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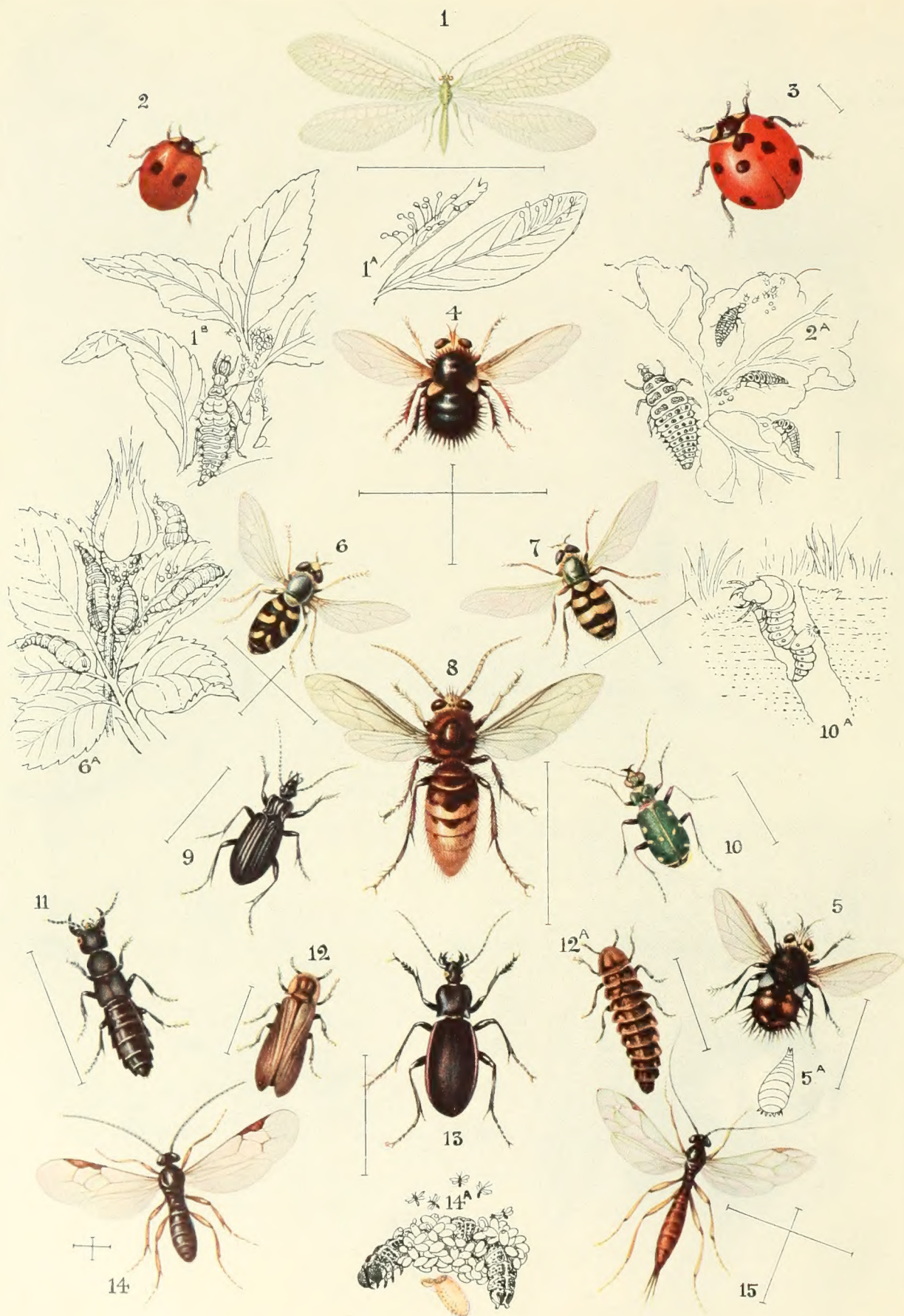




TREES AND SHRUBS OF THE  
BRITISH ISLES

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# BRITISH ISLES

NATIVE & ACCLIMATISED

## USEFUL INSECTS.

1. Lace-wing Fly (*CHRYSOPEA* (*NOTOCHRYSOPEA*) *VULGARIS*). 1A. Eggs. 1B. Larva.
2. Two-spot Lady-bird Beetle (*COCCINELLA BIPUNCTATA*). 2A. Larvae, with one enlarged.
3. Seven-spot Lady-bird Beetle (*COCCINELLA SEPTEMPUNCTATA*).
4. Spiny Fly (*TACHINA* (*ECHINOMYIA*) *GROSSA*).
5. Spiny Fly (*TACHINA* (*FABRICIA*) *FEROX*). 5A. Larva.
6. Hover Fly (*SYRPHUS* (*CATABOMBA*) *PYRASTRI*). 6A. Larva.
7. Hover Fly (*SYRPHUS RIBESII*).
8. Hornet (*VESPA CRABRO*).
9. Sun Beetle (*PTEROSTICHUS VULGARIS*).
10. Green Tiger Beetle (*CICINDELA CAMPESTRIS*). 10A. Larva, in burrow.
11. Devil's Coach-horse Beetle (*OCYPUS OLENS*).
12. Glow-worm Beetle (Male) (*LAMPYRIS NOCTILUCA*). 12A. Female.
13. Violet Ground Beetle (*CARABUS VIOLACEUS*).
14. Bracon Fly (*MICROGASTER GLOMERATUS*). 14A. Cocoons, spun by larva, emerged from Caterpillar of Common Cabbage White Butterfly, with enlarged cocoon below, showing lid.
15. Ichneumon Fly (*PIMPLA INSTIGATOR*).

LONDON

J. M. DENT & CO.

NEW YORK: E. P. DUTTON & CO.

MCMIX

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NATIVE & ACCLIMATISED

BY

C. S. COOPER, F.R.H.S.

AND

W. PERCIVAL WESTELL, F.L.S.

SIXTEEN FULL-PAGE COLOURED PLATES

AND

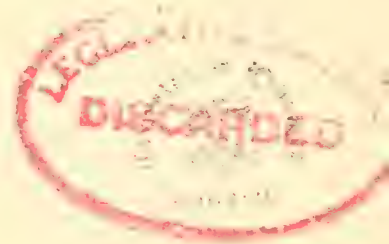
70 FULL-PAGE BLACK AND WHITE PLATES

DRAWN DIRECT FROM NATURE

BY

C. F. NEWALL

VOL. II



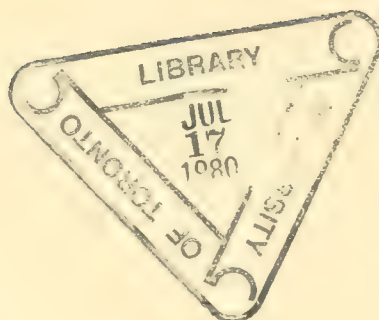
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# TREES AND SHRUBS

## ROCKY MOUNTAIN BRAMBLE, *Rubus deliciosus*.

Gardens, lawns, walls. May, June. This very distinct and most beautiful Bramble has well been called the Queen of the genus. It delights in sunshine, making a handsome shrub in the open, but producing its handsome blossoms in greater profusion when on a wall. It is propagated by layers in late summer.

*Flowers* white, resembling Dog Rose,  $2\frac{1}{4}$  ins. diam., solitary; *Sepals* ovate-oblong, with dilated acumination; tomentose, shorter than petals; *Petals* ovate, margins wavy; *Stamens* numerous; *Ovary* superior, carpels numerous; *Fruit* an etærio of drupels, delicious flavour.

*Leaves* alternate, reniform-orbicular, resembling Currant, 3–5-lobed, wrinkled, finely serrated, acute, tomentose when young,  $1\frac{3}{4}$  in. long,  $1\frac{1}{2}$  in. broad; stipules persistent.

A deciduous *shrub*, 3–6 ft. erect, or 8 ft. against a wall; *Branches* without prickles, tomentose.

Native of Rocky Mountains; discovered by Dr. James in 1822; introduced to Britain, 1870, by Mr. Anderson-Henry of Edinburgh.

## BLACKBERRY, *Rubus fruticosus*.

Woods, hedges. July—September. A well-known fruiting shrub of the country-side, of which many varieties and hybrids are in cultivation. Propagated by suckers and layers in October or November; seeds sown in shady border as soon as ripe, or in shallow pans filled with sandy peat and leaf-mould in a cold frame

*Flowers* white or pink in terminal *racemes*; lateral branches corymbose; *Calyx* reflexed, 5-lobed, persistent; *Fruit* an etærio of drupels, black or reddish-purple, without bloom, not readily separating from receptacle, sweet or acid-sweet.

## TREES AND SHRUBS

*Leaves* alternate, 3–5 foliate, pinnate, very variable, leaflets ovate or obovate, petiolate, coarsely irregularly serrated, acute, glabrous and dark green above, white and downy beneath, midribs and petioles with small hooked prickles; stipules subulate or linear, inserted short way up stalk; leaves subpersistent.

A deciduous *shrub*; *Stems* prickly, bristly, glandularly hirsute, or downy, sometimes sub-erect, often rooting from a callus at extremity, straggling, or prostrate, furrowed, aculeate; flowering stems biennial, or a few years old; *Buds* long, pointed; scales imbricated, hairy.

Native of Britain. Irregular, spindle-shaped swellings on stems, 1–7 ins. long, produced by larvæ of a Gall-fly (*Diastrophus rubi*).

### RASPBERRY, *Rubus Idæus*.

Woods, cultivated in gardens. Propagated by suckers and seeds. June—August.

*Flowers* white, honeyed, in long pendulous *panicled cymes*, axillary and terminal, few-flowered; *Calyx* somewhat campanulate, 5-lobed, inferior, persistent, lobes ovate-lanceolate, tips long; *Petals* 5, short, linear-obovate; *Stamens* indefinite; *Ovary* superior, carpels several, distinct, styles many; *Fruit* an etærio of succulent 1-seeded drupels, on a dry conical receptacle, forming a kind of granulated berry, usually separating from the receptacle when ripe; red.

*Leaves* alternate, 3–5 foliate, often 3 in upper, 5 in lower, leaflets ovate or oblong, 3–5 ins. long, coarsely serrated, acute, light green above, downy beneath; stipules small, subulate, often adnate half-way up stalk.

A deciduous *shrub*, 3–5 ft.; *Stem* shrubby, erect, terete, downy, sterile first year, bearing flowers and fruit in second, then dying; prickles straight and slender; flowering shoots with curved prickles; *Suckers* freely produced.

Native of Britain.

*Injurious Insects*:—*Blossoms*, *Buds*, and *Fruit*—Raspberry Beetle (*Byturus tomentosus*); *Leaves*—Weevils (*Otiorhynchus*); *Roots*—Weevils (*Otiorhynchus*); Garden Swift Moth (*Hepialus lupulinus*).







DOG ROSE (*Rosa canina*)

A. Flowering branch. B. Flower, with petals removed. C. Seed. D. Section of flower.  
E. Section of fruit. F. Fruit.



## ROSACEÆ

### NOOTKA SOUND RASPBERRY, *Rubus nutkanus*.

Gardens. Prefers a moist soil and partial shade. May—August.

*Flowers* white, large, 1–2 ins. diam., in a terminal *corymbose cluster*, few-flowered, 1–2 ins. broad; *Sepals* cuspidate, appendage long and slender; *Fruit* an *etærio* of drupels, red, hemispherical.

*Leaves* alternate, 3–5-lobed, resembling Vine, 3 lobes nearly equal, broad, coarsely and unequally serrated, acute.

A deciduous *shrub*, 1–10 ft.; *Stems* flexuous, glandularly hirsute; sends up annual shoots like Raspberry.

Introduced from N.W. America, 1826; discovered by Douglas growing wild from North California to Nootka Sound. Known in America as Salmon Berry.

### PURPLE-FLOWERED RASPBERRY, *Rubus odoratus*.

Gardens and shrubberies. June—August. Thrives best in partial shade. A handsome shrub of very robust growth. Old flowering stems should be cut away in December. Propagate by layers and seeds.

*Flowers* purple-red, showy, 2 ins. diam., in a *corymbose cluster*; peduncles many-flowered, bracts membranous; *Calyx* lobes with narrow appendage; *Petals* 5, rounded, broad; *Fruit* an *etærio* of drupels, reddish-yellow or amber, flat, broad, velvety, seldom ripening in England.

*Leaves* alternate, palmately 3–5-lobed, sometimes 6 ins. diam., lobes minutely serrated, acute, glabrous above, viscid beneath, sweet scented; larger ones on long viscid petioles, those near ends of shoots nearly sessile and 3-lobed.

A deciduous *shrub*, 3–8 ft.; *Stem* glandularly hirsute, without prickles, erect; suckers freely produced; *Buds* ovoid, scales hirsute.

Introduced from N. America, 1739. Called Flowering Raspberry in U.S.A.; in England also known as Virginian Raspberry and Scented Bramble.

## TREES AND SHRUBS

### JAPANESE WINEBERRY, *Rubus phœnicolasius*.

Gardens, rockeries. A handsome straggling Bramble of vigorous growth, well suited for low fences or bold rockwork. It has large handsome foliage, and its somewhat unique blossoms are followed by large scarlet fruits, which are very sweet and juicy. June, July.

*Flowers* pale pink or whitish, inconspicuous in a terminal *raceme*; *Calyx*  $1\frac{1}{2}$ –2 ins. diam., covered with reddish glandular hairs; *Petals* minute, erect; *Fruit* an etærio of some forty ellipsoid drupels; scarlet, ovoid-oblong,  $\frac{3}{4}$  in. long, edible.

*Leaves* alternate, 5–7 ins. long, upper ones simple, others pinnately trifoliate, leaflets crenate, white tomentum beneath, glandularly hirsute.

A deciduous *shrub*, 10 ft.; sub-scandent; *Stems* covered with stiff, long, red-purple glandular hairs and prickles.

Introduced from Japan, 1877.

### SALMON BERRY, *Rubus spectabilis*.

Gardens. April, May.

*Flowers* purple, large, fragrant, peduncles solitary or in pairs, 1–2 flowered, drooping; *Sepals* hairy at base, shorter than petals; *Fruit* an etærio of drupels, yellow or red, ovoid, acid, ripe in June or July.

*Leaves* alternate, trifoliate, lateral leaflets distant from terminal, often deeply 2-lobed, ovate, serrate, acuminate, membranous, nearly glabrous, downy when young.

A deciduous *shrub*, 3–10 ft.; *Stems* erect, terete, unarmed or with deciduous prickles, flexuose, thin; *Suckers* freely produced.

Native of California; introduced from N. America by Douglas, 1827.

### SHRUBBY CINQUEFOIL, *Potentilla fruticosa*.

Rocky banks, gardens. June—August. Thrives in fairly light, loamy soil, with plenty of moisture at roots. A charming small shrub, bearing a profusion of bright golden-yellow blossoms. Seeds are sown in shallow pans or boxes





SWEET BRIAR (*Rosa rubiginosa*)



## ROSACEÆ

of light sandy soil in gentle heat in March, transplanting seedlings outdoors in May or June, or in partially shaded border outdoors in April.

*Flowers* golden-yellow, 1-1½ in. diam., in a few flowered terminal *sub-corymbose cyme*; *Calyx* inferior, 5-lobed, lobes ovate-lanceolate, valvate in bud, persistent; *Epicalyx* of 5 lanceolate bracteoles, longer than sepals; *Petals* 5, orbicular; *Stamens* numerous, perigynous; *Ovary* superior, carpels many; *Fruit* an etærio of achenes, hairy, on hispid receptacle.

*Leaves* alternate, petiolate, sub-digitately pinnate, leaflets 3-5, oblong or lanceolate, ½-¾ in. long, entire, revolute, glabrous above, silky when young; stipules narrow, thin, entire, adnate to petiole.

A deciduous erect *shrub*, 2-4 ft.; or spreading undershrub, much branched; *Bark* flaking.

Native of N. England, and Clare and Galway in Ireland. Generic name from L. *potens, entis*, powerful, from the medicinal effects ascribed to some of the genus; specific name *fruticosa* = shrubby; L. *frutex, -icis*, a shrub or bush.

### FIELD ROSE, *Rosa arvensis*.

Hedges and thickets; gardens. June, July. The Ayrshire Roses of gardens are the offspring of this native species. They are extremely hardy, of rapid growth, useful for poor soils, and of great value for covering rough buildings, ugly fences, trunks of trees, banks and mounds. They require but little pruning or training, but should have all dead wood cut out in February or March.

*Flowers* white, scentless, in a 1-6 flowered *corymb*, or rarely solitary, peduncle setose; *Calyx-tube* globoid, glabrous, *sepals* purple, short, broad, naked at back, slightly pinnate, reflexed, deciduous; *Styles* glabrous, united into an exserted column; *Fruit* a cynarrhodium, sub-globose, small, naked, sessile, or stalked; disk convex, much thickened.

*Leaves* alternate, imparipinnate, eglandular, glabrous, or slightly pubescent, glaucous beneath.

A deciduous *shrub*, 2-6 ft.; *Stem* arched or trailing; *Branches* purple, glaucous; *prickles* strong, often large, equal, hooked; *Buds* ovoid, glabrous.

## TREES AND SHRUBS

Native of England and Ireland, rare in Scotland. Known as Ayrshire Rose.  
Syn. *R. repens*.

### DOG ROSE, *Rosa canina*.

Hedges, thickets, gardens. Useful for covering unsightly fences or walls. It is a valuable stock for grafting purposes. June, July.

*Flowers* pink or white, usually fragrant, solitary or 3-4 in a *corymb*; *Sepals* 5, pinnate, reflexed, tube persistent, lobes imbricate in bud; *Petals* 5; *Stamens* numerous, inserted on the disk; *Carpels* many, sunk in calyx-tube, styles distinct, hirsute, stigma thickened; *Fruit* a cynarrhodium, ovoid or sub-globose, scarlet-crimson, polished, cavity hairy, containing 20-25 achenes ("stones"), each angular, yellowish, hairy, flesh-orange, sepals deciduous, bracts persistent.

*Leaves* alternate, leaflets 5-7, ovate, acute, serrate or biserrate, eglandular, glabrous beneath.

A deciduous *shrub*, 3-6 ft.; *Branches* arching, prickles falcate or equal, hooked; *Rootstock* woody, suckers often produced; *Buds* flattened, scales green, tipped with red.

Native of Britain. Hooker says, "In its common form this is the largest and freest growing of British roses, and may be distinguished from *R. spinosissima* by the hooked prickles and habit, from *R. pilosa* by being more glabrous, from *R. rubiginosa* by being eglandular, and from *R. arvensis* by the free styles."

*Insects* injurious to Roses, wild and cultivated:—*Flowers*—Rosechafer (*Centonia aurata*), Garden Chafer (*Phyllopertha horticola*), Brown Weevil (*Otiorhynchus sulcatus*); *Leaves* and *Shoots*—Green Fly (*Siphonophora rosæ*), Leaf-cutter Bee (*Megachile centuncularis*), Banded Saw-fly (*Emphytus cinctus*), Leaf-rolling Saw-fly (*Lyda inanita*), many other Saw-fly larvæ, including the Genera *Eriocampa*, *Blemnocampa*, and *Hylotoma*; among Moth larvæ are the Lackey Moth (*Bombyx neustria*), Vapour Moth (*Orgyia antiqua*), Winter Moth (*Chcimatobia brumata*), and several *Tortricina* and *Tineina*.



JAPANESE ROSE

*Rosa rugosa*







## ROSACEÆ

The most common *Gall* is the Rose Bedeguar or Robin's pin-cushion, produced by the larvæ of a Gall-gnat (*Rhodites rosæ*); other species of the same genus produce Pea-like Galls on the foliage, especially of wild roses.

### MUSK ROSE, *Rosa moschata*.

Gardens. July, August. A fine climbing species with clusters of large single flowers having a very characteristic scent. Shoots should be shortened in April.

*Flowers* yellowish-white, very fragrant,  $1\frac{1}{2}$ –2 ins. diam., in a compound terminal *corymb*, pubescent; *Calyx* hoary pubescent, tube small, obovoid, lobes 2–3 times length of tube, glandularly serrate, often pinnatifid; *Petals* orbicular-obovate; *Styles* united into a hairy clavate column; *Fruit* a cynarrhodium, globose or ovoid,  $\frac{1}{3}$  in. diam., dark-brown, crowned by base of deciduous calyx-lobes.

*Leaves* alternate, imparipinnate, 2–6 ins. long, leaflets 3–9, ovate or ovate-lanceolate, acute or acuminate, acutely serrated, puberulous beneath.

A deciduous climbing *shrub*, 18–20 ft.; *Prickles* scattered, stout, recurved.

Native of S. Europe, N. India, Afghanistan, and China; introduced 1590. Specific name from *L. moschus*, musk.

### SWEET BRIAR, *Rosa rubiginosa*.

Chalky hills, gardens. A native Rose, justly prized for the delightful fragrance exhaled from the glands of its leaves. It is a good hedge plant. June, July.

*Flowers* pink, small, solitary or corymbose, 1–3 flowers, peduncles setose; *Calyx* pinnate, sub-persistent, densely glandular; *Styles* free, hairy; *Fruit* a cynarrhodium, sub-globose or oblong, glabrescent, or with few small prickles, disk small.

*Leaves* alternate, imparipinnate, leaflets 5–7, small, oval or sub-orbicular, round at base, acute or obtuse, biserrate, shining and glabrous or slightly



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hairy above, glandular-pubescent beneath, fragrant, petiole glandular. Autumn tint purplish-brown.

A deciduous *shrub*, 5-6 ft.; *Branches* sub-erect, slender; prickles stout at base, curved or hooked, slender, scattered, mixed with glandular hairs and bristles, giving rusty appearance; *Buds* ovoid, glabrous.

Native of Britain. Hooker says, "Best distinguished by its sub-erect habit and copious glandular pubescence, which gives out the strong sweet-briar odour." Specific name = rusty-leaved (*L. robigo* or *rubigo*, *-inis*, rust). Known also as Eglantine. Syn. *R. Eglanteria*.

Leaves and shoots attacked by Green Fly (*Siphonophora*), Pea-like Galls produced by *Rhodites eglanteriæ*.

### JAPANESE ROSE, *Rosa rugosa*.

Gardens. June. A very robust shrub, noteworthy for its handsome foliage, large single flowers, and fine orange-red, apple-like fruits. It makes a good hedge plant. Thin out shoots in April.

*Flowers* rosy-red, large, solitary, ebracteate; peduncles with straight, short, scattered prickles; *Sepals* lanceolate, entire, reflexed, hairy; *Petals* emarginate; *Fruit* a cynarrhodium, large and showy, 1 in. or more in diam., resembling apples, orange-red to deep red, depressed-globose, glabrous, pendulous; persistent sepals, erect, foliaceous, 1½ in. long.

*Leaves* alternate, imparipinnate, leaflets 5-9, obtuse, ovate, serrate, wrinkled.

A deciduous *shrub*, 4-6 ft.; *Branches* slender, prickles very dense, straight, nearly equal.

Introduced from Japan, 1845.

### SCOTCH ROSE, *Rosa spinosissima*.

Open places, especially sandy seashores; gardens. May, June. A small-leaved, prickly little bush-rose, bearing a profusion of white blossoms. Thin out shoots in November.



WHITE BEAM (*Pyrus Aria*)

A. Flowering branch. B. Fruit. C. Flower, with petals removed. D. Flower.  
E. Transverse section of fruit. F. Longitudinal section of fruit.





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*Flowers* white or pink, 1-1½ in. diam., solitary or in *corymbs* of rarely more than 3; *Calyx-tube* usually glabrous, globoid, *sepals* simple, lanceolate, acuminate, persistent, eglandular; *Styles* free; *Fruit* a cynarrhodium, globose, glabrous, purple to black, disk very small.

*Leaves* alternate, imparipinnate, leaflets 7-9, small, rounded, serrate, glabrous above, eglandular.

A deciduous *shrub*, 1-4 ft.; *Branches* short, erect; *Twigs* rounded, setigerous; prickles crowded, unequal, subulate, expanded at base.

Native of Britain. Also called Burnet Rose. Red galls in leaves and other young parts formed by a mite (*Rhodites spinosissimæ*).

### DOWNY ROSE, *Rosa villosa*.

Hedges and thickets. June, July.

*Flowers* rose, solitary or in small terminal *corymbs*; *Calyx-tube* globose, *sepals* copiously pinnate, long, persistent, glandular hairs black; *Corolla* often ciliate and glandular; *Styles* free, slightly protruding from the mouth of calyx in a dense tuft; *Fruit* a cynarrhodium, globoid, bright red, sepals erect, prickles small.

*Leaves* alternate, leaflets 5-7, oblong or elliptical, biserrate, downy above, eglandular, or nearly so beneath.

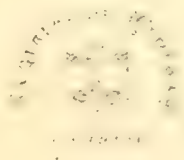
A deciduous *shrub*, 3-6 ft.; *Branches* erect, or elongate and arching, rigid, slender, prickles scattered, nearly straight.

Native of Britain. Hooker says, "Chiefly distinguished from *R. spinosissima* by its larger size, equal prickles, fewer very downy leaflets, which are more constantly doubly serrate, and the more glandular fruit; and from *R. canina* by the straight prickles, and globose, glandular fruit."

### WILLOW-LEAVED PEAR, *Pyrus amygdaliformis*.

Gardens, plantations. May.

*Flowers* white, in a lax *corymb*; *Fruit* a pome, oval, small, woody, yellowish-green, pedicel short.



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*Leaves* alternate, linear, acute, hoary on underside with silky, silvery hairs.

A deciduous *tree*, 15–20 ft.; inclined to be pendulous.

Native of the Levant and Siberia. Syn. *P. salicifolia*.

### WILD PEAR, *Pyrus communis*.

Woods, hedgerows. The parent of our cultivated Pears, of which there are nearly 700 varieties. April, May.

*Flowers* white, 1–1½ in. diam., in *corymboid* or *racemose cymes* of 6–10 on wood of previous year; proterogynous, attracting flies; *Calyx-tube* (receptacle) adhering to ovary, becoming fleshy in fruit, limb 5-lobed, persistent; *Petals* 5; *Stamens* numerous; anthers purple, then black; *Ovary* 5-celled, spuriously inferior by up-growth of receptacle, 3–5 styles, distinct; *Fruit* a pome, pyriform, 2 ins. long, 5-celled, gritty, walls cartilaginous; green till November, then turning yellow.

*Leaves* alternate, on shoots, fascicled on previous year's wood, ovate or obovate, petiolate, obtusely serrated, acute, glabrous, slightly downy in young stage, 1–1½ in. long. Autumn tint yellow, dead leaves black.

A deciduous *tree*, 20–60 ft.; somewhat pyramidal; *Twigs* drooping, sometimes ending in a spine; *Bark* rough; *Dwarf shoots* sometimes thorny; *Buds* glabrous, brown; *Wood* fine-grained, strong, reddish tinge; used for instruments and small cabinet and turnery work.

Native of Britain.

Name Pear from A.S. *peru*, *pere*; L. *pirum*, a pear.

*Insects* injurious to Pears:—*Bark*—American Blight (*Schizoneura lanigera*), Fruit-tree Bark Beetle (*Scolytus rugulosus*), Mussel Scale (*Mitilaspis pomorum*); *Blossom* and *Fruit*—Pear Gnat Midge (*Diplosis pyrivora*), Apple Blossom Weevil (*Anthonomus pomorum*); *Leaves*—Apple Aphis (*Aphis mali*), Pear Leaf-blister Mite (*Phytoptus pyri*), Leaf Weevils (*Phyllobius*), Cherry and Pear Saw-fly (*Selandria atra*), Lackey Moth (*Bombyx neustria*), Mottled Umber Moth (*Hybernia defoliaria*), Winter Moth (*Cheimatobia brumata*);



A



ROWAN-TREE, or MOUNTAIN ASH (*Pyrus Aucuparia*)

A. Flowering branch. B. Fruit. C. Single flower, enlarged. D. Flower, after removal of petals.  
E. Transverse section of fruit.





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Wood—Goat Moth (*Cossus ligniperda*, *Trypanus cossus*), Wood Leopard Moth (*Zeuzera æsculi*, *Z. pryi*na).

*Fungoid Pests*:—Pear-leaf Cluster-cups (*Ræstelia cancellata*), Pear-leaf Blister (*Exoascus bullatus*), Apricot Brown Rot (*Monilia fructigena*).

### SIBERIAN CRAB, *Pyrus baccata*.

Gardens, lawns. April, May. A handsome tree when in flower, which few can surpass for beauty, and conspicuous in autumn when laden with its cherry-like fruits. It does best when grafted on the apple or pear.

*Flowers* white, in a sessile *umbellate corymb*; pedicels long and slender; *Calyx lobes* spreading, deciduous, lanceolate, equal to or longer than tube, cottony inside; *Petals* with dark veins; *Styles* 3-5, nearly free, woolly at base; *Fruit* a pome, globose, sometimes pyriform, bright red or yellow tinged with red, about size of cherry; used for jelly.

*Leaves* alternate, ovate, acute, serrated, glabrous, petioles of same length.

A deciduous *tree*, 15-30 ft.; dense, round-headed.

Native of Siberia, China, Japan, and Himalayas; introduced 1784.

### SWEET-SCENTED AMERICAN CRAB, *Pyrus coronaria*.

Gardens. May, June. A very beautiful and ornamental tree. The flowering species of *Pyrus* are propagated by cuttings 8-12 ins. long, inserted in ordinary soil outdoors in autumn; layers in autumn; budding on Pear or Quince in July; grafting in March; seeds sown in sandy soil in a sunny position outdoors in March.

*Flowers* rosy, fragrant with the scent of Violets, 1 2 ins. diam., in lax *corymbs*, pedicels glabrous; *Calyx* slightly pubescent, lobes acute; *Petals* obovate, often serrate or dentate; *Styles* woolly or tufted at base; *Fruit* a pome, round, flat, 1-1½ in. diam.; fragrant, grass-green, glossy, very acid.

*Leaves* alternate, ovate, cordate at base, angularly-lobed or serrated, glabrous, appearing late in spring, more or less sub-evergreen in mild seasons, 1-3 ins.

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long,  $1\frac{1}{2}$ - $2\frac{1}{2}$  ins. wide; petioles slender, sometimes glandular; stipules acuminate. Autumn tint yellow.

A deciduous *tree*, 15-30 ft.; *Twigs* tomentose, pubescent or glabrous, spiny, red-brown; *Bark* red-brown, fissured; *Buds* minute, obtuse; scales red, scarious, ciliate; *Wood* soft, reddish.

Introduced from N. America, 1724. Syns. *Cratægus coronaria*, *Malus coronaria*.

### CORAL-BUD APPLE, *Pyrus floribunda*.

Gardens, lawns. April, May. This is one of the most ornamental of hardy flowering shrubs, its slender, green, arching branches being almost hidden beneath a wealth of crimson buds or soft rosy-white blossoms. It makes a handsome specimen when planted singly on a lawn. It is usually grafted on *Pyrus communis*.

*Flowers* white, suffused with rose, in the bud stage a deep rich crimson, borne in *cymose clusters*, completely covering the shoots; *Calyx* 5-lobed; *Petals* 5, tapering and widely separated at base; *Stamens* numerous, perigynous; *Ovary* inferior, carpels 5; *Fruit* a pome, yellow, nearly spherical, about size of a pea, pedicel long.

*Leaves* alternate, elliptical-lanceolate, petiolate, stipulate, serrated, acuminate, 1- $1\frac{1}{2}$  in. long.

A deciduous *shrub* or small *tree*, 10-15 ft.; *Shoots* long and flexible.

Native of Japan. Considered by some to be a variety of *P. spectabilis*. Syn. *Malus floribunda*.

### CRAB APPLE, *Pyrus Malus*.

Woods and hedges. May, June.

*Flowers* white, streaked with pink,  $1\frac{1}{2}$  in. diam., proterogynous, entomophilous, few, in a sessile *umbel*, 5-6 flowered; *Calyx-lobes* broad, downy; *Styles* shortly united at base; *Fruit* a pome, 1 in. diam., sub-globose, indented at base and apex, smooth, very acid, yellow or red, 5-celled.

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*Leaves* alternate, and tufted on dwarf shoots, ovate-oblong, shortly petiolate, serrated, acuminate or cuspidate, glabrous above, generally downy beneath when young, 1-2 ins. long; stipules subulate, downy, deciduous. Autumn tint brown.

A deciduous *tree*, 20-30 ft.; *Branches* spreading when young, more drooping later, giving a rounded head; trunk unsymmetrical; *Bark* rugged; *Twigs* round, shining, red-brown; *Buds* small, somewhat triangular; *Wood* hard, heavy, fine-grained, slightly brown, taking high polish.

Native of Britain. Syn. *Malus communis*. Name Apple from A.S. *appel*, *apl*.

*Chief insects* injurious to cultivated Apple:—*Bark*—American Blight (*Schizoneura lanigera*), Fruit-tree Bark Beetle (*Scolytus rugulosus*), Mussel Scale (*Mytilaspis pomorum*); *Blossom* and *Fruit*—Codlin Moth (*Carpocapsa pomonella*), Apple Weevil (*Anthonomus pomorum*), Apple Sawfly (*Hoplocampa testudinea*), Apple Chermes (*Psylla mali*); *Leaves*—Apple Aphis (*Aphis mali*), Garden Chafer (*Phyllopertha horticola*), Lackey Moth (*Bombyx neustria*), Winter Moth (*Cheimatobia brumata*), Small Ermine Moth (*Hyponomeuta padella*); *Wood*—Goat Moth (*Cossus ligniperda*, *Trypanus cossus*), Wood Leopard Moth (*Zeuzera æsculi*, *Z. pyrina*).

*Fungoid Pests*:—Apple-leaf Spot (*Septoria pyricola*), Apple-tree White Mould (*Oidium farinosum*), Apple-tree Canker (*Nectria ditissima*), Apricot Brown Rot (*Monilia fructigena*).

### CHERRY CRAB, *Pyrus prunifolia*.

Gardens. April, May. When laden with its pinkish flower buds in spring this makes an ornamental tree, but is chiefly grown for the sake of its handsome fruits, which are yellowish flushed with red, and of an agreeable flavour.

*Flowers* white, resembling Common Pear, in *cymose clusters*; peduncles pubescent; *Calyx-lobes* persistent; *Styles* woolly at base; *Fruit* a pome, globose, yellowish and red, decaying like Medlar.

*Leaves* alternate, ovate, acuminate, serrate, glabrous, petioles long.

A deciduous *tree*, 20-30 ft.

Native of Siberia; introduced 1758. Syn. *Malus prunifolia*.

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### SHOWY CHINESE CRAB, *Pyrus spectabilis*.

Gardens, lawns, shrubberies. April, May. Pruning should be done December to February, cutting back previous year's shoots to within 2 ins. of base, and leading shoots to 8-12 ins.

*Flowers* pale rose, semi-double, 2 ins. or more in diam., in a many-flowered, terminal, sessile *umbel*, buds deep red; *Calyx-tube* glabrous; *Petals* ovate, unguiculate; *Stamens* numerous, sometimes over 40; *Styles* woolly at base; *Fruit* a pome, irregularly globose, greenish-yellow, pedicels long.

*Leaves* alternate, oval-oblong, acute, serrated, glabrous.

A deciduous *tree*, 20-30 ft.; *Branches* crowded, erect when young, afterwards spreading and slender.

Native of China and Japan; introduced 1780. Specific name from L. *spectabilis*, worth seeing—*specto*, I look at.

### WHITE BEAM, *Pyrus Aria*.

Woods, borders of forests, gardens. Common on chalky soils. May, June. The group *Aria*, which includes the present species and the Wild Service, is distinguished by broadly ovate or oval leaves, and flattened corymbs of white blossoms.

*Flowers* white,  $\frac{1}{2}$  in. diam., in a loose *corymb* at the ends of short leafy branches; inflorescence covered with soft, white cotton; *Calyx-tube* adhering to carpels, becoming fleshy in fruit, lobes 5; *Petals* 5; *Stamens* numerous, anthers white; *Ovary* becoming spuriously syncarpous and inferior; *Styles* usually 3, sometimes 4, hairy at base; *Fruit* a pome, sub-globose,  $\frac{1}{2}$  in. diam., bright red dotted with brown points, ripe in September, orange flesh sharp and rough to taste, usually 3-celled, 2 seeds in each cell.

*Leaves* ovate or obovate, very variable, sometimes pinnately lobed, petiolate, coarsely and irregularly serrated, glabrous and shining green above, white and flocculent beneath, 2-6 ins. long. Autumn tints yellow, brown, orange-scarlet.



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A deciduous pyramidal *tree*, 20–40 ft.; or a low *bush*; *Branches* slender, having an upward tendency, young shoots cottony; *Bark* smooth, reddish-brown; *Twigs* shining, red-olive-brown to grey; *Buds* ovoid, scales green, margins brown, pubescent; *Wood* fine-grained, hard, white, inclining to yellow; used for small cabinet and turnery work.

Indigenous throughout Britain; several more or less cut-leaved forms are found in various parts of the British Isles, and are considered by some botanists to be species or sub-species.

### WILD SERVICE, *Pyrus Torminalis*.

Woods, hedges; will grow in dry situations; prefers strong clay soil. April, May.

*Flowers* white, more numerous and smaller than *P. Aria*,  $\frac{1}{2}$  in. diam., in a *corymbose cyme*, at ends of short leafy branches; young inflorescence clothed with loose down; *Calyx* pubescent, tube hemispherical, teeth triangular; *Anthers* white; *Styles* usually 2, united to above middle; *Fruit* a pome, pyriform or sub-globose, greenish-brown,  $\frac{1}{3}$  in. diam., dotted with lenticels, juiceless, usually 2-celled, ripe in November, flesh becomes brown and almost friable after bletting by frost.

*Leaves* oblong-ovate or cordate, 6–10 lobed, lobes triangular, acuminate, lower ones spreading, serrated, glabrous on both surfaces, 2–4 ins. long, 3 ins. broad, young leaves downy, underside bluish or grey, petioles slender. Autumn tint yellowish-brown.

A deciduous *tree*, 40–50 ft.; growth slow; *Branches* spreading, forming large head; *Twigs* sub-angular, reddish-brown, polished; *Bark* smooth, grey; *Buds* globoid, obtuse; scales broad, scalloped, bifid; *Wood* fine-grained, red-tinted, susceptible of high polish; used for small cabinet and turnery work.

A native of Southern and Central England. Some specimens said to be 1000 years old. Skeat says name Service is corruption of *servis* = M.E. plural of *serf* or *serve*, the name of the fruit; A.S. *syrf* = fruit of service-tree—*syrf-treow*, a service-tree—L. *sorbus*, the tree; *sorbum*, its fruit.

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### NEPAL WHITE BEAM, *Pyrus vestita*.

Gardens. A handsome Indian species with long, silvery leaves. May, June.

*Flowers* white, in a branched terminal *corymb*, woolly; *Calyx* tomentose; *Petals* woolly inside; *Styles* 3-5, woolly at base; *Fruit* a pome, globose, tubercled, glossy,  $\frac{1}{2}$  in. diam., greenish-brown, ripe in October.

*Leaves* alternate, ovate or elliptical, acutely crenated or coarsely serrated towards point, very woolly in young stage, glabrous when older, glossy green, sometimes 10-12 ins. long, petioles long. Autumn tint pale yellow.

A deciduous *tree*, 20-30 ft.; *Branches* tomentose when young, glabrous later.

Native of Nepal; introduced 1820. Syns. *P. crenata*, *lanata*, *nepalensis*.

### AMERICAN MOUNTAIN ASH, *Pyrus americana*

Gardens. June. The group, including the Mountain Ash and True Service, is characterised by pinnate foliage, flat corymbs of white blossoms, and showy fruits.

*Flowers* white, in a large terminal *corymbose cyme*, 3-6 ins. broad; bracts and bracteoles minute; *Calyx* 5-lobed; *Petals* 5, spreading, short clawed, *Stamens* indefinite; *Ovary* inferior, styles usually 3, distinct, stigma truncate; *Fruit* a pome, globose, red, not larger than peas, very numerous, in large terminal corymbs.

*Leaves* alternate, imparipinnate, 6-8 ins. long, leaflets 13-15, lanceolate, tapering at apex, sharply serrated with acute teeth, glabrous, shining above, slightly paler beneath,  $1\frac{1}{2}$ -4 ins. long; petioles grooved, green or red; stipules nearly triangular, caducous. Autumn tint yellow.

A deciduous *tree*, 15-20 ft.; erect, fastigiate; *Bark* smooth; *Buds* acute, scales vinous red, acuminate; *Wood* soft, light brown.

Introduced from N. America, 1782; native of Canada, Newfoundland, and sub-Alpine prairies of northern United States





MEDLAR (*Pyrus germanica*)

A. Flowering branch. B. Two of the stamens. C. Fruit. D. Section of flower.



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### MOUNTAIN ASH, *Pyrus Aucuparia*.

Woods, hillsides, gardens. May, June. This tree is especially handsome in early autumn when laden with its orange-scarlet berries. It is not particular as to soil or aspect, and is therefore specially suitable for town gardens. Any necessary thinning of branches should be done December to February. Propagated by cuttings, layers, budding and grafting; seeds sown in ordinary soil outdoors October or November.

*Flowers* cream-white, numerous,  $\frac{1}{3}$  in. diameter, proterogynous, in a *corymbose cyme*, 4–6 in. diam., at ends of short leafy branches, peduncles downy, dense-flowered; *Calyx* downy; *Styles* short, usually 3, almost glabrous and free from base; *Fruit* a pome, small,  $\frac{1}{4}$  in. diameter, globose, orange-scarlet, flesh orange-yellow, ripe in September, usually 3-celled; a favourite with Finches and Thrushes.

*Leaves* imparipinnate, petiolate, 5–8 ins. long, leaflets 11–19, linear-oblong, serrate, sub-acute, glabrous or nearly so above, pale beneath, hairy along midrib and nerves, glabrous when old or nearly so, 1–1½ in. long. Autumn tints yellow, red, brown.

A deciduous *tree*, 30–50 ft.; rapid in growth; *Branches* with an upward tendency; *Bark* smooth, grey, scarred horizontally; *Buds* violet-black or grey, and downy; *Wood* tough, elastic; used for small cabinet and turnery work.

A native of Britain. Also known as Rowan Tree.

### TRUE SERVICE TREE, *Pyrus Sorbus*.

Parks, Gardens. Requires deep, dry soil and shelter. May.

*Flowers* cream-white, larger than *P. Aucuparia*, in a *corymb*; *Calyx-lobes* reflexed; *Ovary* of 5 carpels, styles 5, often woolly; *Fruit* a pome, apple-shaped or pyriform, 1 in. long; greenish-brown, with rust-red spots; very austere when unripe, somewhat resembling a medlar when mellowed by age.

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*Leaves* imparipinnate, petiolate, leaflets 13–17, oblong, acuminate, serrated towards point, downy when young, becoming glabrous, paler beneath. Autumn tints yellow to purple-brown.

A deciduous *tree*, 30–60 ft; *Branches* with an upward tendency; *Bark* rugged; *Buds* green and smooth, viscous, scales olive-green with brown border; *Twigs* stout, round, glabrous, olive-green to brown or grey; *Wood* reddish, close-grained, takes high polish; said to be hardest and heaviest of European woods; used for wright-work.

Not an indigenous species; thought by some to be a product of cultivation; Synonymous with *P. domestica* and *Sorbus domestica*.

### RED CHOKE-BERRY, *Pyrus arbutifolia*.

Gardens. May, June.

*Flowers* white, or tinged with purple, in a few-flowered *corymbose cyme*, woolly; *Calyx* tomentose; *Fruit* a pome, pyriform or globular, small, dark red or purple, persistent through winter.

*Leaves* alternate, ovate or obovate, 1–3 ins. long, acute, finely serrated, petiolate, downy beneath. Autumn tints deep red and purple.

A deciduous *shrub*, 2–10 ft., twiggy.

Introduced from N. America, 1700; found throughout Canada and Newfoundland. Also known as Arbutus-leaved Aronia. Syns. *Aronia arbutifolia*, *Sorbus arbutifolia*.

### MEDLAR, *Pyrus germanica*.

Hedges, thickets, gardens. May, June.

*Flowers* white,  $1\frac{1}{2}$  in. diam., solitary, sessile on short leafy branches, peduncle  $\frac{1}{2}$  in.; *Calyx* 5-lobed, divisions foliaceous, woolly, persistent; *Petals* 5; *Stamens* numerous; *Ovary* spuriously syncarpous and inferior; styles usually 5, distinct, glabrous; *Fruit* a pome,  $\frac{1}{2}$ –1 in. diam.; nearly globular or pyriform,

## ROSACEÆ

large depressed area at top, surrounded by a hairy disk formed of persistent calyx lobes; 5 bony cells slightly protruding, and readily separable; ripe in October and November.

*Leaves* alternate, simple, lanceolate or oblong, nearly sessile, finely serrated, sub-acute and slightly downy, especially beneath. Autumn tints yellow, orange, russet, and red.

A deciduous *shrub*, or small *tree*, 10–20 ft.; *Branches* more or less thorny when wild, but losing thorns in cultivation.

Apparently wild in several localities in southern England, but probably only escapes from cultivation. “Fruit called *medles*; M.E. *medler*, the tree, also called *medle-tree*; O.F. *mesle*, a medlar (whence *meslier*, the tree); L. *mespilum*; Gr. *mespilon*, a medlar” (Skeat). Syn. *Mespilus germanica*.

### JAPANESE QUINCE, *Cydonia japonica*.

Gardens, walls, fences. March, onwards through greater part of year. This handsome shrub is easy of culture, doing well in good garden soil, but thriving best in that of a rich, moist, loamy character. It does well on a south wall, and makes one of the loveliest hedges. The fruit should be gathered in October, and stored in a cool room till yellow. Propagated by cuttings of the year's shoots with portion of old wood attached; inserted in ordinary soil outdoors in October; layering of shoots in October or November; seeds sown outdoors in November. It may be transplanted in early autumn, and the suckers used for propagation.

*Flowers* deep scarlet, solitary, or *cymose clusters* of 2–3; *Calyx* glabrous; lobes short, obtuse, entire; *Fruit* a pome, 5-celled, 1½ in. long, 1½ in. diam.; yellow, spotted, about 60 seeds; an excellent preserve.

*Leaves* alternate, simple, oval, somewhat cuneate, crenated, glabrous both surfaces; stipules reniform, serrated.

A deciduous *shrub*, 5–8 ft.; *Twigs* brown.

Introduced from Japan, 1815. Syns. *Malus japonica*, *Pyrus japonica*. Specimen at Aldenham, Herts, 22 ft. through, 8 ft. high, 60–70 years old.



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### MAULE'S QUINCE, *Cydonia Maulei*.

Gardens, walls. April.

*Flowers* bright red, 1 in. diam., in dense *cymose clusters*; *Fruit* a pome, about size of small Apples, bright gold, suffused with red, very abundant, fragrant, very acid; an excellent conserve.

*Leaves* resembling *P. japonica*, but smaller; crenate-dentate, petioles long.

A deciduous *shrub*, 3-4 ft.; *Branches* slender, spreading; *Twigs* brown.

Introduced from Japan, 1874. Syn. *Pyrus Maulei*.

### COMMON QUINCE, *Cydonia vulgaris*.

Gardens, orchards. May, June.

*Flowers* white or pale red, in a few-flowered *umbellate cyme*; pedicels downy; *Calyx* downy, lobes leafy, glandular-serrate, longer than tube; *Ovary* 5-celled; styles 5, connate at base, woolly; *Fruit* a pome, varying in shape, oblong, ovate or obovate, 2 ins. long, 1½ in. diam., fragrant, acid, astringent, 5-celled, cells cartilaginous, many seeded; ripe in October; used for preserves.

*Leaves* alternate, ovate, blunt at base, entire, acute, tomentose beneath; petioles short; stipules oblong, obtuse, glandular-serrate.

A deciduous *tree*, 20 ft.; *Branches* spreading, contorted; *branchlets* tomentose.

Native of Asia; naturalised in S. Europe. Specific name from Kydon, in Crete, where tree has long been plentiful. Syn. *Pyrus Cydonia*.

*Injurious Insects*:—*Bark*—Fruit-tree Bark Beetle (*Scolytus rugulosus*); *Fruit*—Codlin Moth (*Carpocapsa pomonella*); *Leaves*—Large Tortoiseshell Butterfly (*Vanessa polychloros*).

### SCARLET THORN, *Crataegus coccinea*.

Parks, gardens. April, May. This fine oramental species does best in good loamy soil, and then forms a vigorous growing tree amply furnished with bright green foliage and large flattened corymbs of white blossoms.





HAWTHORN (*Crataegus Oxyacantha*)

A. Flowering branch. B. Flower, with petals removed. C. Fruit. D. Section of fruit.



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The various species of *Cratægus*, popularly known as Thorns, are propagated by grafting on the Hawthorn in March, or budding in July; seeds (berries) are stored in sand for a year before sowing, being then put in the open garden in November, transplanting largest seedlings in the following October, and the remainder the next year.

*Flowers* white,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam.; in a many-flowered loose *corymb*; pedicels slender; villose or tomentose; *Calyx-tube* hairy, lobes acute, glandular serrate; *Petals* orbicular; *Stamens* 10, anthers pale yellow; *Ovary* inserted at bottom of calyx-tube; styles 3–4; *Fruit* a pome, sub-globose,  $\frac{1}{2}$  in. diam.; scarlet, dark dots, calyx enlarged, lobes bright red; flesh yellow, dry; nutlets 3–4.

*Leaves* alternate, elliptical or obovate, acute or acuminate, cuneate and entire at base, finely serrate and glandular above, several acute lateral lobes, coriaceous, dark green, smooth and lustrous upper surface, paler below,  $1\frac{1}{2}$ –2 ins. long,  $1$ – $1\frac{1}{2}$  in. wide; petioles glandular. Autumn tints yellow and yellowish-scarlet.

A deciduous bushy-headed *tree*, 20–30 ft.; *Branches* stout, ascending; *branchlets* slender, glabrous; *spines* stout, straight or curved,  $1$ – $1\frac{1}{2}$  in. long; *Bark* red-brown, scaly; *Wood* hard, reddish-brown.

Introduced from U.S.A., 1683. Syn. *Mespilus coccinea* (Marsh).

### WASHINGTON THORN, *Cratægus cordata*.

Parks, gardens. This, the latest flowering of the Thorns, makes a small tree, rather compact and regular in outline, well clothed with dark shining green leaves, and bearing dense clusters of white blossoms. May, June.

*Flowers* white, in a compact many-flowered terminal *corymb*, glabrous, pedicels slender; *Calyx-tube* glabrous, lobes short, nearly triangular, ciliate, pubescent inner surface; *Stamens* 20, anthers rose; *Styles* 2–5, tufts of hairs at base; *Fruit* a pome, small, depressed globose, scarlet; calyx deciduous, nutlets 3–5; ripe in September or October, persisting through winter.

*Leaves* alternate, broadly ovate or triangular, truncate, rounded or cordate and entire at base, acute or acuminate at apex, coarsely glandular serrate, 3-lobed



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or more, thin, dark shining green above, pale below,  $1\frac{1}{2}$ –2 ins. long,  $1$ – $1\frac{1}{2}$  in. wide ; petioles  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long, terete. Autumn tints bright scarlet and orange.

A deciduous *tree*, 10–30 ft. ; or bushy *shrub* ; *Branches* slender ; *branchlets* glabrous, grey, or red-brown ; *spines*  $1\frac{1}{2}$ –2 ins. long ; *Wood* hard, reddish-brown.

Introduced from U.S.A., 1738.

### COCKSPUR THORN, *Cratægus Crus-galli*.

Parks, gardens, lawns. May, June. Given sufficient space, as on a lawn, this forms a shapely tree with wide spreading branches, well armed with sharp spines, and clothed with shining foliage. The autumn tints are brilliant, and the large red fruits hang on the branches throughout the winter without diminution of brightness.

