold frame. In the spring and
early summer cuttings may be quickly rooted by keeping them moist and shaded on a gentle hot-bed, but taking care to give both air and sun if there is the slightest appearance of a tendency towards damping off. When rooted they should be potted singly, but grown on for a time in the same close temperature. When they have become well established as pot-plants they should be gradually allowed more air, until finally they can be put outside to harden before being wintered in the cold frame. They will also root readily during July and August if planted in a small frame placed against a wall with a northern aspect, so that they will be in continual shade; the soil should be sandy, and pressed firm, the cuttings put in close together, the whole well-watered and the lights kept close until there are clear signs of growth. Then they should be potted and treated as directed for spring cuttings.

Suckers are not invariably produced by Roses. Where they occur we must be sure the Rose is on its own roots, or the suckers will be worthless as a means of propagating a plant we have admired on account of its beautiful flowers. Suckers from a standard or half-standard that has been grafted or budded will only give us plants of the Wild Briar upon which the good sort has been grafted. Where, however, a Rose-bush or tree has been grown from seed or cutting, the suckers will give us true duplicates. Suckers should be taken off in autumn, and if they can be removed with a small root attached, so much the better. If there are roots, they may be planted out in the border at once; if not, they should be dibbled deeply in sandy soil in a cold frame, and left there through the winter. Where it is desired to get an increased stock by this means, and the species or variety produces suckers shyly, or altogether fails in this respect, it may sometimes be induced to push them forth by piling a cone of earth around the base of its stem.

Divisions of the root may be effected in the case of small bushy plants on their own roots, but it is a method not commonly adopted. In following it care should be taken to get an equal quantity of root-fibres to each of the divided portions. These portions may then be dealt with as though they were newly-acquired plants, as instructed in a later page.

Layering is another process not generally adopted in the case of Roses; yet it is a very good method for increasing those of dwarf habit or those with pendent branches. The most suitable period for the operation is in June or July; and the plan most likely to succeed is that form of layering called tonguing. It will be remembered that we explained this method when dealing with Carnations (page 78). The selected branch is bent downwards gently until it touches the soil. The point of contact should be carefully noted and allowance made for the branch being slightly
BOURBON ROSE—"SOUVENIR DE LA MALMAISON"

\( \frac{2}{3} \) Nat. size

PL. 77
buried; now on the under-surface of the portion that will lie in the earth a clean upward cut must be made half-way through the shoot and then in a direction towards the tip. A small splinter of wood is put in to keep the cut open, a slight groove is made in the earth to receive the "layer," which is pegged down and covered with mould, the growing end being bent upward and secured to a stick. Two or three buds near the tip should be allowed to remain, but the others should all be nipped out. When there is no doubt that good roots have been emitted and attained sufficient dimensions to enable them to feed a young plant, the layer should be cut across below the tongue, and the newly-constituted plant removed without injury to the tender roots.

**Budding** is the highest form of the art of Rose-propagation. It is not a very difficult operation, but it must be performed according to the rules, and at the appropriate season, otherwise the bud may perish and the experiment result in failure. Should it be intended to manipulate plants kept in the greenhouse, the operation may be performed early in the year; as soon in fact as suitable buds may be obtained. But for open-air work, from the end of May to the beginning of August is the most suitable time. There are many methods of budding, and each has its advantages for special purposes; but as one form is most frequently practised in the case of Roses, we shall be content with giving that. We must, however, preface our directions by explaining the theory of budding in a few words. The process must be performed when the sap is freely circulating but is not too thin and watery; and a dormant bud from a desirable fine-flowering variety is so intimately united to a vigorous stock of, say, the Dog Rose, that by the suppression of all other buds, the vital forces of the Dog Rose go to stimulate and feed the foreign bud and cause it to grow into a stout shoot. This is then trained as a continuation of the main-stem, and allowed to branch and flower whilst the stock is deprived of every opportunity for growth except through this shoot. Such a Rose-tree will bear abundant flowers of the approved kind years before a flowering tree of the same size could be obtained from seed, and at least a year earlier than from a cutting. In order to get a perfect union between the bud and the stock, the former is cut from its parent tree with a portion of the bark and inner bark attached, but with none of the wood. The bark of the stock is then turned aside and the bud brought into close contact with the naked stock; the bark again turned down and secured with bast-fibres. This can only be done properly in July or August when the bark separates from the wood freely, a remark which applies to budding generally. By this means the surfaces of stock and bud become inseparably united, and by the destruction of
all other buds, the tree produces flowers having all the fulness and beauty of the hybrid from which the bud was taken whilst it is supported by all the vigour of the stock.