*Flowers* white, tinged with red, in a many-flowered glabrous *corymb* ; pedicels slender ; *Calyx-tube* glabrous, lobes linear-lanceolate, entire or glandular serrate ; *Stamens* 10, anthers rose ; *Styles* usually 2, tufts of pale hairs at base. *Fruit* a pome, oblong to sub-globose,  $\frac{1}{2}$  in. long, deep red, flesh dry and mealy ; nutlets usually 2 ; ripe in October, persistent through winter.

*Leaves* alternate, obovate, cuneate and entire at base, acute or rounded at apex, serrate, usually glandular teeth, thick, coriaceous, glabrous, dark shining green above, pale below, 1–4 ins. long,  $\frac{1}{2}$ –1 in. wide, nearly sessile. Autumn tints bright orange, scarlet, red and bronze.

A deciduous *tree*, 10–30 ft. ; *Branches* stout, spreading, rigid ; *branchlets* light grey or brown ; *spines* sharp, 3–4 ins. long, on trunks and large branches 6–8 ins., with lateral spines ; *Wood* hard, satiny, reddish-brown.

Introduced from N. America, 1691. Also called Newcastle Thorn. There are several varieties in cultivation.

### DOUGLAS'S THORN, *Cratægus Douglasii*.

Parks, gardens. May.

*Flowers* white  $\frac{1}{3}$ – $\frac{1}{2}$  in. diam., in a broad many-flowered *corymb*, glabrous ; *Calyx-tube* glabrous, lobes acute or acuminate, glandular serrate, hairy on inner



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surface; *Stamens* 20, anthers yellow; *Styles* 2-5, tufts of hair at base; *Fruit* a pome, oblong, truncate at apex,  $\frac{1}{2}$  in. long, black or dark purple; calyx deciduous; flesh thick, yellow; nutlets 3-5; ripe in September.

*Leaves* alternate, ovate to obovate, cuneate and entire at base, glandular serrate, acute, lobed, subcoriaceous, glabrous, dark green and lustrous above, paler beneath, 1-2 ins. long,  $\frac{1}{2}$ -1 $\frac{1}{2}$  ins. wide; petioles glandular.

A deciduous *tree*, 20-30 ft. or *shrub*; *Branches* ascending, spreading; *branchlets* slender, rigid, glabrous, bright red, shining; *spines* bright red or brown to grey,  $\frac{3}{4}$ -1 in. long, rigid.

Introduced from Western N. America, 1827.

### RED HAW, *Cratægus mollis*.

Parks, gardens. May. "The large flowers and brilliant scarlet fruits of this tree make it very ornamental in spring and early autumn, and when young the intricate branches, covered with lustrous chestnut-brown bark, render it interesting in winter."

*Flowers* white, 1 in. diam., in a many-flowered compound *corymb*, tomentose, bracteate and bracteolate; pedicels stout; *Calyx-tube* hoary-tomentose, lobes narrow, acuminate, glandular-serrate; *Petals* with small red mark at base; *Stamens* 20, anthers large, yellow; *Styles* 4-5, hoary-tomentose at base; *Fruit* a pome, oblong to sub-globose, pubescent,  $\frac{3}{4}$ -1 in. diam.; scarlet with black dots; flesh thick, yellow, mealy; nutlets 4-5; ripe August-September.

*Leaves* alternate, ovate, cordate or rounded at base, acute, glandular-serrate, 4-5-lobed, thick, firm, dark yellow-green, paler and pubescent on lower surface; 3-4 ins. long and broad; petioles terete, often glandular; stipules lunate, serrate. Autumn tints yellow, orange and scarlet.

A deciduous *tree*, 15 ft., spreading head; *Branches* smooth; *Twigs* pubescent; *Bark* ashy grey; *Spines* straight, 1-2 ins. long; *Wood* hard, light reddish-brown.

Native of U.S.A. Syn. *Mespilus coccinea* (Schmidt).

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## EASTERN THORN, *Cratægus orientalis*.

Parks, gardens. May, June.

*Flowers* white, fragrant, corymbose; *Fruit* a pome, globose, yellowish-red or purple, 5-cornered.

*Leaves* alternate, 3-lobed, lobes ovate, deeply toothed at apex, middle lobe trifid, pubescent, stipules broad.

A deciduous *tree*, 15 ft.; flat-headed; *Branches* with hoary tomentum.

Introduced from the Levant, 1810. Syn. *Mespilus Aronia* (Willd).

## HAWTHORN, *Cratægus Oxyacantha*.

Woods, hedges, gardens. May, June. "Our hedges in May can boast no ornament at all comparable to the Hawthorn, whose blossoms, by their exquisite fragrance, their snowy beauty, and their early blooming, render it the universal favourite among our wild shrubs; while poets have long sung the praises of the sweet May-blossom, identifying it even in name with the fair month of its birth." The Glastonbury Thorn, which blossoms at mid-winter, is the variety *præcox*, of the sub-genus *monogyna*.

*Flowers* white or pink,  $\frac{3}{4}$  in. diam., sweet-scented, attracting flies, proterogynous, in a sessile *corymbose cyme*, on short leafy branches, pedicels glabrous, many-flowered; *Calyx* glabrous or slightly downy, tube urceolate, segments acute; *Petals* broad; *Stamens* numerous, anthers pinkish-brown; *Ovary* 1-3 carpels, styles 1-3; *Fruit* a small pome, globular or ovoid, crowned by small divisions of persistent calyx, dark red or sometimes yellow, mealy, insipid, containing a hard, bony 1-2-celled nut, each cell with a single seed.

*Leaves* obovate cuneiform, very variable, 3-5 segments, petiolate, obtuse, glabrous, shining, lobes serrated or entire, stipules leafy,  $\frac{1}{2}$  sagittate, toothed. Autumn tints brown, orange, yellow, crimson.

A deciduous thorny *shrub* or small *tree*, 10-40 ft.; *Twigs* red or brown, forming a dense network; *Bark* dull grey, smooth, tendency to flaking in old trees; *Buds* short, ovoid-pointed or conic, scales red-brown, smooth; *Wood*

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hard and tough, used as a substitute for Box-wood in engraving, and for small turnery and cabinet-work.

Indigenous throughout British Isles; makes a good hedge plant; said to live perhaps 200 years. English name from A.S. *hæge*, a hedge, and *thorn*; Generic name from Gr. *kratos*, strength; specific name from Gr. *oxys*, sharp, and *acantha*, a thorn.

*Injurious Insects*:—Thorn Fly (*Aphis Cratægi*), Lackey Moth (*Bombyx neustria*), Mottled Umber Moth (*Hybernia defoliaria*), March Moth (*Anisopteryx æscularia*), Brown-tail Moth (*Porthesia chrysorrhæa*), Ermine Moths (*Hyponomeutidæ*).

*Fungoid Pests*:—Hawthorn Powdery Mildew (*Podosphaera Oxyacanthæ*).

Gall consisting of a tuft of leaves at the summit of a shoot is produced by a Gall-gnat (*Cecidomyia cratægi*) allied to the Hessian-fly (*C. destructor*).

### LARGE-FRUITED THORN, *Cratægus punctata*.

Parks, gardens. May.

*Flowers* white,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam., in a many-flowered compound *corymb*, tomentose or villose; *Calyx-tube* villose or tomentose, lobes narrow, acute, entire or glandular serrate; *Stamens* 20, anthers rose or yellow; *Styles* 5, tufts of white hairs at base; *Fruit* a pome, oblong or sub-globose,  $\frac{1}{2}$ –1 in. long, red, or sometimes yellow dotted, flesh thin and dry; nutlets 5.

*Leaves* alternate, obovate, cuneate and entire at base, rounded or acute at apex, serrate, glabrous, thick, firm, grey-green, villose beneath, 2–3 ins. long,  $\frac{3}{4}$ –1 $\frac{1}{2}$  in. wide; petioles stout, winged. Autumn tints orange and scarlet.

A deciduous *tree*, 15–30 ft.; *Branches* stout, spreading, nearly at right angles; *Twigs* light orange-brown or ashy-grey; *Spines* slender, 2–3 ins. long.

Introduced from U.S.A., 1746.

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### EVERGREEN THORN, *Crataegus Pyracantha*.

Walls, gardens. May. This is one of the most showy of all evergreens in winter, and when covered with its large clusters of brilliant orange-scarlet berries, so beloved of birds, is well deserving of its name "Fire Thorn," or the "Buisson-ardent" of our Gallic neighbours. Pruning should be done in February, cutting away those shoots that have borne berries.

*Flowers* white, in a dense *corymbose cyme*; *Fruit* a pome, globose, size of pea, orange-scarlet, persistent through winter.

*Leaves* alternate, ovate-lanceolate, acute, crenate, petiolate, stipulate, glabrous.

An evergreen *wall-shrub*, 20 ft.; or dense *bush*, 10 ft.

Introduced from S. Europe, 1629. Syns. *Mespilus Pyracantha*, *Cotoneaster Pyracantha*, *Pyracantha coccinea*.

### TANSY-LEAVED THORN, *Crataegus tanacetifolia*.

Gardens. May, June. The large, much-divided leaves and the densely hairy twigs and fruits give this tree a character of its own.

*Flowers* white, fragrant, in a *corymbose cyme*; *Calyx-lobes* acute, reflexed, hairy, much divided, epicalyx glandular; *Stamens* small, brown; *Fruit* a pome,  $\frac{3}{4}$  in. diam., globose, often 5-ribbed, greenish-yellow, hairy, 5 bony seeds.

*Leaves* alternate, deeply pinnatifid, lobes oblong, acute, glandular, serrate, downy on both surfaces, dark green above, lighter below,  $2\frac{1}{2}$  ins. long,  $1\frac{1}{4}$  in. broad, petioles downy.

A deciduous *tree*, 12–30 ft.; *Twigs* densely hairy; *Bark* corky and flaking.

Introduced from the Levant, 1789.

### SMALL-FRUITED COTONEASTER, *Cotoneaster affinis*.

Gardens. April, May. The Cotoneasters vary from large shrubs or small trees to dwarf or prostrate bushes. All are useful for the shrubbery, and some





DOUBLE-FLOWERED JAPANESE APPLE OR QUINCE.

(*Cydonia japonica*, v, flore pleno.)



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are well adapted for covering walls or fences, or trailing over tree roots, rocks, or bare ground under trees. They are propagated by cuttings inserted in sandy soil outdoors in October; layering of shoots in October; grafting on the common species, or Quince or Hawthorn in March; seeds sown outdoors in March.

*Flowers* white, in lateral *corymbose cymes*; *Calyx* woolly, 5-lobed, persistent; *Petals* 5; *Stamens* indefinite; *Ovaries* 2-5, adnate at back to calyx-tube; *Fruit* a drupe, small, spherical, bright red, 2 5 bony 1-seeded stones; ripe in September, persistent through winter.

*Leaves* alternate, ovate or obovate, attenuated at base, mucronate, ciliate, bright green above, woolly beneath,  $3\frac{1}{2}$ -4 ins. long,  $1\frac{1}{2}$  in. broad, petioles woolly.

A sub-evergreen *tree*, 10-15 ft.; *Branches* somewhat horizontal; *Twigs* terete, red-brown; *lenticels* well shown; *Buds* acute.

Native of Lower Nepaul; introduced 1828. Specific name said to be given from close affinity to *C. frigida*, of which some regard it as a variety.

### ROD COTONEASTER, *Cotoneaster bacillaris*.

Gardens. April, May.

*Flowers* white,  $\frac{1}{3}$  in. diam.; in a short, many flowered, divaricate *cyme*, pilose; *Calyx* segments 5, short, persistent; *Petals* 5; *Stamens* numerous, *Ovary* inferior, carpels 2-5; *Fruit* a drupe,  $\frac{1}{3}$  in. long, in axillary *cymes*, on long slender pedicels, smooth, purplish-red, black or brown; 2-5 bony 1-seeded stones.

*Leaves* alternate, ovate, obovate or oblong, lanceolate, tapering towards base, mucronate or obtuse, entire, ciliate, coriaceous, glabrous above, woolly or glabrescent beneath,  $2\frac{1}{2}$  ins. long,  $1\frac{3}{4}$  in. broad; petioles red, long, and slender; stipules subulate, caducous.

A deciduous *shrub*, or small *tree*, sub-evergreen in mild seasons, 8-10 ft., spreading head; *Branchlets* slender, twig-like, glabrous, red; *Wood* white, strong, elastic.

Native of Nepaul; known as Twig-branched Cotoneaster.



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### BOX-LEAVED COTONEASTER, *Cotoneaster buxifolia*.

Gardens, walls. April, May. This is a vigorous and free-growing species, doing well in any garden soil, useful for the rock garden or for covering walls. Seeds may be sown as soon as ripe in gentle heat, or outdoors in the following spring.

*Flowers* white; in a compact, short, terminal *cyme*, at ends of short lateral shoots, 2–6 flowered, usually 5; tomentose; *Calyx* tomentose; *Fruit* a drupe, usually in fives, globular, smooth, deep crimson, ripe in September.

*Leaves* alternate, ovate or elliptical, entire, ciliated, acute, tapering towards base, downy on underside when young, glabrous when mature,  $1\frac{1}{2}$  in. long,  $\frac{3}{4}$  in. broad, petioles long.

An evergreen *shrub*, 4–12 ft.; twiggy, straggling.

Native of Neilgherry Mountains; introduced 1824. Also called Box-leaved Rose-box.

### ALPINE COTONEASTER, *Cotoneaster frigida*.

Gardens. April, May. A very ornamental hardy shrub of robust growth.

*Flowers* snow-white, in a small, terminal, *corymbose cyme*, woolly; *Calyx* woolly; *Fruit* a drupe, small, spherical, bright red, borne in great profusion, ripe in September, persisting through great part of winter.

*Leaves* alternate, oblong or oblong-lanceolate, tapering towards base, slightly crenulated, mucronate, coriaceous, glabrous above when mature, silvery tomentose beneath, 4–5 ins. long,  $1\frac{1}{2}$  in. broad, dark shining green above, lighter below.

A sub-evergreen *shrub* or *tree* 15–20 ft., or more; *Branchlets* woolly when young, smooth later.

Native of Nepaul; introduced 1824.







SMALL-LEAVED COTONEASTER (*Cotoneaster microphylla*)

A. Flowering branch. B. Transverse section of fruit. C. Flower (longitudinal section).  
D. Flower. E. Fruit. F. Longitudinal section of fruit.

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### *Cotoneaster horizontalis.*

Gardens, walls, rockeries. May, June. A very attractive and decorative species with dense branches growing in a horizontal position. It is almost sub-evergreen, the leaves being retained well on to winter. They are at first suffused with bronze, and then take on varying shades of red, those at the end of the shoots lasting the longest.

*Flowers* white or rose; *Fruit* a drupe, ovoid, scarlet,  $\frac{1}{4}$  in. diam., 2-seeded.

*Leaves* alternate, or fascicled on dwarf shoots, ovate-oblong, acuminate, points recurved, entire, ciliate, glabrous and dark glossy green above, hoary beneath,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; petioles short. Autumn tint bright red.

A deciduous *shrub*, 2 ft., or 12 ft. on wall; *Branches* stout, very dense, horizontal, somewhat frond-like; *Twigs* brown; *Bark* scaly.

Native of Himalayas; introduced 1879.

### COMMON COTONEASTER, *Cotoneaster integerrima.*

Great Orme's Head. It is the only native species. May, June.

*Flowers* pink, small,  $\frac{1}{5}$  in. diam., solitary, on short downy peduncles, or 4–5 in short lateral *cymes*, on very short leafy branches, bracts minute; *Calyx* gamosepalous, turbinate, 5-lobed, persistent, lobes obtuse, margins woolly; *Petals* 5, small, persistent; *Stamens* numerous, inserted in mouth of calyx; *Ovary* inferior, carpels 2–5, styles usually 3, stigma truncate; *Fruit* a false drupe,  $\frac{1}{4}$  in. diam., globose, shining red, pubescent, pendulous, 2–5 bony 1-seeded stones cohering only to sides of fleshy receptacle of calyx-tube (*hypanthium*).

*Leaves* alternate, broadly elliptical-oblong, ovate or orbicular, 1–2 ins. long, shortly petiolate, entire, rounded or acute, coriaceous, glabrous upper side; short, dense, white cottony down beneath; stipules scarious, deciduous, minute. Autumn tint brown.

A deciduous *shrub*, 1–2 ft.; or 3–5 ft. under cultivation; *Branchlets* ruddy, pubescent, tortuous.

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Confined in wild state to Great Orme's Head. Usually known as *C. vulgaris*. Used as a stock for grafting the dwarf species. Dr. Lindley says, Generic name signifies *quince-like*; in Latin Quince was *Cotonea*; and *aster* is a corruption of *ad instar* or *instar*, "according to the likeness of."

### LOOSE-FLOWERED COTONEASTER, *Cotoneaster laxiflora*.

Gardens. April—June.

*Flowers* pink, in a loose forked many flowered *panicked-cyme*, pilose; *Calyx* glabrous; *Fruit* a drupe, oblong, glabrous, black, with bluish tint; ripe in September.

*Leaves* alternate, oblong or ovate-elliptic, obtuse at both ends, or mucronate at apex, glabrous above, woolly beneath, 2 ins. long, 1½ in. broad.

A deciduous *shrub*, 3–5 ft.; straggling.

Native of N. Asia; found among rocks in Soungarian desert; introduced 1826.

### SMALL-LEAVED COTONEASTER, *Cotoneaster microphylla*.

Gardens, walls. May, June. This is probably the best known species, and is well suited for rockwork, or as a standard on a Thorn, and will even do well on a north-east wall. Rambling over rocks, fences, or hanging over walls, it is particularly attractive in early summer, when its small white flowers are put forth in abundance, and in autumn it is made equally interesting by its brilliant red berries.

*Flowers* white, resembling Hawthorn, ½ in. diam., solitary or 2–3 together, terminal on short lateral branches; *Fruit* a drupe, globular, rather large, bright red, ripe in August, persistent through winter.

*Leaves* alternate, very variable, ovate, obovate, or oblong, cuneated, acute, obtuse, or retuse, margins recurved, coriaceous, glossy green and smooth on upper surface, pubescent or tomentose beneath, persistent, rigid, ½ in. long, ¼ in. broad.



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An evergreen *shrub*, 3–4 ft., or 8–10 ft. on a wall, dense, spreading, somewhat trailing; *Stems* wiry.

Native of Nepaul; introduced 1824. Specific name from Gr. *micros*, little, and *phyllon*, a leaf.

### MONEYWORT-LEAVED COTONEASTER, *Cotoneaster Nummularia*.

Gardens. April, May.

*Flowers* white, in an axillary *cyme*, 2–5 flowered, very short, woolly; *Calyx* white, woolly; *Fruit* a drupe, small, numerous, black, ripe in September.

*Leaves* alternate, orbicular or obovate, entire, flat, mucronate, somewhat emarginate, tomentose in young state, glabrous on upper side when older, distantly placed,  $1\frac{3}{4}$  in. diam., petioles hairy when young.

A sub-evergreen *shrub*, or small *tree*, 10–15 ft.; round-headed, spreading; *Branchlets* slender, twiggy, hairy when young; *Buds* hairy.

Native of Kashmir, Nepaul, and Thibet; introduced 1824.

### ROUND-LEAVED COTONEASTER, *Cotoneaster rotundifolia*.

Gardens. April, May.

*Flowers* white, solitary and terminal, on short lateral branches, subsessile; backs of *Petals* often pinkish; *Fruit* a drupe, oblong, glabrous, bright scarlet; ripe in August, frequently persistent till March.

*Leaves* alternate, orbicular or broadly ovate, obtuse or slightly mucronate, coriaceous, glabrous or sparsely hairy, and deep glossy green above, pilose beneath, somewhat sparse,  $\frac{1}{2}$  in. long,  $\frac{1}{3}$  in. diam.

A sub-evergreen *shrub*, 3–4 ft., dense; *Shoots* spreading, rigid, distichous. Introduced from Nepaul, 1825.

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### SIMON'S COTONEASTER, *Cotoneaster Simonsii*.

Gardens. April—June. This is one of the most effective and charming shrubs in the autumn when the long slender branches are wreathed with orange-scarlet berries and the foliage is a glowing crimson. The plants are inclined to become “leggy” and bare at the base, but if cut down to the ground vigorous shoots will quickly spring up, and will be laden with berries in the second year.

*Flowers* white, deeply tinted with pink when young and in bud; solitary and terminal, or in *cymes* of 2–4, on short lateral branches, nearly sessile; *Fruit* a drupe, turbinate, abundant, orange-scarlet, ripe in September, persistent all winter.

*Leaves* alternate, ovate or rhombic-orbicular, acuminate, mucronate, ciliated, glabrous and dark green upper surface, silky beneath,  $\frac{3}{4}$  in. long. Autumn tint crimson.

A sub-evergreen *shrub*, 5–8 ft. as a standard, or 12 ft. on a wall; young shoots hairy.

Native of Himalaya; introduced 1850.

### SERVICE BERRY, *Amelanchier alnifolia*.

Gardens. This deciduous shrub is distinguished from the next species by its denser racemes of white blossoms, its larger fruits, and its dark green, broader and shorter leaves, the blades of which are toothed on the terminal half only. April, May.

*Flowers* white, in an erect, rather dense *raceme*, 1–1½ in. long, pedicels short, villose, bracteoles acute; *Calyx* 5-partite, cup-shaped, persistent, tomentose to glabrous, lobes linear, acute; *Petals* 5, oblong to obovate, rounded or acute, glabrous,  $\frac{1}{4}$ –1 in. long; *Stamens* about 20, in 3 rows, filaments subulate, anthers oblong; *Ovary* inferior, adnate to calyx-tube, 5-celled; *Fruit* a pome, sub-globose,  $\frac{1}{2}$ –1 in. diam.; dark blue to nearly black, glaucous bloom, sweet, juicy; *seeds* 5–10, red-brown.



MOCK ORANGE (SYRINGA) (*Philadelphus coronarius*)

A. Flowering branch. B. Flower with petals removed. C. Section of ovary (transverse). D. Pistil and part of calyx.







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*Leaves* alternate, resembling Alder, ovate or orbicular, usually obtuse, rounded or sub-cordate at base, entire below, coarsely serrated above, tomentose when young, afterwards glabrous, membranaceous to subcoriaceous, dark green above, paler beneath, 1-1½ in. long; petioles slender; stipules linear, acute, red-brown.

A deciduous *shrub*, 8-15 ft.; *Branches* spreading, slender, glabrous; *Bark* light brown, tinged red; *Buds* acute, chestnut-brown, glabrous.

Native of western parts of N. America (tree 20-40 ft.). Fruit largely eaten by Indians of S.W. America. Discovered in 1804; introduced from Oregon by David Douglas, 1826.

### GRAPE PEAR, *Amelanchier canadensis*.

Gardens. April. The nodding racemes of snow-white flowers, borne in profusion by even young specimens, make this one of the most beautiful and showy of spring-flowering trees. It may be grafted on the Quince or Hawthorn in March.

*Flowers* snow-white, appearing when leaves are one-third grown, in an erect or nodding *raceme*, 3-4 ins. long; pedicels slender; *Calyx* campanulate, lobes lanceolate, acute, villous inner surface; *Petals* 5, ligulate or obovate, rounded or acute, thin, ½-1 in. long, ¼-½ in. wide; *Fruit* a pome, globose, ⅓-½ in. diam.; bright red, becoming dark purple with glaucous bloom.

*Leaves* ovate or ovate-oblong, cordate at base, acute, serrated, thick, glabrous, dark green above, pale beneath, pilose when young, 3-4 ins. long, 1-1½ in. wide, midrib prominent, petiole slender; autumn tints deep golden yellow and brilliant crimson.

A deciduous *tree*, 40 ft.; with bushy head; *Branches* spreading; *Twigs* slender, light green to dark red, becoming dark brown or reddish brown; *Bark* red brown, longitudinal fissures, scaly; *Buds* small, acute, scales chestnut-brown, pubescent, ciliate; *Wood* heavy, hard, strong, close-grained, dark brown, tinged red.

Introduced from eastern parts of N. America, 1746; known also as June-Berry and Shad Bush.

# TREES AND SHRUBS

CLASS I. . . . . *Dicotyledons*

DIVISION II. . . . . *Calycifloræ*

NATURAL ORDER . . . . . *Saxifragaceæ*

Herbs, shrubs, or trees, with alternate or opposite leaves, usually exstipulate; *Flowers* regular; *Calyx* of 4-5 sepals, free, or more or less adnate to the ovary; *Petals* 4-5, perigynous or epigynous, sometimes wanting; *Stamens* usually as many, or twice as many as sepals, perigynous or epigynous, anthers dorsifixed; *Ovary* 1-4 celled, superior, or inferior, usually of 2 carpels, more or less connate at base, but diverging at the apex; *Fruit* a capsule or berry.

All European plants with polypetalous flowers, and 2 divaricating many-seeded carpels belong to this Order.

## COMMON HYDRANGEA, *Hydrangea hortensis*.

Gardens. April—September. Best in rich loamy soil; requires protection during winter, except in warmer counties; partial shade is beneficial. Cut out old wood in winter. Cuttings may be taken at almost any time with the aid of a little bottom heat.

*Flowers* varying in colour according to soil. Fertile flowers few; *Inflorescence* a large *corymbose cyme*; sterile flowers consisting of much enlarged calyces; *Fruit* a membranaceous capsule.

*Leaves* opposite, broadly ovate, acuminate, serrate, shining green.

A deciduous shrub, 2-5 ft.

Native of China, introduced 1790; Generic name from Gr. *hydor*, water, and *aggeion*, a vessel, a capsule, in allusion to the cup-shaped fruit; Specific name from L. *hortus*, a garden.

## *Hydrangea paniculata*.

Gardens. September, October. Prune rather severely in winter, and mulch with well-rotted manure.

*Flowers* greenish white, nearly all perfect, in a terminal corymbose panicle;

## SAXIFRAGACEÆ

sterile flowers few, on long pedicels; peduncles white, downy; *Calyx* superior, 5-toothed, white; *Petals* 5, ovate, rose-tinted outside, especially in bud; *Stamens* 10, perigynous; *Ovary* half-inferior, styles 3, connate; *Fruit* capsular.

*Leaves* opposite, ovate-oblong, acute, glandular-serrate, glabrous, paler on underside, veins prominent, pubescent.

A deciduous *shrub*, 4-6 ft.; *Branches* terete, brown.

Introduced from Japan, 1874.

## PLUMED HYDRANGEA, *Hydrangea paniculata* v. *grandiflora*.

Gardens. July—September. This magnificent variety is the finest form in cultivation. The flowers, after lasting for several weeks, die off a rich reddish hue.

*Flowers* white. Fertile flowers small, star-shaped; *Inflorescence* a terminal, corymbose *panicle*, 1 ft. long; small flowers intermixed with sterile ones, 1 in. or more in diam.; *Calyx* superior, 5-toothed, white, teeth rose-coloured; *Petals* 5, valvate, rose on outside; *Stamens* 10, perigynous; *Ovary* half-inferior, styles 3, stigmas sessile; *Fruit* capsular.

*Leaves* opposite or in threes, ovate-oblong, acute, serrate, pubescent, 5-6 ins. long, midrib prominent.

A deciduous *shrub*, 4-6 ft.; *Branches* terete, brown; old stems with scaly bark.

Introduced from Japan, 1874; there forms a tree 25 ft. high; discovered by Dr. Von Siebold.

## HIMALAYAN SNOW-FLOWER, *Deutzia corymbosa*.

Gardens. May. Best in a warm and sheltered position. All the *Deutzias* prefer a well-drained, rich and rather sandy soil, and respond to a mulch of manure at times. They are propagated by cuttings of young shoots 3 ins. long inserted in sandy soil under a bell-glass in a cold frame in June or July, or of firm shoots 10-12 ins. long in ordinary soil outdoors, November

## TREES AND SHRUBS

January; also by layers and division. Old wood should be cut out in June; but do not shorten young shoots.

*Flowers* white, in a *trichotomous, corymbose panicle*; *Calyx* 5-partite, teeth ovate, shorter than tube, dotted; *Petals* 5, obovate, nearly glabrous, imbricate,  $\frac{1}{4}$  in. long; *Stamens* 10, filaments broadly winged; *Ovary* inferior, 3-5-celled, placentation axile, styles 3-5, filiform; *Fruit* a capsule, separating into 3-5 cocci.

*Leaves* opposite, oblong or elliptic-lanceolate, acuminate, serrate, scabrous with stellate hairs, underside green.

A deciduous *shrub*, 5 ft.; *Branches* opposite; *Bark* peeling in long thin shining rolls.

Native of Himalayas, introduced 1830; Genus named in honour of Johann Deutz, a Dutch naturalist, a friend and patron of Thunberg.

### JAPANESE SNOW-FLOWER, *Deutzia crenata*.

Gardens. May, June. This is one of the hardiest of dwarf white-flowering shrubs, and looks well as a single specimen on the grass, in a sheltered position.

*Flowers* white, in a terminal *panicle*, pedicels scabrous; *Calyx* 5-toothed, scabrous with stellate hairs; *Petals* 5, ovate, obtuse; *Stamens* 10, perigynous, filaments white, broad, horned; *Disk* pink; *Ovary* inferior, 3-celled, styles 3, white, stigmas recurved; *Fruit* a capsule.

*Leaves* opposite, ovate-lanceolate, crenate-dentate, obtuse, scabrous, lighter green underside.

A deciduous *shrub* 4-10 ft.; *Stems* slender; *Bark* peeling.

Native of Japan, introduced 1833; known in gardens as *D. scabra*, the Rough-leaved Deutzia; leaves used for polishing ivory.

### SLENDER DEUTZIA, *Deutzia gracilis*.

Gardens. April, May. Being somewhat tender, this is most frequently seen under glass, but will grow luxuriantly outdoors in a warm, sheltered position.



## SAXIFRAGACEÆ

*Flowers* pure white, in dense axillary *panicles*; *Calyx* small, sepals triangular; *Petals* ovate; *Disk* yellow; *Styles* 3; *Fruit* a capsule.

*Leaves* opposite, small, ovate, acuminate, serrated.

A deciduous *shrub*, 2–3 ft.; *Branches* erect; *Buds* small, scales tinged with red.

Introduced from Japan, 1843.

### MOCK ORANGE, OR SYRINGA, *Philadelphus coronarius*.

Gardens. June. This is a favourite garden shrub, very floriferous and fragrant, of easy culture in any ordinary soil. Careful pruning after flowering will encourage new growth, which will flower in the next year. It may be propagated by cuttings of young shoots in sandy soil in gentle heat in April, or in a close cold frame in May; suckers or layers may be taken in spring.

*Flowers* white, fragrant, orange-like odour, 1–1½ in. diam., axillary, or in small *cymes* at the ends of branchlets; *Calyx* 4-partite, lobes ovate, acute, tube turbinate, adnate to ovary; *Petals* 4, obovate, convolute, ½ in. long; *Stamens* 20–40, epigynous, filaments subulate; *Ovary* inferior, 4-celled, 4 placentas protruding into the cell from the inner angle, styles 4, stigmas capitate; *Fruit* a capsule, top-shaped, 4-celled, 4-valved, many-seeded.

*Leaves* opposite, exstipulate, ovate, acuminate, distantly serrate, glabrous, dark green above, paler and pubescent beneath, 2–4 ins. long, odour and taste of cucumber, when crushed.

A deciduous *shrub*, 10–12 ft.; *Stems* erect, rigid; *Bark* light grey, peeling in narrow longitudinal strips.

Native of S. Europe and Asia; introduced 1596.

### CALIFORNIAN MOCK ORANGE, *Carpenteria californica*.

Gardens. June, July. The pure white flowers, resembling those of the Japanese Anemone, render this a shrub of great beauty. It is best when sheltered by a south or south-west wall, and in a well-drained loamy soil. Prune

## TREES AND SHRUBS

away shoots that have flowered as soon as blossoms fade. Propagate by cuttings of young shoots in cold frame in April; tongued layers with moss and damp sand pressed into cut and kept moist in September; suckers removed in autumn.

*Flowers* white, fragrant,  $2\frac{1}{4}$  ins. diam., axillary, paniced, usually in fives, pedicels long; *Calyx* inferior, 5-lobed; *Petals* 5, obovate; *Stamens* very numerous, perigynous, anthers golden; *Ovary* superior; *Fruit* a capsule.

*Leaves* opposite, broadly lanceolate, entire or serrated, recurved, acute, petiolate, exstipulate, pinnately veined, pale green, whitened beneath with dense pubescence, 2–4 ins. long.

A deciduous *shrub*, 6–15 ft.; *Branches* slender.

Native of Sierra Nevada, California; introduced 1880; said to have first flowered here in 1885. Named after Professor Carpenter of Louisiana.

### MOUNTAIN CURRANT, *Ribes alpinum*.

Woods. April, May.

*Flowers* yellowish-green, dioecious; *Male racemes* erect,  $1-2\frac{1}{2}$  ins. long, 20–30 flowered, pedicels slender, shorter than bracts; *Females* shorter, often nearly sessile, 8–10 flowered, more green; bracts linear; *Calyx* glabrous; *Petals* much shorter than calyx-lobes; *Styles* very short, cleft; *Fruit* a berry, globose,  $\frac{1}{4}$  in. diam., scarlet, tasteless, racemes erect.

*Leaves* alternate, broadly ovate, 3–5-lobed, lobes acute, serrate, nearly glabrous,  $1\frac{1}{2}$ –2 ins. diam.; petiole slender.

A deciduous *shrub*, 2–4 ft.; *Branches* slender.

Probably indigenous in North of England.

### MISSOURI CURRANT, *Ribes aureum*.

Gardens, shrubberies. April, May. Best in an open, sunny situation. The flowering species of *Ribes* should be pruned only directly after the blossoms have withered. They may be propagated by cuttings 6–8 ins. long inserted in ordinary soil outdoors, October to February; layering in autumn; suckers November to February; seeds in ordinary fine soil outdoors in September or October.

## SAXIFRAGACEÆ

*Flowers* golden-yellow, fragrant, in a many-flowered drooping *raceme*; *Petals* much shorter than calyx segments, bordered with red; *Stamens* bright red; *Fruit* a berry, yellow, seldom black, glabrous.

*Leaves* alternate, 3-lobed, lobes divaricate, pale green, glabrous, shining; petioles long, ciliated at base. Autumn tints bright purple to brilliant vermilion.

A deciduous *shrub*, 6-8 ft.; *Twigs* straw-coloured, slender, straggling.

Introduced from N. America, 1812. Known also as Buffalo Currant and Golden-flowered Currant. Specific name = golden (*L. aurum*, gold).

### GOOSEBERRY, *Ribes Grossularia*.

Hedges, copses, gardens. April, May. Prune weak shoots of current year's growth to within 1 in. of base in June or July; thin out remaining shoots in winter, shortening those left to 4 or 6 ins.

*Flowers* greenish-white,  $\frac{1}{4}$  in. diam.; proterandrous, in racemose groups of 1-3 flowers on laterals and dwarf shoots, pedicels short, 2-3 ovate bracts; *Calyx-tube* campanulate, 5-toothed, erect or spreading, then reflexed, epigynous, violet glandular hairs; *Corolla* small, erect, pale greenish-white; *Stamens* epigynous; *Ovary* inferior, style 1, stigma bifid, 2 parietal placenta; *Fruit* a berry, ellipsoid or globoid,  $\frac{1}{4}$ - $1\frac{1}{4}$  in. long, glabrous, pubescent or glandular, juicy pulp; *seeds* several, small.

*Leaves* alternate, fascicled on dwarf shoots,  $\frac{3}{4}$ - $1\frac{1}{2}$  in. diam., sub-orbicular or ovate, 3-5-lobed, crenated, pubescent, nearly glabrous above, paler beneath. Autumn tints yellow and brown.

A deciduous *shrub*, 3-4 ft.; *Branches* spiny, grey to brown; spines single or triple, both at leaf-scars and scattered along internodes; *Twigs* slender, grey; *Buds* pointed, scales brown, ciliate.

Native of Britain.

*Chief insects* injurious to cultivated Gooseberries:—*Bark*—Gooseberry and Currant Scale (*Lecanium ribis*); *Leaves*—Currant Aphis (*Aphis ribis*), Magpie Moth (*Abraxas grossulariata*), Winter Moth (*Chimatomia brumata*), V-Moth (*Thamnonoma variaria*, *Ilia variaria*). Gooseberry and Currant Saw-fly (*Nematus ribesii*); *Shoots*—Currant Clearwing Moth (*Scsia tipuliformis*).





## TREES AND SHRUBS

*Fungoid Pests*:—Gooseberry Mildew (*Microsphaera Grossulariæ*), American Gooseberry Mildew (*Sphærotheca Mors-uæ*), Gooseberry Polypore (*Fomes Ribis*).

### BLACK CURRANT, *Ribes nigrum*.

Woods, gardens. April, May. Prune November—February, thinning out old shoots only.

*Flowers* yellowish-green,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam., in a lax pendulous raceme, few flowered, tomentose, pedicels glandular, bracts subulate; *Calyx* campanulate, 4–5-fid, glandular pubescent; *Petals* 4–5, minute; *Stamens* 4–5; *Ovary* inferior, 1-celled, 2 parietal placentæ, styles terete, capitate; *Fruit* a berry, globose, black, gland-dotted, odorous glandular hairs.

*Leaves* alternate, pentagonal, cordate, 3–7-lobed, serrate or biserrate, acute, dark green, glabrous, shining, or slightly pubescent, coarse and rough above, paler and yellow glandular hairs beneath, aromatic when bruised,  $1\frac{3}{4}$ – $2\frac{3}{4}$  ins. long,  $3\frac{1}{4}$ – $4\frac{1}{2}$  ins. broad; petiole slender, pubescent. Autumn tints yellow and brown.

A deciduous shrub, 3–5 ft.; *Twigs* grey tawny, yellow glandular hairs, odorous; *Buds* greenish, tinged red, scales loosely imbricated, golden glandular hairs.

Native of Britain.

*Chief insects* injurious to Currants:—*Bark*—Gooseberry and Currant Scale (*Lecanium ribis*), Mussel Scale (*Mytilaspis pomorum*); *Buds*—Currant Gall Mite (*Phytoptus ribis*); *Leaves*—Currant Aphis (*Rhopalosiphum ribis*), Comma Butterfly (*Vanessa c-album*), Gooseberry and Currant Moth (*Abraxas grossulariata*), Gooseberry and Currant Sawfly (*Nematus ribesii*); *Shoots*—Currant Clearwing Moth (*Sesia tipuliformis*).

### RED CURRANT, *Ribes rubrum*.

Woods, thickets, gardens. April, May. *Pruning*:—Select strong shoots for forming new branches, and shorten others to within 1 in. of base







FLOWERING CURRANT (*Ribes sanguineum*)

Flower and fruit.

## SAXIFRAGACEÆ

in June or July; cut back selected shoots to within 4-8 ins. November—February, and cut out old and distorted branches.

*Flowers* greenish-white,  $\frac{1}{4}$  in. diam., in a pendent axillary *raceme*, 1-3 ins. long, many-flowered, glabrous or pubescent, never glandular, bracts ovate; *Calyx* cup-shaped, 4-5-fid, spreading, lobes obovate or rounded, twice length of petals; *Petals* 4-5, minute, inserted at base of calyx-segments; *Stamens* 4-5, perigynous, filaments short; *Ovary* inferior, 1-celled, styles 2, stigmas divided, spreading; *Fruit* a berry, globose,  $\frac{1}{4}$  in. diam., thin skinned, red, acid, 1-celled.

*Leaves* alternate, 2-4 ins. long, 2-3 $\frac{3}{4}$  ins. broad, palmately 3-5-lobed, cordate at base, obtuse, irregularly and coarsely serrated, usually glabrous above, paler beneath, tomentose, inodorous, young leaves pubescent, especially beneath, eglandular; petiole pubescent or setose. Autumn tints yellow and brown.

A deciduous *shrub*, 3-5 ft.; *Branches* grey; *Twigs* brown or grey; *Buds* pale brown, scales densely imbricated.

Native of Britain. The name Currant is a corruption of Corinth, a small grape at one time principally produced near Corinth, the fruit being formerly known as *Uvæ Corinthiaceæ*. Leaves attacked by an *Aphis* (*Myzus ribes*).

### FLOWERING CURRANT, *Ribes sanguineum*.

Gardens, shrubberies. April. Best in a sunny position.

*Flowers* rose, fragrant, in a drooping *raceme*, twice length of leaves; *Calyx-tube* campanulate, 5-fid, bright rosy-red, glandular pubescent; *Petals* 5, white, inserted at throat of calyx; *Stamens* 5, inserted with petals, alternate; *Ovary* inferior, 1-celled, styles 2; *Fruit* a berry, turbinate, purplish, glaucous bloom, bitter; *seeds* numerous.

*Leaves* alternate, cordate, 5-lobed, serrate, glabrous above, villous tomentum beneath.

A deciduous *shrub*, 4-8 ft.; *Twigs* orange-brown; *Buds* pointed, scales red.

Native of North-west America; discovered by Menzies; introduced by Douglas, 1826. Specific name is Latin for "blood-red."

# TREES AND SHRUBS

## FUCHSIA-FLOWERED GOOSEBERRY, *Ribes speciosum*.

Gardens, shrubberies, walls. April—June. A rather hairy shrub with small clusters of Fuchsia-like blossoms. Best on a wall in cold districts.

*Flowers* deep red, 1–3 on axillary peduncle, which is longer than leaves; *Calyx* cylindrical, lobes often 4, linear-lanceolate, acute, glandularly pubescent, hairs red; *Petals* red, linear-lanceolate, as long as sepals; *Stamens* protruding beyond calyx for 1 in. or more, filaments red, anthers purplish-black; *Fruit* a berry, red, rather dry, few-seeded.

*Leaves* fascicled, indistinctly 3-lobed, cuneate at base, acute, crenate, glabrous, shining, petioles short.

A deciduous *shrub*, 6–8 ft.; much higher on walls, 15–20 ft.; *Branches* glandular hispid, spines triple, infra-axillary.

Introduced from California, 1829. Syns. *R. stamineum* (long stamens), *R. fuchsioides* (resembling Fuchsia).

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION II.	.	.	.	.	<i>Calycifloræ</i>
NATURAL ORDER .	.	.	.	.	<i>Hamamelideæ</i>

Trees or shrubs with watery juice, alternate, petiolate leaves, and deciduous stipules; *Flowers* perfect or unisexual; *Calyx* 4-partite or 0, more or less adnate to ovary; *Petals* usually 4 or 0; *Stamens* 4–8, anthers basifixed, introrse; *Ovary* inferior, 2-celled; *Fruit* a woody capsule opening at summit, usually 1-seeded.

### *Corylopsis spicata*.

Shrubberies. February, March. Best in sandy loam, and warm, sheltered situations. Propagated by cuttings of well-ripened shoots in summer in heat; also by layers.

*Flowers* pale yellow, fragrant, appearing before leaves, resembling Cowslips



## HAMAMELIDEÆ

in odour, in a pendulous *raceme*, 2–3 ins. long, 8–12 flowered, bracts greenish-yellow; *Petals* 5; *Stamens* 5, exserted, anthers red; *Fruit* a capsule, woody; *seeds* ellipsoid, shining black.

*Leaves* alternate, orbicular, cordate, resembling Hazel, mucronately serrated, hoary beneath, petioles long.

A deciduous *shrub*, 3–4 ft.; *Buds* large, ovate, green, young scales red, brown later.

Introduced from Japan by Fortune, 1864. Generic name from Gr. *Korylos*, the Hazel tree, and *opsis*, like.

### ARBORESCENT WITCH HAZEL, *Hamamelis arborea*.

Gardens. January—March. In the early part of the year this shrub presents a striking appearance, its curious blossoms looking like rolls of ribbon before they expand, and when fully open resembling twisted strips of gold leaf. The species are propagated by layering of branches in October or November.

*Flowers* yellow, on the bare branches, in axils of leaves of previous year; *Calyx* 4-partite, adnate to ovary, deep claret-coloured; *Petals* 5, resembling short twisted threads, clear, rich primrose-yellow.

*Leaves* alternate, sub-rotund, unequal at base, crenate, penni-nerved, petiolate, stipules deciduous.

A deciduous *tree*, 15–20 ft.

Introduced from Japan, 1862; there called “Mansak.”

### AMERICAN WITCH HAZEL, *Hamamelis virginica*.

Gardens. October—February. Does well in bold groups planted in rich loam. “During autumn and winter the plant is profusely covered with its fine rich yellow flowers, which begin to expand before the leaves of the previous summer drop off, and continue on the bush throughout the winter; after the petals drop off, in spring, the persistent calyces remain on till the leaves reappear in April or May.”—*Dictionary of Gardening*.

## TREES AND SHRUBS

*Flowers* yellow, in axillary clusters; *Calyx* 4-partite, adnate to lower part of ovary, lobes spreading or recurved, oval, ciliate, pubescent; *Petals* 4, linear, persistent; *Stamens* 4, alternating with 4 scale-like staminodes, filaments short, anthers dehiscing by a valve; *Ovary* 2-celled, styles 2, subulate, spreading, persistent; *Fruit* a capsule, woody, 2-valved, beaked with the 2 persistent styles, densely pubescent, orange-brown, 1-seeded.

*Leaves* alternate, obovate, acuminate or rounded, acutely serrated, entire or dentate at base, dark green and usually glabrous above, lighter beneath, pubescent on midribs and principal veins, 4–6 ins. long, 2–2½ ins. broad; petioles short; stipules deciduous. Autumn tint yellow.

A deciduous *shrub*, 6–12 ft.; or small *tree*, 20–30 ft.; *Branches* spreading; *Twigs* flexible, orange-brown to reddish-brown, rusty stellate hairs when young; *Bark* brown, smooth, scaly; *Buds* acute, orange-brown, pubescent; *Wood* hard, light brown, heavy, cross-grained.

Introduced from N. America, 1736. Generic name from Gr. *hama*, together, and *melon*, a fruit; the fruit accompanies the flower.

### SWEET GUM, *Liquidambar styraciflua*.

Parks, gardens, plantations. April. Best in moist loamy soil in sheltered position. Propagated by layering of shoots, September–November; seeds sown in sandy soil outdoors October, November, March or April, transplanting 2–3 years afterwards.

*Flowers* greenish-yellow, inconspicuous, monœcious; *Males* in terminal racemes, conical or sub-globose, surrounded by 4 deciduous bracts; *Females* in solitary and axillary sub-globose heads on long pedicels; *Males* without calyx and corolla; *Stamens* indefinite, interspersed with minute scales, filaments shorter than anthers; *Females* without sepals, calyx-limb nearly obsolete; *Stamens* usually 4, and abortive; *Ovary* partly inferior, 2 united carpels; styles subulate, recurved, persistent; *Fruit* a woody capsule, 1–1½ in. diam., crowned by hard curved styles, consolidated into globose head; seed winged.



IVY (*Hedera Helix*)

A. Flowering shoot. B. Fruit. C. Flower, enlarged. D. Transverse section of ovary.  
E. Longitudinal section of flower.





## MYRTACEÆ

*Leaves* alternate, palmately 5-7-lobed, lobes acuminate, glandular-serrate, glabrous, villose in axils of principal veins, bright shining green, resinous fragrance when bruised, 6-7 ins. wide; petioles slender, 5-6 ins. long; stipules entire, glabrous. Autumn tint deep crimson, after sunless summer a dull purple.

A deciduous *tree*, 30-50 ft.; *Branches* slender; *Twigs* angled, hairy at first, light orange to reddish-brown, corky; *Buds* acute, scales ovate, acute, orange-brown; *Wood* heavy, hard, close-grained, not strong, brown tinged red.

Introduced from N. America, 1681; there reaches 140-160 ft. Generic name from L. *liquidus*, flowing, liquid, and Arabic *ambar*; a terebinthine gum exudes from members of the genus, smelling like Balsam of Tolu. Specific name from Gr. *styrax*, the tree yielding storax, a resin, and L. *flua*, *fluo*, I flow.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION II.	.	.	.	.	<i>Calycifloræ</i>
NATURAL ORDER.	.	.	.	.	<i>Myrtaceæ</i>

Trees or shrubs, with opposite or alternate, usually entire and exstipulate, leaves, often dotted with pellucid glands; *Calyx* superior, 4-5-lobed, valvate; *Petals* 4-5, imbricate, sometimes obsolete; *Stamens* 8-10, or indefinite, rarely 4-5, filaments free or united in bundles; *Ovary* inferior, 1-6 celled, style and stigma simple, placentation axile, or rarely parietal; *Fruits* various, dry or succulent.

MYRTLE, *Myrtus communis*.

Gardens, shrubberies. July. Hardy in the south of England, but needs shelter from cold winds. Best in sandy loam and leaf soil, and requires water in summer. Propagated by cuttings of young shoots 2 ins. long inserted in sandy soil under bell-glass in a little heat, in spring or summer;

## TREES AND SHRUBS

cuttings of firm shoots 2-3 ins. long in sandy soil in cool greenhouse, June or July; seeds sown in sandy soil in little heat, autumn or spring.

*Flowers* white, fragrant, solitary, pedicels about as long as leaves, bracteoles linear; *Calyx* 4-5-lobed, tube turbinate; *Petals* 4-5, ovate, spreading; *Stamens* numerous; *Ovary* inferior, style long, placentation axile; *Fruit* a berry.

*Leaves* opposite, exstipulate, ovate or lanceolate, sub-sessile, acute or obtuse, entire, glabrous, dark glossy green above, paler beneath, full of pellucid dots, fragrant.

An evergreen *shrub*, 3-10 ft.; *Twigs* angled.

Introduced from S. Europe, 1597. Generic name from *Myrtos*, the old Greek for Myrtle.

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CLASS I.	. . . .	<i>Dicotyledons</i>
DIVISION II.	. . . .	<i>Calycifloræ</i>
NATURAL ORDER .	. . . .	<i>Passifloreæ</i>

Trees, shrubs, or herbs, with watery juice, usually climbing or twining by means of tendrils; *Leaves* alternate or rarely opposite, simple or compound, sometimes glandular; *Calyx* tubular below, lobed, usually with a corona at throat, simple, duplex, tubular, or cut into radiating filaments; *Petals* as many as calyx-lobes, usually 5, inserted outside corona; *Stamens* usually 5, and the filaments united around the gynophore; *Ovary* superior, supported on a long gynophore, 1-celled, 3 parietal placentas, 3 clavate, spreading styles; *Fruit* a many-seeded, dehiscent or indehiscent, berry or capsule.

### BLUE PASSION-FLOWER, *Passiflora cœrulea*.

Walls. June—October. Best in turfy loam and peat. Propagated by cuttings in cold frame in summer; layering young shoots in summer.

*Flowers* blue, faintly scented, lasting but one day, solitary, bracts 3, ovate, entire; *Calyx-tube* short, urceolate, lobes 5, linear-oblong, pale greenish-

## ARALIACEÆ

white; *Rays of corona* in two series, purple at bottom, white in middle, blue at ends; *Petals* 5, resembling the sepals; *Stamens* 5, filaments adnate to gynophore, anthers large, 1-lobed, spreading horizontally; *Ovary* supported on gynophore, styles purplish; *Fruit* a berry, egg-shaped, yellow.

*Leaves* alternate, 5-partite, lobes oblong, entire, glabrous; petioles with 4 glands at apex; stipules falcate.

A climbing *shrub*.

Native of Brazil, Uruguay, and Peru; introduced 1699. Generic name from L. *passio*, passion, *pattior*, *passus*, to suffer, and *flos*, *floris*, a flower; specific name from L. *cæruleus*, sky-blue, *cælum*, the sky. Common name given by missionaries in S. America from fancied resemblance to a halo and crown of thorns, the emblem of Christ's Passion.

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CLASS I.	. . . .	<i>Dicotyledons</i>
DIVISION II.	. . . .	<i>Calycifloræ</i>
NATURAL ORDER .	. . . .	<i>Araliaceæ</i>

Shrubs or trees, sometimes climbing, rarely herbs; *Leaves* alternate, usually exstipulate; *Flowers* in simple umbels, sometimes paniculate; *Calyx-limb* superior, very short, entire, toothed or lobed; *Petals* 5, deciduous, valvate or slightly imbricate in bud, inserted under an epigynous disk; *Stamens* 5, anthers versatile; *Ovary* inferior, 2 or more celled; *Fruit* a berry-like drupe, with as many seeds as there are carpels.

### CHINESE PAPER-PLANT, *Aralia chinensis*.

Gardens. July, August. The pinnate leaves, often 3 ft. long, with their prickly petioles, give a beautiful fern-like aspect to the plant. It is best in a well-drained loamy soil, and requires water in summer, and some protection in winter. Propagated by cuttings and root-cuttings.

*Flowers* creamy-white, inconspicuous, in a terminal *umbellate panicle*; *Petals* 5, inserted on margin of disk; *Fruit* a berry, black.

## TREES AND SHRUBS

*Leaves* alternate, bipinnate, 2–3 ft. long, pinnae imparipinnate, leaflets 15, ovate, acute, serrated at apex, coriaceous, woolly both surfaces when young; petioles spiny; leaf scars 3 ins. in circumference.

A deciduous *shrub*, 5–12 ft.; *Twigs* purple.

Introduced from N. China. Syn. *Dimorphanthus mandschuricus*.

### HERCULES' CLUB, *Aralia spinosa*.

Gardens. Best in sheltered spots. September, October.

*Flowers* white, perfect or unisexual, in a terminal compound *umbellate panicle*; pedicels pubescent; *Calyx* gamosepalous, tube coherent with ovary; *Petals* 5, acute, inflexed at apex; *Stamens* 5, inserted on margin of disk, alternate with petals, filaments filiform, anthers introrse; *Ovary* inferior, 2–5-celled; styles 2–5, connivent; stigmas capitate; *Fruit* a berry, globose, 3–5-angled,  $\frac{1}{8}$  in. diam., crowned with blackened styles, purple, juicy; *seeds* 2–5, small.

*Leaves* alternate, tripinnate, 3–4 ft. long,  $2\frac{1}{2}$  ft. wide, pinnae imparipinnate, leaflets 11–13, ovate, acute, dentate or crenate, rounded at base, membranous, dark green above, pale beneath, 2–3 ins. long,  $1\frac{1}{2}$  in. wide; petioles stout, 18–20 ins. long, usually with slender prickles; leaf-scars 3 ins. in circumference; stipules acute, 1 in. long, ciliate. Autumn tint yellow.

A deciduous *tree*, 30–35 ft.; or *shrub*, 6–20 ft.; *Branches* stout, spreading, armed with stout prickles; *Twigs* orange to light brown; *Bark* dark brown, fissured; *Suckers* freely produced; *Buds* triangular, flattened; scales brown; *Wood* light, soft, brittle, close-grained, brown streaked with yellow.

Native of N. America; introduced 1688. Also called Angelica Tree.

### IVY, *Hedera Helix*.

Hedgerows, trees, walls. October, November. Propagate by cuttings of firm shoots in ordinary soil outdoors, September–November; in well-drained pots in cold frame in October, or in little heat, September–November.







DOGWOOD (*Cornus sanguinea*)

A. Flowering branch. B. Fruit. C. Section of fruit (transverse). D. Flower.  
E. One of the stamens. F. Flower with stamens removed. G. Part of the cyme, showing branching.

## CORNACEÆ

*Flowers* yellowish-green, with unpleasant odour, attractive to flies: proterandrous; *Umbels* often grouped into *sub-racemose panicles*, sub-globose, stellate hairs; bracts small, concave; *Calyx* 5-toothed, minute; *Petals* 5, broad, short, triangular ovate, epigynous, not cohering at top, valvate in bud; *Stamens* 5, epigynous, anthers yellow; *Ovary* inferior, 5–10-celled, styles united into one, very short; *Fruit* a berry-like drupe,  $\frac{1}{3}$  in. diam., blue-black, pruinose, flesh green, 2–5 seeds.

*Leaves* alternate, exstipulate, petiolate, very variable, palmately 3–5-lobed, ovate or angular, cordate at base, acute or obtuse, entire or sinuate, thick, coriaceous, upper side deep green, polished, paler beneath; dying leaves brown.

An evergreen *shrub*, climbing by small root-like excrescences, main stems woody; *Branches* spreading along ground; *Buds* conical, pointed, naked, sessile, green.

Native of Britain.

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CLASS I.	. . . .	<i>Dicotyledons</i>
DIVISION II.	. . . .	<i>Calycifloræ</i>
NATURAL ORDER .	. . . .	<i>Cornaceæ</i>

Shrubs, trees, or rarely herbs, with usually opposite, exstipulate leaves, and small, regular flowers; *Calyx-limb* minute, superior, 4–5-toothed; *Petals* 4–5, valvate; *Stamens* 4–5, alternating with petals; *Ovary* inferior, usually 2-celled; *Fruit* a drupe.

Distinguished from Caprifoliaceæ by the distinct petals, and from Araliaceæ by the usually opposite leaves.

### WHITE FLOWERING DOGWOOD, *Cornus florida*.

Gardens, shrubberies. April, May. Requires a warm and sheltered situation. Propagated by cuttings of firm shoots in sandy soil outdoors in November; layering of shoots in October; suckers in November.

## TREES AND SHRUBS

*Flowers* greenish-yellow, appearing after leaves, very small, in centre of large white involucre, in a dense *cymose head* surrounded by a corolla-like involucre of 4 white bracts, each 1-1½ in. wide, the whole measuring 3-4 ins. diam.; bracts round, retuse, or nearly obcordate; *Calyx* light green, 4-lobed, urceolate; *Corolla*; 4 petals, valvate in bud, lobes strap-shaped, green tipped with yellow; *Stamens* 4, alternate; *Ovary* inferior, 2-celled; stigma truncate; *Fruit* a drupe, ovoid, ½ in. long, bright scarlet, thin, mealy flesh, 1-2-seeded; ripe in October.

*Leaves* opposite, ovate to elliptical, acuminate, narrowed at base, slightly crenulate, thick, firm, bright green above, pale and pubescent beneath, 3-6 ins. long, 1½-2 ins. wide; petioles grooved. Autumn tints yellow, scarlet, purple.

A deciduous *shrub*, or bushy *tree*, 20-30 ft., of slow growth; *Branches* slender, spreading or erect; *Twigs* yellow-green, or red to brown or grey; *Bark* red-brown, scaly, very bitter; *Wood* heavy, hard, strong, close-grained, brown shaded green and red; takes good polish.

Introduced from U.S.A., 1731.

### LARGE-LEAVED DOGWOOD, *Cornus macrophylla*.

Gardens. July. Likes deep, fairly moist soil.

*Flowers* white, in a terminal *dichotomous cyme*, 4-5 ins. diam., peduncles short, pedicels white tomentose; *Calyx* urceolate, teeth minute, white adpressed hairs; *Petals* white tomentose, valvate; *Stamens* alternating with petals, anthers oblong; *Ovary* 2-celled; *Fruit* a drupe, globose, ½ in. diam., 2-celled, 2-seeded.

*Leaves* opposite or alternate, ovate, acuminate, dark green above, pale glaucous beneath, 4-6 ins. long, 3¼ ins. broad, or larger. Autumn tint orange-red.

A deciduous *tree*, 40 ft.; *Branches* nearly horizontal; *Twigs* purplish; *Bark* smooth.

Native of Asia, N. India to Japan; introduced 1827. Syn. *C. brachypoda*.





VARIEGATED LAUREL (*Acuba japonica*)

A. Branch, with male flowers. B. Female flowers. C. Single male flower, (enlarged).



## CORNACEÆ

### CORNELIAN CHERRY, *Cornus Mas.*

Shrubberies. A very beautiful early-flowering shrub, made especially attractive by having a background of dark evergreens. February—April.

*Flowers* bright yellow, small, appearing before leaves, in an *umbel*, involucre 4-leaved; *Fruit* a drupe, cornelian-red, oval,  $\frac{1}{2}$  in. long; used for marmalade and jelly.

*Leaves* oval, acuminate, pubescent on both surfaces.

A deciduous *shrub*, 15–20 ft.; *Branches* smooth.

Introduced from Europe (Austria), 1596.

### CORNEL OR DOGWOOD, *Cornus sanguinea.*

Woods and hedgerows. June, July. The red bark makes this an attractive shrub in winter.

*Flowers* greenish-white, small, regular, having an unpleasant odour, in a dense-flowered terminal *corymbose cyme*, without bracts, pedicels long; *Calyx* 4-toothed, covered with down; *Petals* 4, lanceolate, downy, valvate; *Stamens* 4, subulate, alternating with petals, inserted under yellow epigynous disk; *Ovary* inferior, 2-celled, style simple, terete; *Fruit* a drupe, globular, almost black, with whitish dots, very bitter, stone 2-celled.

*Leaves* opposite, broadly ovate, shortly petiolate, entire or waved, acute, hoary or silky when young, glabrous later, green, turning to red in autumn, 2–3 ins. long, petiole short.

A deciduous *shrub*, 5–8 ft.; *Branches* opposite, straight, dark-red when old; *young shoots* bright red, pubescent; *Buds* sessile, slender, pubescent; *Bark* scaly, fetid odour when bruised; *Wood* used for skewers, and in manufacture of gunpowder.

Native of Britain.

## TREES AND SHRUBS

### RED OSIER DOGWOOD, *Cornus stolonifera*.

Shrubberies. May. Likes damp spots, and makes a good cover plant for game.

*Flowers* white, inconspicuous, in a small flat *cyme*, pubescent, 1–2 ins. diam.; *Petals* ovate-oblong; *Fruit* a drupe, white, globose.

*Leaves* ovate, acute, pubescent, light green above, hoary beneath, 1–5 ins. long, petioles slender.

A deciduous *shrub*, 5–10 ft.; usually stoloniferous; *Branchlets* glabrous, bright red-purple, youngest pubescent; *Bark* red-purple.

Introduced from N. America, 1741. Syn. *C. alba* (Wangenh).

### VARIEGATED LAUREL, *Aucuba japonica*.

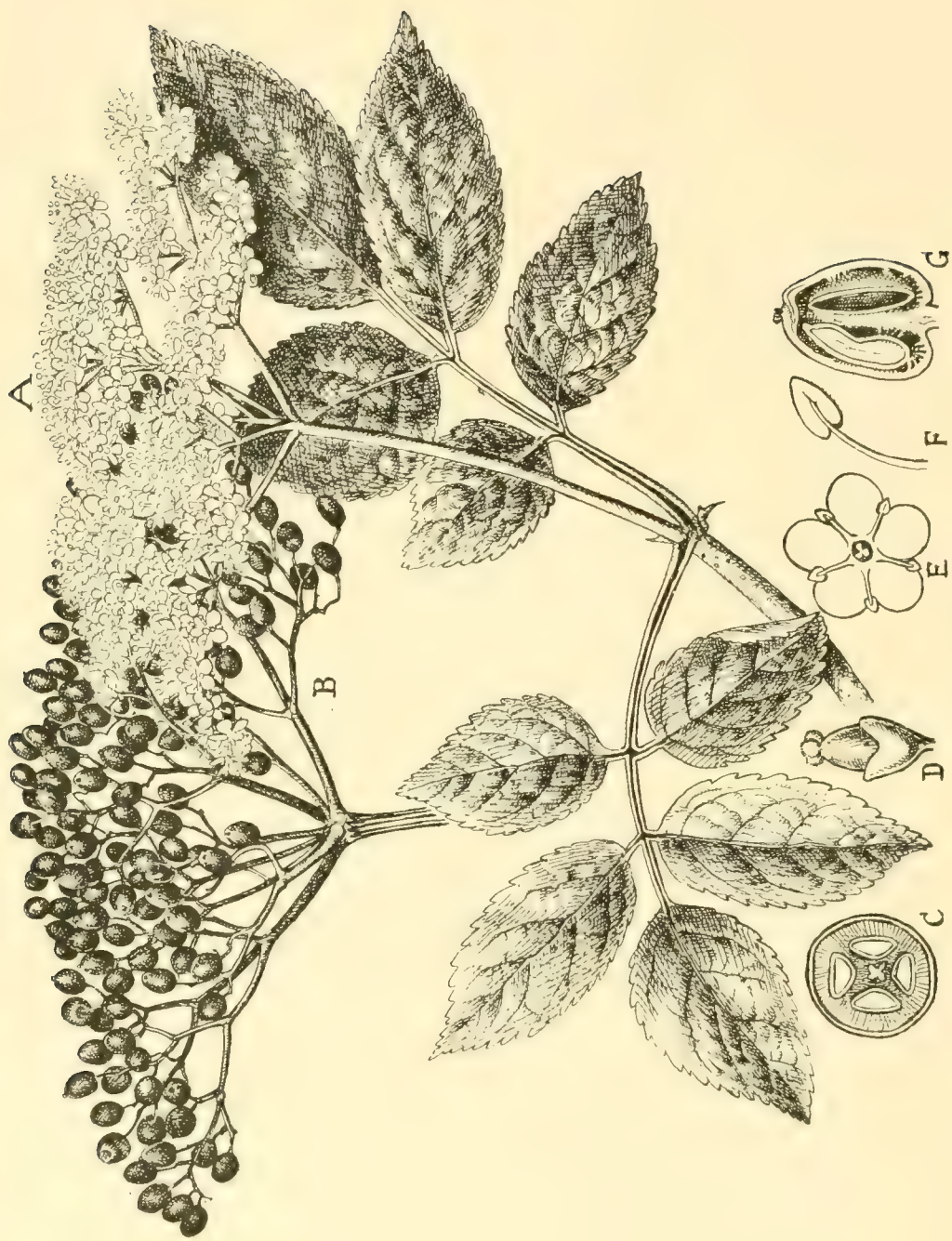
Shrubberies. May. To develop the full beauty of its variegated foliage, this attractive shrub should be planted in an open space where it may obtain plenty of light and air. In order to ensure a plentiful supply of the scarlet berries it is necessary to have the male plants in close proximity to the females, or artificial pollination may be resorted to, placing among the pistillate flowers some branches bearing staminate blossoms. If left to Nature, it will be sufficient to have one male plant in the vicinity of several females. Propagated by cuttings in sandy soil in sheltered border or cold frame, September to November; layering in autumn; seeds in cold frame in October.

*Flowers* white, small, inconspicuous, dioecious, visited by pollen-eating flies; *Inflorescence* a branched *dichasial cyme*, terminal and axillary; *Males*, *Calyx* gamosepalous, 4 minute teeth; *Corolla* of 4 petals, epigynous, ovate to lanceolate, valvate; *Stamens* 4, alternate with petals, filaments subulate; *Disk* 4-angled and fleshy; *Females*, *Calyx* with 4 minute teeth, tube ovoid or nearly cylindrical; *Petals* 4; *Ovary* inferior, 1-celled, style short, stigma slightly bifid; *Fruit* an oblong, scarlet drupe,  $\frac{1}{2}$  in. long, 1-seeded.

*Leaves* decussate, ovate lanceolate or elliptical, petiolate, exstipulate, entire or slightly toothed, acuminate or obtuse, coriaceous, glabrous, green mottled with yellow, midrib prominent; dead leaves brown.







ELDER (*Sambucus nigra*)

A. Flowering branch. B. Fruit. C. Transverse section of fruit. D. Pistil and calyx of flower.  
E. Flower. F. Stamen. G. Longitudinal section of fruit.

## CAPRIFOLIACEÆ

An evergreen *shrub*, 6–10 ft. ; *Branches* green, terete, smooth ; *Buds* large ; *young wood* tender, easily destroyed when exposed to strong winds.

A native of Japan. Female introduced in 1783, male in 1850 (by Fortune).

### *Garrya elliptica.*

Shrubberies, walls. October—March. The male plant is more usually grown, and is by far the more handsome. In most districts it is best against a south or west wall. Prune after flowering. Propagated by cuttings of half-ripe wood in sandy soil under hand-light or cold frame. August or September ; layering of shoots, September or October ; seeds in well-drained pans of sandy soil in cold frame, September—October.

*Flowers* greenish-white or yellowish, diœcious ; *Males* in slender pendulous *catkins*, 6–10 ins. long, persistent through summer, bracts densely hairy ; *Females* in dense *catkins*, 3–4 ins. long ; *Bracts* connate ; *Fruit* a drupe, black, pulp purple, 2 bony seeds.

*Leaves* opposite, oblong or elliptical, acute, entire, wavy when young, thick, coriaceous, shortly petiolate, dark shining green above, hoary beneath, 3 ins. long.

An evergreen *shrub*, 8–10 ft. ; head dense, spreading ; *shoots* slender, downy when young, glabrous when mature.

Native of N.W. America ; males discovered by Douglas, 1828 ; females by Hartweg, 1848 ; first fruited in 1850. Genus named in honour of Michael Garry, Secretary to the Hudson's Bay Company.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER.	.	.	.	.	<i>Caprifoliaceæ</i>

Trees, shrubs, or rarely herbs, with opposite, usually exstipulate leaves, and regular or irregular cymose flowers, terminal or rarely axillary ; *Calyx* superior, 2–5-lobed or toothed ; *Corolla* gamopetalous, epigynous, 4–5-lobed,

## TREES AND SHRUBS

imbricate in bud; *Stamens* 4-5, or rarely double the number, epipetalous, alternate with lobes, anthers versatile; *Ovary* inferior, 1-5-celled; *Fruit* a berry or drupe.

### CANADIAN ELDER, *Sambucus canadensis*.

Gardens. July, August. A moist soil being most favourable to luxuriant growth, this shrub is useful for growing in groups near ponds and streams. The shrubby species of Elder may be propagated by cuttings of branches or shoots in moist soil outdoors, October—March.

*Flowers* dull white, almost scentless, in a terminal *panicled cyme*, 5 main branches; *Fruit* a berry-like drupe, deep bluish-black.

*Leaves* opposite, imparipinnate, leaflets 5-11, mostly 7, oblong-elliptical, acuminate, sometimes appendiculated at base, pubescent beneath, rigid, serrate, 2-5 ins. long; heavy scented when crushed.

A deciduous *shrub*, 6-10 ft.; usually glabrous.

Native of Canada and eastern U.S.A.; introduced 1761.

### GLAUCOUS ELDER, *Sambucus glauca*.

Gardens. June. The distinctive character of this species is the glaucous covering of the fruits. The plant will stand severe pruning.

*Flowers* yellowish-white, in a *cyme*, 4-6 ins. wide, glaucous, bracts and bractlets linear, caducous; *Calyx* 5-cleft, ovoid, lobes acute, red-brown; *Corolla* rotate, 5-lobed, lobes oblong, rounded at apex, as long as stamens; *Fruit* a drupe, sub-globose,  $\frac{1}{4}$  in. diam., blue-black, with mealy, glaucous bloom, juicy.

*Leaves* opposite, imparipinnate, 5-7 ins. long, leaflets 5-9, ovate or oblong, cuneate or rounded at base, acuminate, coarsely serrate, glabrous, thin, firm, bright green above, pale below, 2-6 ins. long,  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. wide; petioles stout, grooved.

A deciduous *shrub* or small *tree*, 6-18 ft.; *Branches* spreading, glabrous; *Twigs* red-brown; *Bark* fissured, brown; *Buds* axillary, scales ovate, brown; *Wood* light, soft, weak, yellow tinged with brown.



## CAPRIFOLIACEÆ

Native of N. America; there a tree 30–50 ft. Discovered early in the nineteenth century in Oregon by a party under the leadership of Lewis and Clark.

### COMMON ELDER, *Sambucus nigra*.

Woods, coppices, hedgerows, gardens, waste places. June. Thrives best in good loamy soil, with moisture.

*Flowers* cream-white, in a flat *corymbose cyme*, 6 ins. or more in diam., much branched, 5 primary branches; *Calyx* 5-cleft, with small teeth; *Corolla* rotate, 5-lobed,  $\frac{1}{4}$  in. diam., tube very short; *Stamens* 5, inserted at base of corolla, filaments slender; *Ovary* 3-celled, inferior, stigma sessile, 3-lobed; *Fruit* a berry-like drupe, small, globular, succulent, aromatic, purplish-black, usually 3 stone-like seeds.

*Leaves* opposite, imparipinnate, petiolate, exstipulate, leaflets 5–9, ovate-oblong, 1–3 ins. long, serrate, acute or acuminate, nearly glabrous, having an unpleasant odour, stipules small or absent. Autumn leaves yellow-green.

A deciduous *shrub* or small *tree*, 20–25 ft.; growth very rapid when young; *Stem* and *branches* full of pith; *branchlets* angular, grass-green, showing lenticels well, juicy; *Bark* grey, rough, corky; *Bud-scales* olive or greenish-brown, membranous; *Lenticels* conspicuous; *Wood* hard, heavy, used for small turnery and cabinet work.

Indigenous in England and Ireland. Specific name from Gr. *sambyke*, a musical instrument, probably a harp; L. *sambuca*, a triangular stringed instrument with a sharp, shrill note; English name from A.S. *ellærn*, the hollow tree.

### SCARLET-BERRIED ELDER, *Sambucus racemosa*.

Gardens, shrubberies. April, May. The bunches of scarlet berries make this a very attractive shrub in late summer. Moisture at the roots is essential for its perfect development, and when in such positions, as on river-banks or at pond-heads, the running roots help to bind the soil.

## TREES AND SHRUBS

*Flowers* greenish-white, in a terminal panicle *cyme*, ovate, racemose in appearance; *Calyx* 5-cleft; *Corolla* 5-lobed; *Stamens* 5; *Ovary* inferior; *Fruit* a berry-like drupe, globular, large, resembling bunch of Grapes, 4-6 ins. in length, scarlet, ripe in August.

*Leaves* opposite, imparipinnate, leaflets 5-7, oblong-elliptic, serrated, acute, unequal at base, bluish-green above, light glaucous green beneath, glabrous, membranous; petioles glabrous.

A deciduous *shrub* or small *tree*, 10-20 ft.; *Branches* numerous, arching; *Bark* dark, smooth, few fissures.

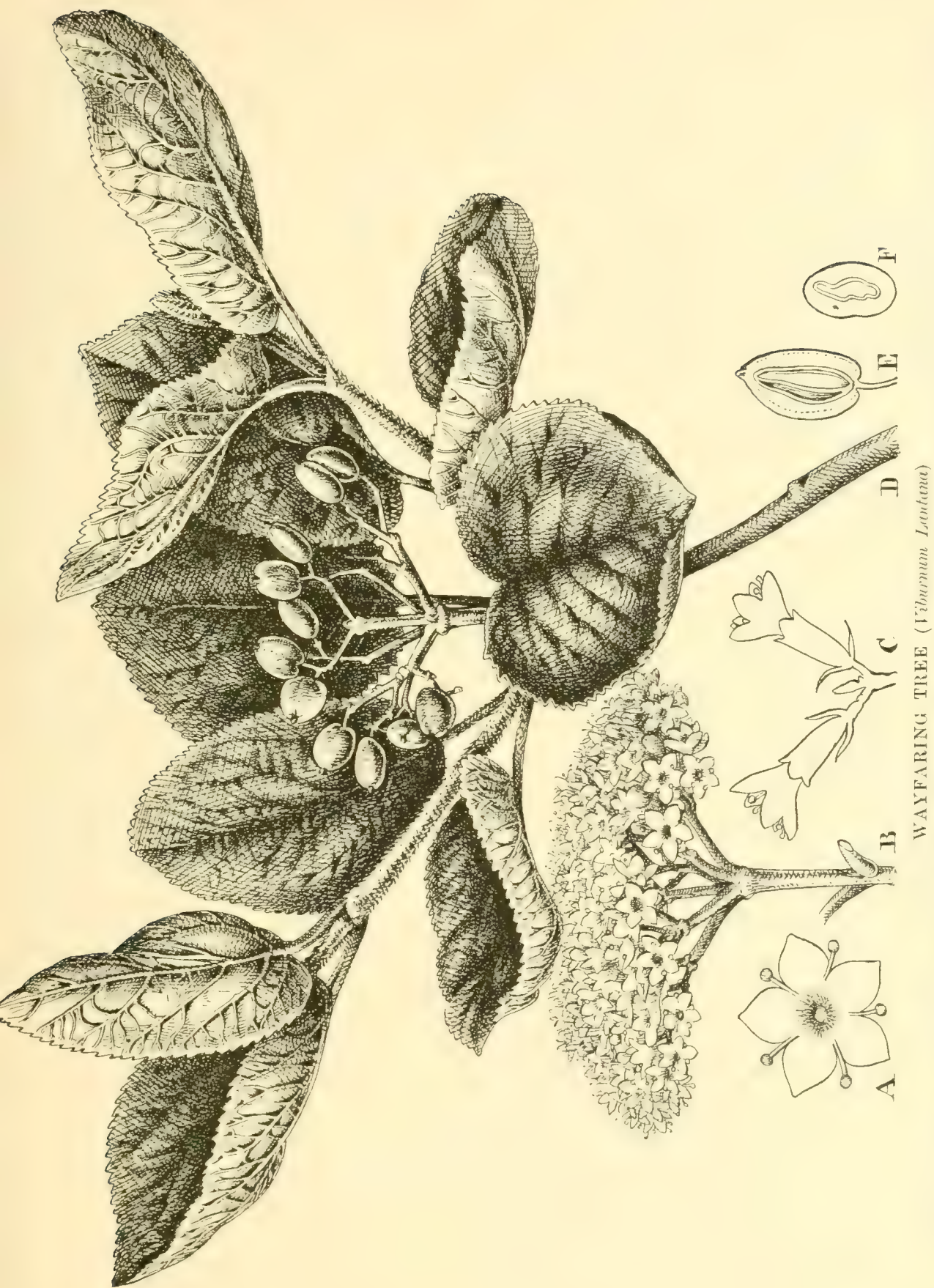
Native of S. Europe and Siberia; introduced 1596. Known also as Hart's Elder.

### WAYFARING TREE, *Viburnum Lantana*.

Woods, hedges, gardens. May, June. This is plentifully met with on chalky or limestone soils. It may be distinguished by its pliant mealy branches and its ovate, cordate leaves covered with mealy down. It is most conspicuous when the berries are partially ripe, for they are then seen in all stages of transition from coral red to purplish-black. Old wood should be cut out occasionally. The species of *Viburnum* are propagated by cuttings of half-ripened shoots, inserted in sandy soil, under handlights, in a somewhat shady position, September or October; layering of shoots, September or October.

*Flowers* white, all small and perfect,  $\frac{1}{4}$  in. diam., 2-bracteolate, in a dense *corymboid cyme*, 2-3 ins. diam., flat-topped, pedicels scurfy; *Calyx* 5-toothed; *Corolla* 5-lobed; *Stamens* 5, shortly exerted; *Ovary* inferior, 1-celled, stigmas 3, sessile; *Fruit* a drupe,  $\frac{1}{3}$  in. diam., somewhat oblong, turning from coral-red to purple-black, flesh dryish, friable; *seeds* grooved ventrally.

*Leaves* ovate, cordate at base, petiolate, exstipulate, toothed or entire, obtuse, rugose, soft and velvety on upper side, dull yellow-green, very downy beneath with stellate hairs; 3-5 ins. long, veins prominent beneath. Autumn tint deep red.



A. Single flower, enlarged. B. Natural cluster of flowers. C. Flowers, showing calyx, &c. D. Fruit and leaves. E. Longitudinal section of fruit. F. Transverse section of fruit.







## CAPRIFOLIACEÆ

A deciduous *shrub* or small *tree*, 10–20 ft.; *Branches* opposite, pliant. young shoots brown, covered with down; *Bark* grey-brown, fissured; *Buds* long, narrow, naked; *Leaf-scars* crescent.

A native of Britain.

### SHEEP BERRY, *Viburnum Lentago*.

Gardens. May—July. This is a fast-growing and attractive shrub, having a great tendency to assume a tree-like form, and well suited for the lawn or the margin of a wood.

*Flowers* pale cream or white, all perfect,  $\frac{1}{4}$  in. diam., in a flat terminal *umbellate cyme*, 3–5 ins. diam., bracteate and bracteolate; *Calyx-tube* slender, ovoid, lobes triangular acute; *Corolla* lobes ovate, acute, toothed; *Stamens* 5; *Ovary* inferior, 1-celled, style thick, light green, stigma broad; *Fruit* a drupe, oval, black or dark blue, glaucous bloom, sweet, juicy, ripe in September.

*Leaves* opposite, ovate or lanceolate, acute or acuminate, sharply serrate, deep shining green above, yellow-green with black dots beneath,  $2\frac{1}{2}$ –5 ins. long,  $1$ – $1\frac{1}{2}$  in. wide; petioles grooved, wing margined. Autumn tints purple, red, yellow.

A deciduous *shrub* or small *tree*, 10–20 ft.; *Branches* slender; *Twigs* green to red, scurfy, sometimes with glaucous bloom; *Bark* red-brown; *Buds* long-pointed, scurfy pubescent; *Wood* heavy, hard, close-grained, bad-smelling, dark orange-brown.

Introduced from N. America, 1761.

### LARGE-HEADED GUELDER ROSE, *Viburnum macrocephalum*.

Gardens, shrubberies, walls. May, June. The large rounded or pyramidal trusses make this unequalled among the *Viburnums*. It comes to greatest perfection against a wall. It is a sterile form of *V. Keteleeri*, a species in cultivation.

## TREES AND SHRUBS

*Flowers* pure white, all neuter,  $1\frac{3}{8}$  in. diam., in a terminal compound, sub-globose or pyramidal *cyme*, 8 ins. diam.; peduncles with stellate scales.

*Leaves* opposite, 3 ins. long, ovate, obtuse, denticulate, flat, slightly scabrous, stellate furfuraceous pubescent beneath, and on short petioles.

A deciduous *shrub* or small *tree*, 20 ft.; *Branches* spreading, terete, stellate furfuraceous; *Buds* elongated, flattened, scaleless.

Native of China and Japan; introduced from former by Fortune in 1844. Specific name from Gr. *makros*, long or great, and *kephale*, a head.

### GUELDER ROSE, *Viburnum Opulus*.

Copses, hedges, gardens. June, July. In its native haunts it brightens the countryside by its fine autumn foliage and blackish-red berries.

*Flowers* creamy-white, in a dense *corymbose cyme*, sub-globose, 2–4 ins. diam.; outer flowers large, neuter; inner ones perfect,  $\frac{1}{4}$  in. diam.; *Calyx* superior, 5-toothed; *Corolla* rotate, 5-lobed. *Stamens* 5, epipetalous, alternate with lobes, exserted, anthers versatile; *Ovary* inferior, 1-celled, stigmas 3, sessile; *Fruit* a drupe, globular, blackish-red; *seed* compressed, keeled on faces.

*Leaves* opposite, 3–5-lobed, coarsely toothed, acute or acuminate, glabrous, 2–3 ins. broad; petiole glandular, stipules small, glandular, adnate to petioles. Autumn tint crimson.

A deciduous *shrub*, 6–15 ft., in cultivation growing to a small tree; always glabrous in all parts; *Bark* brown; *Branches* slender, lenticellate; *Twigs* brown or grey, glabrous, angular; *Buds* small, oval, apparently only one scale, red, coriaceous.

Native of Britain. English name said to be corruption of Dutch “Gheldersche Rose,” a name applied to a sterile variety first cultivated at Gueldres, in Holland; also called Cranberry Tree, Dog Elder, Dog Rowan Tree, Marsh or Water Elder, and Snowball Tree.





GUELDER ROSE (*Viburnum Opulus*)

A. Flowering branch. B. Fruit. C. One of the inner flowers. D. Portion of the cyme. E. Transverse section of fruit.  
F. Longitudinal section of fruit.



## CAPRIFOLIACEÆ

### SNOWBALL TREE, *Viburnum Opulus*, v. *sterile*.

Gardens, shrubberies. It loves a good soil and abundant moisture. June.

*Flowers* white, all neuter, in a globular *corymbose cyme*.

*Leaves* opposite, 3-lobed, coarsely and unevenly serrated, veins prominent on underside.

A deciduous *shrub*, 10 15 ft.; *young twigs* green, brown when older.

Origin unknown.

### LAURUSTINUS, *Viburnum Tinus*.

Gardens and shrubberies. October—March. The bright glossy evergreen foliage and pinkish-white flowers place this in the first position among the winter-flowering shrubs. A rather light warm soil brings it to the greatest perfection.

*Flowers* white, rose-coloured before expansion, in a flat *corymbose cyme*; *Calyx* gamosepalous, 5-toothed, superior; *Corolla* gamopetalous, epigynous, rotate, 5-lobed; *Stamens* 5, epipetalous, alternate with lobes, anthers versatile; *Ovary* inferior, 1-celled, stigma sessile; *Fruit* a drupe, dark blue.

*Leaves* opposite, ovate-oblong, petiolate, entire, acute, bright glossy green, glabrous, exstipulate, veins glandular, hairy, 2½ ins. long.

An evergreen *shrub*, 6–10 ft.; *Branches* erect; *Twigs* red; *Bark* smooth; *Lenticels* conspicuous.

Native of S. Europe; introduced 1596. It was the “Wild Baie” of Gerarde.

### PLAITED GUELDER ROSE, *Viburnum tomentosum*, v. *plicatum*.

Gardens, shrubberies. This is commonly considered the best of the *Viburnums*. May, June.

*Flowers* snow-white, turning purplish when fading, all neuter, in a



## TREES AND SHRUBS

globular terminal *corymbose cyme*, 3 ins. diam., arranged in a double row along the branches.

*Leaves* opposite, ovate or ovate-orbicular, cuspidate, obtuse, coarsely serrated, somewhat plicate, scabrous, dark green above, veiny and tomentose beneath, 3 ins. long.

A deciduous *shrub*, 4–6 ft.; *Branches* glabrous, red-brown; *Buds* brown.

Native of N. China and Japan; introduced 1844. Also called Chinese Guelder Rose.

### SNOWBERRY, *Symphoricarpus racemosus*.

Gardens and shrubberies. August, September. This is a general favourite, well able to adapt itself to circumstances. It will grow in town or country, in rich soil or poor, in the open or under trees. Old and decayed wood should be cut out, October—February. Propagated by cuttings, 6–8 ins., of firm wood in ordinary soil in shady position outdoors, October—February; suckers, October—February.

*Flowers* pink, small, in a loose and somewhat leafy, interrupted *spike* at ends of branches, each flower with 2 or more minute bracteoles; *Calyx* 4–5-toothed, sub-globose; *Corolla* funnel-shaped, 4–5-lobed, bearded within; *Stamens* 4–5, epipetalous, filaments short; *Ovary* 4-celled, ovoid; style glabrous, stigma dilated; *Fruit* a drupe, baccate, globose, white, 2-celled, 2-seeded, persistent through winter.

*Leaves* opposite, ovate-oblong, shortly petiolate, acute, entire, glaucous or downy beneath, 2 ins. by 1½ in. Autumn tint brown.

A deciduous *shrub*, 4–7 ft.; much branched; *Suckers* in abundance; *Twigs* pale grey to brown, glabrous, terete, hollow at internodes; *Buds* minute.

Introduced from N. America, 1817. Flowers much visited by bees; fruits form excellent food for game.



SNOWBALL TREE (*Viburnum Opulus*, var. sterile)

A. Flowering branch. B. Single flower, from below.





## CAPRIFOLIACEÆ

### COPIOUS-FLOWERING ABELIA, *Abelia floribunda*.

Gardens, walls. March. Hardy only in favoured situations; best as a greenhouse plant. Outdoors requires sheltered position, and best in equal parts of loam and peat with some sharp sand. Propagated by cuttings of firm shoots in cold frame in July; layers in March.

*Flowers* rosy-purple, in axillary *cymose clusters* of 2–3 flowers; *Calyx* gamosepalous, 5-lobed, persistent, lobes nearly equal, oblong, fringed; *Corolla* gamopetalous, infundibuliform, 5-lobed, tube about 2 ins. long, slender; *Stamens* 5, epipetalous; *Ovary* inferior; *Fruit* a berry.

*Leaves* opposite, ovate-oblong, petiolate, acute, crenated, small, glabrous.

An evergreen *shrub*, 3 ft., sub-erect; *Branches* straggling.

Native of Mexico; introduced to Europe by Belgian nurserymen; reached England about 1847. Genus named after Dr. Clarke Abel, Physician to Lord Amherst's Embassy to China, 1817; died 1826.

### PERFOLIATE HONEYSUCKLE, *Lonicera Caprifolium*.

Hedges, copses, gardens. May, June. This is a robust deciduous twiner, which favours chalky districts. All the Honeysuckles like a light good soil and sunny position, seldom flowering in the shade. Thinning out old wood after flowering encourages growth, but as the flowers are borne on the young wood which has ripened in the previous year, little pruning should be done. The species are propagated by cuttings of firm shoots, 8 ins. long, in sandy soil in sheltered position outdoors, October or November; layering of shoots, August—November.

*Flowers* yellowish and red, fragrant, pollinated by moths, sessile in terminal *whorls* in axils of upper connate leaves; *Calyx-limb* short, 5-toothed, persistent; *Corolla* irregular,  $\frac{3}{4}$ –1½ in. long, tubular, ringent, curved, limb bilabiated, upper lip 4-lobed; *Stamens* 5, exserted; *Ovary* 3-celled, style green; *Fruit* a berry, globoid, red, 1-celled, 1-seeded, mass of berries sessile in axils of connate leaves.

## TREES AND SHRUBS

*Leaves* opposite, elliptic to obovate, hardly acute, entire, glabrous, white or glaucous beneath, upper ones connate,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ins. long. Autumn leaves brown.

A deciduous *twining shrub*, 15–20 ft.; glabrous.

Naturalised in some English counties, and in the south of Scotland.

### ITALIAN HONEYSUCKLE, *Lonicera etrusca*.

Walls. May, June.

*Flowers* purplish outside when expanding, yellowish-white inside, finally becoming yellow, fragrant, in *verticillate heads*, usually 3 heads at top of each branch; *Fruit* a berry.

*Leaves* opposite, obovate, entire; upper ones connately-perfoliate, cup-shaped, acute, hairy; lower ones shortly petiolate, obtuse.

A deciduous *twining shrub*, 15 ft.; *Stems* reddish-purple.

Native of S. Europe. Known in gardens as *L. gigantea*.

### YELLOW TRUMPET HONEYSUCKLE, *Lonicera flava*.

Arbours. A strong grower in warm situations, as against a south wall. June, July.

*Flowers* bright yellow, fading to orange, very fragrant, in an *interrupted spike* of large terminal verticillate heads; *Corolla* ringent, tube  $1$ – $1\frac{1}{2}$  in. long, lobes oblong-obtuse, about half as long as tube; *Filaments* and *style* glabrous, exserted; *Fruit* a berry,  $\frac{1}{4}$  in. diam.

*Leaves* opposite, obovate or oval, entire, obtuse, thin, pale and glaucous, upper ones connately-perfoliate, sometimes cup-shaped.

A deciduous *twining shrub*.

Native of N. America; discovered by John Fraser on Paris Mountain, South Carolina; introduced 1810. Specific name from *L. flavus*, yellow.





LAURUSTINUS (*Viburnum Tinus*)

A. Flowering shoot. B. Fruit. C. Flower, from above.  
D. Longitudinal section of flower.



## CAPRIFOLIACEÆ

### VERY FRAGRANT HONEYSUCKLE, *Lonicera fragrantissima*.

Walls. January—March. This may be pruned a little after flowering.

*Flowers* white, appearing before leaves are developed, in *axillary pairs* on long peduncles, enclosed at base by two long, narrow bracts; *Corolla* nearly 1 in. across, tube short, tinged with pink towards base, mouth expanded; *Fruit* a berry, glabrous, 2 united at base.

*Leaves* opposite, oblong-obovate, entire, petiolate, acute, rounded at base, glabrous, deep shining green on upper surface, pale or slightly glaucous beneath.

A sub-evergreen *climbing shrub*, 6 ft.; or small *bush*, 3 ft.; *leading shoots* brown, slender.

Native of N. China; discovered by Fortune; introduced 1845. Specific name from *L. fragrans*, *antis*, sweet-scented, — *fragro*, to smell, to be fragrant.

### JAPANESE HONEYSUCKLE, *Lonicera japonica*.

Arbours. July—September. This is a very valuable species, being a strong grower, retaining its leaves through most winters.

*Flowers* white at first, changing to yellow, very fragrant, in terminal *axillary pairs*, sessile; *Corolla* tubular, 1 in. long, white inside, villous outside; *Fruit* a berry.

*Leaves* opposite, ovate, petiolate, entire, acute, bright green, villous, pale beneath, 1–3 ins. long, upper ones small, larger leaves having a tendency to become pinnatifid.

An evergreen *climbing shrub*, 6–15 ft.; *Branches* opposite, flexuous, twining, very hairy.

Native of China and Japan; introduced 1806. Synonymous with *L. chinensis*.

## TREES AND SHRUBS

### SHORT-STALKED HONEYSUCKLE, *Lonicera japonica*, v. *flexuosa*.

Arbours. This is one of the best for pillars and archways. June, July.

*Flowers* pale red outside, white within, few, usually in *axillary pairs*, almost sessile, very fragrant; *Calyx* inferior, 5-toothed; *Corolla* gamopetalous, tubular, 5-lobed; *Stamens* 4, epipetalous; *Ovary* inferior, 2-3-celled, style long, stigma capitate; *Fruit* a berry, globose, glabrous, acute, black when ripe.

*Leaves* opposite, ovate-oblong, acute, entire, shortly petiolate, glabrous, villous and purplish below when young, dark green when older.

A deciduous *twining shrub*, 4-5 ft.; *Stems* flexuous, slender, villous at apex, dark red.

Native of Japan; introduced 1806. Genus named after Adam Lonicer, or Lonitzer, a German botanist (1528-1586). Specific name from L. *flexilis*, bent, curved. Synonym, *Lonicera brachypoda*=short-stalked, from Gr. *brachys*, short, *pous*, *podos*, a foot.

### BLACK-BERRIED HONEYSUCKLE, *Lonicera nigra*.

Gardens. March—May.

*Flowers* reddish and pubescent outside, white within, in *axillary pairs*, peduncles shorter than leaves; *Fruit* a berry, black, globose, pairs connate at base.

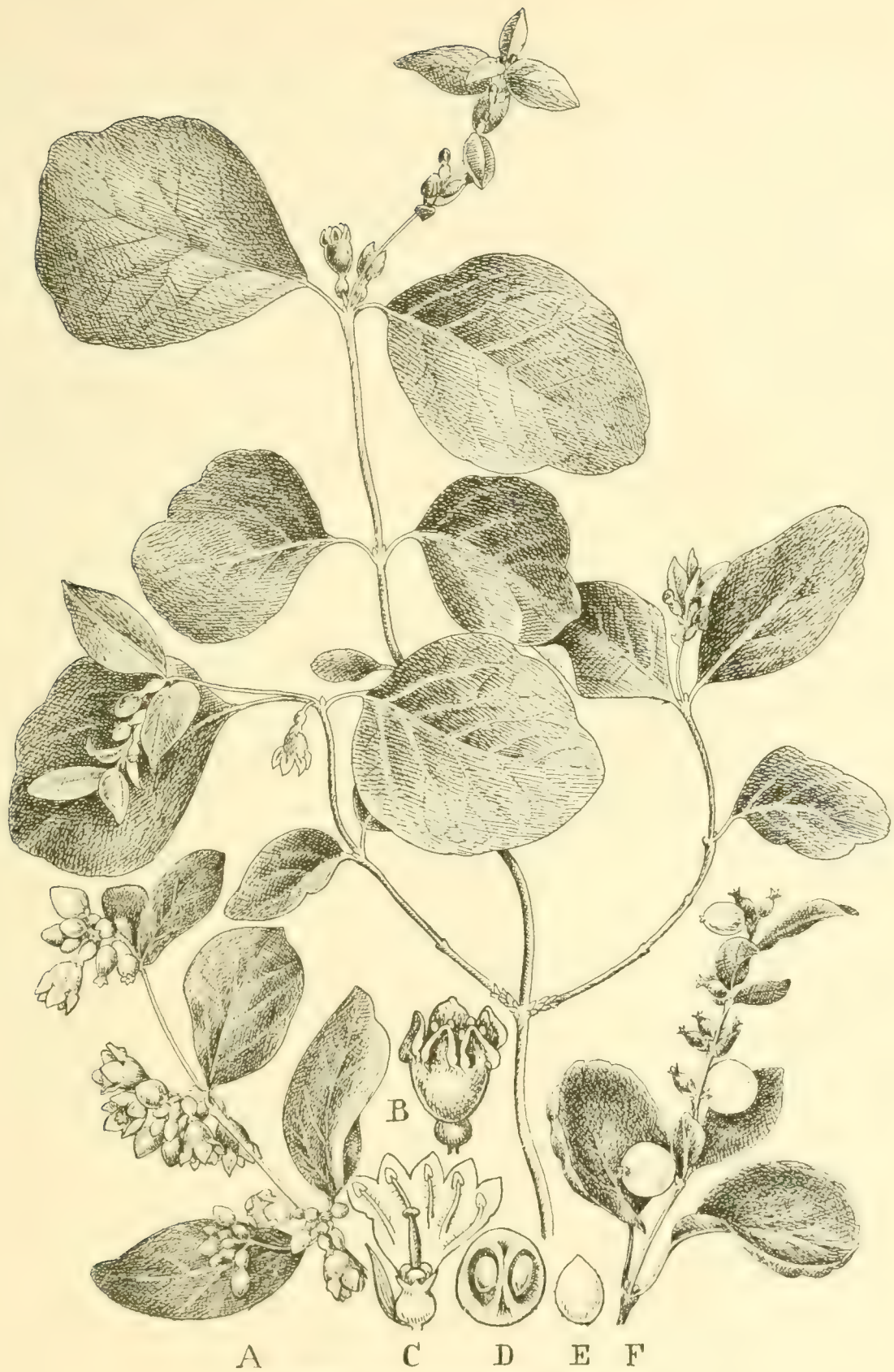
*Leaves* opposite, oval-oblong or elliptic.

An erect, dwarf, deciduous *shrub*, 3-4 ft.

Native of Europe, in sub-alpine woods.

### WOODBINE OR COMMON HONEYSUCKLE, *Lonicera Periclymenum*.

Hedges, copses, gardens. June—September. This is one of the most beautiful and most exquisitely fragrant of our native climbers. It is a great favourite for covering arbours or trellises.



A B C D E F

SNOWBERRY (*Symphoricarpos racemosus*)

A. Branch, in full flower. B. Flower. C. Flower, with corolla opened to show stamens.

D. Transverse section of fruit. E. Seed. F. Fruit-bearing branch.





## CAPRIFOLIACEÆ

*Flowers* fragrant, in a terminal stalked ovate *head*, flowers sessile, bracts persistent; *Calyx* 5-toothed; *Corolla* tubular, ringent, 1-1½ in. long, glandular pubescent, red outside, yellow within, limb 2-lipped, 5-lobed; *Stamens* 5, exserted; *Ovary* 3-celled, style filiform, stigma capitate; *Fruit* a berry, globose, 1-celled, 1-seeded, fleshy, crimson, bitter and nauseous, mass of berries pedunculate.

*Leaves* opposite, ovate to oblong, entire, obtuse, attenuated at base, glabrous above, glaucous beneath, 1-3 ins. long, upper leaves sessile, lower ones shortly petiolate, all distinct at base.

A deciduous *twining shrub*, 10-20 ft.; glabrous or slightly pubescent.

Native of Britain.

Flowers sometimes stunted and distorted by an *Aphis* (*Siphocoryne xylostei*).

### EVERGREEN TRUMPET HONEYSUCKLE, *Lonicera sempervirens*.

Gardens, walls. Requires light rich soil and open sunny situations, disliking clay and the smoke of towns. It is one of the best for lawns. May—August.

*Flowers* scarlet outside, yellow within, inodorous, in a series of *whorls* on long axillary peduncles; *Corolla* tube ventricose on upper side, 1 in. long, narrow, limb short, nearly regular; *Stamens* and *Style* scarcely exserted; *Fruit* a berry, reddish-yellow, ¼ in. diam., ripe in September.

*Leaves* opposite, ovate or obovate, petiolate, entire, obtuse, glabrous, and deep green above, glaucous beneath, upper ones connately-perfoliate, 2 ins. long, 1 in. broad.

A *sub-evergreen shrub*; *Branches* slender, twining, brown, glabrous.

Introduced from N. America, 1656. Specific name from *L. semper*, always, *virens*, green; but not strictly evergreen in this country.

# TREES AND SHRUBS

## TARTARIAN HONEYSUCKLE, *Lonicera tartarica*.

Gardens, shrubberies. April, May. Its freedom of growth, early leafing habit, abundant blossoms, showy fruit, and perfect hardiness, all tend to make this the most popular of the Bush Honeysuckles. Old and weak wood may be thinned out in winter.

*Flowers* rose, in *axillary pairs*, peduncles shorter than leaves; [*Corolla* infundibuliform, short, slightly gibbous at base; *Anthers* yellow; *Fruit* a berry, red, nearly globose when young, pairs connate at base when ripe.

*Leaves* opposite, cordate-ovate, slightly acute.

An erect deciduous *shrub*, 4–8 ft.; glabrous.

Native of Tartary and Siberia; introduced 1752.

## FLY HONEYSUCKLE, *Lonicera Xylosteum*.

Copses, gardens. May, June.

*Flowers* white to yellow, dashed with red, inodorous, pollinated by bees, sessile in *axillary pairs*, 2 small linear bracts, bracteoles minute; *Calyx-limb* deciduous, 5-toothed; *Corolla* infundibuliform, slightly 2-lipped, saccate at base, pubescent,  $\frac{1}{2}$  in. long; *Stamens* 5, exserted, curved, downy, anthers yellow; *Ovaries* connate, 3-celled, style downy; *Fruit* a berry, globoid, size of pea, purple-red, fused below in pairs, bitter, 2-celled, 2–6 seeds, ripe in September or October.

*Leaves* opposite, elliptic or ovate to obovate, base rounded, apex acute or sub-mucronate, entire or serrate, dark green above, paler grey-green beneath, velvety pubescent,  $1\frac{1}{2}$  in. long, shortly petiolate. Autumn leaves brown.

An erect deciduous *shrub*, 3–5 ft.; much branched; *Twigs* grey, slender, glabrous or slightly hairy; *Bud-scales* numerous, triangular, downy.

Naturalised in England.





HONEYSUCKLE, OR WOODBINE (*Lonicera Periclymenum*)

A. Flowering branch. B. Fruit. C. Transverse section of fruit.  
D. Flower with corolla opened to show stamens. E. Flower. F. Vertical section of fruit.



## CAPRIFOLIACEÆ

### HIMALAYAN HONEYSUCKLE, *Leycesteria formosa*.

Gardens, shrubberies. May—August. The peculiar disposition of the blossoms and the leaf-like purplish bracts make this an attractive shrub in summer, whilst in winter attention is still drawn to it by the bright green bark. It makes a good covert plant, increasing itself rapidly from self-sown seed. It is easily propagated from cuttings of side shoots in light soil in temperature of 45°–50° in April, or of half-ripe shoots in sandy soil under handlight in autumn; layers in autumn; seed may be sown in light soil in temperature as above in March or April.

*Flowers* white with tinge of purple, in a short, leafy, drooping *raceme*, flowers sessile, in fascicles, disposed in approximate whorls of 5–6, subtended by foliaceous purple bracts, pubescent, usually 6 under each whorl; *Calyx* 5-toothed, superior, persistent; *Corolla* infundibuliform,  $\frac{1}{2}$ –1 in. long, tube gibbous at base, limb campanulate, 5 ovate lobes; *Stamens* 5, epipetalous; *Ovary* inferior, 5-celled, style slender, stigma capitate; *Fruit* a berry, 5-celled, many-seeded,  $\frac{1}{4}$  in. long, glandular-hairy, purplish; said to be sought after by pheasants.