To perform this operation special budding-knives are made, of various patterns, but all having, in addition to some form of cutting blade, a thin ivory handle or ivory blade for opening the bark of the stock without injury. The stock and the bud must be prepared at the same time, and no delay must be permitted in carrying out the operation, or there will be no union. Having selected your stock and the tree that is to provide buds, prepare the former by making two clean cuts that shall together represent the letter T, through the bark only, the perpendicular cut to be about an inch long. Now select a firm bud in the axil of a leaf, cut through the leaf-stalk so as to leave only half an inch to remain as a handle, and cut round the bud a shield-shaped outline about \( \frac{1}{2} \)-inch broad and an inch long. Having thus marked it out by cutting cleanly through the bark, insert the edge of the knife under the lower end, and gently remove the shield-shaped flake with the bud in the centre. Hold this by the remains of the leaf-stalk, and remove any thin layer of woody tissue that may have been left attached to the bark, but be careful not to injure the base of the bud. Now with the ivory handle of your knife raise the cut bark of the stock where the two incisions meet, and insert the shield and bud. Press down the flaps of the stock upon it, and bind them closely in position by tying round firmly, but gently, with thin shreds of bast above and below the bud. In this last stage of the operation, care must be taken not to bruise or otherwise injure the bark; at the same time the binding must be sufficiently firm to prevent the access of air with the consequent drying up of the cut surfaces. It is also advisable for similar reasons to shield the parts from direct sunshine for a few days. When the growth of the bud has commenced, it is a sign that union of the parts has taken place, and the bast may then be removed. The most suitable time for budding is early morning or evening or in dull weather.

Grafting is also a very important method by which to quickly obtain flower-bearing trees of a particular sort, without waiting for the ordinary processes of growth. Here again a Dog Rose, Manetti Briar, or other vigorous grower is selected as the stock, and a growing stem of a choice kind is amalgamated with it, the object to be aimed at the union of the inner bark of each. Without this union there can be no success. There are many methods of grafting, but it is impossible here to enter into details concerning them. The simplest forms are cleft and splice grafting, and the former is effected in the following manner. The stem
POMPON ROSE

(ROSA CENTIFOLIA—var. pomponia)

Nat. size

PL. 78
of the stock is cut straight across at the requisite height, and a slit about four inches long made down its centre. This should be clearly cut to a narrow wedge-shape, widest at the top. The graft or "scion" should be a well-matured shoot of last year's growth, furnished with buds; and the lower end of this should be cleanly pared off to a wedge to fit the slit in the stock as accurately as possible. In the form known as saddle-grafting, the respective shapes are reversed; the stock ending in a wedge-shaped point, and the graft having a wedge-shaped hollow to fit on it. In splice-grafting, which is better than either of the other forms, both stock and scion are cut obliquely across, and made to fit accurately on one side if not on both. No matter which plan is adopted, the parts must be held in position by tying firmly round with soft woollen threads, and covering the whole with an egg-shaped mass of fine clay, or grafting-wax, to exclude the air. Spring is the best period for grafting, the sap being then circulating freely, and the danger of drying up less than in summer. A stout stake should be driven into the ground close to the stock, and both stock and scion independently tied to it to prevent all possibility of shifting through wind or other disturbance.

Grafting-clay is a mixture of fine clay and cow-dung, in the proportion of two parts clay to one part wax, thoroughly incorporated some time before required and kept equally moist all through. Much depends upon this composition being carefully prepared, otherwise when applied it will shrink unequally, crack and fall off. Grafting-wax may be used in many cases where clay is too cumbrous and heavy. It is prepared as follows: take of pitch and resin each four parts, beeswax two parts, tallow one part; melt over gentle heat, stir until thoroughly incorporated. When required for use warm slightly, and knead round the graft into a neat and smooth egg-shape.