*Leaves* opposite, ovate-lanceolate, petiolate, acuminate, entire, smooth, flaccid, pale green underneath, 3–5 ins. long; petioles connate at base.

A deciduous *shrub*, with rambling habit, 4–10 ft.; *Stems* woody, hollow, green; *Branches* slender, fistular, young shoots pubescent; *Growth* rapid.

Native of N. India; introduced by Dr. Rayle, 1824; named after William Leycester, Chief Judge of the principal native Court in Bengal. Also called Flowering Nutmeg.

### ROSY WEIGELA, *Diervilla florida*.

Gardens. April—June. This free-growing and profuse-flowering shrub forms a graceful and well-furnished bush in almost any soil. The Weigelas or Bush Honeysuckles may be pruned after flowering. They are propagated by cuttings of young shoots in pots of sandy soil under bell-glass in cool

## TREES AND SHRUBS

greenhouse in spring, or of firm shoots 6 ins. long inserted 3 ins. deep in north border under handlight in October or November; suckers in autumn.

*Flowers* rose, or white, pinkish in interior shading into rose, in dense axillary and terminal *cymes*; buds deep rose; *Calyx* 5-toothed; *Corolla* funnel-shaped, 5-lobed; *Stamens* 5; *Ovary* inferior; *Fruit* a 1-celled, 1-seeded berry.

*Leaves* opposite, sessile or shortly petiolate, ovate-lanceolate, serrulate, acute.

A deciduous *shrub*, 6–10 ft.

Native of China; introduced by Robert Fortune, 1844. Synonymous with *Weigela rosea* (Lindl.), *D. rosea* (Walp.), *Weigela amabilis* of gardens.

### LARGE-FLOWERED WEIGELA, *Diervilla grandiflora*.

Gardens. May, June.

*Flowers* pink-rose, regular, in axillary and terminal *cymes*, extremely floriferous; *Calyx* gamosepalous, 5-lobed, superior; *Corolla* gamopetalous, epigynous, 5-lobed; *Stamens* 5, epipetalous, anthers versatile; *Ovary* inferior, large nectary at side of style easily mistaken for a superior ovary; *Fruit* a 1-celled, 1-seeded berry.

*Leaves* opposite, serrated, strongly reticulated, veins very prominent on underside, under-surface white.

A deciduous *shrub*, 8–10 ft., often assuming a climbing habit.

Native of Japan. Synonymous with *D. amabilis* (Carr). Generic name in honour of M. Dierville, a French surgeon.

### MIDDENDORF'S WEIGELA, *Diervilla middendorffiana*.

Gardens.

*Flowers* yellowish-white, in a terminal *panicked cyme*; *Lower petal* dotted with pink, or darker yellow; *Stigma* large, inverted cup-shaped; *Fruit* a 1-celled, 1-seeded berry.

# RUBIACEÆ

*Leaves* opposite, ovate-lanceolate, nearly sessile, finely reticulated, hairy on nerves.

A deciduous *shrub*.

Native of Siberia. Syn. *Weigela middendoriana*.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER.	.	.	.	.	<i>Rubiaceæ</i>

Trees, shrubs, or herbs; *Leaves* opposite, with interpetiolar stipules, or apparently whorled, usually entire, the stipules sometimes resembling the leaves; *Flowers* hermaphrodite, rarely unisexual, usually regular; *Calyx* 3-6-lobed or toothed or obsolete, tube adnate to ovary; *Corolla* 3-6-lobed; *Stamens* usually as many as corolla lobes, inserted in the throat or tube; *Ovary* inferior, 2 or more celled; *Fruit* a capsule, berry, or drupe.

## BUTTON BUSH, *Cephalanthus occidentalis*.

Gardens, shrubbery borders, or woods. July. Best in peaty soil. Propagated by layers in early autumn.

*Flowers* yellowish-white, small, very fragrant, in dense terminal globose *panicked heads*, 1-1½ in. diam., bracts glandular; *Calyx* 4-5-lobed, lobes rounded, villose at base; *Corolla* tubular, infundibuliform, 4-5-lobed, glandular or eglandular; *Stamens* 4-5, inserted on throat of corolla, anthers sub-sessile, included, dehiscing before flower opens; *Ovary* inferior, 2-celled; style filiform, stigma clavate, entire; *Fruit* a capsule, coriaceous, dark red-brown; *seeds* 2, with white spongy arillus.

*Leaves* opposite, or verticillate in threes, ovate or lanceolate, acute or acuminate, rounded or cuneate at base, membranaceous, dark green above, paler below, 4-7 ins. long, 1-3½ ins. wide; petioles stout, grooved; stipules minute, nearly triangular.

# TREES AND SHRUBS

A deciduous *shrub*, 2–7 ft.; *Branches* ascending, spreading; *Bark* grey-brown, scaly; *Buds* minute.

Introduced from N. America, 1735. Generic name from Gr. *kephale*, a head, and *anthos*, a flower. Also called Globe-bush, Little Snow-balls, and Snowy Globe-flowers.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER.	.	.	.	.	<i>Compositæ</i>

Herbs or shrubs, with usually alternate, exstipulate leaves, and flowers mostly white or yellow, usually small, crowded in dense capitula surrounded by involucreal bracts; *Calyx* superior, completely united with the ovary, and undistinguishable from it, its limb wanting, or consisting of a border of minute teeth, scales, or pappus of hairs, simple or feathery; *Corolla* gamopetalous, epigynous, either all tabular and 5-toothed, or all ligulate, or with a central disk of tubular florets and a ray of ligulate; *Stamens* 5, or rarely 4, epipetalous, anthers syngenesious and basifixed, sometimes tailed; *Ovary* inferior, 2 carpels, 1-celled, stigmas 2; *Fruit* a cypsel, often crowned by a pappus.

The most extensive Order in the vegetable kingdom, containing over 10,000 species. Distinguished from Valerianæ and Dipsacæ by the syngenesious anthers.

## NEW ZEALAND DAISY-BUSH, *Olearia Haastii*.

Gardens, shrubberies, rockeries. July—September. This is the hardiest of the *Olearias*, and will do well as far north as the Midland counties. In smoky districts it does better than most evergreens, and is also an excellent seaside shrub. It makes a dense Box-like bush, well suited for forming a hedge, and may then be pruned in early spring or after flowering. In late summer it is almost completely covered with little Aster-like blossoms.



## COMPOSITÆ

The *Olearias* may be propagated by cuttings of firm shoots in sandy soil under handlight in a warm sheltered spot or cold frame, September—October ; layers in autumn.

*Flowers* white, in a lax or dense, sub-terminal, *corymbose*, hoary *cyme* of *capitula* ; *cymes*  $1\frac{1}{2}$ –3 ins. diam. ; pedicels short, hoary ; peduncles hoary, longer than leaves, involucre campanulate ; *Ray florets* 4–5 ; *Fruit* a cypsela.

*Leaves* alternate, crowded, elliptic or ovate-oblong, obtuse or sub-acute, entire, wrinkled, coriaceous, dull green above, white beneath,  $\frac{3}{4}$ – $1\frac{1}{2}$  in. long.

An evergreen *shrub*, 5 ft. ; *Branches* woody, thick ; *branchlets* hoary.

Native of New Zealand ; introduced 1858.

### NEW ZEALAND DAISY-TREE, *Olearia macrodonta*.

Gardens. July, August. This is one of the most handsome of all shrubs, happiest in the Southern counties, especially when against a south or west wall. It makes a good hedge plant.

*Flowers* white, Daisy-like,  $1\frac{1}{2}$  in. diam. ; *Capitula* in large terminal hemispherical *corymbs* ; *Fruit* a cypsela.

*Leaves* alternate, very variable, elliptic-oblong, elliptic-ovate, or cordate-ovate, obtuse, crenate or coarsely toothed, undulate, Holly-like,  $1\frac{1}{2}$ –2 ins. long, silvery-green above, almost white beneath, smelling faintly of Musk.

An evergreen *shrub*, 3–5 ft. ; or small *tree*, 20 ft. ; flat-topped ; *Branches* stout.

Native of New Zealand ; introduced 1886. Syn. *O. dentata*.

### TASMANIAN DAISY-BUSH, *Olearia stellulata*.

Gardens. Best when sheltered by wall. June—September.

*Flowers* white,  $\frac{3}{4}$ –1 in. diam. ; *Ray florets* about 12, in a *capitulum*, borne in great profusion ; involucre bracts scabrous, persistent, forming a silvery star  $\frac{1}{4}$  in. diam. ; *Fruit* a cypsela, with pappus.

*Leaves* alternate, oblanceolate, obtuse, coarsely toothed, upper side dark green

## TREES AND SHRUBS

and with stellate hairs, underside hoary with stellate hairs; leaf  $\frac{1}{2}$ –2 ins. long,  $\frac{3}{16}$  in. wide, petiole short.

An evergreen *shrub*, 3–5 ft.; *Branches* hoary.

Native of Tasmania and Australia. Syn. *Eurybia gunniana*. Also called Victorian Snow Bush.

### SNOW IN SUMMER, *Helichrysum rosmarinifolium*.

Gardens. June, July. Requires shelter; hardy in South and West of England. It does best in a light loamy soil and plenty of air. If the flowers are hung up and dried they will last for many months, forming a charming winter decoration. Any necessary pruning may be done in April. Propagate by cuttings of half-ripened shoots in sandy soil under handlight in shady position in summer.

*Flowers* white, small, like Daisies; flower heads (*capitula*) in dense *corymbs*, usually terminating small leafy branches, forming a large leafy *panicle*; *Fruit* an achene (*cypsela*).

*Leaves* alternate, Rosemary-like, lanceolate, obtuse, revolute,  $\frac{1}{2}$ –1 $\frac{1}{2}$  in. long.

A deciduous *shrub*, 3–10 ft.; *Branches* long, arching.

Native of S. Australia and Tasmania; introduced 1827. Also known as Rosemary Everlasting Flower. Syn. *Ozothamnus rosmarinifolius*. Generic name from Gr. *ozein*, to smell, and *thamnos*, a shrub.

### SOUTHERNWOOD, *Artemisia Abrotanum*.

Gardens. August—October. This is one of our oldest garden favourites, doing well in any dry soil. Propagated by cuttings in shady border, July—September; seeds in light soil in cold frame in March.

*Flowers* yellowish, small, in small *capitula*, racemose-paniculate, involucrel bracts with slightly scarious margins, outer lanceolate, acute, inner obovate; *Florets* all tubular, anemophilous, central flowers fertile, marginal ones pistillate; *Fruit* an achene (*cypsela*), narrow at top, pappus 0.

## ERICACEÆ

*Leaves* alternate, lower ones bipinnate or tripinnate, upper pinnate, segments hair-like, fragrant, glabrous or somewhat pubescent, deep green.

A deciduous *shrub*, 2–4 ft.; *Stem* straight, puberulent or glabrous, much branched; *Branches* short, erect or ascending.

Native of S. Europe; introduced about 1548. Also called Lad's-love and Old Man. Generic name *Artemisia* derived from Artemis, one of the names of Diana.

### SAGE BUSH, *Artemisia tridentata*.

Gardens. A small erect bushy shrub covered with a dense silvery-grey tomentum, and exhaling a strong and agreeable odour. August.

*Flowers* yellowish, all perfect and fertile, in a dense *panicle of capitula*, 5–8-flowered; sessile or nearly so; involucre oblong, tomentose; inner bracts oblong; outer short, ovate, obtuse; *Anthers* obtuse, entire at base; *Fruit* a cypsela.

*Leaves* alternate, 3–7-toothed, apex truncate, narrowly cuneate at base,  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. wide, silvery tomentose.

An evergreen *shrub*, 4–5 ft.; much branched, silvery canescent.

Native of Western U.S.A.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER.	.	.	.	.	<i>Ericaceæ</i>

Mostly evergreen shrubs, occasionally growing into small trees, with simple, exstipulate leaves and hermaphrodite flowers, regular or nearly so, mostly white or red; *Calyx* gamosepalous, 4–5-toothed or lobed, superior or inferior; *Corolla* usually gamopetalous, 4–5-cleft or toothed, sometimes persistent; *Stamens* usually twice as many as corolla lobes, hypogynous or epigynous, anthers dehiscing by pores or slits, often appendiculate; *Ovary* superior or inferior, 4–5-celled, placentation axile; *Fruit* a capsule or berry.

## TREES AND SHRUBS

An Order of about 13,000 species, often favouring peaty soils, and having mycorrhiza on their roots. Distinguished from Campanulaceæ by the apical pores or slits of the anthers. The Ericaceæ and Campanulaceæ are the only gamopetalous orders in which the stamens are not inserted on the corolla.

### BILBERRY OR WHORTLEBERRY, *Vaccinum Myrtillus*.

Heaths, moorlands, rockeries. April—June. A pretty little shrub, admired in spring for its rosy waxen flowers and fresh green foliage, and in autumn for its refreshing fruit. No pruning is necessary. The species are propagated by cuttings of shoots in sandy moist peat under handlight in shade in summer; layers in autumn; division in September or March; seeds in shallow boxes or pans filled with moist sandy peat in temperature 55°–65° in spring, transplanting outdoors in summer.

*Flowers* rose tinged with green, solitary and axillary, pedicels  $\frac{1}{4}$  in.; *Calyx* turbinate, 5-lobed; *Corolla* urceolate-globoid,  $2\frac{1}{2}$ – $2\frac{3}{4}$  ins. long, epigynous, 5 small teeth; *Stamens* 10, epigynous, anthers awned, dehiscing by pores; *Ovary* inferior, 4–5-celled, style filiform, stigma obtuse; *Fruit* a berry, globoid, 4–5-celled, blue-black, pruinose, size of pea, many-seeded, edible; used as preserve.

*Leaves* alternate, ovate or elliptical, acute, serrulate, thin, pale green, glabrous,  $\frac{1}{2}$ –1 in. long, petiole short. Autumn tints cherry-red, scarlet, crimson, brown.

A sub-evergreen *shrub*, 6–18 ins.; *Stem* erect, rigid, angular; *Branches* ascending, angular, glabrous; *Buds* scaly; *Rootstock* creeping.

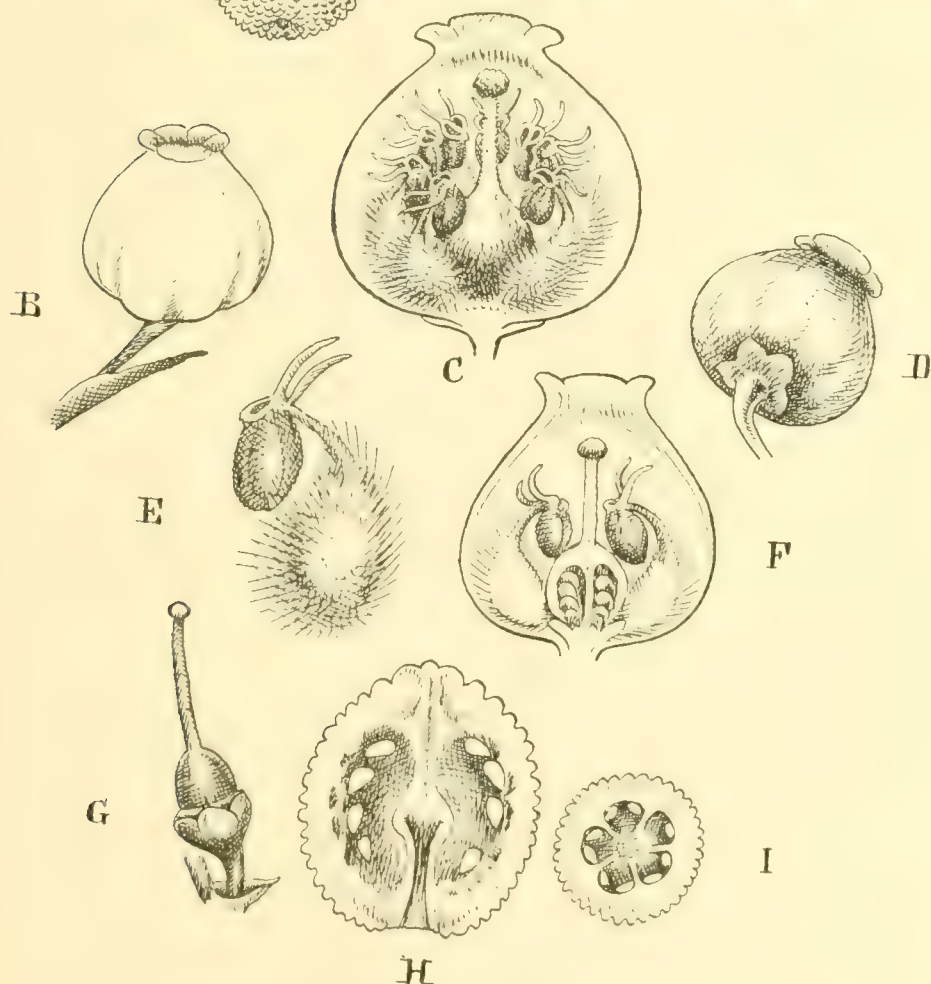
Native of Britain. Also called Blueberry.

### BOG WHORTLEBERRY, *Vaccinum uliginosum*.

Mountain heaths and bogs. A useful trailing shrub for the rock-garden. May, June.

*Flowers* pale pink, solitary, on axillary peduncles, 1–3 together; *Calyx tube*





# STRAWBERRY TREE (*Arbutus Unedo*)

A. Branch, with cluster of fruit. B. Single flower. C. Flower, with front part of corolla and two front stamens removed. D. Flower showing calyx. E. One of the stamens. F. Section of flower (two stamens in position). G. Pistil. H. Longitudinal section of fruit. I. Transverse section of fruit.



## ERICACEÆ

hemispheric, 4-5-toothed, obtuse; *Corolla* sub-globose,  $\frac{1}{6}$  in. long; *Stamens* 8-10, epigynous, dorsal awns; *Ovary* inferior; *Fruit* a berry, dark blue, with glaucous bloom.

*Leaves* alternate, obovate or orbicular, obtuse or acute, entire, thin, coriaceous, glaucous beneath,  $\frac{1}{2}$ -1 in. long.

A deciduous *shrub*, 6-10 ins.; *Stem* procumbent, woody, rigid, glabrous; *Branches* cylindrical or slightly angled, ascending; *Buds* scaly.

Native of Britain. Specific name=swamp-loving (*L. uliginosus*; *uligo*; *uvere*, to be wet). Also known as Great Bilberry and Bleaberry.

### COWBERRY, *Vaccinium Vitis-idaea*.

Woods, heaths, rocky moors, gardens. May—August. A native of the peaty moorland, good for the rock-garden.

*Flowers* red, in a short, dense, terminal, drooping *raceme*, pedicels 2, bracteolate; *Calyx tube* hemispheric, 4-lobed, lobes ovate, ciliate; *Corolla* campanulate, 4-lobed, spreading; *Stamens* awnless; *Ovary* inferior; *Fruit* a berry, globose, coral-red,  $\frac{1}{3}$  in. diam.; acid; ripe August—October.

*Leaves* alternate, resembling Box, obovate or oblong, margin thickened, entire or serrulate, revolute, coriaceous, glossy green above, pale beneath,  $\frac{1}{2}$ -1 $\frac{1}{4}$  in. long.

An evergreen *shrub*, 6-18 ins.; *Stem* procumbent, much branched, wiry, tortuous; *Branches* pubescent, trailing or ascending.

Native of British Isles. Known also as Mount Ida Whortleberry, Flowering Box, and Brawlins. Specific name = Vine of Mt. Ida (*L. vitis*, a vine).

### CRANBERRY, *Oxycoccus palustris*.

Peaty bogs. June—August.

*Flowers* red, solitary and axillary, drooping; peduncles 1-3, slender, 1 in. long, puberulous, bracteate; *Calyx limb* minute; *Corolla* rotate,  $\frac{1}{3}$  in. diam., 4-lobed, lobes linear-oblong, reflexed; *Stamens* epigynous, exerted, filaments purple, pubescent, anthers yellow; *Ovary* inferior; *Fruit* a berry, globular, red,  $\frac{1}{4}$  in. diam.; very acid; used for jam and tart making.

## TREES AND SHRUBS

*Leaves* alternate, ovate or lanceolate, cordate at base, entire, revolute, deep green above, glaucous beneath,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, petiole short.

An evergreen *shrub*, 3–4 ins.; *Stem* creeping, filiform, wiry, puberulous; *Buds* scaly.

Native of Britain. Syns. *O. vulgaris* and *Vaccinium Oxycoccus*. Known also as Marsh Whortleberry.

### STRAWBERRY TREE, *Arbutus Unedo*.

Parks, gardens, lawns. September—November. Unlike most of the Heath family this will grow in a soil containing a little chalk or lime, but it does best in sandy peat. When laden with its waxy blossoms and the Strawberry-like fruits of the previous year, this forms one of our most striking shrubs. Propagated by seeds in well-drained pots of sandy peat in cold frame in March; it is used as a stock.

*Flowers* cream-white, often flushed with pink, in a drooping terminal *panicle*, glabrous, lax; pedicels short, bracts deciduous; *Calyx* inferior, sepals 5, small; *Corolla* 5-fid, ovately campanulate, hypogynous; *Stamens* 10, hypogynous, filaments short, villous at base, anthers with 2 pores at tip, awned; *Ovary* superior, 5-celled, style simple, stigma obtuse, viscid; fertilised by bees; *Fruit* a berry, globular, granulated, 5-celled, and many-seeded, resembling a strawberry, but rather dry, friable and flavourless, red, takes about 14 months to reach maturity, edible,  $\frac{2}{3}$  in. diam.; *seeds* angled, testa coriaceous.

*Leaves* alternate, ovate or oblong-lanceolate, shortly petiolate, acute, bluntly serrated, glabrous on upper side, 2–3 ins. long; coriaceous, dark glossy green, petioles glandular; dying leaves reddish.

An evergreen *shrub*, 10–15 ft., or small *tree*; *branchlets* clothed with glandular hairs; *Bark* rough, twisted, scaly, tinged with red; *Twigs* red.

Indigenous in S.W. Ireland, there a tree of 40 ft. Generic name possibly from L. *arbor*, a tree. Specific name a contraction of *unum edo*; *unum*, one, *edo*, I eat, *i.e.* one is sufficient at a time.

Leaves sometimes attacked by Arbutus Purple Spot (*Septoria Unedonis*).







BILBERRY, or WHORTLEBERRY (*Vaccinium Myrtillus*)

A. Flowering branch. B. Leaf. C. Pistil and calyx. D. Corolla.  
E. Flower after removal of corolla (showing stamens with appendages).

## ERICACEÆ

### BLACK BEARBERRY, *Arctostaphylos alpina*.

Dry barren Scotch mountains, rockeries. May—August. The species are propagated by seeds and layers.

*Flowers* white or flesh-coloured, resembling *Arbutus*, in a small terminal reflexed *raceme*, 2–3-flowered, appearing with the young leaves; pedicels short, rather hairy; bracts ciliated; *Calyx* gamosepalous, inferior, 5 minute sepals; *Corolla* gamopetalous, hypogynous, 4–5-lobed,  $\frac{1}{4}$  in. diam., pubescent within; *Stamens* 10, hypogynous, filaments subulate, anthers brown, awns very short; *Ovary* superior, 5–10-celled; disk of 3 fleshy scales; *Fruit* a berry (drupe),  $\frac{1}{4}$  in. diam., black, 5–10 stones; berries eaten by Grouse; ripe in September.

*Leaves* alternate, obovate, or spathulate, shortly petiolate, exstipulate, narrowed towards base, wrinkled and coarsely serrated above middle, ciliated, acute, thin, prominently veined,  $\frac{1}{2}$ –1 $\frac{1}{2}$  in. long. Autumn tint fiery red.

A deciduous *shrub*, 3–4 ins.; procumbent; *Branches* short, stout, interlaced; *Bark* scaly.

Native of central and northern mountains of Scotland. Badge of the Clan Ross. Synonymous with *Arbutus alpina*. Generic name from Gr. *arktos*, a bear, and *staphyle*, a grape, the fruit of some species being eaten by bears.

### POINTED-LEAVED BEARBERRY, *Arctostaphylos pungens*.

Rockeries. February.

*Flowers* white, tinged with rose, in a drooping *raceme* of 8–10 flowers; pedicels short; *Fruit* a drupe, smooth, glabrous.

*Leaves* alternate, ovate-oblong, entire, acute, mucronate, coriaceous, downy when young both surfaces, glabrous later, greyish, rather pungent, 1–1 $\frac{1}{2}$  in. long.

An evergreen *shrub*, 1 ft.; much branched, erect; *Branchlets* angular, downy.

Introduced from Mexico, 1839.

## TREES AND SHRUBS

### COMMON BEARBERRY, *Arctostaphylos Uva-ursi*.

Dry, heathy, rocky hills, or mountains; rockeries. Best in sandy peat. April—June.

*Flowers* pink, or flesh-coloured with red mouth, in a very short, few-flowered, crowded, terminal *raceme*; *Sepals* short and broad; *Corolla* urceolate,  $\frac{2}{3}$  in. diam., teeth 4–5, hairy within; *Stamens* 10, anthers with long awns; *Ovary* superior; *Fruit* a drupe, globular, smooth, shining, insipid, pulpy, mealy, red,  $\frac{1}{4}$  in. diam.; ripe in September.

*Leaves* alternate, Box-like, obovate, spathulate, or oblong, entire, ciliate, obtuse, coriaceous, glossy deep green, reticulately nerved both surfaces,  $\frac{1}{2}$ –1 in. long, petiole and margin finely woolly. Autumn tints bright red to purplish-brown.

An evergreen *shrub*, 4–6 ins.; procumbent; *Branches* scandent.

Native of N. England, Scotland, and Ireland; leaves and branches used for dye. Syn. *Arbutus Uva-ursi*. Specific name from L. *uva*, a bunch or cluster of grapes, and *ursa*, a bear. Known as Red Bearberry.

### SHOWY ZENOBIA, *Zenobia speciosa*.

Gardens. June, July. Thrives in peaty soil, and warm but open situation, liking plenty of moisture at the roots. Propagate by layers September or October.

*Flowers* white, waxy in texture, resembling Lily of the Valley, in an *umbellate axillary cluster*; pedicels drooping; *Calyx* gamosepalous, 5-lobed, lobes short, triangular; *Corolla* gamopetalous, campanulate, 5-lobed,  $\frac{1}{3}$  in. diam.; *Stamens* 10, anthers with awns; *Ovary* 5-celled; *Fruit* a capsule, depressed-globose, obtusely 5-lobed, 5-celled.

*Leaves* alternate, oval or oblong, crenulated or slightly serrulated, coriaceous, silvery, glabrous, 1–2 ins. long.

A sub-evergreen *shrub*, 3–4 ft.; glabrous, often glaucous.

Introduced from Southern U.S.A., 1800. Syn. *Andromeda speciosa* Also called Silvery Andromeda.



## ERICACEÆ

### MARSH ROSEMARY, *Andromeda polifolia*.

Peaty bogs, gardens. May—August. Requires peaty soil. It is a lovely dwarf rock plant, best in the South of England, where it flowers as early as April. Propagated by layers of shoots pegged down till rooted, detached after 12–18 months; seeds in peaty soil in autumn or spring.

*Flowers* pink, drooping, in a short terminal *raceme* or cluster, pedicels  $\frac{1}{2}$ –1 in., slender, red; *Calyx* small, deeply 5-lobed, obtuse; *Corolla* hypogynous, ovoid,  $\frac{1}{4}$  in. long, 5-lobed, reflexed; *Stamens* 10, hypogynous, included, filaments bearded, awned; *Ovary* 5-celled, superior, stigma simple; *Fruit* a capsule, erect, 5-lobed, 5-celled, 5-valved, sub-globose.

*Leaves* alternate, oblong-lanceolate, acute, revolute, coriaceous, dark glossy green above, glaucous beneath,  $\frac{1}{2}$ –1 $\frac{1}{2}$  in. long, petiole short.

An evergreen *shrub*, 6–18 ins.; glabrous; *Stem* ascending, rooting at base; *Branches* sub-erect, twiggy; *Bark* smooth, brown; *Buds* scaly.

Native of Britain. Known also as Moorwort. Generic name is mythical, referring to Andromeda, the daughter of an Ethiopian king, rescued from a sea-monster by Perseus, who married her. Syn. *Andromeda rosmarinifolia*.

### AMERICAN ANDROMEDA, *Pieris floribunda*.

Gardens. April—June. This handsome evergreen spring-flowering shrub is best in a fairly rich loam or moist peat, and sheltered from cutting winds. It may be propagated by seed, layers, or cuttings, but the last two methods are slow, layers usually requiring 12 months before transplanting.

*Flowers* pure white, resembling Lily of the Valley, formed in autumn, expanding in April, in an axillary and terminal *panicle* of dense secund *racemes*; *Corolla* urceolate, 5-angled; *Fruit* a capsule.

*Leaves* alternate, ovate, or oblong-lanceolate, acute, finely serrulated, adpressedly ciliated, glabrous, coriaceous, deep glossy green, 1 $\frac{1}{2}$ –2 ins. long.

## TREES AND SHRUBS

An evergreen *shrub*, 2–6 ft. ; much branched.

Native of N. America ; introduced by Lyon, 1811. Known also as Lily of the Valley Tree. Syns. *Andromeda floribunda* and *Zenobia floribunda*.

### JAPAN ANDROMEDA, *Pieris japonica*.

Gardens, March—June. Thrives in sandy peat. During the growing season this ornamental evergreen is made especially attractive by the beautiful crimson tint of its shoots, bark, and leaves. Cuttings of young shoots strike readily.

*Flowers* waxy-white, in a pendulous *panicle* of dense *racemes*, shortly pedicellate, bracteate and bracteolate ; *Calyx* 5-fid, persistent, segments ovate acute ; *Corolla* urceolate, 5-toothed, lobes recurved ; *Stamens* 10, included ; *Fruit* a capsule.

*Leaves* alternate, lanceolate, narrowed at base, serrated, rather thick, dark green, 2 ins. long.

An evergreen *shrub*, 3–10 ft. ; much branched ; glabrous ; growth slow.

Native of Japan (tree 30 ft.) ; introduced 1882. Syn. *Andromeda japonica* ; described under this name by Thunberg in 1784.

### LING, *Calluna vulgaris*.

Heaths, moors, gardens. July—September. Thrives in peaty soil. It may be propagated by division in October or April. Cut out straggling shoots after flowering.

*Flowers* rose or white, small, numerous, slightly proterandrous, in a terminal and lateral leafy *raceme* ; pedicels short, drooping ; 2 pairs of opposite bracts, outer foliaceous, inner scarious ; *Calyx* 4-partite, rosy, longer than corolla, embracing it, scarious, lobes obtuse ; *Corolla* bell-shaped, deeply 4-cleft, hypogynous, persistent, enclosing capsule, lobes triangular ; *Stamens* 8, inserted on disk, anthers short, dorsal, awned ; *Ovary* 4-celled, superior, pubescent, style exserted, stigma dilated ; *Fruit* a capsule, 4-celled, 4-valved ; *seeds* 1–2 in each cell.



LING or HEATHIER (*Calluna vulgaris*)

A. Flowering branch. B Flower, enlarged. C. The same, from below. D. Section of flower, showing two of the stamens in position. E. A stamen.





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*Leaves* opposite, decussate, small, sessile, slightly auricled or spurred at base, linear or linear-lanceolate, obtuse, revolute, convex above, slightly grooved beneath, shining green or glabrous, or sometimes pubescent or hoary.

An evergreen *shrub*, 1–3 ft.; *Branches* elongate, red-brown.

Native of Britain. Generic name from Gr. *kallino*, the twigs being used for sweeping.

### WINTER HEATH, *Erica carnea*.

Gardens. January—April. This compact little shrub is one of the brightest ornaments of rockeries and gardens in winter and early spring. It is best in peat, but will grow in sandy loam. The hardy species of *Erica* are propagated by cuttings in sandy peat under bell-glass or handlight outdoors in September or October; layering shoots September—November; division in October.

*Flowers* pale pink or reddish, axillary, drooping, forming leafy secund *racemes* either terminal or below the ends of the branches; *Sepals* 4, linear-lanceolate, red, glandularly hairy; *Corolla* 4-lobed, narrow-ovoid,  $\frac{1}{4}$  in. long, persistent, lobes broad; *Stamens* 8, anthers slightly protruding, oblong, inserted by their lower ends on flattened filaments, 2-fid at top, without appendages; *Ovary* superior, 4-celled, style long; *Fruit* a capsule, 4-celled, many-seeded.

*Leaves* 3–4 in a whorl, linear, obtuse, revolute to midrib, glabrous.

An evergreen *shrub*, 6 ins.; *Stem* erect, glabrous or glandularly-hairy.

A native of Europe; introduced 1763. Also known as Alpine Forest Heath. Syn. *E. herbacea*.

### CILIATE HEATH, *Erica ciliaris*.

Sandy heaths, gardens. This has the largest blossoms of all our native heaths. It will thrive in a loamy soil as well as in peat. June—September.

*Flowers* rose, dying off a russet-brown, in a terminal unilateral *raceme*; pedicels short; *Sepals* small, ciliate, pubescent; *Corolla* ovoid, nearly  $\frac{1}{2}$  in.

## TREES AND SHRUBS

long, oblique at mouth, 4-lobed; *Stamens* included, anthers awnless; *Ovary* globose, style exserted; *Fruit* a 4-valved capsule.

*Leaves* 3-4 in a whorl, ovate, sub-sessile, ciliate, recurved, pubescent above, glaucous beneath.

An evergreen *shrub*, 12-18 ins.; *Stem* slender; *branchlets* many, erect, pubescent.

Native of S.W. England (Cornwall and Dorset) and parts of Ireland. Called Dorset Heath and Fringed Heath.

### FINE-LEAVED HEATH, *Erica cinerea*.

Heaths, commons, gardens. July—September. When planted in masses it makes an attractive shrub in early autumn.

*Flowers* reddish-purple, fading to bluish-lilac, drooping, in a dense elongated or oblong terminal whorled *raceme*; pedicels short, puberulous; bracteoles under calyx; *Calyx* deeply 4-partite, segments linear-lanceolate; *Corolla* ovate-urceolate, slightly 4-lobed, straight at mouth,  $\frac{1}{4}$  in. long, persistent; *Stamens* 8, hypogynous, enclosed in corolla, anthers small, toothed appendages; *Ovary* superior, 4-celled, glabrous, style long, exserted, stigma capitate; *Fruit* a 4-celled capsule.

*Leaves* crowded in whorls of 3, minute,  $\frac{1}{5}$ – $\frac{1}{3}$  ins. long, linear, acute, minutely serrated, margins revolute, cartilaginous, whitish, dark shining green above, glabrous and furrowed beneath.

An evergreen *shrub*, 1-2 ft.; much branched; *Branches* slender, red-brown, pubescent; shoots glabrous.

Native of Britain. Known also as Scotch Heather, Bell Heath, and Grey Heath.

### MEDITERRANEAN HEATH, *Erica mediterranea*.

Boggy heaths of Mayo and Galway; cultivated in English gardens. March—May.

*Flowers* pink, axillary, in dense secund, nodding *racemes*, pedicels solitary

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or in pairs, short, 2-bracteolate in the middle; *Sepals* ovate-lanceolate; *Corolla* cylindric-campanulate,  $\frac{1}{6}$  in. long, lobes broad; *Stamens* 8, anthers dark, half-exserted, 2-fid at tip, awnless; *Ovary* superior, 4-celled; *Fruit* a capsule, 4-celled, 4-valved, many-seeded.

*Leaves* 3-5 in a whorl, crowded, linear, margins revolute to midrib and connate to the under-surface, shortly petiolate, glabrous,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long.

An evergreen *shrub*, 2-6 ft.; bushy, glabrous.

Native of Western Europe. Considered by some as a variety of *E. carnea*.  
Syn. *E. hibernica*.

### CORSICAN HEATH, *Erica stricta*.

Gardens. A wiry-looking shrub of compact habit. August—November.

*Flowers* purple-red, in a terminal *umbellate cluster*; *Corolla* urceolate,  $\frac{1}{4}$  in. long, segments reflexed; *Fruit* a capsule.

*Leaves* 4 in a whorl, linear, obtuse, glabrous, warm green,  $\frac{1}{4}$  in. long.

An evergreen *shrub*, 3-6 ft.

Native of S. Europe (Corsica); introduced 1765.

### CROSS-LEAVED HEATH, *Erica Tetralix*.

Heaths, gardens. This likes an open situation, and will thrive in moist or boggy places. July—September.

*Flowers* rose-red, in a terminal *sub-umbellate cluster*, flowers drooping; pedicels short; *Sepals* oblong-lanceolate, downy; *Corolla* ovoid-globose,  $\frac{1}{3}$  in. long; *Anthers* included, awns long, subulate; *Ovary* pubescent, glandular hairs; *Fruit* a 4-valved capsule.

*Leaves* cruciate, 4 in a whorl, acicular or linear-oblong, revolute to midrib, ciliate, stiff glandular hairs, downy, dark green above, blue glaucous beneath.

An evergreen *shrub*, 12-18 ins.; *Stems* wiry; *Branches* rarely glabrous; shoots downy.

Native of Britain.

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### CORNISH HEATH, *Erica vagans*.

Heaths, gardens. This makes a vigorous bush, and thrives in almost any soil. July—September.

*Flowers* pink, in a dense terminal axillary leafy *raceme*, flowers erect; pedicels long, usually twin, slender, bracteolate; *Sepals* ovate, ciliate, obtuse; *Corolla* campanulate,  $\frac{1}{6}$  in. long, lobes short; *Anthers* exserted, filaments slender, awnless; *Ovary* globose, style exserted, stigma capitate; *Fruit* a capsule.

*Leaves* 3–5 in a whorl, linear, recurved, revolute to midrib, obtuse, glabrous,  $\frac{1}{3}$  in. long.

An evergreen *shrub*, 1–3 ft.; *Stem* stout, woody; *Branches* stiff, erect, fascicled, densely leafy.

Indigenous in Cornwall and parts of Ireland.

### CREEPING AZALEA, *Loiseleuria procumbens*.

Scotch mountains; rock gardens. May—August. Being a natural bog plant, it does best in deep sandy peat. It may be propagated by layering shoots, September—November; or slowly by seed.

*Flowers* rose-pink, proterogynous, in a *sub-corymbose terminal cluster* of 2–3 flowers; peduncle red, ebracteolate; *Sepals* 5, ovate-lanceolate, red; *Corolla* campanulate, 5-lobed, hypogynous, obtuse, deciduous; *Stamens* 5, hypogynous, slightly adnate to corolla; *Ovary* superior, 2–3-celled, sub-globose, style short, stigma capitate; *Fruit* a capsule, minute, 2–3-celled, 2–3-valved, valves 2-fid; *seeds* several, ovoid, pitted.

*Leaves* opposite, crowded, petiolate, ovate to linear-oblong, entire, revolute, coriaceous, thick, obtuse, convex and grooved, midrib prominent, glabrous, shining deep green above, and channelled, pubescent beneath.

An evergreen Alpine *sub-shrub*, 2–3 ins.; *Stem* glabrous, woody; *Branches* spreading, procumbent, red-brown; *Buds* scaly.







PONTIC RHODODENDRON (*Rhododendron ponticum*)

A. Flowering branch. B. Longitudinal section of fruit. C. Flower, with petals removed.  
D. Fruit. E. Transverse section of fruit.

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Indigenous in Scotch Highlands. Known also as Alpine Azalea. Generic name after Loiseleur Deslongchamps, a French botanist. Syn. *Azalea procumbens*.

### SCOTTISH MENZIESIA, *Bryanthus taxifolius*.

Mountainous heaths in Scotland; gardens. May—July. Propagated by layers in autumn.

*Flowers* lilac, drooping, in terminal *umbellate corymbs* of 3–4 flowers, pedicels  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long, bracteate and bibracteolate; *Sepals* 5, ovate-lanceolate, glandular-pubescent; *Corolla*  $\frac{1}{3}$  in. long, ovoid, urceolate, deciduous, 5-cleft, lobes short; *Stamens* 10, hypogynous, filaments slender, anthers purple, truncate, open by pores, awnless; *Ovary* 5-celled, glandular, pubescent, style slender, stigma capitate; *Fruit* a capsule, erect, 5-celled, 5-valved, many-seeded, seeds shining.

*Leaves* alternate, crowded, spreading, linear-obtuse, glandularly serrate, rigid, coriaceous, glabrous, margins reflexed to midrib, glossy green both surfaces,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long; petioles short.

An evergreen *shrub*, 5–10 ins.; much branched; *Branches* tubercled; *Buds* scaly.

Native of Scotland; found in Perthshire. Known also as Blue Menziesia. Syns. *Andromeda cærulea*, *A. taxifolia*, *Menziesia cærulea*, *Phyllodoce taxifolia*, *P. cærulea*.

### ST. DABEOC'S HEATH, *Daboëcia polifolia*.

Moist heaths in Ireland; gardens in England. May—September. Needs peaty soil. Cut away old flowering stems in early winter.

*Flowers* crimson, purple, or white, in a lax, terminal, drooping *raceme* of 5–10 flowers; pedicels short, stout, curved; bracts leafy; *Calyx* 4-partite, lobes ovate-lanceolate, ciliate; *Corolla* urceolate, ventricose, deciduous, shortly 4-cleft, lobes broad, slit, reflexed,  $\frac{2}{3}$  in. long; *Stamens* 8, included, anthers

## TREES AND SHRUBS

purple, awnless; *Ovary* superior, 4-celled, villous and glandular, style simple, stigma dilated; *Fruit* a capsule, 4-celled, 4-valved.

*Leaves* alternate, oval, shortly petiolate, ciliate, revolute, bright glossy green above, downy beneath,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long.

An evergreen *shrub*, 1–2 ft.; decumbent; *Branches* erect, slender, glandularly hairy; *Bark* flaking; *Buds* scaly.

Native of Ireland; found in Connemara and Mayo. Syn. *Andromeda Daboëcia*.

### SHEEP LAUREL, *Kalmia angustifolia*.

Gardens, shrubberies. May—July. Best in cool damp soil, especially of peaty nature. The species are propagated by cuttings of young shoots in pots of sandy peat under bell-glass in shady cold frame, April—August; seeds in well-drained shallow pans of sandy peat in cold frame, April or October.

*Flowers* purple or rose, in lateral *corymbs*, usually 3-flowered; *Calyx* gamosepalous, 5-partite, persistent; *Corolla* gamopetalous, saucer-shaped, 5-lobed, tube short, 10 pouches just below limb; *Stamens* 5, hypogynous, dehiscing by pores; *Ovary* superior, sub-globose, 5-celled; style filiform, exserted; stigma capitate; *Fruit* a capsule, depressed-globose, 5-celled, 5-lobed, woody, valves crustaceous; *seeds* minute.

*Leaves* alternate, mostly in twos or threes, oblong, entire, revolute, obtuse, exstipulate, petiolate, light green above, dull, pale or rusty beneath, 1–2 ins. long, coriaceous.

An evergreen *shrub*, 1½–3 ft.; *Branches* often in threes, ascending, terete; *Bark* brown, scaly; *Buds* minute.

Introduced from Canada, 1736. Also known as Lambkill. Generic name in honour of Peter Kalm (1715–1799), an eminent botanist of Finland, who became Professor at Abo.



## ERICACEÆ

### GLAUCOUS AMERICAN LAUREL, *Kalmia glauca*.

Gardens, shrubberies. April, May.

*Flowers* purplish-pink,  $\frac{1}{2}$ – $\frac{2}{3}$  in. diam., in a terminal *umbellate corymb*, 1–13 flowers, pedicels filiform; *Calyx* 5-partite, lobes ovate, scarious-coriaceous, much imbricated, persistent; *Corolla* 5-lobed, with cavities for anthers; *Stamens* 10, anthers brown; *Ovary* 5-celled; *Fruit* a capsule, 5-valved, depressed-globose, glabrous.

*Leaves* opposite, or rarely in threes, 1 in. long, oblong or linear-oblong, nearly sessile, obtuse or acute, margins entire, strongly revolute, dark green above, glaucous white beneath, 1–2 ins. long,  $\frac{1}{2}$  in. wide.

An evergreen *shrub*, 1–3 ft.; *Stem* straggling; *Branches* opposite, or whorls of three; *Bark* greenish-brown, smooth.

Introduced from N. America, 1767.

### CALICO BUSH, *Kalmia latifolia*.

Gardens, shrubberies. May—July. “Few flowering shrubs can surpass this *Kalmia* for beauty when at the zenith of its loveliness. Each delicately fashioned, cupped blossom, of which Ruskin wrote so appreciatively, is a marvel of perfect form, and the large clusters, ranging in colour from white to soft pink, almost hide the shining, lance-shaped leafage in their profusion.”—*The Garden*. Best in sandy peat, or light, friable loam and leaf soil.

*Flowers* white, tinted with pink, nearly 1 in. diam., in a many-flowered compound terminal *corymb*; pedicels red or green, covered with dark scurfy scales; glandularly hirsute; bracts persistent, acute; 2 minute bracteoles; *Calyx* 5-partite, rose-coloured, segments linear, acute, viscid-pubescent; *Corolla* sub-hypocrateriform, 5-lobed, each lobe with 2 small pockets for anthers, viscid-pubescent; *Stamens* 10, epipetalous, filaments white, anthers rose, pores at apex, immature anthers held down in pockets; *Ovary* 5-celled



## TREES AND SHRUBS

superior, style long, stigma rose; *Fruit* a 5-valved capsule, crowned with persistent style, depressed-globose, glandular.

*Leaves* in twos or threes, oblong or elliptical-lanceolate, acute or obtuse, narrowed at base, entire, thick, coriaceous, rigid, bright green, glandular white tomentose when young, 3–4 ins. long, 1–1½ in. wide, petioles stout, red.

An evergreen *shrub*, 3–10 ft.; forming large, round-headed bush, resembling *Rhododendron*; *Branches* stiff; *Twigs* terete; *Bark* brown, tinged red, scaly; *Buds* ovate, acute, glandular.

Introduced from N. America, 1734; there forms tree 30–40 ft. high, trunk 18–20 ins. diam. Known also as Spoonwood and Mountain Laurel; called by Indians “Clamoun.”

### LABRADOR TEA, *Ledum latifolium*.

Gardens, shrubberies. April—June. Best in peaty soils, cool and moist. Propagated by layers in September; division of roots, September or October; seeds in well-drained pans of sandy peat in cold frame in March.

*Flowers* white,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam., in a many-flowered terminal *umbellate cluster*; pedicels bracteate at base, tomentose; *Calyx* 5-fid; *Petals* 5, obovate, obtuse, spreading; *Stamens* 5–7, as long as petals, exserted; *Ovary* 5-celled; *Fruit* a capsule, dry, oblong, 5-celled, 5-valved, opening from base.

*Leaves* alternate, linear-oblong, exstipulate, shortly petiolate, entire, revolute, coriaceous, upper side with globules of odoriferous gum, under side covered with thick brownish or rust-coloured down, slightly fragrant when bruised, pale dull green, 1–2½ ins. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. wide.

An evergreen *shrub*, 2–3 ft.; *young stems* downy.

Native of Northern U.S.A.; introduced 1763. Leaves used as substitute for tea. Generic name from Gr. *ledon*, a species of *Cistus* which produced the *ledonon*, a resinous substance. Specific name from L. *latus*, broad, wide, and *folium*, a leaf. Known also as Wild Rosemary.

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### MARSH LEDUM, *Ledum palustre*.

Gardens. A compact shrub, succeeding best in cool, damp, peaty soil, but will grow in sandy loam with a little leaf-mould. April—June.

*Flowers* white, tinged with pink, smaller than *L. latifolium*, in a terminal *umbel*, pedicels pubescent; *Calyx* teeth ovate, obtuse; *Stamens* 10, longer than corolla; *Fruit* a capsule, oblong or oval, scurfy, nodding, 5-celled, 5-valved; *seed* ripened freely.

*Leaves* alternate, linear, distant, exstipulate, petiolate, entire, revolute, coriaceous, under side with rusty brown tomentum,  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long,  $\frac{1}{6}$  in. wide.

An evergreen *shrub*, 2–3 ft.; *Twigs* rusty tomentose.

Native of northern part of Eastern hemisphere; introduced 1762.

### FLAME-COLOURED AZALEA, *Rhododendron calendulaceum*.

Gardens, shrubberies. May—June. This is perhaps the most beautiful of any of the American types of Azalea. The various species of Azalea are propagated by cuttings in sandy soil under bell-glass in temperature of 60°–70° in March; by grafting in same temperature in March.

*Flowers* yellow, red, orange, or copper-coloured, not clammy, appearing before leaves, in a terminal *umbel*; pedicels short, pilose or glandular; *Calyx* inferior, gamosepalous, 5-fid; *Corolla* gamopetalous, 5-lobed, tube shorter than segments, hairy; *Stamens* 5, long exserted; *Ovary* superior, 5-celled; *Fruit* a capsule, linear-oblong, erect, pubescent,  $\frac{2}{3}$  in. long.

*Leaves* alternate, oblong, exstipulate, petiolate, entire, pubescent both surfaces, at length hairy.

A deciduous *shrub*, 4–8 ft.; *Twigs* mostly glabrous.

Native of Alleghany forests; said to be handsomest shrub in N. America. Discovered by Bertram in Georgia in 1774; introduced by Lyon in 1806. Generic name from Gr. *rhododendron*, the Rose Bay or Oleander—*rhodon*, a rose, *dendron*, a tree, in allusion to rose-red flowers of many species. Specific name = Marigold-like, from *L. calendula*, the marigold,—

## TREES AND SHRUBS

L. *kalendæ*, the first day of each month; Gr. *kalein*, to call, because beginning of month was proclaimed; name of flower (*calendula*) in allusion to almost perpetual flowering. Common name Azalea, from Gr. *azaleos*, dry,—*aza*, dryness, in allusion to habitat.

### PONTIC AZALEA, *Rhododendron flavum*.

Gardens, shrubberies. May. This is the only Azalea indigenous to Europe, and is probably the commonest of the recognised species. It is of free growth in good light peaty or sandy soil.

*Flowers* yellow, fragrant and clammy, proterandrous, in terminal *umbellate clusters*, pedicels clammy; *Calyx* 5-lobed, glandular-viscid; *Corolla* infundibuliform, tube long, narrow, hairy outside, viscid; limb spreading, 5 segments, ovate-lanceolate; *Stamens* 5, very long exserted, anthers orange; *Fruit* a capsule.

*Leaves* alternate, ovate-oblong, ciliated, shining, pilose, clammy.

A deciduous *shrub*, 6–10 ft.

Native of the Caucasus; introduced by J. Bell, 1793. Synonymous with *Azalea pontica*. Honey collected by bees is said to have narcotic properties.

### PINXTER FLOWER, *Rhododendron nudiflorum*.

Gardens, shrubberies. April—June.

*Flowers* pink, red, or white, appearing before or with the leaves, rather naked, not clammy, 1½–2 ins. diam., in a terminal *umbel*; *Calyx* lobes short, rather rounded; *Corolla* slightly glandular, hirsute, tube scarcely longer than lobes; *Stamens* much exserted; *Fruit* a capsule, linear-oblong, erect, hairy.

*Leaves* alternate, lanceolate-oblong, acute at both ends, nearly smooth and green both surfaces, entire, ciliated, midrib bristly above, downy beneath, 2–4 ins. long.

A deciduous *shrub*, 6 ft.; spreading; *Branchlets* hairy or glabrous.



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Native of hilly districts of Canada and U.S.A.; introduced by Collinson, 1734. Specific name from *L. nudus*, naked; *florum*, of flowers. Also called Naked-flowered Azalea.

### JAPANESE AZALEA, *Rhododendron sinense*.

Gardens, shrubberies. May. This is a general favourite, and of all the species of Azalea it is perhaps the most showy to the eye. Its seed is produced freely, and is most satisfactory for raising fresh stock, but the process is a long one.

*Flowers* orange, suffused with red, appearing before or with leaves, almost scentless, in a terminal *cluster*, pedicels pilose; *Corolla* campanulate, downy; *Stamens* equal in length to petals; *Fruit* a capsule.

*Leaves* clustered, elliptic, entire, acute, ciliated, pinnately nerved, pilosely pubescent, greyish beneath, slowly deciduous.

A deciduous *shrub*, 4–5 ft.; *young branches* hairy.

Native of China and Japan; introduced by Loddiges, 1823, and by Fortune, 1845. Synonymous with *Azalea japonica*. Better known in gardens as *Azalea mollis*.

### VASEY'S AZALEA, *Rhododendron Vaseyi*.

Gardens, shrubberies. April—May. This is one of the prettiest and most distinct species, of robust growth, flowering freely even in the young state, and well suited for the rock garden.

*Flowers* pale pink, becoming white, in lax *umbellate clusters*, appearing before leaves; *Corolla* 1½ in. diam.; three upper petals spotted with reddish-brown; *Stamens* long exserted; *Fruit* a capsule.

*Leaves* clustered, oblong-lanceolate, acute, cuneate at base, entire, sparsely hairy, thin, 1½–3 ins. long.

A deciduous *shrub*, 2–3 ft.

Native of North Carolina, growing 15–18 ft. Discovered by G. R. Vasey near Webster, in Jackson County, 1878; introduced 1888.

## TREES AND SHRUBS

### CLAMMY AZALEA, *Rhododendron viscosum*.

Gardens, shrubberies. July—August. This is the latest flowering of the deciduous Azaleas, one of the hardiest, most floriferous, and easily managed. It is best in rather moist peat.

*Flowers* white, sometimes pink, fragrant, appearing after leaves, in a terminal *umbellate cluster*; pedicels glandular; *Calyx* small; *Corolla*  $1\frac{1}{2}$ –2 ins. long, viscid, tube densely glandular, longer than lobes, limb 1–2 ins. broad, 2-lipped; *Fruit* a capsule, glandular-bristly,  $\frac{1}{2}$  in. long.

*Leaves* oblong-ovate, entire, acute, or obtuse, ciliated, glabrous, green both surfaces, midrib bristly, 2–4 ins. long.

A deciduous *shrub*, 2–4 ft.; *shoots* bristly.

Introduced from N. America by Peter Collinson, 1734. Known in U.S.A. as Swamp Honeysuckle. Syn. *Azalea viscosa*.

### CALIFORNIAN RHODODENDRON, *Rhododendron californicum*.

Gardens, shrubberies. June. Rhododendrons are better for a mulch of well-decayed manure in May; even decayed leaves or grass cuttings are beneficial if covered with soil. All seed-pods should be removed directly the flowers fade. The species are propagated by cuttings of firm shoots, 3 ins. long, in sandy peat under bell-glass in temperature of  $45^{\circ}$ – $55^{\circ}$ , ultimately raising this to  $65^{\circ}$ ; layering in September or March; grafting on common species in close frame in March; seeds sown on the surface of finely prepared sandy peat under bell-glass in cold frame.

*Flowers* rose-purple,  $2\frac{1}{2}$ –3 ins. diam., in a terminal *umbel*; *Calyx* gamosepalous, 5-toothed, small, slightly pilose; *Corolla* broadly campanulate, 5-lobed, upper petal spotted greenish-yellow, tube very short; *Stamens* 10, shorter than corolla; *Fruit* a capsule, woody.

*Leaves* alternate, obovate-elliptical, entire, acute, coriaceous, glabrous, shortly petiolate, dark-green, paler beneath.

An evergreen *shrub*, 6–8 ft.

Native of California.

## ERICACEÆ

### CATAWBAN RHODODENDRON, *Rhododendron catawbiense*.

Gardens, shrubberies. May—July. This is extremely hardy, and is used as a stock.

*Flowers* lilac-purple, in a *corymbose cluster*, pedicels rusty pubescent, becoming glabrous; *Calyx lobes* small, triangular-ovate, acute; *Corolla* broadly campanulate, 5-lobed,  $1\frac{1}{2}$ –2 ins. long,  $2$ – $2\frac{1}{2}$  ins. broad; *Fruit* a capsule, linear-oblong, rusty pubescent,  $\frac{3}{4}$  in. long.

*Leaves* oval or oblong, rounded both ends, entire, mucronate, incurved, glabrous, deflexed, pale beneath, 3–5 ins. long,  $1\frac{1}{2}$ –2 ins. wide.

An evergreen *shrub*, 4–12 ft.; *Branches* stout.

Introduced from river Catawba, in mountainous regions of Southern United States, 1809.

### ALPINE ROSE, *Rhododendron ferrugineum*.

Rock gardens. May—July. This does best in light sandy peat or leaf-mould.

*Flowers* rose or scarlet, small, less than 1 in. diam., in a terminal *umbel*; *Calyx lobes* 5, short, obtuse; *Corolla* infundibuliform, marked with ash-coloured or yellow dots; *Fruit* a capsule.

*Leaves* small, oblong, attenuated both ends, Box-like, glabrous and shining above, ferruginous spots beneath, ciliated and slightly hairy beneath when young.

An evergreen *shrub*, 1–3 ft.; compact, forming a low spreading bush.

Native of European Alps; introduced 1752. Leaves subject to *Rhododendron* Galls, caused by a fungus (*Exobasidium Rhododendri*).

# TREES AND SHRUBS

## FORTUNE'S RHODODENDRON, *Rhododendron Fortunei*.

Gardens, shrubberies. May.

*Flowers* pale rose, fragrant, 3–5½ ins. diam., in a loose, pendulous *cluster* of 8–10 flowers; *Calyx* discoid, small; *Corolla* shortly campanulate, lobes 7, rounded; *Stamens* 14; *Fruit* a capsule.

*Leaves* oblong or linear-oblong, entire, acute, rounded or cordate at base, bright green above, glaucous below, 5–7 ins. long; petioles red-brown, ½–1 in. long.

An evergreen *shrub*, 10–12 ft.; *Branches* very stout, terete.

Introduced from China, 1859.

## PONTIC RHODODENDRON, *Rhododendron ponticum*.

Woods, gardens, shrubberies. May, June. This is the most largely grown and most popular of Rhododendrons. It is the hardiest and least exacting of the large-flowered species, and is used as a stock for the less hardy.

*Flowers* purple, proterandrous, in a short terminal *corymb*; *Calyx* lobes 5, sub-acute, very short; *Corolla* campanulate-rotate, 2 ins. diam., 5-lobed, lobes lanceolate and acute or obtuse, upper lobe often spotted; *Stamens* 10, filamentous, pink, anthers red; *Ovary* cylindroid, 5-celled; style filamentous, red; stigma capitate, pink; *Fruit* a capsule.

*Leaves* clustered, oblong-lanceolate, acute or obtuse, entire, attenuated both ends, glabrous, pale or slightly ferruginous beneath, coriaceous; petiole short, thick; dying leaves yellow.

An evergreen *shrub*, 6–20 ft.; spreading; *Shoots* rigid, brittle; *Buds* ovoid-conic, pointed, viscid, ferruginous; scales spirally imbricate, triangular-ovate, acuminate.

Native of Spain, Portugal, and Asia Minor; introduced 1763. Known as Rose Bay.



## ERICACEÆ

### *Rhododendron racemosum.*

Rock gardens. April, May. A species of dwarf and compact habit, flowering when only a few inches high; very suitable for rockwork or the Alpine garden.

*Flowers* pinkish-white, edged with deeper pink, 1 in. diam., slightly fragrant, in axillary and terminal *clusters*; *Fruit* a capsule.

*Leaves* alternate, small, oval, entire, acute, or obtuse, coriaceous, bright green, tomentose beneath, 1 in. long.

An evergreen *shrub*, 1–2 ft.; *Stems* erect, brown.

Native of Western China; introduced by Messrs. Veitch, 1880; first exhibited, 1892.

### *Rhododendron yunnanense.*

Gardens, shrubberies. May. This makes a freely-branched, yet somewhat loose-growing bush.

*Flowers* white or pale lilac, in a loose cluster of 4–6; pedicels 1 in. long; *Calyx* small, lobes almost obsolete; *Corolla* spreading, 2 ins. diam.; lobes deep, upper petal with blood-red spots; *Fruit* a capsule.

*Leaves* lanceolate, dark glossy green, hairy above, glaucous beneath, glandularly dotted,  $1\frac{1}{2}$ –4 ins. long,  $2$ – $2\frac{1}{2}$  ins. wide.

An evergreen *shrub*,  $2\frac{1}{2}$ –4 ft.; erect, *shoots* slender.

Native of China. Discovered by the Abbé Delavay at Houanglipin in Yunnan; introduced 1894; first flowered at Kew, 1897.

## GLOBE-FLOWERED MENZIESIA, *Menziesia globularis.*

Gardens. May, June. Moist peaty soil. Propagate by cuttings in sandy soil under bell-glass in summer; layers in autumn; division of plants in autumn.

*Flowers* pink, solitary, axillary, pendulous; *Corolla* globose, lobes rounded; *Fruit* a capsule.

## TREES AND SHRUBS

*Leaves* fascicled at ends of branches, ovate, pale beneath.

An evergreen *shrub*, 3–5 ft.

Introduced from N. America, 1806. Named after Archibald Menzies (1754–1842), surgeon and naturalist to the expedition under Vancouver.

### WHITE ALDER-BUSH, *Clethra acuminata*.

Gardens, shrubberies. July—October. Thrives best in loam and sandy peat, and is invaluable for the lake-side. Propagated by cuttings in sandy soil under bell-glass in October; layering in October; seeds sown outdoors in March, or in boxes of light soil in temperature of 55° in February.

*Flowers* white, fragrant, in a terminal, drooping *raceme*, 2–8 ins. long, almost solitary, bracts longer than flowers, tomentose, caducous; *Calyx* 5-fid; *Corolla* gamopetalous, 5-lobed, so deeply cut as to appear like 5 separate petals; *Stamens* 10, filaments hirsute; *Ovary* superior, 3-celled, style long; *Fruit* a capsule, 3-celled, 3-valved.

*Leaves* alternate, oval or oblong, acuminate, bluntish at base, serrated, thin, glabrous both surfaces, glaucous beneath, 5–7 ins. long, 3–3½ ins. wide.

A deciduous *shrub* or small *tree*, 12–15 ft.

Native of Eastern U.S.A.; introduced by Lyon, 1806. The common name is that used in America.

### SWEET PEPPER-BUSH, *Clethra alnifolia*.

Gardens, shrubberies. July—September. A rather stiff-growing shrub, with leaves resembling our Common Alder, and thriving in damp swampy ground.

*Flowers* white, fragrant, in a terminal erect *raceme*; bracts shorter than flowers, tomentose, deciduous; *Calyx* deeply 5-fid, hoary, lobes oblong, obtuse; *Petals* 5, ovate; *Stamens* 10, filaments glabrous, anthers appendiculate, dehiscing by pores; *Style* longer than *Stamens*; *Fruit* a capsule, sub-globose, 3-celled, 3-valved.

*Leaves* alternate, cuneate-obovate, entire near base, coarsely serrated above,



SNOWDROP TREE (*Halesia tetraphylla*)  
 A. Flowering shoot. B. Flower. C. Flower from below. D. Leaf.





# STYRACEÆ

prominently straight-veined, glabrous and green both surfaces, 1-3 ins. long.

A deciduous *shrub*, 3-4 ft.

Native of Eastern U.S.A.; introduced 1731.

CLASS I. . . . . *Dicotyledons*

DIVISION III. . . . . *Gamopetalæ*

NATURAL ORDER . . . . . *Styraceæ*

Trees or shrubs, with alternate, exstipulate leaves; *Flowers* regular, usually hermaphrodite; *Calyx* gamosepalous, 4-5 teeth or lobes; *Corolla* 4-5 petals; *Stamens* as many, or twice as many, as corolla lobes, sometimes indefinite and polyadelphous; *Ovary* superior or inferior; *Fruit* baccate or drupaceous, 1-seeded.

## SNOWDROP TREE, *Halesia tetraptera*.

Gardens. April, May. Best in rich, moist, loamy or peaty soil, and liking moisture at the roots. Well adapted for a sheltered lawn. Prune into shape in November. Propagated by root-cuttings in sandy soil outdoors in March or October; layering of shoots in October or November.

*Flowers* white, resembling common Snowdrop, 9 or 10 in a lateral *fascicle*, drooping, racemose; *Corolla* monopetalous, ventricosely campanulate, deep 4-lobed border; *Stamens* 8; *Ovary* superior, 4-celled; *Fruit* a drupe, dry, corticate, oblong, 4 winged angles, 1-2 ins. long, cells 1-seeded.

*Leaves* alternate, ovate-lanceolate, sharply serrated, acuminate, glabrous, 2-6 ins. long, 1-3 ins. wide, petioles glandular.

A deciduous *tree*, 20-30 ft.; round-headed; *Bark* corky, furrowed; *Twigs* brown; *Buds* pointed, scales rosy-purple.

A native of N. Carolina; introduced 1756. Also called Silver-Bell Tree. Genus named after Dr. Stephen Hales. Specific name from Gr. *tetra*, four, and *pteron*, wings, referring to the four-winged fruit.

# TREES AND SHRUBS

## JAPANESE STORAX, *Styrax japonicum*.

Gardens. June—August. Best in moist light loam. With its tiny Snowdrop-like bells hanging abundantly on slender stalks, this makes one of the most beautiful of summer-flowering shrubs, and in autumn, its branches laden with clusters of seed-pods present a charming appearance scarcely equalled by any other shrub. The species are propagated by cuttings of half-ripe shoots in spring; layering of shoots in autumn.

*Flowers* white, Snowdrop-like,  $\frac{3}{4}$  in. diam., depending from the undersides of the shoots, in a many-flowered axillary *raceme*, buds pinkish; *Calyx* glabrescent; *Corolla* 5–6-lobed, pubescent; *Stamens* yellow; *Fruit* a drupe, 1-seeded, rarely ripening.

*Leaves* alternate, oblong, or ovate, acuminate, acute at base, usually widest below middle, serrulated or entire, glabrous and bright green above, paler and powdery beneath, 2–3 ins. long.

A deciduous *shrub*, 8–12 ft.; or small *tree*, 20–25 ft.; *Branches* slender; *branchlets* flattened and spreading.

Introduced from Japan, 1868.

### *Styrax Obassia*.

Gardens. June—July. This makes charming masses for beds or borders.

*Flowers* white, fragrant, 1–1½ in. diam., in a nodding *raceme*, 6–9 ins. long; *Fruit* a drupe, ovoid-oblong, size of Hazel-nut.

*Leaves* alternate, elliptical to orbicular, cuspidate, denticulate, hoary-tomentose beneath, 3–8 ins. by 3–8 ins. Autumn tint yellow blotched with red.

A deciduous *shrub* or small *tree*, 4–6 ft.

Introduced from Japan by Maries, 1888.

## MEDICINAL STORAX, *Styrax officinale*.

Gardens. June—July. Requires rich soil; best on south wall.

*Flowers* white, resembling Orange-blossom, in an axillary *raceme*, 3–5-flowered, shorter than leaves; *Calyx* campanulate, 5-toothed; *Corolla*

# JASMINEÆ

5-lobed, often 6-7-partite, segments erecto-patent; *Stamens* 10; *Fruit* a drupe, globose, 1-celled, generally 3-sided, green, ripe in October.

*Leaves* alternate, oval-obovate, entire or serrated, often rounded at apex, sub-acute at base, bright shining green above, hoary-tomentose beneath,  $1\frac{1}{2}$  2 ins. long.

A deciduous *shrub* or small *tree*, 4-10 ft.; *roots* very fine.

Native of Levant; naturalised in S.W. Europe; introduced 1597.

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CLASS I. . . . . *Dicotyledons*

DIVISION III. . . . . *Gamopetalæ*

NATURAL ORDER . . . . . *Jasmineæ*

Mostly twining shrubs, with opposite or alternate, exstipulate leaves, ternate, imparipinnate, or simple; *Flowers* regular, often fragrant; *Calyx* 5-8-fid; *Corolla* 5-8-lobed, often hypocrateriform or infundibuliform, imbricate in bud; *Stamens* 2, epipetalous; *Ovary* superior, 2-celled; *Fruit* baccate or capsular.

Closely related to, and often included in, the Order Oleaceæ, differing from them only by the imbricated æstivation of the corolla, and the ovules being erect instead of pendulous.

## SHRUBBY JASMINE, *Jasminum fruticans*.

Gardens, walls. June—August. Prefers sunny situation, and shelter in cold districts. The species are propagated by cuttings in well-drained pots of sandy soil in cold frame or in sheltered border September—December; layering of shoots in summer.

*Flowers* golden-yellow, in a terminal *corymb*; *Petals* oblong, obtuse; *Fruit* a berry, blackish-purple.

*Leaves* alternate, ternate, leaflets obovate or cuniform, obtuse.

An evergreen *shrub*, 10-12 ft.; *Branches* angular; *Suckers* numerous.

Native of S. Europe; introduced 1570.

# TREES AND SHRUBS

## YELLOW JASMINE, *Jasminum nudiflorum*.

Shrubberies, walls. December—March. Prefers sunny situations. During the winter months this charming species has its branches wreathed with star-shaped golden blossoms. It is not particular as to soil, but likes ample supplies of water during summer. Being practically surface rooting, it should not be disturbed by digging. It may be pruned moderately after flowering, removing only shoots that have flowered.

*Flowers* yellow, fragrant, solitary, opposite throughout length of branches; *Calyx* gamosepalous, 6-fid, inferior; *Corolla* gamopetalous, hypocrateriform, 1 in. diam., 6-lobed, imbricate in bud; *Stamens* 2, epipetalous; *Ovary* superior, 2-celled; *Fruit* a berry, 2-celled.

*Leaves* very small, numerous, resembling bracts, ternate, leaflets bluntly ovate, deep glossy green.

A sub-evergreen *shrub* with rambling habit; *Stems* 10–20 ft. long, slender, numerous, flexible, green, small twiggy branches; growth rapid.

Native of China; introduced 1844. “*Jasminum*” is the Arabic name,—Persian, “yasmin.” Known also as Chinese Winter Jasmine.

## WHITE JASMINE, *Jasminum officinale*.

Walls, bowers, verandahs. June—September. Best in a dry soil and sunny aspect. It will stand hard pruning.

*Flowers* waxy-white, fragrant, in a terminal *corymbose cyme* at ends of young shoots, pedicels longer than calyx; *Calyx* gamosepalous, deeply 4–5-fid, inferior; *Corolla* gamopetalous, 4–5-cleft, hypocrateriform, lobes acuminate; *Stamens* 2, epipetalous; *Ovary* superior, 2-celled; *Fruit* a berry.

*Leaves* opposite, imparipinnate, leaflets 5–9, ovate, entire, acuminate, terminal the largest, bright green.

A sub-evergreen *climbing shrub*, 20–30 ft.; *Branches* flexible, angular, shoots slightly pubescent, deep green; growth rapid.

Native of S. Asia; introduced 1548.







WHITE JASMINE (*Jasminum officinale*)

## OLEACEÆ

### CURLED-LEAVED JASMINE, *Jasminum revolutum*.

Walls, arbours. May—October. Requires warm, sunny aspect.

*Flowers* bright yellow, fragrant, in a compound terminal *corymbose panicle*, pedicels longer than calyx; *Calyx teeth* 5, shorter than tube; *Corolla* salver-shaped, lobes 5, obtuse, ovate, shorter than tube; *Fruit* a berry, globose, didymous.

*Leaves* alternate, imparipinnate, leaflets 5–7, ovate-lanceolate or elliptic, shortly petiolate, coriaceous, glabrous, dark glossy green,  $\frac{1}{2}$ –2 ins. long.

A sub-evergreen *climbing shrub*, 10–20 ft.; *Branches* angled.

Native of N. India; introduced 1812. A form of *J. humile*.

### WALLICH'S JASMINE, *Jasminum wallichianum*.

Walls, arbours. June—October. Best in sunny situation.

*Flowers* bright yellow, smaller than *J. revolutum*; *Inflorescence* terminal, sub-corymbose; peduncles elongated, one-flowered; *Corolla lobes* 5 or 6, obtuse; *Fruit* a berry.

*Leaves* alternate, imparipinnate, leaflets 7–9, ovate-lanceolate or oblong-acuminate, sessile, pubescent when young, dark green.

An evergreen *climbing shrub*, 10–20 ft.; dense, softly tomentose.

Native of N. India; introduced 1827. Named in honour of Dr. Wallich. A form of *J. humile*. Synonymous with *J. pubigerum* (L. *pubes, cris*, downy pubescent).

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER	.	.	.	.	<i>Oleaceæ</i>

Shrubs or trees with usually opposite, exstipulate, simple, or pinnate leaves, and regular flowers, mostly hermaphrodite, rarely dicecious or polygamous; *Calyx* inferior, 4, or many, toothed or lobed, sometimes wanting; *Corolla*

## TREES AND SHRUBS

hypogynous, 4-6-partite, or of free petals; *Stamens* usually 2, epipetalous or hypogynous; *Ovary* superior, 2-celled; *Fruit* 1-2-celled, indehiscent, or a capsule, berry, or drupe.

### GOLDEN BELL, *Forsythia suspensa*.

Gardens, shrubberies, walls, fences. March—April. This is one of the most charming of early flowering shrubs, its exceedingly graceful and slender shoots being wreathed with blossoms, so closely set as to look like a stream of gold. It is a delightful plant when trained on a wall, and gives a fine effect when planted in a mass in a sunny position where it can ripen its young wood. Old wood should be cut out after flowering, and shoots cut back where necessary. Propagated by cuttings inserted in sandy soil under bell-glass or handlight in autumn; layering in autumn; grafting on Privet in March or April.

*Flowers* yellow, appearing before leaves, solitary, drooping, scattered, in axils of previous year's leaves, peduncle slender; *Calyx* 4-partite, segments linear-oblong; *Corolla* 4-partite, 1 in. long, lobes linear-oblong, orange lines at base inside; *Stamens* 2, hypogynous; *Ovary* superior, 2-celled, stigma lobed.

*Leaves* opposite, simple and trifoliate on same branch, central leaflet largest, serrate, acute, glabrous.

A deciduous *shrub*, 8-12 ft.; rambling; *Branches* long, slender, pendulous, easily rooting when meeting the ground; *Twigs* brown; *Buds* pointed, scales brown; *Suckers* freely produced.

Native of China and Japan. Said to have been introduced into Holland from China 1833, and to England 1850; also to have been sent home from Japan by Fortune, 1861. Generic name in honour of William Forsyth (1737-1804), the King's gardener at Kensington. Syns. *F. Fortunei* and *F. Sieboldi*.





LILAC.  
(*Syringa vulgaris*.)



## OLEACEÆ

### GOLDEN BELL, *Forsythia viridissima*.

Gardens, shrubberies. March—April. This is a species of more compact, erect, and bushy growth than the former. It likes full sun and air, and does well either in masses or on a wall or trellis.

*Flowers* greenish-yellow, resembling *F. suspensa*, appearing before leaves, solitary, numerous, peduncles much shorter than flowers, bracteolate.

*Leaves* opposite, simple, linear-lanceolate or oblong, entire, acute, dark green.

A deciduous *shrub*, 4–10 ft.; erect; *Branches* erect, very green, terete.

Introduced from China, 1845. Specific name = very green (*L. viridis*, green).

### HIMALAYAN LILAC, *Syringa Emodi*.

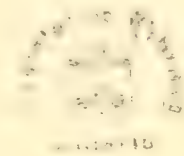
Gardens. July—August. Its spotted shoots make this a very distinctive species of Lilac. It is the last to flower. The various species should be kept free from suckers. They may be pruned moderately after flowering, removing or shortening only shoots that have flowered. They are propagated by layering of shoots in September; suckers planted October—February; choice varieties by budding on common species in July; seeds sown in sunny position outdoors in spring or autumn.

*Flowers* white, small,  $\frac{1}{5}$  in. diam., very fragrant, in a rather large terminal *thyrsoid panicle*, 3–5 ins. long, pubescent; *Calyx* minute, 4-toothed; *Corolla tube*  $\frac{1}{4}$  in. long; *Fruit* a 2-valved capsule, coriaceous, almost cylindrical, often curved,  $\frac{3}{4}$  in. long.

*Leaves* opposite, oblong-elliptical, acute, tapering towards base, entire, deep green above, glaucous beneath, glabrous, 4 ins. or more in length, secondary nerves prominently reticulated beneath, petioles  $\frac{1}{2}$ – $\frac{3}{4}$  in. long.

A deciduous *shrub*, 6–10 ft., or small tree; *Shoots* bronze-green, spotted with white; *Buds* acute.

Introduced from the Himalayas, 1840. Seeds first sent home by Dr. Royle. Syns. *S. Bretschneideri* and *S. villosa*.



## TREES AND SHRUBS

### JAPANESE LILAC, *Syringa japonica*.

Gardens. July. This is the most robust species, being almost indifferent as to soil, but preferring a sunny position. In appearance and scent it somewhat resembles the Privet.

*Flowers* creamy-white, very small,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam., in a large, dense-flowered *thyrsus*, 12 ins. or more long; *Corolla tube* included in calyx; *Stamens* exserted; *Fruit* a capsule, oblong, obtuse, smooth.

*Leaves* broad ovate, with a round or sub-cuneate base, obtuse or acuminate, glabrous above, dark green, thick, coriaceous, 5–8 ins. long, 3–3½ ins. wide, midrib and veins pubescent beneath.

A deciduous *shrub*, 15–25 ft.; *Branches* slender; *Bark* light red, occasionally scaly; *Trunk* and *Branches* marked with raised, white, oblong dots (lenticels); *Buds* very small.

Synonymous with *Ligustrina amurensis* v. *japonica*. Native of China, Japan, Manchuria; introduced 1885.

### LILAC, *Syringa vulgaris*.

Gardens. May. “No flowering shrub, either native or foreign, except the Rose, has become more closely identified with English gardens and English country scenes.”—*The Garden*.

*Flowers* lilac or white, very fragrant, in a terminal *thyrsoid panicle*; *Calyx* campanulate, irregularly 4-toothed, persistent; *Corolla* regular, 4-partite, limb slightly concave; *Stamens* 2, inserted near apex of tube; *Ovary* superior, 2-celled, stigma bifid; *Fruit* a woody capsule, ovate-oblong, much compressed, 2-valved; *seeds* about 4, with membranous wing.

*Leaves* opposite, ovate or ovate-cordate, petiolate, exstipulate, entire, acute, glabrous, thin, paler beneath, 2–4 ins. by 2–3 ins. Autumn tint brown.

A deciduous *shrub*, 8–20 ft. or more; *Branches* grey to brown; *Twigs* smooth, round, yellowish-grey to olive or brown; *Bark* scaly; *Buds* ovoid, quadrangular, glabrous; *Wood* used for small turnery.





LILAC (*Syringa vulgaris*)

A. Fruit. B. Longitudinal section of fruit. C. Longitudinal section of flower. D. Single fruit capsule.  
E. Fruit capsule dehiscent. F. Transverse section of fruit.



## OLEACEÆ

Native of Persia ; introduced from S. Europe, 1597, under name of Pipe-tree  
Name Lilac is Spanish,—Arab. “lilak,” a lilac ; Persian,—“lilaj, lilanj, lilang”  
= indigo plant. The Arab. “lilak (nilak)” = bluish ; named from bluish tinge of  
flowers (Skeat).

### MANNA ASH, *Fraxinus Ornus*.

Gardens, lawns. May, June. The dense waving plumes of greenish-white  
blossoms make this one of the most ornamental and desirable of hardy deciduous  
trees. It is propagated by layering in autumn, and grafting on the common  
species in March.

*Flowers* greenish-white, very sweet-scented, in a dense pendulous *panicle* of  
axillary clusters, peduncles shorter than leaves ; *Calyx* gamosepalous, 4-partite,  
inferior ; *Corolla* 4 free petals, only slightly united at base, linear, hypogynous ;  
*Stamens* 2, hypogynous ; *Ovary* superior, 2-celled, stigmas 2 ; *Fruit* a samara,  
brown.

*Leaves* opposite, imparipinnate ; leaflets lanceolate or elliptic, attenuated,  
serrate, entire at base, petiolate, villous or downy beneath. Autumn tint  
bronze.

A deciduous *tree*, 20–30 ft. ; round-headed ; *Branches* when young purplish or  
livid, with yellow dots ; growth slow.

Introduced from S. Europe, 1730. Synonymous with *Ornus europæa* and  
*F. paniculata*.

### ASH, *Fraxinus excelsior*.

Woods, hedges, parks, and gardens. March—May. “While the oak has been  
justly called the Hercules of the forest, the Ash has equally merited the title of  
the Sylvan Venus, from the elegance of its form, the feathery lightness of its  
foliage, and the graceful waving of its branches—qualities especially to be  
appreciated when it is grouped with other trees of more massive character, or, as  
we have frequently seen and admired it, growing, as it loves to do, by brook or

## TREES AND SHRUBS

river side." It prefers cool and damp situations. Propagated by seed, which should be mixed with sand and laid in an open pit till February, being occasionally turned over to prevent heating; sow in sandy soil, and transplant after two years; after another two years permanently plant in mild weather of autumn or early spring.

*Flowers* greenish-yellow, polygamous or diœcious, proterogynous, without perianth, appearing before leaves, in a short, dense, axillary *panicle*, arising from sides of leaf-buds near tips of young shoots; *Stamens* 2, opposite, hypogynous, purple; *Ovary* 2-celled, stigmas sub-sessile, bifid, purple; *Fruit* a samara (key), in drooping bunches, compressed, linear-oblong, winged upwards, slightly notched at tip, 1-1½ in. long, glossy green streaked with black; produced after forty years; ripe in October, often persisting through winter.

*Leaves* opposite, imparipinnate, 12 ins. long or more, petiolate, exstipulate, leaflets 7-13 or more, oblong-lanceolate, serrate, acuminate, almost sessile, 3 ins. long, thin, glabrous; petiole and midrib grooved. Autumn tints brown and yellow; leaflets disarticulating as they fall.

A deciduous *tree*, 60-80 ft.; *Branches* often turning downwards and then upwards at extremities; *Twigs* somewhat dichotomous, compressed, usually only one shoot in each pair coming to maturity, often the lower one, giving rise to pendent boughs; *Buds* large, quadrangular, protected by very dark olive-green scales, which are modified petioles; *Bark*, pale grey, grooved; *Wood* hard, light, strong; toughest and most elastic of British timber; used for coach and wheelwrights' work, agricultural implements, domestic arts, and turnery; in young state (ground Ash) for walking-sticks, hoops, and hop poles.

A native of Britain; lives to about 200 years. Common name from A.S. *æsc*, the Ash-tree.

Timber bored by larvæ of Goat Moth (*Cossus ligniperda*) and Wood Leopard Moth (*Zeuzera æsculi*).

*Fungoid Pests*:—Ash-leaf Spot (*Septoria Fraxini*), Heartwood-rot (*Polyporus hispidus*).







ASH (*Fraxinus excelsior*)

A. Branch, with fruit at early stage. B. Flowers at early stage. C. Hermaphrodite flower. D. Flower cluster. E. Staminate flower. F. Mature flowers. G. Fruit (keys).

## OLEACEÆ

### NARROW-LEAVED JASMINE BOX, *Phillyræa angustifolia*.

Gardens, shrubberies. April—May. Requires shelter in north of England. The species of *Phillyræa* are propagated by cuttings of firm shoots in sandy soil in cold frame in September; by grafting on the Common Privet in March.

*Flowers* white, inconspicuous, fragrant, in an *axillary cluster*; *Calyx* inferior, 4-lobed; *Corolla* 4-lobed, lobes obtuse, imbricate; *Stamens* 2; *Ovary* superior, 2-celled; *Fruit* a drupe, 1-2 seeds.

*Leaves* opposite, linear-lanceolate, entire, glabrous, obsoletely veined, deep green,  $1\frac{1}{2}$ –2 ins. long.

An evergreen *shrub*, 8-12 ft.; *Branches* with elevated dots (lenticels).

Native of Italy and Spain; introduced 1597. Sometimes known as Mock Privet. Generic name from *Philyra*, the old Greek name used by Theophrastus for the Privet.

### VILMORIN'S MOCK PRIVET, *Phillyræa decora*.

Gardens, shrubberies. May, June. This is a beautiful free-growing shrub of somewhat spreading habit. The small white flowers usually commence at about 6 inches from the end of the shoot, and from that point extend for about a foot in dense axillary clusters, forming a perfect wreath of blossom. It is the best of the species, well withstanding frost, and does well in smoky districts, but will not thrive in cold, heavy soil. It is sometimes grafted on the Privet, but is better on its own roots.

*Flowers* white, small, fragrant, numerous, in *axillary clusters*; *Fruit* a drupe, oblong, reddish-purple to black,  $\frac{1}{4}$  in. long, ripe in September.

*Leaves* opposite, resembling Portugal Laurel, ovate, acuminate, entire, slightly revolute, stiff, coriaceous, glabrous, dark green, 4-6 ins. long,  $1\frac{3}{4}$  in. wide.

An evergreen *shrub*, 3-10 ft.; much-branched.

Introduced 1885. Discovered by Balansa in mountain valleys of Lazistan. Known in gardens as *P. vilmoriniana* and *P. laurifolia*.



# TREES AND SHRUBS

## BROAD-LEAVED JASMINE BOX, *Phillyræa latifolia*.

Gardens, shrubberies. May. A species of somewhat bushy habit, well adapted for the seaside garden.

*Flowers* white, inconspicuous, in *axillary clusters*; *Fruit* a drupe.

*Leaves* opposite, ovate, rounded at base, acute or obtuse, obsoletely serrated, glabrous, dark green above, lighter below, veiny, 1 in. long; young leaves orbicular, sub-cordate at base; petioles cano-pubescent.

An evergreen *shrub*, 20-30 ft.; *Twigs* pubescent, beset with elevated dots (lenticels); *Buds* minute, scales violet.

Introduced from S. Europe, 1597. Subject to *Phillyræa* Leaf-spot (*Phyllosticta Phillyræa*).

## MOCK PRIVET, *Phillyræa media*.

Gardens, shrubberies. May.

*Flowers* white, inconspicuous, in *axillary clusters*; *Fruit* a drupe.

*Leaves* opposite, lanceolate, acuminate, entire, or slightly serrated in middle, veiny.

An evergreen *shrub*, forming a dense bush, 10-18 ft. high.

Introduced from S. Europe about 1597. Most common species in English gardens; several varieties of all three species are grown, often grafted on the Privet. Leaves subject to *Phillyræa* Leaf-spot (*Phyllosticta Phillyræa*) and *Phillyræa* Rust (*Uredo Phillyræa*).

## HOLLY-LEAVED OLIVE, *Osmanthus Aquifolium*.

Gardens, shrubberies. August, September. A rich loamy soil and warm position is desirable. It is a beautiful, free-growing shrub, rather like a Holly, and often mistaken for such. Propagated by cuttings of firm shoots in sandy soil under handlight outdoors, or in frame in summer; seeds in sandy peat in cold frame in spring or autumn.



## OLEACEÆ

*Flowers* greenish-white, small, very fragrant, axillary; *Calyx* 4-lobed; *Corolla* 4-lobed, imbricate; *Stamens* 2; *Ovary* superior; *Fruit* a drupe.

*Leaves* opposite, oval or oblong, prickly-toothed, resembling Holly, coriaceous, glabrous, shining deep green, 3-4 ins. long.

An evergreen *shrub*, 6 ft.; *Bark* of young shoots almost black.

Native of Japan. Generic name from Gr. *osme*, perfume, and *anthos*, a flower.

### WHITE FRINGE TREE, *Chionanthus virginica*.

Gardens, shrubberies. May—July. Will flourish in moist, sandy peat or loam, in somewhat shady position. Propagated by grafting on Ash in March; budding on Ash in July; seeds in sandy soil in cold frame in April.

*Flowers* white, fragrant, perfect and andro-dioecious, in a drooping *panicle* of 3-flowered clusters, pubescent, 4-6 ins. long, bracteate and bracteolate; *Calyx* minute, 4-partite, inferior; *Petals* 4, long and narrow, fringe-like, hypogynous; *Stamens* 2-4, inserted on base of corolla, anthers yellow, connective green; *Ovary* ovate, style short, stigma fleshy, 2-lobed; *Fruit* a drupe, purple, glaucous, oval or oblong, 1 in. long, flesh thin and dry, stone thick-walled, crustaceous, foliaceous bracts 2 ins. long; ripe in September.

*Leaves* opposite, oval, oblong, or obovate-lanceolate, entire, ciliate, acute or obtuse, glabrous, petiolate, exstipulate, dark shining green above, pubescent on veins below, 4-8 ins. long,  $\frac{1}{2}$ -4 ins. wide. Autumn tint yellow.

A deciduous *shrub* or small *tree*, 10-15 ft.; *Branchlets* angled, compressed at top; *Bark* smooth, light-coloured; *Buds* ovate, acute; scales brown, ciliate; *Wood* heavy, hard, close-grained, light brown.

Introduced from N. America, 1796; there reaches 30 ft. Generic name from Gr. *chion*, snow, and *anthos*, a flower, referring to snow-white flowers.

### IBOTA PRIVET, *Ligustrum Ibot*a.

Gardens. August. The Privets are most suitable for growing in town gardens, and make good hedges. The deciduous kinds may be pruned in autumn, and evergreens in April. Propagate by cuttings of young shoots

## TREES AND SHRUBS

2-4 ins. long in shady position outdoors or under handlight in summer; cuttings of firm shoots 8-12 ins. long in shady position outdoors, September—November; layering of shoots, September or October; seeds (berries) in open ground in November, transplanting largest seedlings in following October, and remainder next year.

*Flowers* white, in a large *thyrsoid panicle*; *Calyx* 4-toothed; *Corolla* salver-shaped, 4-lobed; *Stamens* 2; *Ovary* superior, 2-celled; *Fruit* a berry, round, shining, black.

*Leaves* ovate or elliptical, rarely lanceolate, obtuse, thick, fleshy, glabrous, principal vein hairy beneath.

A deciduous *shrub*, 6-8 ft.; *Branches* long, slender, arching; *Twigs* terete.

A native of Japan and China; introduced 1861.

### JAPANESE PRIVET, *Ligustrum japonicum*.

Gardens, shrubberies. June, July. Prefers dry soil and shelter. It makes a good hedge.

*Flowers* white, slightly fragrant, in a large, lax, *thyrsoid panicle*; *Fruit* a berry.

*Leaves* ovate or oblong-ovate, acuminate, dark glossy green, glabrous, coriaceous, 2-3 ins. long, young leaves tinged with purple.

An evergreen *shrub*, 5-10 ft.; or *tree*, 30 ft.

Introduced from Japan by Siebold, 1845.

### SHINING PRIVET, *Ligustrum lucidum*.

Gardens, shrubberies. September—October. The large glossy evergreen leaves and Lilac-like panicles of sweet-smelling flowers make this perhaps the handsomest and most striking of the Privets. Best in rich soil, well drained, near sunny wall.

*Flowers* white or cream, fragrant, in a much-spreading *terminal thyrsoid panicle*, 6-8 ins. long and broad; *Fruit* a berry.

## OLEACEÆ

*Leaves* oval, oval-lanceolate, elliptical or nearly rotundate, acute, dark glossy green above, paler below, veins prominent, coriaceous, 6 ins. long, 2 ins. wide.

An evergreen *shrub*, 8–12 ft.; or a *tree*, 20 ft.; erect, twiggy; *Branches* specked with lenticels.

Introduced from China by Sir Joseph Banks, 1794. Known as the Woa Tree. Specific name, *L. lucidum* = shining.

### OVAL-LEAVED PRIVET, *Ligustrum ovalifolium*.

Gardens, hedges. June, July. A vigorous town shrub of somewhat erect and stiff habit, very valuable as a hedge plant.

*Flowers* yellow-white, as in *L. vulgare*, in a terminal *thyrsoid panicle*, small, dense, odour heavy, somewhat unpleasant; *Fruit* a berry.

*Leaves* oval, oval-elliptical, or obovate, shortly petiolate, reticulately veined, dark green above, lighter beneath, almost persistent.

A sub-evergreen *shrub*, 6–10 ft.

A native of Japan; introduced 1877.

### CHINESE PRIVET, *Ligustrum sinense*.

Gardens. July, August. Needs a well-drained soil. Thrives best when sheltered by other trees.

*Flowers* white or cream, small, very abundant, in a feathery *panicle*, compressed; *Fruit* a berry, black-purple.

*Leaves* decussate, ovate-lanceolate, shining above, hairy beneath, light green, petioles twisted so as to give the appearance of a distichous arrangement.

A sub-evergreen *shrub*, 12 ft.; or *tree*, 20 ft.; *Branches* arching, smaller *branchlets* frond-like, pubescent.

Introduced from China by Fortune, 1874.

# TREES AND SHRUBS

## COMMON PRIVET, *Ligustrum vulgare*.

Thickets, hedgerows, gardens. June, July. Best in a moist and strong loamy soil.

*Flowers* white, changing to reddish-brown, fragrant, in a panicled, *thyrsoid* cyme, 1-3 ins. long; *Calyx* slightly 4-toothed; *Corolla* 4-lobed, short tube; *Stamens* 2, short, within tube; *Ovary* superior, 2-celled, ovoid, stigma bifid, obtuse; *Fruit* a berry, purple-black, globular, 2-celled,  $\frac{1}{3}$  in. diam., flesh oily; *seeds* ovoid; ripe in November, persistent through winter.

*Leaves* nearly evergreen, opposite, elliptical-lanceolate or oblong, acute, entire, glabrous, shortly stalked, 1-2 $\frac{1}{2}$  ins. Autumn tint purplish.

A sub-evergreen *shrub*, 6-10 ft.; *Branches* slender, wiry; *Twigs* smooth.

Common in S. England; especially favours chalk districts and coast cliffs; also indigenous in S. Ireland.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER	.	.	.	.	<i>Apocynaceæ</i>

Trees, shrubs, or rarely herbs, usually with milky juice; *Leaves* opposite, rarely whorled or alternate, entire, exstipulate; *Calyx* 4-5-fid, salver-shaped or campanulate; *Corolla* hypogynous, 4-5-lobed, twisted in bud; *Stamens* 5, rarely 4, included within corolla tube, anthers sometimes adhering to the stigma; *Ovary* superior, 2-, or rarely 1-celled, of 2 carpels, sometimes distinct below, but united in the style and stigma; stigma often swollen above or below, constricted in middle; *Fruit* of 1 or 2 follicles, or a capsule, berry, or drupe.

Distinguished from Gentianaceæ chiefly by the ovary completely divided into 2 cells, or more frequently into 2 distinct carpels, with the style, or at least the stigma, entire.





PRIVET (*Ligustrum vulgare*)

A. Flowering branch. B. Fruit. C. Flower. D. Stamen, opening along sides.  
E. Section of drupe. F. Flower opened to show stamens and pistil.



## APOCYNACEÆ

### GREATER PERIWINKLE, *Vinca major*.

Woods, shady banks, gardens. April, May. This makes a useful trailer for rough banks or stumps. Propagate by division in March or April.

*Flowers* blue-purple, solitary and axillary, pedicels shorter than leaves; *Calyx* 5-partite, segments narrow, equalling corolla tube, ciliate on margins, glandular at base inside; *Corolla* 5-lobed, tube almost campanulate, slightly contracted at mouth, hairy inside, limb flat, spreading, lobes broad, almost angular; *Stamens* 5, epipetalous, enclosed in tube, filaments short, anthers inflexed, tipped with membrane, bearded; *Ovary* of 2 carpels, distinct at base, connate at apex, style 1, stigma oblong; *Disk* of 2 glands alternating with the carpels; *Fruit* of 2 follicles, oblong, terete, each of 1 cell, greenish; *seeds* several, seldom ripened.

*Leaves* opposite, broadly ovate, or cordate at base, entire, ciliate, shining green.

An evergreen *under-shrub*; *Barren shoots* long, trailing, not tough; *flowering stems* nearly erect in flower, afterwards elongating, rooting at tip only; *Root-stock* creeping.

A native of Britain. Known also as Rand-plant and Cut-finger.

### LESSER PERIWINKLE, *Vinca minor*.

Woods, copses, hedge banks, gardens. April, May.

*Flowers* blue-purple, solitary and axillary, peduncles short; *Calyx* 5-partite, segments broad,  $\frac{1}{3}$  length of corolla tube, glabrous; *Corolla* 5-lobed, tube more open than in *V. major*; *Fruit* of 2 follicles, rare.

*Leaves* opposite, elliptic-ovate or oblong, narrow, glabrous, 1-1 $\frac{1}{2}$  in. long, petioles short.

An evergreen *under-shrub*; *Barren shoots* trailing, tough, 1-2 ft. long, rooting; *flowering stems* short, erect.

A native of Britain.

# TREES AND SHRUBS

CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER.	.	.	.	.	<i>Loganiaceæ</i>

Trees, shrubs, or herbs, mostly with a very bitter juice; *Leaves* opposite, entire, and usually stipulate; petioles sometimes dilated and connate at base, with the stipules reduced to an obsolete border; *Calyx* 4-5-partite, sepals sometimes distinct; *Corolla* 4-5 or 10-cleft; *Stamens* epipetalous, equal in number to lobes of corolla, alternate with lobes when 4-5, opposite when 10; *Ovary* superior, usually 2-celled, rarely 3-4-celled; *Fruit* drupaceous, capsular, or baccate.

## COLVILLE'S BUDDLEIA, *Buddleia Colvillei*.

Gardens. June—August. Hardy in West of England. Best against a south-west wall, or as a bush in a warm corner in well-drained soil. Sir J. Hooker calls this the handsomest of Himalayan shrubs. Prune away dead or straggling shoots. Propagated by cuttings of firm shoots with heel in sandy soil in cold frame in September; seeds in light soil in temperature of 60° in March.

*Flowers* rosy-purple or crimson, resembling a small Pentstemon, in a *thyrsiform panicle*, 1-1½ ft. long, drooping pedicels ¼ in. long, bracteoles small, setaceous; *Calyx* broad-campanulate, ¼ in. long, lobes hairy; *Corolla* infundibuliform, 4-lobed, 1 in. long, ¾ in. diam., white ring round mouth; *Stamens* 4, anthers on short filaments; *Fruit* a capsule, 2-valved, lanceolate, tomentose, ½-¾ in. long.

*Leaves* opposite, elliptic-lanceolate, acuminate, serrate, glabrous and dark green, stellate-rusty tomentose or nearly glabrous beneath, 5-7 ins. long, petiole short.

A deciduous *shrub*, or small *tree*, 10-12 ft.

Native of Sikkim, there grows to 30 ft. Raised from seed by Messrs. Veitch and Sons; probably flowered for first time in Europe at Queenstown, Ireland, 1892; first flowered at Kew, 1900.



## LOGANIACEÆ

### ORANGE-BALL TREE, *Buddleia globosa*.

Gardens. May, June. Warm soils in S. England, on south or south-west walls in colder districts. In the neighbourhood of London it is the handsomest and most useful of the *Buddleias*. It prefers a rich, moist soil.

*Flowers* orange-yellow, in a terminal, globose, *cymose cluster*, 1 in. diam., pedunculate; *Calyx* equally 4-toothed; *Corolla* tubular-campanulate, 4-cleft, limb spreading; *Fruit* a capsule.

*Leaves* opposite, lanceolate, acuminate, crenate, 6 ins. long, upper side dark green and wrinkled, under side pale brown hoary tomentose, reticulately veined, petioles short.

A deciduous *shrub*, 10–20 ft.; *Branches* sub-tetragonal, hoary tomentose; growth rapid.

Native of Chili and Peru; introduced by Messrs. Lee & Kennedy, 1774. Genus named in honour of Rev. Adam Buddle, at one time Vicar of Farnbridge, in Essex (died 1715).

### *Buddleia paniculata*.

Gardens. May, June. Thrives in loamy soil.

*Flowers* lilac, fragrant, in a dense terminal *panicle*, flowers nearly sessile, bracts lanceolate; *Calyx* 4-partite, persistent, tomentose, lobes short, obtuse; *Corolla* 4-cleft, tube  $\frac{1}{3}$  in. long, tomentose, imbricate; *Stamens* 4, inserted on corolla tube, anthers nearly sessile; *Ovary* superior, 2-celled, style clavate; *Fruit* a 2-valved capsule.

*Leaves* opposite, very variable, oblong-lanceolate, entire, or hastate and deeply sinuate-dentate, greyish-tomentose, petiole sometimes winged.

A deciduous *shrub*, 6–8 ft.; *Branchlets* tomentose; *Bark* peeling.

Native of Afghanistan, Baluchistan, N. India, and China. Discovered by Dr. Wallich in Kumaon; seeds sent to Great Britain by Major Maddon.



# TREES AND SHRUBS

CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER	.	.	.	.	<i>Solanaceæ</i>

Herbs, erect or climbing shrubs, or rarely trees, with alternate, exstipulate leaves, sometimes with a smaller leaf below; *Flowers* regular or slightly irregular, hermaphrodite, solitary or in cymes, either axillary or extra-axillary; *Calyx* usually 5-partite, inferior, persistent; *Corolla* usually 5-lobed, regular or slightly irregular, hypogynous; *Stamens* 5, epipetalous, alternating with corolla lobes; *Ovary* superior, 2-celled, placentation axile; *Fruit* a berry or capsule.

Distinguished by the regular flowers with epipetalous stamens equal in number to the corolla lobes, and the superior many-seeded ovary with axil placentæ. The epipetalous stamens mark them off from the Ericaceæ, the axile placentation and leaves without ribs from the Gentianaceæ, the regular symmetrical flowers from the Scrophularineæ, and the axile placentation and stamens alternating with petals from the Primulaceæ.

## TEA TREE, *Lycium halimifolium*.

Walls, trellis-work. May—August. “Though not a very showy flowering shrub, it is not without value, as there are few others that are so rapid in growth, so graceful, and so indifferent to the nature of the soil; it will, in fact, grow anywhere, and there is not a better shrub for clothing an ugly steep bank, where little else in the way of shrubs would thrive. It is also a capital shrub for covering porches, pergolas, arbours, verandahs, and such like, and in late summer and autumn, when every long, drooping branch is thickly hung with small orange-scarlet berries, it has an extremely pretty appearance.”—*The Garden*.

*Flowers* purple or lilac, changing to greenish-yellow at base inside, twin, extra-axillary, pedicels long, slender; *Calyx* 5-lobed, 2-lipped; *Corolla* infundibuliform, tube as long as limb,  $\frac{1}{2}$  in. diam., lobes ovate-oblong, hairy at margin, honey guides; *Stamens* 5, exserted, spreading, filaments long and slender; *Ovary* superior, 2-celled, style filiform, stigma dilated; *Fruit* a berry, orange-scarlet, ovoid-oblong, persistent cup-like calyx below, seeds numerous.

## SOLANACEÆ

*Leaves* alternate, sub-sessile, lanceolate or elliptical lanceolate, acute, attenuated both ends, entire, flat, glabrous, 2-4½ ins. long, 1-1½ in. wide. Autumn tint yellow.

A deciduous climbing *shrub*, 6-12 ft.; *Branches* angular, long, slender, arched, sometimes axillary thorns; *Twigs* grey; *Buds* naked.

Sometimes called Barbary Box Thorn. Generic name from Gr. *Lukion*, name given to the Rhamnus by Dioscorides, as coming from Lycia, in Asia Minor. Syns. *L. barbarum* (Aiton), *L. europæum* (Gouan).

### CHINESE BOX THORN, *Lycium chinense*.

Gardens. May—July. A hardy, straggling climber, good for the wild parts of the garden or old walls. Pruning may be done, October—February, removing weak shoots, and shortening vigorous ones. Propagated by cuttings of firm shoots 6-8 ins. long in shady position, September or October; layering of shoots, September—November; suckers, October—February.