Provided the soil be deep, well-dug, and liberally manured, Roses will succeed in it without being too nice as to its composition; but a rather stiff loam offers better prospects of success than mould of a light friable character. Roses must have plenty of sunshine and plenty of air; so that the position for a rosary should not be shut in by bushes or trees, though these are useful to it if sufficiently far off. Many amateurs with small gardens regard Rose-culture as a difficult matter, and therefore not to be attempted. The truth is, when once a Rose is well established it needs very little care indeed, beyond pruning at the appropriate time and in the proper manner. Then, if it be given an annual dressing of stable manure, and the ground above its roots be mulched in summer and regularly watered, it will almost certainly flower freely. Where a portion of the garden is set
apart for Rose-culture, it is a good plan, unless the soil is naturally very suitable for their growth, to take out the mould to a depth of about 18 inches, and fill up with a specially-prepared compost. Nothing is better for the purpose than good turfy loam from a newly-broken-up pasture; or failing this, a rich loam to which well-rotted stable manure has been freely added and well worked in. If an annual top-dressing of stable manure be given, the trees will have well-nigh all they require.

Pruning should be done in spring. The weak shoots should be cut well back, and the strong, vigorous ones allowed air and elbow-room. Those shoots which were produced late in the previous season, and were consequently imperfectly ripened, should be cut away first of all, as they will not bear flowers. There is much difference in the amount of pruning required by the different sections of Roses; standards of the Hybrid Perpetual class, for instance, needing rigorous treatment to prevent the heads getting too bushy and heavy, whilst dwarf plants of the same sorts need to be allowed more liberty of growth. In their case, a thinning out of the shoots is more necessary. Climbing Roses require little spring pruning, but after the flowering is over, the old stems and wood should be well thinned or even cut out altogether to allow the new shoots room to develop. Tea Roses require very little pruning. If grown in pots they require practically none, except to keep them within bounds.

Greenhouse culture of Roses is extensively pursued. The plants may be grown in pots or in a border. A climbing Rose is often grown in the greenhouse border and trained over the wall, or up a pillar and along under the roof. One of the climbing varieties of Tea Roses is best suited for this purpose, and a well-drained bed should be prepared for it where it can grow free from staging or other obstacle to light and air. A good soil for the bed is composed of stiff turfy loam and decomposed cow-manure in equal portions. There will be much growth of long shoots that are devoid of flower-buds, and these must be continually thinned out as they grow, or the flowering shoots will be choked. Plenty of water should be given during the growing period, but in winter it must be almost entirely withheld in order that the plant may have its proper term of rest. For pot-culture the Tea Roses and the Hybrid Perpetuals will be found specially suitable, and if possible they should be upon their own roots. The compost should be that just recommended for the greenhouse border, with the addition of a little charcoal and crushed bones. When well established in this, it will be found that top-dressing, and liquid manure once a week during the flowering period, will obviate the necessity for re-potting until they are really pot-bound. At the end of February or the beginning of
March, these pot-plants should be looked over and pruned. All dead or sickly wood must be cut out, and the shoots shortened back to three or four eyes each. In the United States, Roses are largely grown in glasshouses. They are planted in shallow borders of rich soil close to the glass. Each plant is allowed to form only two or three shoots, which are encouraged to grow long and flower freely. The shoots are cut away with the Roses, stems 18 inches or more long being preferred. The plants are then thrown away and a fresh lot planted.

**Explanation of Plates 73 to 78.**

Plate 73.—*Rosa rugosa* (the Wrinkled Rose). Portions of the shrub showing different conditions. The expanded flower is of the natural size; above it is the opening bud, and beside that a flower from which the petals have dropped, showing the persistent sepals. Below are the large round fruits, with the sepals still adhering; the characters of the leaflets, the large stipules, and the straight prickle are also shown.

Plate 74.—Tea Rose, “Gloire de Dijon.” Branch with flowers and leaves of the natural size; the petals fawn-coloured, with salmon outer surface.

Plate 75.—Tea Rose “Safrano.” Branch showing upper and under surfaces of leaves. The petals of the half-open bud are saffron-hued, but as the flower opens they become much paler.

Plate 76.—Hybrid Tea Rose, “La France.” One of the finest of the hybrids obtained from *Rosa indica*. It was produced by M. Guillot fils in 1867. The outer petals are recurved, the inner smaller and forming a close “heart.” The petals are pale pink, tinted with lilac outside. The plant makes rapid growth and is a hardy, free bloomer.

Plate 77.—Bourbon Rose, “Souvenir de la Malmaison.” The fine full flowers are here reduced by about one-third from the natural size. The varying number of leaflets is also shown, and the large stipules.

Plate 78.—Pompon Rose (*Rosa centifolia*, var. *pomponia*). Here represented of the natural size. The diminutive fairy flowers are little Cabbage Roses, not so large as many a single leaflet. The sepals it will be noted are much longer than the petals.

*END OF VOLUME I.*