*Flowers* purple, solitary or twin; *Corolla tube* short, constricted in middle; *Stamens* with filaments fringed at base, closing tube; *Fruit* a berry, orange-scarlet.

*Leaves* alternate or in threes, 1 large and 2 much smaller, ovate, acute, attenuated at base, entire, glabrous, paler green beneath.

A deciduous climbing *shrub*, 6-8 ft.; *Branches* pendulous, prostrate, striated, grey.

Native of China.

CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER .	.	.	.	.	<i>Scrophularineæ</i>

Herbs, shrubs, or small trees, with various exstipulate leaves, and usually irregular flowers; *Calyx* 4-5-toothed or lobed, inferior, persistent; *Corolla* usually 4-5-lobed, often bilabiate, sometimes personate, saccate and spurred; *Stamens* often 4, didynamons, rarely 5, or 2 alternating with corolla lobes,



## TREES AND SHRUBS

inserted in the corolla tube; *Ovary* superior, 2-celled, many-seeded; *Fruit* a 2-celled, usually many-seeded capsule.

An Order of about 1900 species divided into 12 tribes; distinguished from Labiatae by the 2-celled ovary, and from Verbenacae by the ovules being more than one in each cell.

### VANILLA TREE, *Paulownia imperialis*.

Shrubberies, lawns. June. A fine deciduous tree with the habit of a Catalpa. The blossoms are borne only in the warmer counties, being formed in autumn, and usually injured by frost. Propagated by cuttings of firm young shoots in sandy soil in cold frame in summer; seeds in sandy loam in cold frame in spring or autumn.

*Flowers* pale violet, with dark purple spots inside resembling Gloxinia, in a many-flowered terminal *panicle*; *Calyx* 5-lobed; *Corolla* 1½–2 ins. long, tube elongated, limb 5-lobed, irregular, spreading; *Stamens* inserted in corolla tube; *Ovary* superior, 2-celled; *Fruit* a capsule, 2-valved, 2-celled, 1 in. long, ovoid, acuminate, rarely produced.

*Leaves* opposite, ovate-cordate or 3-lobed, entire, wavy with a few acute points, villous or pubescent, 6–12 ins. long, petioles downy; when kept to one stem and cut down annually leaves may be formed 2–3 ft. long, and broad in proportion.

A deciduous *tree*, 30–40 ft.; round-headed; *Branches* few, horizontal, tortuous, velvety, lenticels conspicuous; *Bark* on old stems rough.

Introduced from Japan, 1840. Named in honour of Anna Paulowna, Princess of the Netherlands, daughter of Paul I., Emperor of Russia.

### BOX-LEAVED SPEEDWELL, *Veronica buxifolia*.

Gardens. June, July. Requires partial shade. The New Zealand Speedwells form a large group of very attractive evergreen shrubs. The hardy species are suitable for sunny rockeries or borders and beds near the sea coast, and in somewhat sheltered positions inland. They are easily propagated by



## SCROPHULARINEÆ

cuttings in sandy soil under bell-glass in spring, or under handlight or in cold frame in summer.

*Flowers* white, slightly odorous, in short, dense *racemes*, sub-capitate at ends of branches, puberulous or glabrous, pedicels short, bracts nearly equal to sepals; *Calyx* 4-5-cleft; *Corolla* 4-5-lobed, tube short, limb  $\frac{1}{4}$ - $\frac{1}{3}$  in. diam.; *Stamens* 2, exserted; *Ovary* superior, 2-celled; *Fruit* a capsule.

*Leaves* Box-like, oblong-obovate, obtuse at apex, cordate at base, entire, thick, coriaceous, concave, midrib prominent beneath,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long,  $\frac{1}{5}$ - $\frac{1}{4}$  in. wide, vivid green; petiole short, thick.

An evergreen *shrub*, 2-3 ft.; stout, glabrous, erect.

Native of New Zealand.

### *Veronica cupressoides.*

Gardens. July. Best in a shady, peaty spot, or on rockwork. It is fairly hardy, and easily propagated by cuttings.

*Flowers* violet, 3-4 at extremities of branchlets, bracts larger than sepals; *Sepals* oblong, obtuse; *Corolla*  $\frac{1}{16}$  in. diam.; *Stamens* 2; *Ovary* 2-celled; *Fruit* a capsule.

*Leaves* in opposite pairs, ovate-oblong, obtuse, scale-like, adpressed to branches, glabrous, fleshy, yellowish-green,  $\frac{1}{16}$  in. long.

An evergreen *shrub*, 6 ins.-4 ft.; much branched.

Native of New Zealand; introduced 1876. Specific name from resemblance to a dwarf prostrate Cypress. Known in gardens as *V. salicornoides*, from resemblance to *Salicornia*, the Glass-wort or Marsh Samphire.

### *Veronica pinguifolia.*

Gardens, rockeries. June, July. This forms a compact little bush, so full of blossom as to give the appearance of a fall of snow.

*Flowers* white, in a short, dense-flowered, erect *spike* at tips of branches, pilose and pubescent, 50-100 blossoms; *Sepals* obtuse, ciliated; *Capsule* hairy.

*Leaves* oval or obovate-oblong, obtuse, entire, very thick, coriaceous, glaucous, light green, sessile, imbricated,  $\frac{1}{8}$ - $\frac{1}{2}$  in. long.

## TREES AND SHRUBS

An evergreen *shrub*, 6-18 ins.; erect or decumbent, much branched. *Branches* pubescent, scarred transversely.

Introduced from New Zealand, 1870. Syn. *V. carnosula*. Specific name from Latin *pinguis*, fat, referring to the thickness of the leaves.

### TRAVERS' SPEEDWELL, *Veronica Traversii*.

Gardens, shrubberies. June—August. One of the best and hardiest of the shrubby Speedwells, and the one most frequently planted. It is of rapid growth in almost any soil, and will thrive even in barren sandy spots. It may be propagated by cuttings in spring, summer, and autumn, and by seed in light soil outdoors in April. In favourable situations the ground round old bushes becomes carpeted by self-sown seedlings.

*Flowers* white or pale lilac, in a many-flowered sub-terminal *raceme*, 1-2 ins. long, puberulous; *Calyx* 4-5-partite; *Corolla* 4-5-lobed, lobes  $\frac{1}{4}$  in. across; *Stamens* 2, exserted, anthers purplish; *Ovary* superior, 2-celled; *Fruit* a capsule.

*Leaves* spreading, arranged cross-wise, sessile, obovate or linear-oblong, acute or obtuse, entire, coriaceous, flat, deep green, glossy.

An evergreen *shrub*, 2-6 ft.; *Branches* terete.

Introduced from New Zealand, 1873.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER.	.	.	.	.	<i>Bignoniaceæ</i>

Trees or shrubs, often twining or climbing. *Leaves* usually opposite, exstipulate; *Flowers* large, handsome, irregular, usually trumpet-shaped, mostly in terminal or axillary panicles; *Corolla* 5-lobed; *Ovary* superior, usually 2-celled, placentation axile or parietal; *Fruit* a capsule.

An exotic Order, mostly tropical, furnishing several greenhouse climbers.

## BIGNONIACEÆ

### INDIAN BEAN, *Catalpa bignonioides*.

Parks, gardens, lawns. July—August. This is perhaps the most beautiful flowering tree to be met with in British gardens, and one of the latest to blossom. Good loamy soil is most suitable, and it does best on a sheltered lawn. Being smoke-resisting, it is a good town tree. The species of *Catalpa* are propagated by cuttings of firm shoots in sandy soil under bell-glass in temperature of 55°–65° in summer; seeds in spring; layers in autumn.

*Flowers* white speckled with purple and yellow, in a terminal compound, many-flowered, trichotomous *panicle* 8–10 ins. long and broad, bracts and bracteoles linear-lanceolate, deciduous; *Calyx* 2-lobed,  $\frac{1}{2}$  in. long, glabrous, green or light purple; *Corolla* campanulate, tube broad, 2-lipped, 5-lobed, 2 ins. long,  $1\frac{1}{2}$  in. wide, edges of lobes recurved and slightly frilled; *Stamens* 2, staminodes 3, inserted near base of corolla; *Ovary* superior, 2-celled; style filiform; stigma 2-lobed, exserted above anthers; *Fruit* a pod-like capsule, 2-valved, 6–20 ins. long, somewhat flattened, valves meeting at an angle, usually light brown; *seeds* 1– $1\frac{1}{2}$  in. long,  $\frac{1}{4}$  in. broad; wings pointed, ending with tuft of hairs.

*Leaves* opposite, or 3 in a whorl, ovate, cordate at base, entire, waved, acuminate, thin and firm, green and glabrous on upper surface, pale and pubescent beneath, glandular in axils of veins, disagreeable, almost foetid odour when touched, 5–10 ins. long, 4–7 ins. wide; petioles terete, stout, 5–6 ins. long. Autumn tint yellow

A deciduous *tree*, 20–40 ft.; massive head, growth rapid; *Branches* long, heavy, brittle; *Twigs* thickened at nodes, slightly puberulous, glaucous, purplish to orange and brown; *Bark* light brown, peeling; *Bud-scales* ovate, brown; *Wood* light, soft, not strong, coarse-grained, durable, light brown.

Discovered by Catesby in S. Carolina; introduced 1726. Syn. *C. syringæfolia*. “*Catalpa*” is an Indian name for the tree.

## TREES AND SHRUBS

### WESTERN CATALPA, *Catalpa cordifolia*.

Parks, gardens. May, June.

*Flowers* white, in a few-flowered terminal *panicle*, 5–6 ins. long, pedicels purple, glabrous, bracteoles 1–3; *Calyx* purple, pubescent; *Corolla* 2 ins. long,  $2\frac{1}{2}$  ins. wide, 2-lipped, throat marked yellow and purple; *Stamens* and staminal tubes as long as tube of corolla, filaments with purple spots at base; *Ovary* superior, 2-celled; *Fruit* a pod-like, 2-valved capsule, 8–20 ins. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, usually dark brown, with parallel grooves; *seeds* 1– $1\frac{3}{4}$  in. long,  $\frac{1}{3}$  in. wide, winged and fringed both ends, wings and seeds about equal in length.

*Leaves* opposite, oval, cordate at base, slenderly acuminate, entire, thick, firm, dark green above, pubescent below, glandular in axils of principal veins, inodorous, 10–12 ins. long, 7–8 ins. wide; petioles terete, stout, 4–6 ins. long. Black in autumn.

A deciduous *tree*, 20–40 ft.; erect, broad round head; *Branches* slender; *Twigs* purplish and pilose at first, afterwards orange to brown; *Bark* brown tinged red, thick scales; *Bud-scales* brown, keeled; *Wood* like *C. bignonioides*.

Introduced from U.S.A., 1879; in forests grows 120 ft. high; planted in streets. Syn. *C. speciosa*.

### JAPAN CATALPA, *Catalpa Kämpferi*.

Gardens. July.

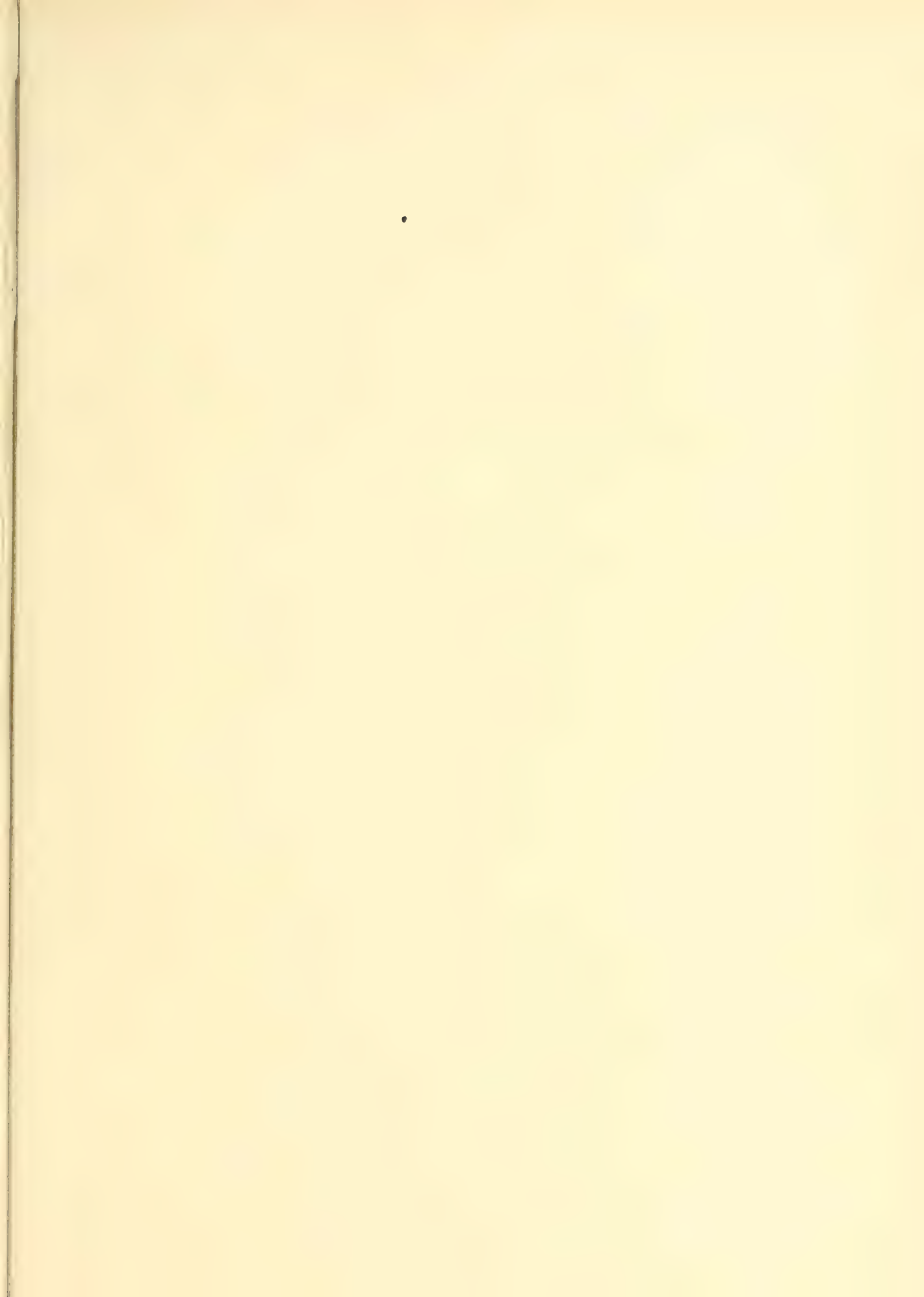
*Flowers* yellow, spotted with reddish-brown and purple, small, 1 in. diam., sweet-scented, in a much-branched terminal *panicle*; *Corolla lobes* toothed; *Fruit* a pod-like capsule, more slender and more numerous than in *C. bignonioides* and *C. cordifolia*.

*Leaves* ovate, cordate at base, acuminate, sometimes with one or more acute lobes, darker green, 6 ins. long and broad, petioles 2–5 ins.

A deciduous *tree*, 10–12 ft.

Discovered by Engelbert Kämpfer in Japan, 1693; seed introduced to Belgium by Siebold, 1849.







TEA TREE (*Lyrium halimifolium*)

A. Flowering branch. B. Fruiting branch. C. Longitudinal section of flower. D. Longitudinal section of berry.

# VERBENACEÆ

CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION III.	.	.	.	.	<i>Gamopetalæ</i>
NATURAL ORDER .	.	.	.	.	<i>Verbenaceæ</i>

Herbs, shrubs, or trees, with generally opposite or whorled, exstipulate leaves, and irregular or nearly regular flowers; *Calyx* inferior, tubular, and persistent; *Corolla* 4–5-fid, usually more or less bilabiate; *Stamens* usually 4, didynamous; *Ovary* 2–4-celled, cells with 1 ovule, style terminal; *Fruit* usually a carcerulus of 4 nutlets, but sometimes drupaceous.

Distinguished from Labiatæ by the entire ovary and terminal style, and from Scrophularineæ by the single ovule in each cell.

## STINKING CLERODENDRON, *Clerodendron fœtidum*.

Gardens. August, September. Requires rich warm loam. This is easily recognised by its downy heart-shaped leaves, which emit a peculiarly fœtid odour when bruised. It is sometimes cut down in severe winters, but will shoot forth again in the following spring.

*Flowers* lilac-rose, fragrant at a distance, unpleasant when nearer, in a dense terminal *corymb*; *Calyx* tubular, 5-fid; *Corolla* gamopetalous, 5-lobed; *Stamens* 4; *Ovary* superior, style terminal; *Fruit* a carcerulus of four 1-seeded nutlets.

*Leaves* opposite, cordate, acuminate, serrated, dark green, pubescent, exstipulate, petioles slender.

A deciduous *shrub*, 5 ft.; with short rigid prickles.

Introduced from China, 1820. Generic name from Gr. *kleros*, chance, *dendron*, a tree, said to be owing to uncertainty of medicinal qualities. Specific name from L. *fœtidus*, fetid, stinking. Syn. *C. Bungei*.

## KUSAGI, *Clerodendron trichotomum*.

Gardens. August, September. Requires rich warm loam. The reddish-purple calyx and white petals make this one of the most beautiful and distinctive of hardy shrubs.

## TREES AND SHRUBS

*Flowers* white, in a loose, terminal, *trichotomous cyme*, peduncles long; *Calyx* inflated, 5-lobed, lobes reddish-purple; *Corolla* hypocrateriform, 5-lobed, tube purple, 1 in. long; *Stamens* 4, inserted at throat of corolla tube, filaments white, 1 in. long; *Ovary* superior; *Fruit* a carcerulus of 4 nutlets, purple.

*Leaves* opposite, ovate, tapering at both ends, acuminate, petioles purplish, exstipulate, serrated, downy beneath, foetid.

A deciduous *shrub*, 6-12 ft.; or small *tree*, 20 ft.; *Branches* terete, hairy; *Suckers* freely produced; *Bark* rough, furrowed; *Buds* black, small.

Native of China and Japan; introduced 1800.

### MOUSTACHE PLANT, *Caryopteris Mastacanthus*.

Gardens. October. Best if sheltered by a wall; requires plenty of water during summer. Propagated by cuttings of young shoots or division of roots in March or April; seeds in light soil in temperature of 55° in spring.

*Flowers* light blue, in *axillary clusters*; *Calyx* deeply 5-cleft; *Corolla* bilabiate, tube short, middle lobe of lower lip larger, crisped or fimbriate; *Stamens* 4; *Ovary* superior; *Fruit* a carcerulus of four 1-seeded nutlets, winged.

*Leaves* opposite, ovate-oblong, coarsely serrated, obtuse or acute, petiolate, exstipulate, downy, fragrant, minute glandularly dotted.

A sub-evergreen *shrub*, 3-4 ft.; young shoots with a Sage-like fragrance.

Introduced from China, 1844. Generic name from Gr. *karuon*, a nut, *pteron*, a wing. Specific name from *mastax*, *mastakos*, the upper lip.

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CLASS I. . . . .	<i>Dicotyledons</i>
DIVISION III. . . . .	<i>Gamopetalæ</i>
NATURAL ORDER . . . . .	<i>Labiatae</i>

Trees, shrubs, or sub-shrubs, with usually square stems and opposite, decussate, exstipulate leaves; *Flowers* in axils of leaves or bracts, solitary or geminate, or in cymose clusters forming verticillasters; *Calyx* tubular, of 5



## LABIATÆ

sepals, 2-lipped or 5-toothed, persistent; *Corolla* hypogynous, imbricate, sometimes bilabiate, ringent, upper lip entire or bifid, lower 3-fid; *Stamens* usually 4, didynamous, outer anterior stamens usually the longest, inserted on corolla tube; *Ovary* superior, of 2 carpels, becoming deeply 4-lobed and 4-celled, style gynobasic, stigma bifid; *Fruit* a carcerulus of 4 nutlets.

Distinguished from all other Orders by the square stems, opposite, decussate leaves, verticillaster inflorescence, and bilabiate ringent corolla.

### LAVENDER, *Lavandula vera*.

Gardens. June—August. This is one of the oldest favourites of English gardens, and makes a charming hedge. Propagated by cuttings of old stems in sunny position outdoors in August or September.

*Flowers* blue, rarely white, fragrant, in a *verticillaster*, 6-10-flowered, spike somewhat interrupted; *Calyx* tubular; *Corolla* bilabiate, tube exserted, dilated at throat, limb oblique; *Stamens* 4; *Ovary* superior; *Fruit* a carcerulus of 4 glabrous nutlets.

*Leaves* opposite, oblong-lanceolate, attenuated at base, entire, somewhat revolute, hoary grey both surfaces.

An evergreen *shrub*, 1-2 ft.

Introduced from S. Europe, 1568.

### COMMON ROSEMARY, *Rosmarinus officinalis*.

Gardens, shrubberies. February. Best in dry border near wall; flourishes on the coast. Propagated by cuttings in shady border in spring or summer; layering of strong shoots in summer; seeds in sunny border outdoors in April.

*Flowers* pale bluish-purple, in short, few-flowered *racemes*, approximating, opposite, sub-sessile; *Calyx* ovoid-campanulate, bilabiate, 5-toothed, purplish; *Corolla* bilabiate, tube shortly exserted; *Stamens* 4; *Ovary* superior; *Fruit* a carcerulus.

## TREES AND SHRUBS

*Leaves* opposite, linear, entire, revolute, canescent beneath, sessile, fragrant, grey-green.

An evergreen *shrub*, 3–8 ft. ; dense growth.

Introduced from S. Europe, 1548. Generic name from Gr. *ros*, dew, and *marinus*, the sea.

### JERUSALEM SAGE, *Phlomis fruticosa*.

Gardens. June, July. This will grow in dry soil, and does well on wild banks. Propagated by cuttings in cold frame in August.

*Flowers* yellow or dusky yellow, very showy, *whorls* twin, terminal, 20–30-flowered ; *Calyx* 5-toothed, as long as corolla tube, acuminate, thick, coriaceous, scabrous, densely hairy ; *Corolla* bilabiate, velvety, tube inclosed, upper lip compressed, notched, lower lip large, 3-cleft, spreading ; *Ovary* superior, style gynobasic, curved, stigma bifid ; *Fruit* a carcerulus of 4 nutlets, ovoid-triquetrous.

*Leaves* opposite, ovate or oblong, acute, roundly cuneate at base, entire, wrinkled, green above, white tomentose beneath,  $2\frac{1}{2}$  ins. long,  $\frac{3}{4}$ –1 in. wide.

A deciduous *shrub*, 2–4 ft. ; *Branches* clothed with tomentum, usually yellow.

Native of Mediterranean region ; introduced 1596.

CLASS I. . . . *Dicotyledons*

DIVISION IV. . . . *Incompletæ*

NATURAL ORDER . . . *Laurineæ*

Trees or shrubs, aromatic or sometimes foetid ; *Leaves* alternate or rarely opposite, exstipulate, usually coriaceous and evergreen, often with pellucid dots ; *Flowers* 2-sexual, or imperfectly 1-sexual ; *Sepals* 4–6, in 2 whorls, coloured, imbricate in bud ; *Stamens* definite, perigynous, some barren, filaments often glandular at base, anthers opening by valves ; *Ovary* superior, 1-celled ; *Fruit* a berry or drupe.

# LAURINEÆ

## SWEET BAY, *Laurus nobilis*.

Shrubberies, gardens. April, May. Needs shelter. Any necessary pruning should be done in April. Propagated by cuttings in sandy soil under handlight in shady position outdoors, August—October; layering of shoots in September or October.

*Flowers* yellowish-white, inconspicuous, diœcious, in *axillary clusters*; *Calyx* 4-partite, imbricate; *Stamens* opposite segments of calyx; *Ovary* single, superior, 1-celled, style simple, stigma obtuse; *Fruit* a berry, oval, dark purple, ripe in October.

*Leaves* alternate, oblong-lanceolate, wavy, acute, pinnately veined, coriaceous, aromatic, shortly petiolate.

An evergreen *tree* or *shrub*, 30–60 ft.; *Branches* arching; *Twigs* smooth; *Bark* smooth.

Native of S. Europe; introduced about 1562. It is the Bay tree, or true Laurel, used in ancient times to form wreaths for poets and conquerors. Name Bay = a berry tree; M.E. *bay*, a berry; F. *baie*; L. *baca*, a berry.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDER.	.	.	.	.	<i>Thymelæaceæ</i>

Trees or shrubs, rarely herbs, with acrid juice, and tough inner bark; *Leaves* opposite, alternate or scattered, exstipulate, entire; *Flowers* usually hermaphrodite, sometimes polygamous or diœcious; *Perianth* inferior, green or petaloid, 4–5-lobed, imbricate in bud; *Stamens* usually twice as many as calyx lobes, in two series, adnate to and included in perianth tube, often an annular disk of hypogynous scales or glands; *Ovary* superior, usually 1-celled; *Fruit* usually a berry or drupe.

Chief characteristics acidity and toughness of bark. Distinguished from Elæagnaceæ chiefly by the one suspended ovule.

## TREES AND SHRUBS

### BLAGAY'S DAPHNE, *Daphne blagayana*.

Rockeries. March, April. Loves shade and rocky places; requires stones laid on branches. Propagated by cuttings of side shoots in well-drained pots or pans of sandy peat under bell-glass in temperature of 50°–55°, October or November; layers in March or April.

*Flowers* ivory-white, fragrant, in a dense terminal *umbellate cluster*; *Perianth* 4-lobed, tubular; *Fruit* a drupe.

*Leaves* whorled, oblong-elliptical or lanceolate, entire, obtuse, glabrous.

A dwarf evergreen *shrub*, 1 ft.

Discovered by Count Blagayana in Carniola, 1837; introduced 1872.

### GARLAND FLOWER, *Daphne Cneorum*.

Gardens, rockeries. April, May; again in September.

*Flowers* reddish-pink, sweet-scented, small, in a terminal, sessile, flattened head or *umbelliferous cyme*, closely surrounded by leaves; *Perianth* of 4 ovate lobes, smooth on upper surface, tube thickly covered externally with short, silky, white hairs; *Fruit* a drupe, white, globose.

*Leaves* alternate, linear-lanceolate, sessile, entire, mucronate, glabrous,  $\frac{1}{2}$  in. long,  $\frac{1}{8}$  in. broad, thickly set upon young shoots.

An evergreen trailing *shrub*, 6–12 ins.

Native of Europe; introduced 1752.

### SPURGE LAUREL, *Daphne Laureola*.

Copses and hedge banks in stiff soils. January—April. It is useful for growing under trees.

*Flowers* yellow-green, faintly fragrant, honeyed, entomophilous, in sub-sessile *axillary clusters* or very short drooping *racemes* of 3–5 flowers, both bisexual and staminate; bracts conspicuous, oblong, deciduous; *Perianth lobes* half the length of tube; *Fruit* a drupe, oval, bluish-black,  $\frac{1}{2}$  in. long.



## THYMELÆACEÆ

*Leaves* in tufts at ends of shoots, oblong or lanceolate, acute, very coriaceous, glossy, shining, dark green above, paler below,  $1\frac{1}{4}$ - $3\frac{1}{4}$  ins. long,  $\frac{3}{4}$ - $1\frac{1}{4}$  in. wide; dying leaves brown.

An evergreen *shrub*, 2-4 ft.; *Branches* few, erect, glabrous, leafless below, pliant, tough.

Native of Britain. Berries poisonous to man, favourites with small birds.

### MEZEREON, *Daphne Mezereum*.

Copses and woods in hilly districts, gardens. February—April.

*Flowers* purplish-red, odorous, honeyed, appearing before leaves are fully out, in a few-flowered *cyme* below leaves on shoot of preceding year, flowers usually in threes, sometimes pairs or fours, bracts small; *Perianth* deciduous, tubular,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long, 4-cleft, slightly hairy, lobes spreading, as long as tube; *Stamens* 8, sub-sessile, at top of tube, in 2 series; *Ovary* superior, 1-celled, style short, stigma capitate; *Fruit* a drupe, bright red, ovoid,  $\frac{1}{2}$  in. long, 1-seeded, very acrid and poisonous, ripe in September.

*Leaves* alternate, oblong-lanceolate or spathulate-lanceolate, exstipulate, shortly petiolate, entire, obtuse or acute, membranous, glabrous, 2-3 ins. long, glaucous or pale green above, bluish beneath. Autumn tint yellow.

A deciduous *shrub*, 1-3 ft.; *Branches* few, erect, glabrous; *Twigs* slender, flexible; *Bark* acid, smooth, yellowish-grey.

Native of Britain; somewhat rare. Berries poisonous to man, but favourites with finches and robin. Bark and branches yield yellow dye. *Daphne* was Greek name of the Bay-tree, *Laurus nobilis*, and originally of the nymph who was changed into a laurel-tree when fleeing from Apollo.

### PONTIC SPURGE LAUREL, *Daphne pontica*.

Gardens. April—May. This and the previous two species are used as stocks for grafting.

*Flowers* yellowish-green, very fragrant in evening, bractless, glabrous, in

## TREES AND SHRUBS

a many-flowered upright *cluster*, flowers in pairs; *Perianth lobes* long, reflexed. *Fruit* a drupe.

*Leaves* alternate, obovate-lanceolate, petiolate, entire, glabrous, glossy, light green.

An evergreen *shrub*, 4–5 ft.; *Branches* spreading.

Native of E. Europe; introduced 1759. First discovered by Tournefort on coast of Black Sea.

CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDER .	.	.	.	.	<i>Elæagnaceæ</i>

Trees or shrubs with alternate or opposite exstipulate leaves, entire, with silvery or brown scurfy scales; *Flowers* 1–2-sexual, white or yellow, regular, axillary, fascicled or cymose; *Calyx* 2–4-lobed, or 2–4 distinct sepals; *Stamens* adnate to calyx tube, in males twice as many as lobes, in 2-sexual flowers as many as lobes and opposite to them; *Ovary* superior, enclosed in thickened base of calyx tube, 1-celled; *Fruit* indehiscent, enclosed in tube, 1-seeded.

In Europe, the only Order containing shrubby plants with scurfy leaves. They differ from Thymelæaceæ chiefly in having 1 erect ovule.

### OLEASTER, OR WILD OLIVE, *Elæagnus angustifolia*.

Parks, gardens, shrubberies. May. Prefers a rather dry soil. The species of *Elæagnus* are very ornamental shrubs or small trees, with conspicuous silvery foliage. Useless growth may be cut away in late summer. They are propagated by cuttings in sandy soil in cold frame in September; layering in October; seeds sown in boxes of light soil in temperature of 55° in March.

*Flowers* yellow within, silvery scales outside, fragrant, usually bisexual, in solitary or axillary clusters of 1–3; *Perianth* campanulate, 4-lobed; *Stamens* 4, alternating with perianth lobes; *Ovary* superior, 1-celled, style linear, long; *Fruit* a fleshy drupe, ovoid-oblong, red, sweet, mealy.



SWEET BAY (*Laurus nobilis*)

A. Flowering branch. B. Fruit. C. One of the stamens (anthers dehiscing). D. Flower, enlarged.  
PLATE XLVIII.





## ELÆAGNACEÆ

*Leaves* alternate, lanceolate, often ovate on young trees and vigorous shoots, acute, serrate, upper surface dull greyish-green, scattered stellate scales, under-side silvery-grey, densely covered with stellate scales, blade 2-3 ins. long.

A deciduous *tree*, 15-20 ft.; *Branches* glabrous, thorny, shining reddish-brown; *branchlets* silvery-grey.

Native of Asia; naturalised in S. Europe; introduced 1633. Syn. *E. hortensis*.

### SILVER BERRY, *Elæagnus argentea*.

Gardens, shrubberies. July, August.

*Flowers* yellow, small, fragrant, silvery,  $\frac{1}{2}$ - $\frac{2}{3}$  in. long, in an *axillary cluster*, nodding; *Perianth lobes* ovate,  $\frac{1}{12}$  in. long; *Fruit* a drupe, roundish-ovate,  $\frac{1}{3}$   $\frac{1}{2}$  in. long, ribbed, silvery scales, stone 8-striate.

*Leaves* alternate, oval-oblong, acute or obtuse, waved, glabrous both surfaces, silvery scales, shortly petiolate, 3 in. long,  $1\frac{1}{2}$  in. wide.

A deciduous *shrub*, 8-12 ft.; *Branches* spreading, rusty-brown, becoming silvery.

Introduced from N. America, 1813.

### LARGE-LEAVED OLEASTER, *Elæagnus macrophylla*.

Gardens, shrubberies. October. This is a distinctive species, with large roundish silvery leaves having a tendency to curl at the edges, and silvery-white blossoms emitting a perfume like Gardenia. It makes a good specimen for a west wall, and does well in sandy peat.

*Flowers* silvery-white, fragrant,  $\frac{1}{2}$  in. long, densely clothed with silvery scales, axillary, solitary or forming *clusters*, pedicels silvery-white; *Perianth* campanulate, 4-lobed, lobes ovate, as long as tube; *Stamens* 4, alternate with lobes, filaments very short; *Ovary* superior, style curved; *Fruit* a drupe, scarlet.

*Leaves* alternate, roundish-ovate, obtuse or acute, margin wavy, glabrous, dark glossy green above, bright silvery scales beneath,  $2\frac{1}{2}$  ins. long,  $1\frac{1}{2}$  in. wide, petioles silvery.

## TREES AND SHRUBS

An evergreen *shrub*, 6-8 ft.; *Branches* erect, spreading, angled; *Twigs* covered with silvery and ferruginous scales; *Buds* small, scales ferruginous.

Native of China and Japan. Known in Japan as "Fon Gumi."

### LONG-STALKED OLEASTER, *Elæagnus multiflora*.

Gardens, shrubberies. May. The silvery leaves are in striking contrast with the dark reddish-brown twigs, and make this a very desirable species; indeed, it is one of the best.

*Flowers* whitish, in *axillary clusters*, pedicels long; *Fruit* a drupe, oblong, orange-red, transparent, small ferruginous scales, pedicels long; used for jelly.

*Leaves* alternate, ovate, acute or obtuse, entire, green above, silvery-white beneath, dotted with ferruginous scales, 2 ins. long, 1 in. wide.

An evergreen *shrub*, 8-15 ft.; *Branches* erect; *Twigs* reddish-brown, scurfy with ferruginous scales; *Buds* ovoid, reddish-brown with similar scales.

Native of China and Japan; introduced 1873. Syns. *E. edulis* and *E. longipes*.

### SEA BUCKTHORN, *Hippophæ rhamnoides*.

Sandy shores and sea cliffs. May, June. A handsome berry-bearing shrub, which grows remarkably well in rich damp soil near ponds, lakes, or rivers. Propagated by cuttings of roots in ordinary soil outdoors in February or March; layering of shoots in autumn; suckers in autumn; seeds sown outdoors when ripe, November or December.

*Flowers* yellow, dioecious, appearing with young leaves on erect dwarf shoots, small and inconspicuous. *Male flowers* in small catkin-like *spikes* in axils of lowest scale-like bracts, *perianth* of 2 ligulate lobes; *Stamens* 4, filaments short, anthers yellow. *Females*, crowded, solitary in each axil, *perianth* tubular, minutely 2-lobed, beset with speltate scales; *Ovary* superior, 1-celled, style shortly protruding, stigma erect; *Fruit* a drupe, berry-like, a membranous utricle enclosed in succulent calyx tube, globose or oblong,  $\frac{1}{3}$  in. diam., orange-yellow, spotted.

## LORANTHACEÆ

*Leaves* alternate, linear to oblong-lanceolate, entire, obtuse, sub-coriaceous, dull green above and nearly glabrous, or white scattered stellate hairs above, silvery-grey, with scaly scurf beneath, midrib with rusty scales, shortly petiolate,  $\frac{1}{4}$ –2 ins. long, lengthening after flowering to 3 ins.,  $\frac{1}{4}$  in. wide. Autumn tint yellow.

A deciduous *shrub*, 1–8 ft.; or Willow-like tree, 10 ft.; *Branches* slender, sub-pendulous, or short and spinescent; *Shoots* with rusty bronze scales; *Buds* rusty-brown.

Native of East and South England; naturalised in Scotland and Ireland. *Hippophaes* was old Greek name used by Hippocrates for a prickly spurge. Specific name from *Rhamnus*, the Buckthorn, from resemblance of spinous branches. Known also as Sallow-thorn.

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CLASS I.	. . . .	<i>Dicotyledons</i>
DIVISION IV.	. . . .	<i>Incompletæ</i>
NATURAL ORDER	. . . .	<i>Loranthaceæ</i>

Evergreen shrubs, with jointed stems, parasitic on the branches of trees; *Leaves* usually opposite, exstipulate, thick and coriaceous; *Flowers* usually diœcious; *Calyx* 4–8-lobed, valvate in bud; *Stamens* 4–8, adnate to calyx lobes; *Ovary* inferior, 1-celled; *Fruit* a 1-seeded berry.

### MISTLETOE, *Viscum album*.

Parasitic on trees, especially apple. March—May.

*Flowers* yellowish-green, diœcious or rarely monœcious, entomophilous, small, in a dense *cymose cluster* between the forks, or at the apex of, dichasial shoots; *Males* 3–5, in a cup-shaped fleshy bract; *Females* solitary, or 2–3 in bract; *Males*, perianth of 4–6 triangular segments on margin of hollow receptacle; *Stamens* 4–6, anthers sessile, cells adnate to the inner faces of sepals, dehiscing by pores; *Females*, 4 segments, sunk in receptacle, crowning the ovary, stigma



## TREES AND SHRUBS

sessile, thick; *Fruit* a 1-seeded pseudo-berry, ovoid or globose, greenish-white, semi-transparent, pulp viscid.

*Leaves* opposite, or 3 in a whorl, exstipulate, oblong to nearly ovate, entire, obtuse, narrowed at base, thick, fleshy or coriaceous, green or yellow-green, 1–3 ins. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. wide; dead leaves yellow.

A deciduous parasitic *shrub*, 1–3 ft.; *Stem* becoming woody when old; *Branches* dichotomous, smooth, green, terete, knotted; *Buds* small, green.

Native of Britain. Generic name from *L. viscum*, bird-lime, mistletoe; cog. with Gr. *ivos* or *biskos*, mistletoe; English name from A.S. *mistel-tan*; *mistel*, mistletoe; *tan*, a twig; *mistel* is dim. of *mist*, darkness=anything which darkens the sight or judgment.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDER	.	.	.	.	<i>Euphorbiaceæ</i>

Herbs, shrubs, or trees with entire leaves, usually alternate, often stipulate, stems often with lactiferous vessels; *Flowers* usually 1-sexual, monœcious or dioecious, bracteate, sometimes with a calyx-like involucre, occasionally without a perianth; *Calyx* 3–5-lobed or wanting; *Corolla* usually absent, sometimes represented by scales or petals; *Stamens* 1 or more, distinct or united, sometimes branched; *Ovary* superior, 2–3-celled, 2–3-lobed, styles 2–3, often branched; *Fruit* a schizocarp, separating elastically into 3 cocci, or succulent.

Distinguished from other Orders by the unisexual flowers and tri-coccus fruit.

### MINORCA BOX, *Buxus balearica*.

Gardens. July. Requires dry porous soil, and does best in well-sheltered situations. The species are propagated by cuttings of young shoots 3 ins. long in shady border, August or September; division of old plants, October or March; layers in September or October.







BOX (*Buxus sempervirens*)

A. Flowering branch. B. Fruit. C. Single male flower. D. Single female flower. E. Section of female flower. F. Seed. G. Capsules partly and fully open, showing seeds. H. Section of male flower, showing nectaries.

## EUPHORBIACEÆ

*Flowers* light yellow, small, inconspicuous, monœcious, in a *glomerule*; *Males*, *Sepals* 4; *Stamens* 4; *Females*, *Ovary* 3-celled; *Fruit* a 3-valved capsule.

*Leaves* opposite, oblong-elliptical, emarginate, coriaceous, cartilaginous margin, yellowish-green,  $1\frac{1}{2}$ –2 ins. long.

An evergreen *shrub* or small *tree*, 15–20 ft.

Native of Balearic Islands and other parts of S. Europe; introduced 1780.

### COMMON BOX, *Buxus sempervirens*.

Parks, gardens, chalk hills. April—June.

*Flowers* greenish-white, monœcious, usually entomophilous, small, inconspicuous, in an *axillary cluster* (*glomerule*), several unibracteate male flowers, and 1–2 females with 3 bracteoles; *Males*, *Perianth* small, 4 segments; *Stamens* 4, opposite perianth lobes, hypogynous, around a rudimentary ovary, anthers didymous, introrse, filaments stout; *Females*, *Perianth* 6–12 segments in whorls of 3; *Ovary* globose, superior, 3-celled, styles 3, stigmas 3, obtuse, proterogynous; *Fruit* a 3-valved capsule, ovoid, sessile, hard, coriaceous,  $\frac{1}{3}$  in. long, ending in 3 stiff short beaks, 1–2 black shiny seeds in each cell.

*Leaves* sub-opposite, ovate or oblong, sub-sessile, obtuse or retuse, convex, coriaceous, shining, exstipulate,  $\frac{1}{2}$ –1 in. long; petioles slightly hairy at edges.

An evergreen *shrub*, or small *tree*, 15–20 ft.; slow of growth; *Branches* slender, glabrous, downy when young, erect or drooping; *Twigs* more or less 4-angled; *Bark* rough, grey; *Old Stems* often twisted; *Buds* very small; *Growth* very slow; *Wood* yellow, with very fine grain, hard, heavy, will not float, susceptible of high polish; used for engraving, tools, and carving.

Indigenous in chalky districts of Southern and Central England.

Name is A.S. *box* = Box-tree; L. *buxus*; Gr. *pyxas*.

Leaves sometimes sprinkled with Box Leaf-rust (*Puccinia Buxi*).

# TREES AND SHRUBS

SIOUMI, *Daphniphyllum macropodum*.

Gardens. September. The compact growth and large foliage give this shrub a striking resemblance to a *Rhododendron*. Propagated by layers or cuttings of ripe shoots.

*Flowers* small, diœcious, apetalous, in a short axillary *raceme*; *Sepals* small, 3-8, connate; *Stamens* 5-18, anthers large, basifixed; *Ovary* superior, imperfectly 2-celled, stigmas short, thick, recurved; *Fruit* a drupe, ellipsoid,  $\frac{1}{3}$  in. long, black.

*Leaves* alternate, elliptic, or lanceolate, obtuse, base acute, entire, dark green above, pale and glaucous beneath, 3-8 ins. long, 2 ins. wide, petiole long, reddish-purple.

An evergreen *shrub*, 6-8 ft.; *Bark* reddish.

Native of India, Ceylon, China, and Japan. Known in gardens as *D. glaucescens*. Generic name from Gr. *Daphne*, the Bay-tree (*Laurus nobilis*), and *phyllon*, a leaf=resembling the Laurel. "Sioumi" is the Oriental name.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDER .	.	.	.	.	<i>Urticacæ</i>

Herbs, shrubs, or trees, with usually alternate and stipulate leaves, often with stinging hairs; *Flowers* usually small, unisexual or rarely polygamous, monœcious or diœcious; *Perianth* in the males equally lobed or partite; in the females often unequally lobed, or consisting of a scale-like sepal; *Stamens* usually equal in number to perianth segments, and opposite to them; *Ovary* superior, or in a few genera more or less inferior, 1 or 2-celled; *Fruit* indehiscent, 1-seeded.

Distinguished from Euphorbiacæ by the 1-seeded fruit, and from Cupuliferæ by the regular perianth of the male flowers. The Nettles (Urticæ) are distinguished from Chenopodiaceæ by their stipulate and rough leaves with stinging hairs; the Elms (Ulmæ) often form a separate Order.



## URTICACEÆ

### WINGED ELM, *Ulmus alata*.

Parks, gardens. March, April. The curious ridge-like corky excrescence on the branches makes this one of the most distinct and conspicuous of hard-wooded trees. The species of *Ulmus* are propagated by suckers, October or November; layering of shoots, September or October; seeds gathered as soon as ripe and sown in light soil in shady position outdoors.

*Flowers* reddish, in a few-flowered *fascicle*, pedicels drooping; *Perianth* 5-lobed, lobes obovate, glabrous; *Ovary* hoary tomentose, raised on short slender stipe; *Fruit* a samara, oblong,  $\frac{1}{3}$  in. long, hirsute, tipped with incurved awns, wing narrow.

*Leaves* alternate, ovate-oblong to oblong-lanceolate, unequal at base, acute or acuminate, coarsely doubly serrate, firm or sub-coriaceous, glabrous and dark green above, pale and soft pubescent below,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ins. long; petioles pubescent, stipules linear-obovate, thin, scarious.

A deciduous *tree*, 30–40 ft.; *Branches* erect; *branchlets* glabrous or puberulous, often with 2 thin corky wings, reddish-brown to ashy-grey; *Bark* with shallow fissures, light brown tinged with red; *Buds* slender, acute, scales glabrous or slightly puberulous; *Wood* heavy, hard, not strong, close-grained, not easily split, light brown.

Introduced from N. America, 1820. Specific name from *L. ala*, a wing. Known in America as the Wahoo.

### AMERICAN OR WHITE ELM, *Ulmus americana*.

Parks, gardens. March, April. Best in moist loamy soil.

*Flowers* greenish-red, appearing before leaves, in a 3–4-flowered *cymose fascicle*, pedicels slender, drooping; *Perianth* 7–9-lobed, ciliate; *Stamens* 5–6, anthers bright red; *Ovary* light green, ciliate with white hairs, styles light green; *Fruit* a samara, ovate to obovate-oblong, ciliate,  $\frac{1}{2}$  in. long, wing broad.

## TREES AND SHRUBS

*Leaves* alternate, obovate-oblong to oval, unequal at base, acute, coarsely doubly serrate, dark green and glabrous or scabrate above, usually pale and pubescent below, 2–4 ins. long, petioles stout, stipules linear-lanceolate. Autumn tint yellow.

A deciduous *tree*, 80–100 ft.; *Branches* spreading, not corky; *branchlets* glabrous, destitute of corky wings, reddish-brown to ashy-grey; *Bark* fissured, ashy-grey; *Buds* ovate, acute, flattened, scales glabrous, brown; *Wood* heavy, hard, strong, tough, difficult to split, coarse-grained, light brown; used for coach-making, turnery, and boat-building.

Introduced from N. America, 1752. Known as Canada Rock Elm.

### COMMON ELM, *Ulmus campestris*.

Woods, fields, hedgerows, gardens. March, April.

*Flowers* reddish-brown, in dense *clusters*, appearing before leaves, anemophilous, proterogynous, often males only by abortion; *Perianth* small, 4–8-lobed; *Stamens* often 4, sometimes 5–8, opposite lobes, anthers rusty; *Ovary* 1-celled, stigmas 2; *Fruit* a samara, winged all round, obovate, notched; *seeds* above centre, rarely ripening.

Leaves alternate, ovate, variable, unequal at base, narrow,  $2\frac{1}{2}$ –4 ins. by 1–2 ins., serrated, acute, scabrous above, pubescent beneath, or nearly glabrous, hairs with irritating properties, petiole short, stipules caducous. Autumn tint yellow.

A deciduous *tree*, 125 ft., shedding leaves very early; usually taller and straighter than *U. montana*; *Suckers* abundant; *Bark* rough, corky, with vertical furrows; *Branches* mostly projecting upwards; *Twigs* given off alternately at acute angles, smooth; *Buds* smooth, reddish-brown, scales are stipules; *Wood* brown, heavy, hard, tough, porous, twisted in grain; used for piles, pipes, pumps, blocks, ships' keels and planks, carpentry, wright-work, turnery, and cabinet-making.

Not indigenous in Britain; the most frequent in fields and hedgerows; lives to about 500–600 years. Also called Small-leaved Elm.



ELM (*Ulmus campestris*)

A. Leaf. B. Flowering branch. C. Flower (enlarged). D. Fruit (samaras).





## URTICACEÆ

*Insects injurious to Elms*:—*Bark*—Elm Tree Destroyer (*Scolytus destructor*); *Foliage*—Comma Butterfly (*Vanessa c-album*), Large Tortoise-shell Butterfly (*Vanessa polychlorus*), Mottled Umber (*Hybernia defoliaria*), March Moth (*Anisopteryx æscularia*), Tree Lackey (*Bombyx neustria*); *Wood*—Wood Leopard Moth (*Zeuzera æsculi*).

*Fungoid Pests*:—Elm-leaf Phlœospore (*Phleospora Ulmi*), Elm-leaf Blotch (*Phyllachora Ulmi*).

### WYCH ELM, *Ulmus montana*.

Woods, parks, gardens. Best in good fertile soils and good light. March, April.

*Flowers* reddish-brown, appearing before leaves, borne in dense clusters on sides of branches, surrounded by brownish bracts; *Perianth* campanulate, 4-7-toothed, lobes obtuse; *Stamens* as many as lobes of perianth, and opposite, anthers purple; *Ovary* flat, 2-celled, styles 2, diverging; *Fruit* a thin, flat 1-seeded samara, broadly ovate or orbicular, glabrous, small notch at top; *seed* in centre or below, produced after thirty years.

*Leaves* alternate, nearly sessile, broadly ovate, doubly and trebly serrated, unequal at base, rough on upper side, downy beneath, 3-6 ins. long, 3 ins. diam. Autumn tint golden-yellow.

A deciduous tree, 80-120 ft.; *Branches* long, diverging like letter Y, ascending and pendulous; *Twigs* pubescent; *Bark* rough, often corky; *Trunk* often having excrescences; *Buds* brown, with rusty hairs; *Wood* hard, straight-grained, flexible when steamed, stands alternate wetting and drying; inferior to that of Common Elm, and more liable to split; used in boat-building.

The common wild Elm of North and West England, Scotland, and Ireland; rare in South-east England. Known also as Scotch Elm, Mountain Elm, and Broad-leaved Elm. Several varieties in cultivation. Name from A.S. *elm*, the Elm-tree.

*Leaves* often rolled, blistered, and thickened by an Aphis (*Schizoneura Ulmi*).

## TREES AND SHRUBS

### PAPER MULBERRY, *Broussonetia papyrifera*.

Gardens. May. An ornamental tree which thrives best in well-drained, rather open ground. Propagated by cuttings of ripe wood in sandy soil in cold frame in October; suckers in October or November; seeds when ripe or in the following spring.

*Flowers* greenish, diœcious; *Males* in pendulous, cylindrical *catkins*, each flower in the axil of a bract; *Females* in peduncled, axillary, erect globular *heads*; *Fruit* an etærio of spurious drupes (sorus).

*Leaves* alternate, ovate or deeply lobed, margin entire, acute, hairy.

A deciduous tree, 10-20 ft.

Native of India, China, and Japan; introduced 1751. Genus named after Broussonet, a French naturalist. Inner bark used for paper-making.

### BLACK OR COMMON MULBERRY, *Morus nigra*.

Gardens. June, July. Prefers deep, light, somewhat moist soil in sunny position sheltered from north winds. In the young state it makes a fine specimen shrub, and later grows into an imposing and ornamental tree. Straggling branches may be shortened, or crowded ones thinned in February. Propagated by cuttings 6-8 ins. long, partly current growth and partly two years old, from upper part of tree, inserted half their depth in light soil in sheltered position outdoors, September, October, or March; layering of shoots in September; seeds in light sandy soil in temperature of 55°-65° in March, transplanting seedlings outdoors in June or July; or seeds sown outdoors in May.

*Flowers* greenish-white, monœcious, sometimes diœcious, anemophilous, inconspicuous, in short thick catkin-like *spikes of cymes* on receptacle, becoming succulent when fruit ripens; *Males*, *Calyx* 4-partite, yellowish-green; *Stamens* 4; *Females*, *Sepals* 3-4, greenish, persistent; *Ovary* 2-celled, styles short, stigmas 2, spreading; *Fruit* an oblong mass of spurious drupes (sorus), com-







BLACK MULBERRY (*Morus nigra*)

A. Branch with young fruit. B. Single male flower. C. Vertical section of fruit. D. Part of young fruit, formed from one flower. E. Cluster of male flowers. F. Single female flower. G. Ripe fruit.



## URTICACEÆ

posed of the receptacle, calyces, and utriculi, all succulent and consolidated, very juicy, sub-acid, turning from green to crimson, then red, finally reddish-black ; ripe in August.

*Leaves* alternate, ovate, cordate, or 3-5-lobed, petiolate, irregularly serrate, acute, dark green, upper surface hispid, 4 ins. by 4 ins., young leaves pilose beneath ; stipules lateral, small, linear, caducous. Autumn tint yellow.

A deciduous *tree*, 20-30 ft., with large round head ; *Branches* horizontal ; *Bark* rough, reddish-brown ; *Buds* seldom open before May ; tree slow of growth, but long lived ; *Wood* used for cabinet-work.

Native of Persia and Armenia ; introduced 1548. First planted at Syon House.

### FIG, *Ficus Carica*.

Gardens, walls. May. In mild districts of the south this will grow as a standard, but generally is best against a south or south-west wall. The best crops of fruit are usually secured from trees planted in a compost of fibry loam, brick rubbish, and old mortar by the side of a hard walk into which the roots cannot easily ramify. Deformed, dead, or weak branches should be removed in April or July, and the points of vigorous young shoots pinched in July. Any fruits sufficiently advanced in early autumn to show the shape of the Fig should be pinched off. Propagated by cuttings of previous year's growth, 6-9 ins. long, in sandy soil under bell-glass in temperature of 65°-75° in spring ; layering of shoots, October or November ; suckers in autumn ; seeds carefully cleaned from pulp and kept till early spring, then sown in light soil in temperature of 75°.

*Flowers* monœcious, entomophilous, proterogynous, minute, appearing with the leaves, enclosed, and hidden, in a pyriform hollow fleshy receptacle (hypanthodium) formed of the swollen floral axis, the sides of which have grown up around it, meeting at the top, forming an inverted flask-like *spike* with sessile flowers, in which the outside bearing the flowers has become introverted ; *Male* flowers mostly in upper part ; *Perianth* 3-5-fid ; *Stamens* 3-5 ; *Females* in lower

# TREES AND SHRUBS

part; *Perianth* 5-partite; *Ovary* superior, 1-celled, style lateral, stigma bifid; *Fruit* a syconus, consisting of achenes immersed in pulpy receptacle, greenish-yellow to violet-brown, 2-3 $\frac{1}{4}$  ins. long, one or two together in axils of leaves, orifice at tip closed by small scales; *seeds* very numerous.

*Leaves* alternate, very variable, 3-6 ins. by 2 $\frac{1}{2}$ -7 $\frac{1}{2}$  ins., palmately 3-7-lobed, 5-partite, or entire, lobes variously cut, base cordate, thick, dark green and scabrous above, paler and pubescent beneath, petiole 1-2 ins. long, stout. Autumn tint yellow.

A deciduous *tree*, 15-30 ft.; *Branches* spreading; *Buds* large; *Suckers* abundant.

Native of Mediterranean regions, Syria, Persia, Afghanistan; re-introduced to Britain by Cardinal Pole, 1525. In Italy fertilisation is brought about through the agency of a small wasp (*Blastophaga grossorum*), which lays its eggs in the ovules of the abortive female flowers, producing galls, and afterwards carries pollen to other female flowers. *Ficus* is the old Latin name for a fig-tree, and is akin to the Greek *sukon*, a fig.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDER	.	.	.	.	<i>Platanaceæ</i>

Trees, usually tall, with flaking bark, and without milky juice; *Leaves* alternate, palmately nerved and lobed, petiolate, with sheathing stipules; *Flowers* small, monœcious, in globose, densely-crowded heads, the male and female heads on separate pendulous peduncles, usually 3 heads on each; *Perianth* 0, or replaced by scales or bristles; *Ovary* 1-celled, style persistent; *Fruit* a head of 1-seeded nuts.

Readily distinguished from the Sycamores or False Planes by the alternate leaves.

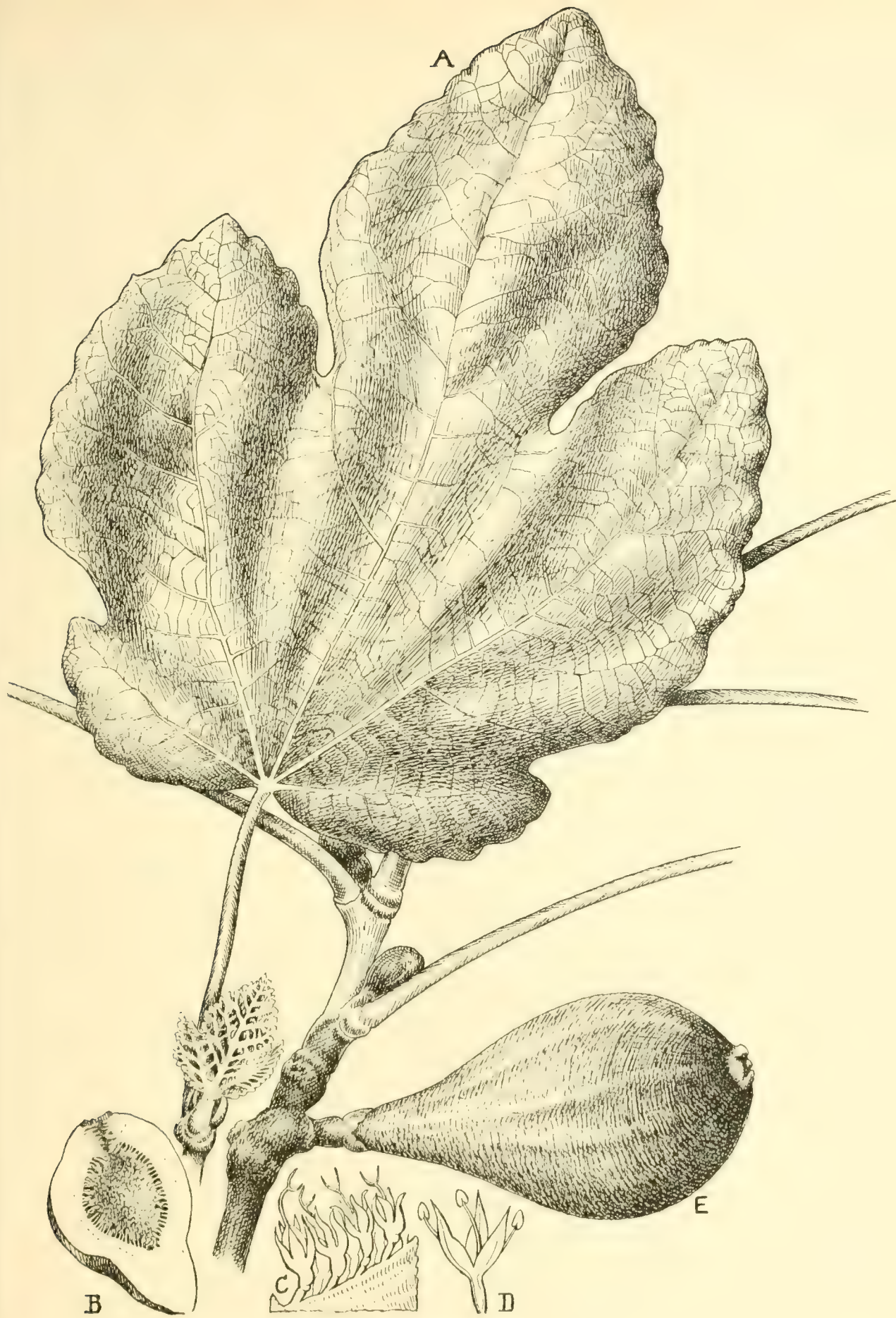


FIG (*Ficus Carica*)

A. Leaf. B. Section of hypanthodium. C. Portion of inner surface of same, showing pistillate flowers (enlarged).  
D. Staminate, or male flower (enlarged). E. Fruit (green fig).







## PLATANACEÆ

### LONDON PLANE, *Platanus acerifolia*.

Parks, gardens, avenues. April. This is one of the most suitable of trees for town planting, having the property of resisting fumes in a high degree. The species of *Platanus* thrive best when their roots have access to water. They may be pruned into shape, October—February. Propagated by cuttings of shoots 6–8 ins. long in moist soil in sheltered position in November; layering of shoots in autumn or spring; seeds merely pressed into surface of soil, and kept moist and shaded, in November.

*Flowers* greenish, as *P. orientalis*, in globular heads on axillary peduncles, generally in threes, sometimes two or four, regular distances wide apart; *Fruit* a globular head, bristly.

*Leaves* alternate, resembling those of Common Maple, broadly and acutely 3–5-lobed or angled, a few remote coarse serratures, nearly straight at base, petiole long and slender, leaves  $6\frac{3}{4}$  ins. long, 8 ins. broad, stipules auricled, lobes acuminate, deciduous.

A deciduous tree, 50–60 ft.; *Branches* mostly straight, not very stout, uniform in size, lower ones horizontal or declining, upper ones more or less erect; *Twigs* slender; *Stems* of young trees smooth, dark greenish-brown; *Bark* in old stems scaling in small, thin pieces.

Native of Asia; introduced 1724. This is the Maple-leaved Plane; the *P. orientalis* var. *acerifolia* of Loudon, and the *P. vulgaris* var. *acerifolia* of gardens.

### WEDGE-LEAVED PLANE, *Platanus cuneata*.

Parks, gardens. April.

*Flowers* greenish, resembling *P. orientalis*; *Fruit* a globular head of small nuts.

*Leaves* palmately wedge-shaped, very variable; on old or stunted plants often 3-lobed, lobes angular, few small teeth; on young and vigorous plants deeply 5-lobed, few small serratures, terminated by hard points, all tapering towards

## TREES AND SHRUBS

base, covered with down when young, glabrous when old,  $4\frac{1}{4}$  ins. long,  $3\frac{1}{2}$  ins. broad; petiole very short.

A deciduous *bush* or low *tree*; *Branches* tortuous, somewhat ascending.

Native of Levant; introduced 1739. Sometimes called *P. undulata*, and considered by some as a stunted variety of *P. orientalis*.

### WESTERN PLANE, *Platanus occidentalis*.

Parks, gardens, avenues. May. This is usually larger and more rapid in growth than its relative of the East. Its leaves are larger and less deeply lobed, and its seed-balls are larger, and usually hang singly on the slender peduncles.

*Flowers* as in *P. orientalis*, in globular heads, 2–4, more commonly only 1, on long slender peduncles, larger than *P. orientalis*; *Males* axillary, dark red; *Females* terminal, light green, tinged red; *Fruit* a globular head of 1-seeded nuts; balls large, smoother than *P. orientalis*, brownish, ripe in October or November, persistent through winter; seed-fibres said to cause irritation of the mucous membrane of the eyes, nostrils, mouth, and probably the lungs.

*Leaves* alternate, broadly 5-lobed or angled, a few large acute serratures, cordate or truncate at base, when young scurfy with rusty-coloured tomentum or silky down, glabrous when older, bright green above, paler beneath, slightly hairy in axils of veins and on principal ribs, petiole purplish-red, leaves up to 8 ins. by 8 ins., stipules brown, woolly, caducous. Autumn tints yellow to red-brown.

A deciduous *tree*, 70–80 ft.; *Bark* smooth, light ash-colour, flaking off in small pieces; *Branches* tortuous, axillary buds concealed within hollowed base of petioles, conical, pubescent, pale brown or olive; *Twigs* rounded, olive-green; *Wood* used for cabinet-work.

Introduced from N. America about 1636; there called Button-wood; reaches height of 140–170 ft. Probably lives more than 600 years.







ORIENTAL PLANE (*Platanus orientalis*)

A. Female flower clusters. B. Fruit cluster. C. Male flower cluster.



# PLATANACEÆ

## ORIENTAL OR COMMON PLANE, *Platanus orientalis*.

Parks, gardens, avenues. April. The Plane-tree has been employed for giving shade since the days of the Greeks, and few trees are better adapted for planting as specimens upon the lawn or elsewhere when the site is moderately sheltered.

*Flowers* greenish-yellow, small, monœcious, anemophilous, appearing before leaves, in a globular *head*, males and females on separate peduncles, 2-5, usually 3, heads on each axillary peduncle; *Stamens* in male flowers mixed, without definite order, with scales, which may be bracts, perianth segments, or staminodes; *Females*, *Ovary* 1-celled, style persistent; *Perianth* replaced with scales, which may be bracts, segments, or abortive ovaries; *Fruit* a globular head of small 1-seeded nuts, ball covered with bristly points, ripe in October, brown, persistent through winter.

*Leaves* alternate, palmately 5-lobed, wedge-shaped at base, divisions lanceolate, sinuated, upper surface glabrous, shining green,  $7\frac{1}{2}$  ins. long,  $7\frac{1}{2}$  ins. broad; petiole green; stipules sheathing, nearly entire. Autumn tints yellow to orange-brown.

A deciduous *tree*, 60-80 ft.; *Branches* widely-spreading, lower ones horizontal; *Bark* flaking in larger pieces, whitish-grey, on young branches more persistent, brown, sometimes tinted with purple; *Buds* concealed by petioles; *Wood* pale-brown, fine-grained, tough, hard; soon perishes if exposed to sun and atmosphere.

Introduced from the Levant some time previous to 1548; possibly lives 2000 years. Generic name is from old Greek for the Plane (*Platanos*)—*platys*, broad, probably referring to foliage. Specific name is Latin for *Eastern*.

# TREES AND SHRUBS

CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDER	.	.	.	.	<i>Juglandæ</i>

Trees with alternate, pinnate, exstipulate leaves; *Flowers* uni-sexual, inconspicuous; *Males* in catkins; *Calyx* irregular, 2-6-partite, or a single scale; *Stamens* 3 or many; *Females* solitary or a terminal cluster; *Calyx* regular, 3-5-lobed; *Ovary* inferior, imperfectly 2-4-celled, with a single ovule; *Fruit* a kind of drupe, 2-valved, 1 seed with large oily cotyledons, divided into 2 or 4 lobes.

Distinguished from Cupuliferæ chiefly by the solitary ovule, and in the absence of a cupule.

## SHELL-BARK HICKORY, *Carya alba*.

Parks, gardens. May. Needs good loamy soil; very impatient of removal. Propagated by nuts sown where trees are intended to remain.

*Flowers* greenish; *Males* in threes at base of shoots of same year, peduncled, glabrous; *Perianth* adnate to bracts, 2-3-lobed, middle lobe linear, much longer than laterals; *Stamens* 3-10, filaments short; *Females* 2-6 on terminal peduncles; *Perianth* 4-toothed, petals 0, styles 2-4; *Fruit* a nut, globose or depressed, 1½ in. long, husk thick, freely splitting at base into four valves; nut greyish-white, angled, barely mucronate, 4-celled, sweet, shell somewhat thin.

*Leaves* alternate, imparipinnate, exstipulate, leaflets 5-9, lower ones oblong-lanceolate, upper obovate-lanceolate, sessile, acuminate, narrow or rounded at base, finely serrate, pubescent, fragrant. Autumn tint golden-yellow.

A deciduous *shrub* or *tree*, 50-80 ft.; *Twigs* tomentose-pubescent, fragrant when crushed; *Bark* rough; *Bud-scales* very large; *Wood* hard, close-grained, elastic; used in carriage-building.

Native of U.S.A. and Canada; introduced 1629. Syn. *Hicoria ovata*. Aboriginal name *Hicori*.

# JUGLANDEÆ

## WALNUT, *Juglans regia*.

Parks, gardens. March. Propagated by nuts sown in light soil outdoors in November, transplanting seedlings following October.

*Flowers* greenish, monoëcious, anemophilous, appearing before leaves; *Male catkins* cylindrical, slender, 3 ins. long, drooping, on shoot of previous year; *Calyx* of 2-5 greenish scales; *Stamens* numerous, 5-20; 1 bract, 2 bracteoles; *Females* solitary, or in clusters at end of shoot of the year; *Calyx* 4-5-lobed; *Ovary* inferior, 2-4 carpels, 1-celled, stigmas 2-3, purplish, fleshy; *Fruit* a drupe, sub-globose, epicarp fleshy, fibrous, bursting irregularly, endocarp woody, furrowed, 2-valved; ripe in October.

*Leaves* alternate, imparipinnate, exstipulate, petiolate, 8-10 ins. long; leaflets, 5-9, oval, obscurely serrated, acute, glabrous, odorous, shining dark green above, paler beneath, fragrant. Autumn tint brown.

A deciduous *tree*, 40-60 ft.; large spreading head; *Branches* twisted, upward tendency; *Twigs* glabrous, shining, lenticels long; *Bark* grey, smooth when young, rugged when older, deep longitudinal furrows; *Wood* white when young, brown when older, coarse grained, beautifully marked, light, tough, takes a high polish; much used for cabinet-work and gun-stocks; burrs or excrescences valuable.

Native of Persia, the Himalayas, and Western Asia; introduced about fifteenth century. Name a contraction of Walsh-nut = foreign-nut. Latin name *Juglans* is probably a contraction of *Jovis Glans*, the Nut of Jupiter. Timber bored by larva of Wood Leopard Moth (*Zeuzera æsculi*); Leaves subject to attacks of Walnut Anthracnose (*Marsonia Juglandis*).

## CAUCASIAN WALNUT, *Pterocarya caucasica*.

Gardens. May. Its grand symmetrical proportions, fine foliage, and unique fruit make this one of the most beautiful of exotic trees. Being one of the first of deciduous trees to burst into leaf, it is apt to be damaged by late frosts, and should, therefore, be in a sheltered position. It may be propagated by layers, suckers, or seed.

# TREES AND SHRUBS

*Flowers* greenish, unisexual, monœcious; *Males* in a pendulous *catkin* 5–6 ins. long; *Female catkins* 10–12 ins. long, sometimes as much as 20 ins.; *Fruit* drupaceous, dry, angled, 2-winged, much tapered at tip, seldom ripening in this country.

*Leaves* alternate, imparipinnate, leaflets about 19, ovate-oblong, acuminate, acutely serrate, glabrous, sessile, bright green above, paler or glaucous beneath, 12–18 ins. long, sometimes more than 2 ft., width 18 ins.

A deciduous *tree*, 20–50 ft.; *Branches* widely spreading; *Trunk* with large excrescences; *Roots* extending to great distance; *Suckers* abundant when near water; *Wood* used for veneering and cabinet-making.

Introduced from the Caucasus about 1800. Generic name from Gr. *pteron*, a wing, and *caryon*, a nut, referring to winged fruit. Syn. *P. fraxinifolia*. Specific name from L. *Fraxinus*, the Ash, and *folius*, a leaf, from resemblance of foliage.

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CLASS I. . . . .	<i>Dicotyledons</i>
DIVISION IV. . . . .	<i>Incompletæ</i>
NATURAL ORDER . . . . .	<i>Myricaceæ</i>

Trees or shrubs, with alternate, usually exstipulate, resinous leaves; *Flowers* in catkins or catkin-like spikes, monœcious or diœcious; *Male flowers* of 2–16 stamens, inserted on base of a bract, sometimes with 2 lateral bracteoles; anthers basifixed, extrorse; *Females*, *Ovary* 1-celled, sessile at base of the bract, usually 2–4 bracteoles; *Fruit* drupaceous.

## BOG MYRTLE, *Myrica Gale*.

Bogs and wet moors, gardens. May—July. Thrives well in moist peaty soil in shaded parts of the rockery or border. Propagated by cuttings in sandy soil in sheltered position outdoors, September or October; layers of shoots, September or October; division of plants, October to March; seeds sown as soon as ripe in ordinary soil in sheltered position outdoors.





WHITE BIRCH (*Betula alba*)

A. Twigs with male and female catkins. B. Male flower. C. Bract scale with three female flowers. D. Seed.  
 PLATE LIV.



## MYRICACEÆ

*Flowers* brownish-green, dioecious, anemophilous, appearing before the leaves; *Male catkins*,  $\frac{1}{2}$ –1 in. long, ovoid, dense, sessile, erect; *Stamens* 4, free, filaments adnate to base of bracts, anthers red, basifixed, extrorse, scales broad-ovate, concave, entire, shining; *Females*  $\frac{1}{4}$  in. long; *Ovary* ovoid, sessile at base of bract, 1-celled, styles 2, red, filamentous, divaricating; *Fruit* an indehiscent nutlet, drupaceous,  $\frac{1}{12}$  in. long, adnate to persistent fleshy bractcoles, densely sprinkled with golden glands, stone 1-seeded.

*Leaves* alternate, exstipulate, variable, lanceolate or cuneate-oblong, entire or minutely toothed at apex, slightly revolute, obtuse or acute, coriaceous, shortly petiolate, matt green above, paler and often pubescent beneath, dotted with golden, resinous, aromatic glands, 2–3 ins. long,  $\frac{1}{4}$ – $1\frac{1}{4}$  in. broad. Autumn tints fawn or purplish-brown.

A deciduous *shrub*, 2–4 ft.; twiggy, sub-erect, resinous, fragrant.

Native of Britain. Generic name from Gr. *Myrike*, used by Homer for the Tamarisk. Also called Sweet Gale.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDER .	.	.	.	.	<i>Cupuliferæ</i>

Trees or shrubs, with alternate leaves and deciduous stipules; *Flowers* monœcious, bracteate and bracteolate, usually in catkins or small heads; *Males* with or without a perianth of 1–5 or more segments or distinct sepals; *Stamens* few or several, on a disk, or adnate to bases of sepals, anthers 2-celled; *Females* with or without a minutely-toothed perianth adnate to the ovary, which is superior or inferior, and usually 2–3-celled, styles 2 or 3; *Fruit* a nut (glans), 1-celled, 1-seeded, inclosed in a cupular involucre formed of the hardened accrescent bracts and bractcoles (Oak, Beech, Chestnut), or enclosed in large leafy bracts (Hazel and Hornbeam), or a winged samara (Birch), or a nut without wings (Alder).

# TREES AND SHRUBS

## SILVER BIRCH, *Betula alba*.

Woods, commons, parks, gardens. April, May. Prefers sandy and loamy soils in cold situations. The "Lady of the Woods" is perhaps the most picturesque of British trees. It makes a good hedge or screen. The species of *Betula* are propagated by layers in October; seeds sown in pans or boxes of sandy soil in cold frame in autumn or spring, simply pressing seeds into soil, and not covering; or in sheltered borders in March.

*Flowers* whitish, monœcious, appearing before leaves are fully out; *Male catkins* at ends of shoots of previous year, no winter buds-scales, cylindrical, lax, with broad, short-stalked peltate bracts, catkins 1–2 ins. long; *Stamens* 6 to each bract, in 3 pairs (flowers), with a scale-like sepal opposite each pair, filaments forked, each branch bearing a single anther lobe; *Female catkins* terminating lateral dwarf shoots, enclosed by winter bud-scales, cylindrical and compact,  $\frac{1}{2}$  in. long, shortly stalked, erect at first, bracts usually 3-lobed and 3-flowered, without perianth; *Ovary* 2-celled, styles 2, stigmas 2, purple; *Fruit* a small, flat, broad-winged samara, with spreading side lobes, 1-celled, 1-seeded, ripe in September—October. Bears usually after the twenty-fifth year.

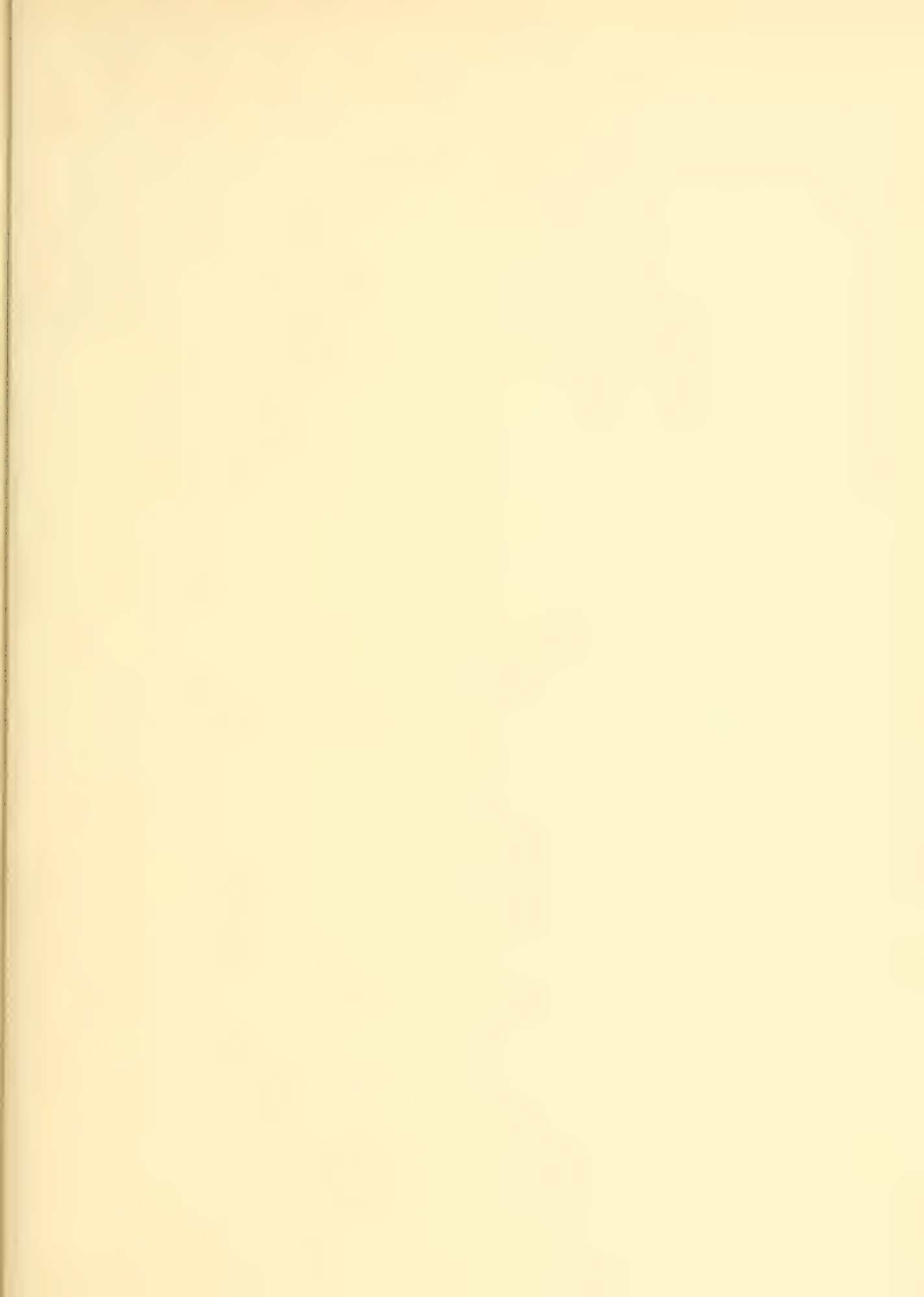
*Leaves* rhomboid-triangular, small, deeply serrated, glossy, coriaceous, petioles long and slender, causing leaves to droop; young leaves emit balsamic odour; stipules broad.

A deciduous tree, 50–60 ft.; *Branches* slender; *Twigs* numerous, small; *Lenticels* on trunk  $\frac{1}{2}$ –4 ins.; *Bark* smooth, silvery-white, peeling in horizontal bands, reddish-brown in young trees, corky on old trunks; *Wood* light brown, hard, even-grained, easily worked; used for turnery, chair-making, cabinet-work, hoops, barrels; twigs for brooms; bark for tanning.

Native of Britain; very hardy; last to disappear in high latitudes or high mountains. Name Birch from A.S. *birce*, *berc*, *beorc*, the Birch-tree.

"Witch Knots," confused clusters of short twigs resembling a rook's nest, are produced by the fungus *Exoascus turgidus*; a somewhat similar growth, starting in axillary buds, is the work of a Gall-mite (*Phytoptus rudis*); *Foliage* destroyed by Winter Moth (*Cheimatobia brumata*), Mottled Umber Moth







ALDER (*Alnus glutinosa*)

I. Immature male catkins. B. Mature male catkins. C. Female flowers. D. Female clusters of last year, after shedding seeds. E. Female clusters of present year. F. Scale with two female flowers. G. Male flowers. H. Section of cone, showing insertion of seeds. I. Seed.

## CUPULIFERÆ

(*Hybernia defoliaria*), and Oak Beauty (*Amphidasys strataria*); Timber by Goat-moth (*Cossus ligniperda*) and Wood Leopard Moth (*Zeuzera æsculi*).

*Fungoid Pests*:—Birch-leaf Rust (*Melampusora betulina*), Birch-leaf Blotch (*Dothidella betulina*), Birch Polypore (*Polyporus betulinus*).

### CHERRY BIRCH, *Betula lenta*.

Parks, gardens. May, June. Best on a dry soil and in a moderately sheltered situation.

*Flowers* monœcious, aromatic; *Male catkins* 3–4 ins. long, scales ovate, reddish-brown; *Females*  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, scales ovate, pale green, smooth, styles light pink, stigmas persistent; *Fruiting cone* oblong-ovoid, sessile, erect, glabrous, 1–1½ in. long, samara obovate, pointed at base.

*Leaves* alternate, ovate, cordate or rounded at base, 2½–6 ins. long, 1½–3 ins. wide, serrated, acute or acuminate, silky pubescence when young, thin, membranaceous, aromatic, dark dull green above, paler beneath, 9–11 pairs of prominent veins, petiolate; stipules ovate, acute, scarious, ciliate. Autumn tint yellow.

A deciduous tree, 60–80 ft.; *Branches* slender, spreading, pendulous at extremities; *Twigs* viscid, pilose, light green to orange-brown, afterwards brown tinged red; *Bark* dark reddish-brown, furrowed, thick irregular plates; young stems and branches smooth, aromatic, sweet; *Buds* ovate, acute, scales brown, loosely imbricated; *Wood* heavy, strong, hard, close-grained, dark brown tinged red; sometimes called Mountain Mahogany and American Birchwood; used for furniture and turnery.

Introduced from N. America, 1759. Known as Black Birch.

### YELLOW BIRCH, *Betula lutea*.

Parks, gardens. May. Best in cold latitudes and moist position; thrives well near London.

*Flowers* monœcious; *Male catkins* 3–3½ ins. long, scales ovate, brown,

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ciliate; *Females*  $\frac{2}{3}$  in. long, scales acute, pilose, green below, red above; *Fruiting cone* erect, sessile, pubescent,  $1-1\frac{1}{2}$  in. long, nut slightly broader than wing.

*Leaves* alternate, ovate, cuneate or cordate at base, usually oblique, acute or acuminate, doubly serrated, teeth glandular, pilose, dark green above, yellow-green below, aromatic,  $3-4\frac{1}{2}$  ins. long,  $1\frac{1}{2}-2$  ins. wide; petioles slender, hairy, yellow; stipules ovate, acute, green tinged with pink. Autumn tint bright yellow.

A deciduous *tree*, 70–80 ft.; *Branches* spreading, pendulous; *Twigs* pilose when young, becoming glabrous, green to orange-brown; *Bark* reddish-brown, large thin plates; on young stems and branches silvery-grey or orange, thin loose scales, aromatic, bitter; *Buds* acute, brown, viscid, hairy; *Wood* heavy, hard, strong, close-grained, light brown tinged with red, taking fine polish.

Introduced from N. America, 1767.

### DWARF BIRCH, *Betula nana*.

Mountainous districts, rockeries, and shrubberies. April, May. In a wild state it affects wet situations, and will grow well in fairly moist ground.

*Flowers* whitish-green; *Male catkins* small,  $\frac{1}{2}$  in. long, sessile; *Males* erect, lateral, axillary, oblong or shortly cylindrical; *Females* terminal, very small, bracts 3-lobed, 3-flowered; *Fruit* a samara, narrowly winged, bracts broadly obcuneate, 3-lobed.

*Leaves* orbicular, very shortly petiolate, crenated, smooth, dark green, reticulate,  $\frac{1}{2}$  in. long; stipules lanceolate, brown.

A deciduous *shrub*, 2–5 ft.; sometimes up to 20 ft.; *Stem* creeping; *Branches* numerous, slightly downy when young; *Bark* reddish when young, silvery when old.

Native of Britain; confined to mountains of Northumberland and Scotland. Also called Marsh Birch.



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### RED BIRCH, *Betula nigra*.

Parks, gardens. May. This is a water-loving tree of singular beauty, the thin broad flakes of red bark producing a wild and very picturesque effect during the winter months.

*Flowers* monœcious; *Male catkins* clustered, 2–3 ins. long, scales ovate, brown; *Females*  $\frac{1}{3}$  in. long, scales green, ovate, rounded or acute, pubescent, ciliate; *Fruiting cone* cylindrical, 1–1½ in. long, pubescent, erect, peduncles tomentose, samara puberulous, nut ovate or oval, as broad as wing, ripe in May or June.

*Leaves* alternate, rhombic-ovate, cuneate, acute, doubly serrated, on young branches often lobed, thin, tough, tomentose when young, 1½–3 ins. long, 1–2 ins. wide, dark shining green; petioles slender, flattened, tomentose; stipules ovate, rounded or acute, pilose. Autumn tint dull yellow.

A deciduous tree, 60–70 ft.; *Branches* slender; *Twigs* tomentose, red-brown; *Trunk* often dividing not far from ground into several erect limbs; *Bark* red-brown, deeply furrowed, scaly; young stems and branches reddish-brown or silvery-grey, large thin papery scales, peeling, remaining on tree for several years; *Buds* ovate, acute, brown, glabrous or slightly puberulous; *Wood* light, hard, strong, close-grained, light brown.

Introduced from N. America by Peter Collinson, 1736. Also called River Birch.

### CANOE BIRCH, *Betula papyrifera*.

Parks, gardens. April, May.

*Flowers* monœcious; *Male catkins* clustered, bright yellow, 3½–4 ins. long, scales ovate, acute, brown; *Females* 1–1¼ in. long, scales lanceolate, light green, styles bright red; *Fruiting cone* cylindrical, 1½ in. long, glabrous, nut oval, narrower than wing.

*Leaves* alternate, ovate, acute or acuminate, cuneate or cordate at base, serrated, entire at base, glandular and pubescent when young, later usually

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glandular on lower surface, dark green above, light yellow-green below, 2-3 ins. long,  $1\frac{1}{2}$ -2 ins. wide; petioles yellow, glandular, glabrous or pubescent; stipules ovate, acute, ciliate. Autumn tint light yellow.

A deciduous *tree*, 60-70 ft.; *Branches* short, pendulous; *Twigs* viscid and pubescent when young, orange-brown; *Bark* brown or nearly black, separating into thin layers; on young trunks and branches creamy-white to brown, orange on inner surface, thin papery layers; *Buds* ovate, acute, resinous, pubescent to glabrous; *Wood* light, strong, hard, tough, close-grained, light brown tinged red; used in turnery; *Bark* used for Indian canoes.

Native of North America. Known also as Paper Birch. Said to have been introduced by the Duke of Argyll, 1750.

### NEAPOLITAN ALDER, *Alnus cordifolia*.

Parks. March, April. Thrives in dry soil, but also very suitable for planting by water or in damp situations. The species are propagated by suckers in November; seeds sown in damp soil in March, transplanting the seedlings when one year old.

*Flowers* greenish-brown, appearing before leaves; *Fruit* a small woody cone.

*Leaves* alternate, cordate, acuminate, serrated, glabrous, dark glossy green.

A deciduous *tree*, 15-50 ft.; round-headed, pyramidal, growth rapid; *Bark* light-coloured.

Introduced from S. Europe, 1820.

### ALDER, *Alnus glutinosa*.

Wet woods, borders of streams, wet pastures. March, April. Best in good soil little above level of water; useful for the sides of ponds or streams.

*Flowers* greenish, monœcious, appearing before leaves fully out; *Male catkins* autumnal, lasting through winter, opening in spring, cylindrical, drooping, 2-4 ins. long, peltate reddish bracts 3-flowered, perianth 4-cleft; *Stamens* 4 to 6 each flower; *Female catkins* in spring, short, ovoid, closely



HORNBEAM (*Carpinus betulus*)

A. Leaves. B. Flowers of pistillate catkin. C. Flower of staminate catkin. D. Staminate catkin. E. Fruit. F. Pistillate catkin.





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imbricated, resembling fir-cone in shape, red-brown bracts or scales, smaller inner scales or bracteoles with 2 ovaries (flowers) in each; *Ovary* 2-celled, styles 2; *Fruit* a small 1-celled, 1-seeded nut, without wings; fruiting catkin erect, woody, resembling miniature fir-cone, black,  $\frac{1}{2}$  in. long, ripe in October or November; *seed* not produced till twenty years old; seed-vessels often persisting after escape of seed, and then black in colour.

*Leaves* broadly ovate or orbicular, cuneate, sharply serrated, shortly petiolate, stipulate, 2-4 ins. long, glutinous in young stage, shining above, underside having tufts of whitish down in angles of veins; stipules ovate to lanceolate, glandular hairs. Autumn tints deep brown to black.

A deciduous *tree*, 30-60 ft.; *Bark* rough, black, full of clefts; *Buds* stalked, large, obtuse, triangular in section, brown, with tinge of violet; *Lenticels* reddish; *Wood* soft, light, very lasting under water, white when alive, red when freshly exposed, pinkish when dry; sometimes called Scottish mahogany; used for carpentry, poles, packing-cases, turnery. In Scotland dyes obtained from tree, —green from flowers, pale brown from twigs, dark red from bark.

Native of Britain. Common name from A.S. *alor*, *aler*, *abr*, the Alder-tree.

Pimple-like galls on leaves produced by a Mite (*Eriophyes laevis*).

### OREGON ALDER, *Alnus oregona*.

Parks. Moist soil. March.

*Flowers* monœcious, opening before unfolding of leaves; *Male catkins* 2-3 ins. long, becoming 4-6 ins. long, perianth lobes ovate; *Stamens* 4, scales dark red-brown; *Females*  $\frac{1}{3}$ - $\frac{1}{2}$  in. long, styles bright red, scales dark red, acute; *Fruit* a cone of small 1-seeded nuts, ovate or oblong,  $\frac{1}{2}$ -1 in. long, peduncles stout, orange, nuts surrounded by membranaceous wing.

*Leaves* alternate, ovate to elliptical, acute, narrowed towards base, crenately lobed, teeth glandular, tomentose when young, glabrous or pilose above, rusty pubescence beneath, 3-5 ins. long,  $1\frac{3}{4}$ -3 ins. broad, sometimes 8-10 ins. long, stipules ovate, acute, tomentose.

A deciduous *tree*, 20 ft.; *Branches* slender, somewhat pendulous; *Twigs*

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green to bright red, ultimately ashy-grey; *Bark* rough, pale grey or nearly white; *Buds* dark red, pale scurfy pubescence; *Wood* light, soft, brittle, not strong, close-grained, brown tinged red.

Native of Western North America (40–80 ft.).

### SEASIDE ALDER, *Alnus maritima*.

Parks. Moist soil. September.

*Flowers* monœcious, appearing in summer; *Male catkins*  $1\frac{1}{2}$ – $2\frac{1}{2}$  ins. long, in axils of upper leaves, scurfy pubescent, glandular pitted, peduncles slender, scales orange-brown, stamens bright orange; *Females* solitary, in axils of lower leaves, bright red at apex, light green below before opening, scales ovate, acute, ciliate, peduncles stout, pubescent; *Fruit* a cone of small 1-seeded nuts, ovate,  $\frac{5}{8}$  in. long,  $\frac{1}{2}$  in. diam., scales thin, dark reddish-brown to nearly black, persistent.

*Leaves* alternate, very variable, oblong to obovate, acute, acuminate, or obtuse, narrowed at base, glandularly serrate, scurfy pubescence above, dark green, 3–4 ins. long,  $1\frac{1}{2}$ –2 ins. broad, midrib, veins and petiole hairy and glandular; stipules oblong, acute, caducous.

A deciduous *tree*, 20–30 ft.; or *shrub*, 15–20 ft.; *Branches* spreading, slender; *Twigs* yellowish-green, becoming orange or reddish-brown in winter, afterwards ashy-grey; *Buds* acute, dark red, scurfy pubescence; *Bark* smooth, brown; *Wood* light, soft, close-grained, light brown.

Native of N. America.

### WHITE ALDER, *Alnus rhombifolia*.

Parks. Moist soil. March.

*Flowers* monœcious, opening before leaves; *Male catkins* 4–6 ins. long; *Perianth* 4-lobed; *Stamens* 2 3, scales orange-brown; *Females*, scales ovate or rounded; *Fruit* a cone,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long, scales lobed, nuts ovate, margin thin.

*Leaves* alternate, ovate to orbicular, rounded or acute, narrowed towards

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base, serrated, margins slightly thickened and reflexed, tomentose when young, dark green and glandular above, paler and puberulous beneath, 2-3 ins. long,  $1\frac{1}{2}$ -2 ins. broad; petioles slender, hairy, flattened and grooved; stipules ovate, acute, scarious, puberulous.

A deciduous *tree*, 20 ft.; *Branches* slender, pendulous at extremities; *Twigs* pubescent when young, becoming dark orange-red and glabrous; *Buds* dark red, pale scurfy pubescence; *Wood* light, soft, not strong, brittle, close-grained, light brown.

Native of N. America.

### HORNBEAM, *Carpinus Betulus*.

Woods and hedges. May. Best on strong porous soil; grows well in partial light; makes a good hedge. Propagated by seeds sown in ordinary soil outdoors in autumn, transplanting when one year old.

*Flowers* yellowish, monœcious, anemophilous, appearing as leaves come out; *Male catkins* sessile, pendulous,  $1\frac{1}{2}$  in. long, bracts ovate, acute, imbricate, ciliated, each containing 5-14 stamens, forked anthers with tufts of hairs; *Female catkins* 2-4 ins. long, lax, terminal, cylindrical, flowers in pairs, each in a 3-lobed bracteole, entire or toothed; *Ovary* 2-celled, stigmas 2, styles long; *Fruit* a small ovoid, brown nut, 7-11-nerved, within a large leafy 3-lobed, entire or serrated bracteole,  $1\frac{1}{2}$  in. long, catkins several inches long, ripe in October—November.

*Leaves* alternate, elliptical-ovate, acute or acuminate, doubly serrated, shortly petiolate, pubescent beneath, 2-3 ins. long, stipules large, linear-oblong, withered leaves persistent through winter.

A deciduous *tree*, 30-70 ft.; *Trunk* usually flattened; *Branches* twiggy; *Bark* smooth, light grey; *Buds* short, adpressed, scales brown, ciliate, pubescent at tips; *Wood* yellowish-white, hard, tough, close-grained, strong, light, flexible; used for cogs, agricultural tools and implements, parts of pianos, also for gun-powder charcoal.

Native of England and Wales.

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“Witch Knots” produced by *Exoascus Carpini*; *Leaves* subject to Hornbeam anthracnose (*Glæosporium Carpini*) and Hornbeam-leaf Blotch (*Gnomoniella fimbriata*).

### AMERICAN HORNBEAM, *Carpinus caroliniana*.

Parks, gardens. May.

*Flowers* monœcious; *Male catkins*  $1\frac{1}{2}$  in. long, scales ovate, acute, boat-shaped, lower half green, upper bright red; *Females*  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, scales green, ovate, acute, hairy, styles scarlet; *Fruit* a nut, bracteole, 2-3-lobed, serrated,  $1-1\frac{1}{2}$  in. long, 1 in. wide, catkin 5-6 ins. long.

*Leaves* alternate, ovate-lanceolate, acuminate, doubly serrated, glandular, entire at base, thin, firm, dull blue-green above, light yellow-green below, tomentose in axils of veins, 2-4 ins. long,  $1-1\frac{3}{4}$  in. wide; petioles slender, terete, hairy; stipules ovate-lanceolate, acute, pubescent, ciliate. Autumn tints scarlet and orange.

A deciduous *tree*, 30-40 ft.; *Branches* long, slender, spreading, pendulous at extremities; *Twigs* silky when young, orange-brown to dark red, finally grey tinged red; *Bark* grey-brown; *Buds* ovate, acute; scales brown, scarious margins; *Wood* light brown.

Native of N. America.

### COMMON HAZEL, *Corylus Avellana*.

Woods, copses, hedges. February—April. Propagated by layering of strong shoots in November, removed and planted in following autumn; suckers in October; seeds (nuts) sown 2 ins. deep in open ground in October or November, transplanting seedlings two years afterwards.

*Flowers* grey-green, monœcious, anemophilous, appearing before leaves are out; *Male catkins* cylindrical, drooping,  $1\frac{1}{2}$ –2 ins. long, without perianth; *Stamens* 8, filaments short, anther-cells separate, tips hairy, bracts sessile, broad, cuncate, with 2 scale-like bracteoles; *Female catkins* small, bud-like, crimson;







HAZEL (*Corylus avellana*)

A. Male catkins. B, B. Female flowers. C. Female flowers enlarged. D. Enlarged apex of female flower clusters. E. Fruit. F. Enlarged male flower.

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sub-sessile, outer scale-bracts empty, inner upper 3-lobed bracteoles each containing 2 flowers; *Perianth* with a minute filiform toothed border; *Ovary* 2-celled, styles 2, stigmas red; *Fruit* a hard brown nut enclosed in a leafy, campanulate bract (cupule), which is unequally lobed and jagged, ripe in October.

*Leaves* alternate, orbicular, obliquely cordate, acuminate, doubly serrated, 2 4 ins. long; petiole short, pubescent when young, coarse and glabrous afterwards; stipules oblong, obtuse, petioles and stipules with reddish glandular hairs. Autumn tint yellow.

A deciduous *shrub* or small *tree*, 20–30 ft.; *Shoots* flexible and tough, brown, hairy, glandular; *Bark* split, ash-grey on stem; *Buds* compressed, scales ciliate, reddish glandular hairs; *Wood* whitish-red, close-grained, soft, very elastic.

Native of Britain; seldom allowed to develop into tree of any size. Name from A.S. *haesel*.

*Injurious Insects*:—*Bud Galls*—Hazel and Filbert Bud Mite (*Phytoptus avellana*); *Fruit*—Nut Weevil (*Balaninus nucum*); *Leaves*—Garden Chafer (*Phyllopertha horticola*), Cockchafer (*Melolontha vulgaris*), Mottled Umber Moth (*Hybernia defoliaria*), Nut-tree Tussock Moth (*Demas coryli*); *Wood*—Wood Leopard Moth (*Zeuzera æsculi*).

### CONSTANTINOPLE HAZEL, *Corylus Colurna*.

Gardens, plantations. March, April. This is one of the strongest-growing of all the Hazels, and seedlings are used as standards for grafting varieties in March.

*Flowers* green, longer and larger than *Corylus Avellana*; *Fruit* a small nut, involucre double, exterior bract many-partite, interior 3-partite, divisions palmate; *seeds* insipid.

*Leaves* alternate, roundish ovate, cordate, serrated, stipules lanceolate, acuminate.

A deciduous *tree*, 40 60 ft.; with broad spreading head; *Branches* horizontal. Introduced from Asia Minor, 1665. Also called Turkish Hazel.

# TREES AND SHRUBS

## TURKEY OAK, *Quercus Cerris*.

Parks, gardens, plantations. April, May. A tree with handsome foliage and peculiar mossy-cupped acorns. The species of Oak are propagated by seed (acorns) gathered in autumn, stored in sand till March, and then sown, transplanting seedlings when one year old; choice kinds are grafted on the common species in March.

*Flowers* greenish-white; *Male catkins* pubescent, 1–3 ins. long, flowers distant; *Females* sessile, at sides of short peduncle, single or groups 2–4; *Perianth* usually 4-partite; *Stamens* 4, hairy; *Ovary* grey-tomentose, stigma lobes often 4, sessile, reflexed, linear, pointed; *Fruit* a glans (acorn), solitary or twin, sessile, cylindrical, brown,  $\frac{3}{4}$ – $1\frac{1}{4}$  in. long, cup hemispherical, with bristly or moss-like scales, rarely ripening till second year, acorn long ovoid, dark brown, tomentose at apex.

*Leaves* oblong or obovate, variable, shortly petiolate, 2–3 ins. long, sinuate or pinnatifid, lobes lanceolate, unequal, acute, angular, slightly pilose both surfaces, stipules narrow-linear, pilose, persistent on leaf-bases. Autumn tints russet-brown to dull grey.

A deciduous tree, 50–60 ft.; pyramidal outline; *Branches* erect, generally in long straight lines, spray small, young branches pubescent; *Buds* with few ciliate, pubescent scales; *Wood* coarser and straighter in grain than English Oak; used for all kinds of constructive work.

Native of S. Europe and Levant; introduced 1735. Also called Mossy-cupped Oak.

## SCARLET OAK, *Quercus coccinea*.

Parks. May. In the early days of autumn there is perhaps no more beautiful tree.

*Flowers* monœcious; *Male catkins* 3–4 ins. long, slender; *Perianth* 4–5-partite, lobes acute, shorter than stamens, red; *Females* on pubescent peduncles, perianth lobes acute, scales red, ovate, acute, stigmatic arms





HOLM OAK, OR EVERGREEN OAK (*Quercus ilex*)

A. Branch with male catkins (to right) and small female flowers (at apex). B. Shoot, with miniature acorns. C. Fruit.



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elongated, linear; *Fruit* a glans (acorn), turbinate or hemispherical,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, projecting  $\frac{1}{3}$ – $\frac{1}{2}$  its length from cupule.

*Leaves* alternate, 5–8 ins. long, 4–5 ins. broad, broad oval to obovate, deeply pinnatifid, sinuses deep, rounded, lobes divergent, sparingly toothed, teeth prolonged into subulate filament, thin, glabrous, bright green, or somewhat yellowish-green beneath, young leaves tomentose in angles of veins, petiole 1–2 $\frac{1}{2}$  ins. Autumn tints brilliant scarlet and crimson.

A deciduous *tree*, 50 ft.; *Twigs* olive-green or brown; *Bud-scales* glabrous, ciliate, red-brown; *Wood* heavy, hard, strong, coarse-grained, reddish-brown used for window-sills, door frames, mallets, &c.

Introduced from N. America, 1691.

### EVERGREEN OAK, *Quercus Ilex*.

Parks, gardens. April, May. Best in good deep sandy loam. This is the best known of the Evergreen Oaks, and a very handsome tree for landscape purposes, greatly resembling the Olive trees of the Italian coast and of the French Riviera.

*Flowers* monœcious; *Male catkins* 1–2 $\frac{1}{2}$  ins. long, flowers distant, few on a peduncle; *Perianth* 6-partite, tomentose; *Stamens* 6, anthers tipped with a short point; *Females* in racemose groups of 4–8, peduncles tomentose, as long as leaves; *Stigmas* short, broad, reflexed; *Fruit* a glans (acorn), twice as long as calyx, sessile, ripening in second year, cup hemispherical, velvety, erect, scales slightly adpressed, tomentose.

*Leaves* very variable, elliptical, oblong, ovate, or lanceolate, serrated or entire, acute, lower ones coriaceous, glabrous, sometimes spiny, deep glossy grey-green, hoary beneath, 1 $\frac{1}{2}$ –5 ins. long, persisting nearly three years, stipules linear, purplish, dying leaves dirty brown.

An evergreen *shrub* or small *tree*, 20–40 ft.; seldom single-stemmed in England, but when so may reach 70–85 ft.; *Twigs* ash-grey; *Bark* ash-grey to black, thin, not corky; *Tap-roots* very long, lateral roots few; *Wood* hard, close-grained, heavy, brown, taking high polish, liable to split in drying.

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Native of S. Europe and N. Africa; introduced about middle of sixteenth century. Also called Holm or Holly Oak, from its leaves sometimes resembling the Holly; a corruption of M.E. *holin*, a holly; A.S. *holen*, *holegn*.

### BLACK JACK, *Quercus marilandica*.

Parks, gardens. May.

*Flowers* monoecious; *Male catkins* 2–4 ins. long, hoary; *Perianth* 4–5-partite, thin, scarious, pale-pubescent, lobes ovate; *Females* on short rusty-tomentose peduncles; *Stigmas* dark red, scales rusty; *Fruit* a glans, solitary or in pairs, usually pedunculate; acorn oblong,  $\frac{3}{4}$  in. long, enclosed for nearly  $\frac{2}{3}$  its length in cup, scales reddish-brown, often ciliate and tomentose, upper rows forming a thick rim.

*Leaves* alternate, broadly obovate, rounded or cordate at base, 3–5-lobed, pink and tomentose when young, afterwards firm, thick, or sub-coriaceous, dark lustrous yellow-green above, yellow, orange, or brown below, 6–7 ins. long and broad, petioles stout, yellow. Autumn tints brown and yellow.

A deciduous tree, 30–50 ft.; *Branches* short, spreading, often contorted; *Twigs* tomentose, with stellate hairs when young, becoming glabrous or puberulous, brown or grey; *Bark* deeply divided into quadrangular plates; *Buds* ovate or oval, angled, red-brown, hairy; *Wood* heavy, hard, strong, dark brown.

Native of U.S.A.

### SWAMP OAK, *Quercus palustris*.

Parks, plantations. May. Though most at home in swamp and low ground, it will thrive in any good rich soil.

*Flowers* monoecious; *Catkins* pilose; *Fruit* a glans (acorn), ovoid or globose, solitary or pairs,  $\frac{5}{12}$  in. long, cups sub-sessile, flat, shallow, saucer-shaped, scales closely packed, 5 in number.

*Leaves* alternate, elliptical-oblong, deeply and widely sinuated, cuneate at



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base, thin, deep green above, pale shining green beneath, glabrous both surfaces, small tufts of tomentum in axils of prominent veins underside, lobes ovate-acute, sinuses deep, round, few very acuminate bristly-pointed serratures, 6 ins. long, 4 ins. broad; petioles long, slender. Autumn tints bright purplish-red, purplish underneath.

A deciduous *tree*, 80 ft.; dense-headed, pyramidal when young; *Branches* when older spreading and drooping, secondary branches numerous, smooth, slender, densely intermingled, giving the appearance of many pins; *Bark* smooth when young, scarcely corked when old; *Wood* used for furniture.

Native of N. America, in marshy places; introduced 1800. Known as Pin Oak.

### BRITISH OAK, *Quercus pedunculata*.

Woods on clay soils. April, May. Thrives best in deep fresh soil and abundance of light. The British Oak is the emblem of majesty, strength, and durability.

*Flowers* monœcious, anemophilous, proterogynous, appearing as leaf-buds open; *Male catkins* pendant, 2-3 ins. long; *Flowers* isolated, sessile; *Perianth* 4-7-lobed, yellowish-green, ciliate; *Stamens* 4-12, sulphur-yellow; *Females* inserted singly or in groups on long stalks, in axils of uppermost leaves; *Involucre* of small reddish bracts; *Perianth* 3-8-toothed; *Ovary* 3-celled, stigmas 3, short, spreading, red; *Fruit* a glans (acorn), oblong, cupule imbricated, scales triangular-ovate, very numerous, small, peduncle 1-6 ins. long; acorns seldom produced till after sixty years.

*Leaves* alternate, oblong-obovate, shortly petiolate or sub-sessile, auricled at base, sinuses rather acute, lobes obtuse, downy beneath when young, glabrous when old, coriaceous, 3-6 ins. long, 1-2½ ins. broad; withered leaves frequently retained till spring, especially young trees. Autumn tints golden, russet, bronze or red.

A deciduous *tree*, 60-130 ft.; *Branches* spreading, tortuous, running horizontally, breaking out at right angles; *Shoots* glabrous; *Buds* brown, crowded,

## TREES AND SHRUBS

ovoid-conoid, slightly 5-angled, scales are stipules; *Bark* thick, rough, dark, deeply furrowed, net-like; *Wood* hard and durable.

Native of Britain; common over greater part of England, Ireland, and Scottish Lowlands; by many regarded as a distinct species. English name Oak from A.S. *ac*, the oak. Probable age of some specimens is 2000 years. Bark used for tanning, and "Oak-wood extract" obtained from sawdust and waste pieces.

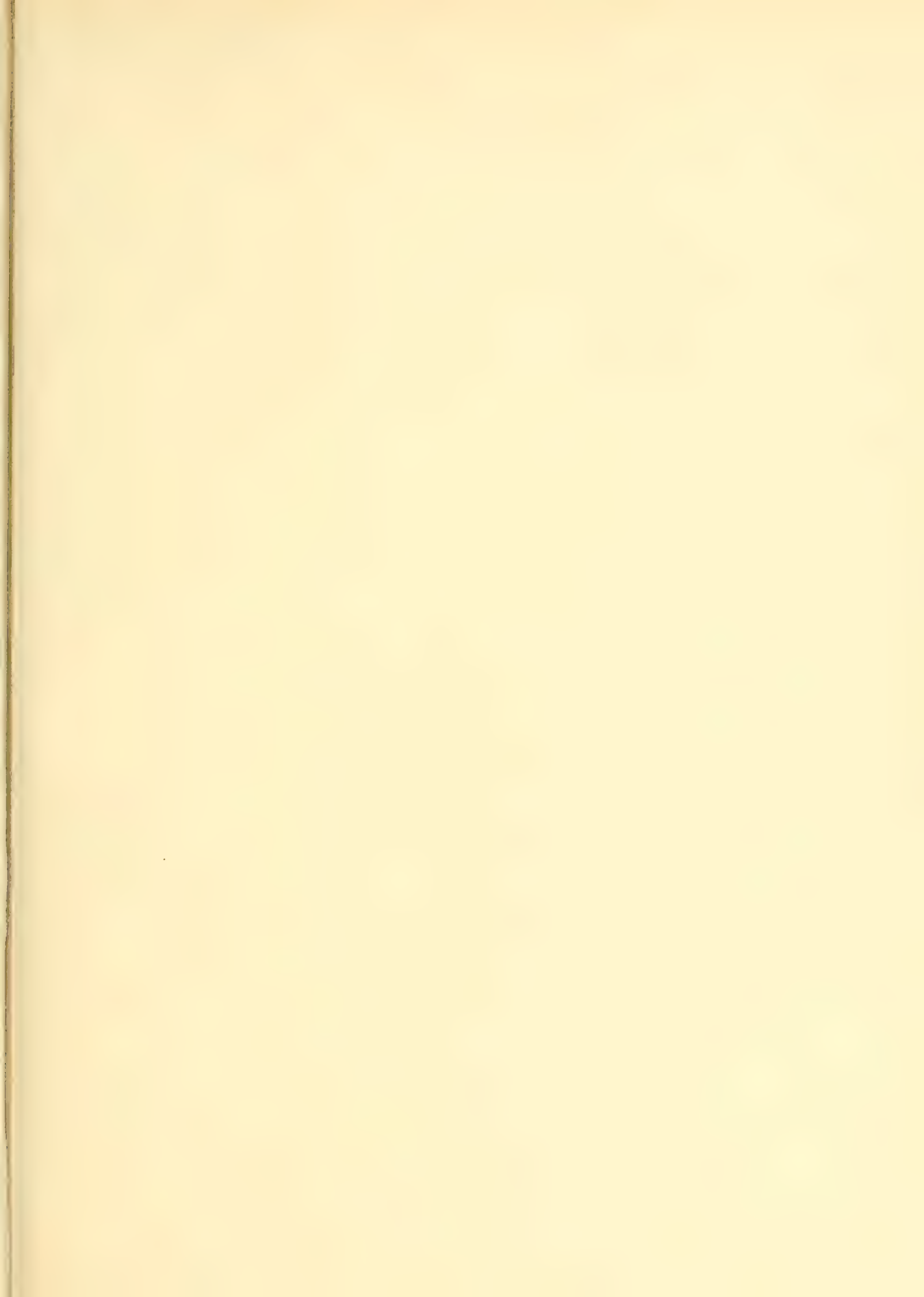
*Insects injurious to Oak*: -1500 species of insects have been described as subsisting on the Oak. The following are some of the most common:—*Sap*—Plant Bugs; *Bark*—Bark-mining Beetles (*Scolytidæ*), Death-watch Beetles (*Anobiidæ*); *Fruit*—Acorn Weevil (*Balaninus glandium*); *Leaves*—Cockchafer (*Melolontha vulgaris*), Leaf Roller Moth (*Tortrix viridana*), Oak Eggar Moth (*Bombyx quercus*), Mottled Umber (*Hybernia defoliaria*), Winter Moth (*Cheimatobia brumata*), Vapourer Moth (*Orgyia antiqua*), Oak Beauty (*Amphydasis strataria*), Peppered Moth (*A. betularia*); *Wood* Stag Beetle (*Lucanus cervus*), Lesser Stag Beetle (*Dorcus parallelipipedus*), Goat Moth (*Cossus ligniperda*), Wood Leopard Moth (*Zeuzera æsculi*). All parts of Oak attacked by Gall Flies, giving rise to Oak Galls of various forms, most common being:—Oak Apples produced by *Teras terminalis*, Marble Gall (*Cynips kollari*), Artichoke Gall (*Aphilothrix fecundatrix*), Currant Gall (*Spathegaster baccarum*), Oak Spangles (*Neuroterus lenticularis*), and Silky Button Gall (*Neuroterus numismatis*).

*Fungoid Pests*:—Vegetable Beef Steak (*Fistulina hepatica*) always found on dead parts of tree, Sulphury Wood-rot (*Polyporus sulfureus*), Sooty Mould (*Fumago vagans*).

### RED OAK, *Quercus rubra*.

Parks. April, May.

*Flowers* monœcious; *Females*, lobes of stigma elongated, linear and style-like, at least as long as the rest of the flower and its cupule; *Fruit* a glans (acorn), long ovoid, cylindrical above, 1 in. long, sessile or very shortly







BRITISH OAK (*Quercus robur*, var. *pedunculata*)

A. Flowering branch, with male and female flowers. B. Fruit. C. Single male flower. D. Single female flower, longitudinal section. E. Cups or cupules of acorn. F. Half grown acorns. G. Longitudinal section of mature acorn. H. Transverse section of young acorn.



## CUPULIFERÆ

pedunculate, in axils of fallen leaves, cupule hemispherical,  $\frac{3}{4}$ –1 in. diam., shallow, scales small, triangular-ovate, closely adpressed.

*Leaves* alternate, elliptic or oblong,  $3\frac{1}{4}$ – $4\frac{1}{2}$  ins. long, 2– $2\frac{1}{2}$  ins. broad, coarsely sinuate-dentate or pinnatifid, sinuses broad and shallow, lobes triangular-acuminate, coarsely toothed, acute or obtuse at base, glabrous, shining green, thin, petiole  $\frac{1}{4}$ – $\frac{1}{2}$  length of midrib. Autumn tints orange, scarlet, brown, dull red.

A deciduous *tree*, 60–80 ft.; *Twigs* olive-brown; *Bark* dark grey, smooth; *Bud-scales* pubescent; *Wood* reddish, coarse-grained.

Introduced from N. America, 1769. Known as Champion Oak.

### SESSILE-FLOWERED OAK, *Quercus sessiliflora*.

Woods and parks. April, May. Prefers high ground with southern or western aspect.

*Flowers* monœcious; *Females* crowded on short stalks in uppermost leaf-axils; *Fruit* a glans (acorn), 1-celled, 1-seeded, peduncle very short.

*Leaves* alternate, oblong-obovate, petiole  $\frac{1}{5}$ – $\frac{1}{4}$  the length of midrib, tapering below without forming auricles, sinuses opposite, lobes more triangular and acute, somewhat pubescent beneath, coriaceous, 3–6 ins. long, pale green.

A deciduous *tree*, 60–130 ft.; *Branches* and spray less tortuous; *Twigs* downy; *Buds* large, crowded, scales ciliate; *Bark* light in colour; *Wood* darker, heavier, more elastic than *Q. pedunculata*.

Native of Britain; common in Forest of Dean; plentiful in N. Wales and N. England.

### CORK OAK, *Quercus Suber*.

Parks. April, May. This makes a handsome tree, and does well on chalky soil.

*Flowers* monœcious; *Male catkins*  $1\frac{1}{2}$  in. long, lax; *Perianth* 6-partite, reddish-tomentose, pedicels long; *Stamens* short, anthers ovoid-acute; *Females*

## TREES AND SHRUBS

white-tomentose, single or grouped, sessile, stigmatic arms 3-4, broad, linear, sessile, reflexed; *Fruit* a glans (acorn), cylindric-oblong,  $\frac{3}{4}$ -1 $\frac{3}{4}$  in. long, subsessile, cupule hemispherical or turbinate, scales loose, grey-tomentose, nut 2-3 times as long as cupule, acute, polished pale brown.

*Leaves* alternate, 1-2 ins. long,  $\frac{1}{2}$ -1 $\frac{1}{4}$  in. broad, ovate, oval, or oblong, toothed or entire, acute, glabrous, grey-green above, stellate-velvety-hoary beneath, coriaceous, petiole  $\frac{1}{4}$ - $\frac{1}{2}$  in. long.

An evergreen *tree*, 25-70 ft.; *Branches* much contorted; *branchlets* hoary; *Bark* rough, thick and corky, cream-coloured.

Native of S. Europe; introduced 1581.

### YELLOW-BARK OAK, *Quercus velutina*.

Parks. April, May.

*Flowers* monœcious; *Male catkins* 4-6 ins. long; *Perianth* covered with pale hairs, lobes ovate, acute; *Females* on short peduncles; *Perianth lobes* acute; *Stigmas* red, scales ovate; *Fruit* a glans, sessile or short-stalked, solitary or in pairs, acorn ovate-oblong to hemispherical, light red-brown,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, enclosed for half its length in a thin red-brown cup.

*Leaves* alternate, ovate or oblong, cuneate or truncate at base, usually 7-lobed, sinuses wide, rounded, thick, firm, or sub-coriaceous, tomentose when young, dark shining green above, yellow-green or brown below, usually 5-6 ins. long, 3-4 ins. wide, sometimes much larger, petioles stout, yellow, 3-6 ins. long. Autumn tints dull red, orange, and brown.

A deciduous *tree*, 60-80 ft.; *Branches* slender, spreading; *Twigs* red or reddish-brown; *Bark* on young stems and branches smooth, dark brown, on old trunks deeply divided into broad rounded ridges; *Buds* ovate, angled, tomentose; *Wood* heavy, hard, strong, coarse-grained, brown tinged with red.

Native of N. America.

## CUPULIFERÆ

### GOLDEN-LEAVED CHESTNUT, *Castanopsis chrysophylla*.

Parks, gardens. May. Prefers a rather deep, loamy, but well-drained soil.

*Flowers* monœcious, densely bristly, maturing in the second year; *Catkins* 2-2½ ins. long; *Males*, *Perianth* campanulate, tomentose, 5-6-lobed, lobes ovate, shorter than stamens; *Stamens* 10-12, filaments filiform, exserted, anthers oblong; *Females*, *Calyx* oblong-campanulate, 6-lobed, free from ovary, lobes short, rounded, hoary tomentose; *Ovary* sessile on disk, 3-celled, styles 3, stigmas 3, spreading; *Fruit* a 4-valved cupule, globose, sessile, solitary or clustered, tomentose, spiny, 1-1½ in. diam., nuts 1-2, ovate, acute, 3-angled, yellow-brown, lustrous.

*Leaves* alternate, simple, lanceolate or oblong, acuminate, acute at base, entire, slightly revolute, thick, coriaceous, dark green and lustrous above, golden-yellow scales below, scattered white scales above, 2-6 ins. long, ½-2 ins. broad, petiolate, stipules ovate, acute or obtuse, brown, scarious, puberulous, leaves persistent 2-3 years.

An evergreen *shrub*, or small *tree*; *Branches* stout, spreading; *Twigs* with golden-yellow scurfy scales, brown and scurfy later; *Bark* scaly, red-brown; *Buds* ovate or sub-globose, scales brown, puberulous, ciliate; *Wood* light, soft, close-grained, not strong, light brown tinged red.

Native of Western N. America, sometimes growing to height of 150 ft.; introduced through William Lobb, 1848. Syn. *Castanea chrysophylla*.

### SWEET CHESTNUT, *Castanea sativa*.

Parks, plantations. May—July. Prefers deep, porous soils and good light; best in sandy loam. Propagated by nuts sown in open ground in November or February; transplant when one year old.

*Flowers* greenish-yellow, with a powerful and disagreeable odour; *Catkins* cylindrical, erect, 5-6 ins. long, males in upper part, females in lower; *Perianth* of males 5-6 lobed, yellowish; *Stamens* 5-20; *Females* green, 2-3 enclosed in a

## TREES AND SHRUBS

4-lobed involucre; *Perianth* investing a tapering 6-celled inferior *Ovary*, stigmas 5-8, reddish; *Fruit* 1-celled, greenish, containing 1-3 brown nuts enclosed in a spiny involucre or cupule, ripe in October; bears after about twenty-five years.

*Leaves* simple, alternate, oblong-lanceolate, acuminate, mucronate serratures, glabrous on both surfaces, veins running straight from midrib to margin, 9-10 ins. long. Autumn tints yellow, orange, brown.

A deciduous *tree*, 60-80 ft.; *Branches* growing horizontally and downwards, thickened towards side spray; *Bark* of young wood smooth and brown, becoming grey later, splitting into longitudinal fissures, which later on have a spiral twist; *Buds* with 2 scales, yellowish-green; *Wood* durable; useful for beams, posts, fences, &c.; more durable when young, sap-wood soon changing into heart-wood.

Supposed to have come from Asia Minor; probably introduced during Roman occupation; average age about 500 years; specimens on Mount Etna 2000-2500 years old.

Name Chestnut is short for *chesten-nut* = nut of the *chesten* = M.E. *chestein*,—O.F. *chastaigne*,—L. *castanea*, the Chestnut-tree,—Gr. *kastanon*, chestnut. Sometimes said to be derived from *Kastanum*, in Thessaly; more probably from Armenian *kaskeni*, a chestnut-tree,—*kask*, a chestnut.

### BEECH, *Fagus sylvatica*.

Woods, parks, gardens. April, May. Prefers limy soils, or clays containing lime; requires deep soil to do well. Propagated by seeds in March or April; transplant when two years old.

*Flowers* greenish-yellow, monoëcious, anemophilous; *Males* on slender, drooping, globose catkins, 1-1½ in. long, usually 4 in a bud, each with about a dozen flowers; *Perianth* campanulate, 4-7-lobed; *Stamens* 8-12, filaments long, anthers yellow, small; *Females* in erect catkins with short peduncles, 2-4 in a cupule of imbricated bracts; *Perianth* 4-5-toothed; *Ovary* 3-celled, styles 3; *Fruit* 2-3 triangular, 1-seeded nuts (masts) enclosed in a 4-valved bristly, woody, tough, reddish-brown capsule, ripe in October.





SWEET CHESTNUT (*Castanea sativa*)

A. Female flowers. B. Male catkins. C. Leaf. D. Male flower. E. Fruit (3 nuts enclosed in prickly involucre or cupule). F. Nuts removed from cupule. G. Section of cluster of female flowers. H. Female flowers.



## SALICINEÆ

*Leaves* ovate-oblong,  $1\frac{1}{2}$ – $3\frac{1}{2}$  ins. long, entire or slightly toothed, ciliate, shortly petiolate, acuminate, glossy, silky and yellowish-green when young, deep green when older. Autumn tints yellow, orange, gold, purple, finally a fiery brown.

A deciduous *tree*, 60–130 ft.; *Branches* with an upward tendency, side spray at acute angles; *Twigs* smooth, polished; *Bark* smooth, leaden-grey; *Buds* long, cone shaped, sharp pointed, 18 20 brown, slightly fringed scales which are modified stipules; *Wood* light brown, hard, close-grained, rather brittle; used for tools, cabinet- and chair-making, piles, wedges, turnery, carpentry, and fuel.

Indigenous in England; extensively planted throughout Britain; lives 200–300 years. The English name is derived from the A.S. *bece*, *boece*, the Beech-tree, so called from the fact that the nuts were eaten (formerly by men, now only by pigs). The Latin name *Fagus* has somewhat the same meaning, being derived from the Greek *phēgos*—*phago*, to eat.

*Injurious Insects*:—*Foliage*—Cockchafer (*Melolontha vulgaris*), Silvery Weevil (*Phyllobius argentatus*), Tree Lackey Moth (*Bombyx neustria*), Mottled Umber Moth (*Hybernia defoliaria*); *Timber*—Wood Leopard Moth (*Zeuzera aesculi*).

*Fungoid Pests*:—Beech Agaric (*Armillaria mucida*), Apple Tree Canker (*Nectria ditissima*).

Galls on leaves produced by a Gall-gnat (*Hormomyia piligera*).

CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDEE .	.	.	.	.	<i>Salicineæ</i>

Trees or shrubs with watery juice, and alternate, petiolate, and stipulate leaves, stipules scaly and deciduous or foliaceous; *Flowers* diœcious, appearing before leaves, borne in catkins in axils of leaves of previous year; *Perianth* 0;

## TREES AND SHRUBS

*Stamens* 2 or many ; *Styles* usually short or obsolete, stigmas 2-4, often 2-lobed ; *Fruit* a capsule, 1-celled, 2-4-valved ; seeds furnished with an arillus of silky hairs.

### WHITE WILLOW, *Salix alba*.

Marshes, moist woods and meadows, and banks of streams. April, May. The Willows are propagated by cuttings, 9-15 ins. long, inserted for two-thirds their length in moist soil, October—March ; choice kinds may be budded on the Goat Willow in July, or grafted on the same in March.

*Flowers* dioecious, appearing with leaves ; *Catkins* erect, sub-sessile, on short, leafy laterals of preceding year's shoots ; *Males* 1½-2 ins. long, ⅓-½ in. diam., cylindrical, lax, often curved ; *Stamens* 2, free, hairy, anthers yellow, scales greenish-yellow, white-silky above, glands 2 ; *Females* 2-2½ ins. long, ¼-⅓ in. diam. ; *Ovary* almost sessile, smooth, style short, stigmas short, deeply bifid, recurved, glands 1 or 2 ; *Fruit* a capsule, ovoid-conic, sessile or sub-sessile, glabrous, pedicel shorter than gland.

*Leaves* alternate, elliptical-lanceolate, finely serrated, lower serratures glandular, acuminate, tapering at base, densely silky when young, glabrous when old, ashy-grey or whitish, never bright green, 2-4 ins. long ; petioles short, glandular ; stipules minute, ovate-lanceolate, pubescent, caducous. Autumn tints yellow and brown.

A deciduous tree, 60-80 ft. ; *Trunk* up to 20 ft. girth ; *Bark* thick, deeply fissured ; *Young twigs* slender, supple, not easily detached, silky pubescence at tips, polished, olive-brown, purplish, or yellow ; older twigs orange ; *Buds* silky, flattened, small ; *Wood* light, tough, easily worked ; much used for cricket-bats ; well adapted for a variety of wright-work ; used especially for poles ; much attacked by larva of Goat Moth.

Native of Britain ; one form called Huntingdon Willow ; specimen at Haverholme Priory probably 1000 years old. Name Willow from A.S. *welig*, *wilig*, pliancy, willingness.

“ Rosette ” Galls (found on several species of Willow), consisting of 30-60 aborted leaves, produced by larva of *Cecidomyia rosaria*.





DWARF SALLOW.

(*Salix repens*)

A. Branch with young Catkins, Male. B. Branch with adult Male Catkins. C. Branch with adult Female Catkins. D. Branch with foliage. E. Male flowers. F. Female flower.



## SALICINEÆ

### GOLDEN OSIER, *Salix alba*, v. *vitellina*.

Osier grounds, lakes-sides. April, May. The yellow and red bark makes this a very effective shrub in winter, especially when planted in masses. To obtain the brightest colours the plants should be cut back in February, thus encouraging a growth of vigorous shoots.

*Flowers* diœcious; *Scales* linear-lanceolate, acute, fringed at base, longer than pistil; *Ovary* sessile, ovate-lanceolate, smooth.

*Leaves* lanceolate, acute, cartilaginous, serrate, smooth above, glaucous and somewhat silky beneath; stipules minute, lanceolate, smooth, deciduous.

A deciduous *shrub*, cultivated as an Osier; or *tree*, 30–40 ft.; *Twigs* pliable, smooth, polished, bright golden-yellow or reddish; older branches orange; *Buds* small, elongated, flat, silky.

Considered by some to be a distinct species. Specific name from *L. vitellus*, yolk of an egg, in reference to yellow bark.

### BUSHY WILLOW, *Salix Arbuscula*.

Scotch mountains. June, July.

*Flowers* diœcious, not specially fragrant, appearing before or just after leaves open, lateral, sessile, or on leafy peduncles; *Male catkins*  $\frac{1}{3}$ –1 in. long,  $\frac{1}{5}$ – $\frac{2}{5}$  in. diam.; *Stamens* 2, free, glabrous, anthers orange, scales obtuse, spathulate, yellowish to rusty-red, ciliate; *Females*, *Ovary* ovoid-conic, tomentose, pedicel shorter than gland, style long, stigmas often divided, filiform; *Fruit* a capsule, sessile, conical, reddish, tomentose, style long, deeply cleft, stigmas thick, notched.

*Leaves* alternate, very variable, ovate-lanceolate to elliptic-lanceolate, finely glandular-serrated, acute or acuminate, glabrous, dark green and shining above, pale and glaucous beneath, silky when young, veins prominent, midrib yellow,  $\frac{3}{4}$ –1½ in. long,  $\frac{1}{3}$ – $\frac{3}{4}$  in. broad, petiole short. Autumn tint yellow.

## TREES AND SHRUBS

A deciduous *shrub*, 1-2 ft.; *Stem* procumbent and rooting, sending up erect, rigid branches; *Twigs* downy, yellow at first, reddish-brown later.

Native of Scotland; rare.

### ROUND-EARED SALLOW, *Salix aurita*.

Damp copses, moist thickets, and moist places on heaths. April, May.

*Flowers* dioecious, appearing before leaves; *Male catkins*  $\frac{1}{4}$ - $\frac{3}{4}$  in. long, sessile, ovoid, dense, silky; *Stamens* 2, free, pubescent below, scales velvety both surfaces; *Females*  $\frac{1}{2}$ - $\frac{3}{4}$  in. long, cylindrical, shortly stalked, peduncle villous, stigmas sessile; *Fruit* a capsule,  $\frac{1}{6}$ - $\frac{1}{4}$  in. long, oval to oblong, conic, tomentose or pubescent, pedicel 3-5 times as long as gland, style short, stigmas short, emarginate, divaricate.

*Leaves* alternate, variable, obovate, oblong-obovate to sub-rotund, crenate or nearly entire, wavy, slightly revolute, cuneiform below, acute, obliquely cuspidate or obtuse, wrinkled, grey-green and downy above, tomentose beneath, reticulate, 1-2 ins. long,  $\frac{1}{2}$ - $1\frac{1}{4}$  in. broad; stipules large, half cordate, persistent. Autumn tint yellow.

A deciduous *shrub*, 2-4 ft.; *Twigs* slender, caducous, pubescent at tips, brown, passing to greenish-grey; *Buds* red-brown.

Common in Britain. Attacked by Goat Willow Rust (*Melampsora farinosa*).

### WEeping WILLOW, *Salix babylonica*.

River-side lawns. May. This graceful tree shows to best advantage on the river-bank or beside some glassy pool, where its pendent boughs may be seen "stooping as if to drink."

*Flowers* unisexual, appearing with leaves or just after, on lateral leafy peduncles; *Male catkins* rarely seen, 1-1 $\frac{1}{2}$  in. long,  $\frac{1}{8}$ - $\frac{1}{5}$  in. diam.; *Stamens* 2, scales ovate-lanceolate, glabrous; *Females* greenish-yellow, slender, compact, shortly curved; *Ovary* sessile, ovate, glabrous, style short, stigmas forked, gland broad, rounded; catkins with males and females mixed occur; *Fruit* a capsule,



## SALICINEÆ

small, sessile, glabrous, oblong, pale green, style short, stigmas emarginate, seldom, if ever, produced in this country.

*Leaves* alternate, lanceolate, finely and sharply serrated, rather obliquely acuminate, glabrous and dark green above, glaucous beneath, 3–6 ins. long,  $\frac{1}{2}$ –1 in. broad; petiole short,  $\frac{1}{5}$  in., hairy above; stipules minute, semi-lunar, serratulate, caducous.

A deciduous *tree*, 40–70 ft.; *Branches* long and slender, hanging down almost perpendicularly, slightly twisted at nodes, pale green; *Twigs* brittle; *Buds* very acute.

Native of Japan and other parts of Asia; introduced from Levant.

### COMMON SALLOW OR GOAT WILLOW, *Salix Caprea*.

Woods, thickets, hedges, dry pastures, banks of streams. April, May. Grows well by the sea.

*Flowers* dioecious, appearing before leaves; the earliest to flower; *Male catkins* sessile, oblong-cylindrical, very stout, 1–1½ in. long, golden, very silky, few spathulate scale-like bracts; *Stamens* 2, free, glabrous; *Female catkins* nodding, lengthening to 3 ins., bracts more leaf-like, hairy, tips black, silvery; *Ovary* stalked, stigmas bifid, nearly sessile; often fertilised by insects; pedicel 3 times as long as gland; *Fruit* a capsule,  $\frac{1}{4}$ – $\frac{1}{3}$  in. long, downy-white, tapering to long beak; pedicels slender, as long as scale.

*Leaves* alternate, ovate-elliptical, very variable, entire or crenated, narrowly recurved, acute or acuminate, wrinkled, rough, greyish-green above, cottony beneath, 2–4 ins. long, stipules half-reniform or absent.

A deciduous *tree*, 30 ft.; or bushy *shrub*; *Stem* erect; *Branches* purplish-brown; *Twigs* and *Buds* downy; *Wood* tough and elastic, taking fine polish.

Native of Britain. Commonly called *Saugh*. Name Sallow from M.E. *salwe*, —O. Mer. *sallh* (A.S. *sealh*), willow. Bloom called Palm—great favourite of bees and moths.

*Insects injurious to Willows*:—The larvæ of innumerable Moths feed on

## TREES AND SHRUBS

foliage, but not often in such numbers as to be a pest; larvæ of more than fifty species of Saw-flies (chiefly of genus *Nematus*) also attack foliage, many being Gall-makers. Stems of Sallows bored by larvæ of Osier Hornet Clearwing (*Trochilium crabroniforme*). Wood bored by Goat Moth (*Cossus ligniperda*).

*Galls*.—Large swellings on twigs caused by larva of a Gall-gnat (*Cecidomyia saliciperda*); Leaves distorted by larvæ of *Hormomyia caprea* (*C. caprea*), also galled by a Mite (*Eriophyes tetanothrix*); Pea Galls formed by *Nematus pedunculi* and others.

*Fungoid Pests*.—Sulphury Wood Rot (*Polyporus sulfureus*), Sooty Mould (*Fumago vagans*), Goat Willow Rust (*Melampsora farinosa*), Willow Leaf Blotch (*Rhytisma salicinum*).

### GRAY SALLOW, *Salix cinerea*.

Moist situations. April, May, and again in September.

*Flowers* dioecious, appearing before leaves; *Catkins* less thick and silky than Common Sallow, opening later; *Males*, *Stamens* 2, pubescent at base, anthers pale yellow, scales velvety; *Females*, peduncle densely velvety; *Ovary* silky, style half as long as scales, stigma short; *Fruit* a capsule, small, narrow.

*Leaves* alternate, variable, elliptic-lanceolate to oblong-obovate, undulate, serratulate, acute or shortly acuminate, pubescent above, glaucous, with reddish-brown hairs beneath, venation prominent both surfaces; petiole pubescent, dilated below, 2–5 ins. long, 1–2 ins. broad; stipules large, half-reniform, serrated.

A deciduous tree, 20–30 ft.; *Stem* erect; *Twigs* tomentose, passing to smooth, tawny; *Buds* large, ovoid, pilose.

Native of Britain. Foliage attacked by Willow Leaf-spot (*Septoria salicicola*) and Goat Willow Rust (*Melampsora farinosa*). Twigs distorted by larvæ of Gall-gnats (*Cecidomyia salicis* and *Agromyza schineri*).





GREAT SALLOW (*Salix Caprea*)

A. Branch with female catkins. B. Branch with male catkins. C. Female flower. D. Male flower.



## SALICINEÆ

### CRACK WILLOW, *Salix fragilis*.

Marshes. April, May.

*Flowers* yellow, diœcious, lateral, appearing with leaves; *Male catkins* 1-2 ins. long, stout, spreading, stalked, scales glabrous, or hairy on upper side, linear-lanceolate, yellowish-green, entire, deciduous; *Stamens* usually 2, distinct, hairy below; *Female catkins*  $1\frac{1}{4}$ - $2\frac{1}{2}$  ins. long, slender; *Ovary* ovate, smooth, style short, stigma bifid, curved, longer than style, glands 2; mixed catkins sometimes occur; *Fruit* a capsule, pedicelled, tapering at top, glabrous, or slightly hairy, scales caducous.

*Leaves* alternate, elliptical-lanceolate, glandularly serrated, acuminate or acute, glossy, glabrous, pale or glaucous beneath, slightly silky when young, 3-6 ins. long; petioles glandular at top; stipules slightly cordate, very deciduous. Autumn tints yellow and brown.

A deciduous *tree*, 80-90 ft.; *Trunk* sometimes 20 ft. in girth; *Branches* spreading obliquely, liable to become "stag-headed," *i.e.* dead in top shoots; *Shoots* yellow-brown, smooth, polished, frequently crossing, tough and pliant, but easily broken off at base; *Bark* rough, thick, deeply scored, on small twigs very bitter—containing salicine; *Buds* pointed, smooth, reddish to deep brown or nearly black; *Wood* light, tough, elastic, durable.

Indigenous in England, doubtfully so in Ireland and Scotland. Called Red-wood Willow. Specific name from *L. fragilis*, brittle, referred to in common name of Crack Willow.

"Horse-bean galls" found on this and other species, produced by larvæ of a Gall-wasp (*Nematus gallicola*).

### DWARF WILLOW, *Salix herbacea*.

High mountains. June.

*Flowers* diœcious; *Male catkins*  $\frac{1}{6}$ - $\frac{1}{3}$  in. long, ovoid, few-flowered, nearly sessile or on short sub-terminal leafless and pubescent peduncles, appearing after

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leaves, scales obovate, obtuse, glabrous; *Stamens* 2, free, glabrous, anthers yellow-brown or purple; *Females*  $\frac{1}{2}$ – $\frac{1}{5}$  in. long; *Ovary* ovoid-conic, sub-sessile, style short, stigma bifid; *Fruit* a capsule, sub-sessile, nearly globose,  $\frac{1}{6}$  in. long, glabrous or rarely pubescent, style short.

*Leaves* in terminal tufts, very variable, obovate or orbicular, obtuse, finely crenate, curled, reticulation prominent beneath, shining green both sides, glabrous, sometimes silky when young,  $\frac{1}{4}$ – $\frac{4}{5}$  in. long,  $\frac{1}{3}$ – $\frac{4}{5}$  in. wide; petiole very short; stipules minute, ovate, or obsolete. Autumn tint yellow.

A deciduous *shrub*, 2–6 ins.; *Stems* seldom above 2 ins., creeping under ground, rooting; *Twigs* scantily-leaved; *Bud-scales* brown, persistent.

The smallest of British shrubs, common at high elevations (2000–4500 ft.) throughout British Isles.

### WOOLLY BROAD-LEAVED WILLOW, *Salix lanata*.

Rocky alpine glens in Scotland. May, June.

*Flowers* dioecious, appearing before leaves, terminal, sessile, stout, dense; *Scales* obtuse, discolour, with long silky golden-yellow hairs; *Stamens* 2, glabrous, free; *Ovary* sessile, stigmas slender, bifid, divaricate, 1 gland; *Fruit* a capsule, tapering, shortly pedicelled, cottony, style very slender, stigmas filiform, notched or bifid.

*Leaves* broadly ovate or obovate, acute, entire, sub-coriaceous, silky wool on both surfaces, golden shimmer, 2–3 ins. long, shortly petiolate, veins prominent, reticulate beneath; stipules large, half-cordate, entire or glandular serrate. Autumn tint yellow.

A deciduous *shrub*; *Branches* twisted, twigs silky; *Buds* large, black, hirsute.

A rare species; conspicuous in spring by its golden catkins. Specific name from *L. lanatus*—*lana*, wool.

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### DOWNY MOUNTAIN WILLOW, *Salix Lapponum*.

Scotch mountains. June, July.

*Flowers* diœcious, fragrant, appearing before or with foliage; *Male catkins* lateral, dense-flowered, sessile or sub-sessile, tomentose,  $1-1\frac{1}{4}$  in. long,  $\frac{1}{2}$  in. diam.; *Stamens* 2, free, glabrous, anthers yellow, becoming violet and brown; scales spathulate, hairy, deciduous; gland linear-oblong; *Females* stalked, few basal leaves; *Ovary* sessile, woolly, style long, stigma divided; *Fruit* a capsule, sub-sessile, conical, cottony,  $\frac{1}{6}$  in. long, style long, stigma filiform, cleft, catkins  $1\frac{1}{2}$ –3 ins. long.

*Leaves* alternate, 1–3 ins. long,  $\frac{1}{2}$ –1 in. broad, very variable, elliptical to lanceolate, margins recurved, entire or sinuate, rugose, silky when young, white cottony beneath when old, nearly glabrous and bright green above, reticulation prominent beneath, veins straight, stipules minute or obsolete. Autumn tint yellow.

A deciduous *shrub*, 2–3 ft., or low and scrubby; *Branches* stout, brown; *Buds* woolly.

Native of Scotland; rare.

### WHORTLE-LEAVED WILLOW, *Salix Myrsinites*.

Scotch and Irish mountains. June, July.

*Flowers* diœcious; *Catkins* terminal, on stout leafy peduncles, appearing with the leaves or after; *Males* loosely cylindrical,  $\frac{1}{2}$ –1 in. long,  $\frac{1}{3}$  in. diam.; *Stamens* 2, free, glabrous, anthers globose, purple, turning black, scales spathulate, pilose, blackish-purple, disk large; *Females*, *Ovary* shortly pedicellate, elongated, reddish or claret-coloured, pubescent, style split, purple-red, stigmas divided; *Fruit* a capsule, nearly sessile, hairy or pubescent,  $\frac{1}{6}$  in. long, catkins  $1\frac{1}{2}$ –2 ins., stigma thick.

*Leaves* alternate, very variable, lanceolate to ovate, attenuate below, acute or obtuse, entire or finely serrated, glandular, firm, rigid, shining green, veins prominent, reticulate, long silky hairs when young, glabrous when old,  $\frac{1}{2}$ –1 in.

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long,  $\frac{1}{4}$ – $\frac{3}{4}$  in. broad; petiole short; stipules ovate-lanceolate, serrated, or obsolete. Autumn tint yellow.

A deciduous *shrub*, much branched, closely procumbent, or sometimes rising,  $1\frac{1}{2}$ –2 ins., young shoots with silky pubescence.

Native of Britain; restricted to higher parts of mid-Scotland, and Sligo in Ireland.

### DARK-LEAVED SALLOW, *Salix nigricans*.

River-banks. April—June.

*Flowers* dioecious, appearing before or after leaves; *Male catkins*  $\frac{1}{2}$ –1 in. long, ovate-cylindrical, erect, sub-sessile; *Stamens* 2, free, 3 times as long as scales, scales linear-oblong, acute or obtuse, pilose, red below, brown tips; *Females* lax, slender, style long; *Fruit* a capsule, narrowly conical, glabrous or tomentose, pedicel and style slender, stigma bifid, spreading.

*Leaves* alternate, very variable, ovate-elliptical to obovate, entire or crenate-serrulate, acute or shortly acuminate, attenuate, rounded or cordate below, pubescent when young, afterwards glabrous above, glabrous or glaucous beneath, reticulate, blackening when dried, thin,  $1\frac{1}{4}$ –4 ins. long,  $\frac{1}{2}$ –2 ins. broad; petiole velvety pubescent; stipules half-cordate or obsolete. Autumn tint yellow.

A deciduous *shrub*, or small *tree*, 10 ft.; *Twigs* velvety, purple-black or olive when young, afterwards smooth, shining, purple-black; *Buds* convex, velvety.

Native of Britain. Closely allied to *S. phylicifolia*, perhaps only a form of it. Also called Black Willow.

### BAY WILLOW, *Salix pentandra*.

Banks of rivers and streams, damp open woods, especially in hilly districts. May, June. A valuable tree, with broad shining foliage resembling that of the Portugal Laurel; well suited for planting in masses by lake or pond.

*Flowers* dioecious, appearing with foliage, fragrant; *Male catkins*  $1\frac{1}{4}$ –2 ins. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. diam., cylindrical, dense, erect, shortly pedunculate; *Stamens* usually



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5, may be 4-12, hairy below, anthers large, yellow, glands 2, scales oblong, yellowish-green, ciliate, caducous; *Females* 1-2½ ins. long,  $\frac{1}{3}$ - $\frac{1}{2}$  in. diam.; *Ovary* sub-sessile or shortly pedicellate, cylindroid-conic, glabrous, style short, divided, stigma bifid, yellow, glands 2 6; *Fruit* a capsule, ovoid-conic, pedicelled, glabrous, yellowish-green,  $\frac{1}{6}$ - $\frac{1}{4}$  in. long, style short.

*Leaves* alternate, very variable, 1-4 ins. long, 1-2 ins. broad, elliptic-ovate to obovate-lanceolate, or oblong-lanceolate, finely glandular-serrate, acuminate, thick, glabrous, dark shining green, paler and reticulate beneath, viscid when young, fragrant with Laurel-like odour, midrib yellow; petiole short, glandular at summit; stipules ovate-oblong, glandular, caducous, or obsolete. Autumn tint yellow.

A deciduous *shrub*, 6-8 ft.; or small *tree*, 8-20 ft., erect; *Twigs* glabrous, polished, greenish-brown; *Buds* erect, ovoid, polished brown, base greenish.

Native of North Wales, the Midlands, and North England; planted in South Scotland; rare in Ireland; the latest flowering. Known as Five-stamened Willow (*Gr. pente*, five; *aner*, *andros*, a male).

### TEA-LEAVED WILLOW, *Salix phylicifolia*.

Woods, thickets, waste places near mountain streams. April, May.

*Flowers* dioecious, appearing with the leaves; *Male catkins* sessile or subsessile, ovoid to cylindrical,  $\frac{1}{2}$ -1 in. long,  $\frac{1}{2}$ - $\frac{3}{4}$  in. broad; *Stamens* 2, free, glabrous, anthers yellow, changing to rosy, scales linear-oblong, acute, black, hairy; *Females*  $\frac{3}{4}$ -1½ in. long,  $\frac{1}{3}$ - $\frac{1}{2}$  in. broad; *Ovary* ovoid-conic, tomentose, style long, stigmas thick, bifid, pedicel shorter than gland; *Fruit* a capsule, shortly pedicellate,  $\frac{1}{6}$ - $\frac{1}{4}$  in. long, glabrous, silky or cottony, valves revolute, catkins 1-2 ins. long.

*Leaves* alternate, very variable, elliptic-lanceolate to ovate or obovate, acute or acuminate, entire or crenate, often downy when young, glabrous when old, not wrinkled, shining green above, bluish-glaucous beneath, venation prominent on upper surface, not turning black when dried, 1-2½ ins. long,  $\frac{1}{4}$ -1¾ in. broad; petiole short, villous; stipules small, lanceolate, or absent.

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A deciduous *shrub*, 6–10 ft.; *Branches* twiggy, glabrous, shining, olive-green, chestnut, or reddish; *Buds* convex, obtuse, silky pubescent, greenish-orange or yellow.

Native of Britain; found in Scotland, North England, and North Ireland; many varieties are found, and are sometimes considered as distinct species.

### PURPLE OSIER, *Salix purpurea*.

Marshy places, river-banks, osier beds. March—May.

*Flowers* diœcious, lateral on branches of preceding year, appearing before leaves; *Male catkins* sub-sessile, erect, then spreading or recurved, cylindrical, dense, seldom 1 in. long; *Stamens* united into an entire filament, or filament forked, with a purple-red anther on each branch, scales short, obtuse, green at base, reddish in middle, tipped with purple, brown, or black, hairy or woolly both surfaces; *Females*, *Ovary* sessile, or on pedicel shorter than gland, ovoid, blunt, tomentose, style short or absent, stigmas slender, ovate, purple-red, becoming black; mixed catkins occur; *Fruit* a capsule,  $\frac{1}{12}$  in. long, broadly ovoid, obtuse, sessile or on pedicel not longer than gland, valves spreading, style short, stigmas entire or cleft.

*Leaves* sub-opposite, variable, oblong to linear-lanceolate, or oblong-ovate to obovate-lanceolate, entire at base, upper part eglandular serratulate, glabrous, shining green above, usually somewhat glaucous with bluish bloom beneath, few silky hairs, especially when young, 3–6 ins. long, petioles short, stipules half-ovate or absent. Autumn tints brown to black.

A deciduous *shrub*, 5–10 ft.; *Twigs* erect, long, slender, tough, glabrous, yellow, green, red, or purple; *Buds* sub-opposite, long, narrow, flat, red-violet or shining red to purple-black, one scale, easily detached.

A doubtful native; fairly common over England, Ireland, and South Scotland. “American” Weeping Willow is a form of this.



ASPEN.

*Populus tremula.*





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### DWARF SILKY WILLOW, *Salix repens*.

Heaths and commons. April, May.

*Flowers* diœcious, appearing with leaves; *Male catkins* cylindrical-oblong or ovate,  $\frac{1}{4}$ – $\frac{3}{8}$  in. long,  $\frac{1}{4}$ – $\frac{1}{2}$  in. diam., erect, sessile or sub-sessile, with foliaceous bracts; *Stamens* 2, free, filament long, glabrous, anther ovoid, yellow, turning to black after dehiscence, scales spathulate or obovate, yellowish-green or purple, with dark tips, dense long velvety hairs; *Females*  $\frac{1}{5}$ – $\frac{1}{2}$  in. long,  $\frac{1}{5}$ – $\frac{1}{3}$  in. diam.: *Ovary* pedicellate, conoid, silky or glabrous, style short, stigmas yellow, rosy or purple, entire or split, diverging or not; *Fruit* a capsule,  $3\frac{1}{2}$  times as large as gland, pedicelled, usually silky, catkins 1 in. long.

*Leaves* alternate, very variable, oblong-lanceolate to linear-lanceolate, or elliptic to ovate, 1–1 $\frac{1}{2}$  in. long,  $\frac{1}{5}$ – $\frac{1}{3}$  in. broad, margins entire or serratulate, recurved, obtuse or acute, glabrous and dark green above, silky beneath, or sometimes both sides; petiole short; stipules minute, lanceolate, or obsolete. Autumn tints yellow and brown.

A deciduous *shrub*; *Stems* ascending 1–3 ft., or procumbent, creeping under ground and rooting at base; *Young shoots* and *leaf-buds* densely silky white.

Common in all parts of British Isles. Some botanists make many varieties, each with minor characteristics.

### OSIER, *Salix viminalis*.

Wet places, osier beds. April, June.

*Flowers* diœcious, appearing before leaves; *Male catkins*  $\frac{3}{4}$ –1 in. long,  $\frac{1}{2}$ – $\frac{3}{4}$  in. broad, sessile, cylindrical; *Stamens* 2, free, glabrous, anthers golden-yellow, scales obovate, silky, brown, gland slender; *Females*  $\frac{1}{3}$ – $\frac{1}{2}$  in. broad, sub-sessile; *Ovary* sub-sessile, ovoid-conic, silky, style linear, stigma yellow, deeply bifid; *Fruit* a capsule, sessile or shortly pedicelled, tapering, base broad, downy, stigmas rarely bifid, valves widely divaricate.

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*Leaves* alternate, linear-lanceolate, tapering both ends, acuminate, entire or obscurely serrated, wavy, revolute, glabrous and grey-green above, silvery silky or grey tomentose beneath, venation prominent above, midrib often orange; petiole very short, 4–10 ins. long,  $\frac{1}{2}$ – $1\frac{1}{4}$  in. broad; stipules lanceolate, sometimes glandular serrated, caducous. Autumn tint yellow.

A deciduous *shrub*, or small *tree*, 30 ft.; *Branches* long, straight, twiggy, velvety when young, afterwards polished, greenish-yellow, olive, and brown; *Buds* small, thin, narrow.

Native of Britain; the most commonly cultivated Osier. Specific name = twiggy (L. *vimen*, a twig, an osier, a pliant twig for plaiting or binding). Attacked by Willow Leaf-spot (*Septoria salicicola*) and Crack Willow Rust (*Melampsora epitea*).

Margins of leaves rolled by larvæ of a Gall-gnat (*Cecidomyia marginemtorquens*).

### RETICULATE WILLOW, *Salix reticulata*.

Scotch mountains. June—August.

*Flowers* dioecious, appearing after leaves; *Male catkins* cylindrical, lax-flowered, on rather long, leafless peduncles at ends of short branches opposite to last leaf, downy,  $\frac{1}{5}$ – $\frac{1}{2}$  in. long,  $\frac{1}{5}$  in. diam.; *Stamens* 2, free, glabrous, anthers red-violet or purplish; glands disk-like and slit, or bifid; scales small, obovate, purple or brown, villous inside, ciliate; *Females*  $\frac{1}{3}$ – $\frac{4}{5}$  in. long,  $\frac{1}{5}$  in. diam.; *Ovary* sessile, ovoid, obtuse, white tomentose, style very short, often split, stigmas short, thick, purple-red, often bifid; *Fruit* a capsule, sessile, obtuse, purple, cottony,  $\frac{1}{8}$  in. long, stigma notched.

*Leaves* alternate, exstipulate,  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long,  $\frac{1}{3}$ –1 in. broad, very variable, obovate to orbicular, firm, entire or waved, obtuse or slightly retuse, glabrous, shining green, and rugose above, glaucous beneath, reticulation prominent both surfaces, young leaves silky; petiole long and slender, channelled, pubescent at base, reddish. Autumn tint yellow.

A deciduous *shrub*; *Stem* woody, much branched, prostrate, often spreading,



CRACK WILLOW (*Salix fragilis*)

A. Branch, with female catkins. B. Single female flower. C. Single male flower,  
D. Male catkin. E. Capsule open, liberating one of seeds.





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rising only a few inches above ground ; *Branches* 2–8 ins. long, tortuous, sparingly leafy, glabrous or hairy when young ; *Buds* few, 2–4, terminal.

Native of Britain ; confined to loftiest Scotch mountains. Attacked by Goat Willow Rust (*Melampsora farinosa*). Specific name refers to the prominent netted veins on the leaf (*L. reticulum*, diminutive of *rete*, a net).

### ALMOND-LEAVED WILLOW, *Salix triandra*.

Banks of rivers and streams, and osier beds. April—June.

*Flowers* yellow, diœcious, on lateral, short shoots appearing with leaves ; *Male catkins* oblong-ovate, slender, 1–3 ins. long, shortly pedunculate, scales glabrous, ciliate, persistent, disk 2 glands ; *Stamens* 3, long, anthers golden, filaments hairy ; *Females*  $1\frac{1}{4}$ – $2\frac{3}{4}$  ins. long,  $\frac{1}{4}$  in. diam. ; *Ovary* pedicellate, oblong, smooth, stigmas sessile, thick, diverging, 1 gland ; *Fruit* a 2-valved capsule, glabrous, pedicelled, style thick, short.

*Leaves* alternate, linear or oblong-lanceolate, serrated, acuminate, glabrous, tough, sub-coriaceous, green above, glaucous beneath, midrib prominent, 2–4 ins. long ; petiole short, glabrous, grooved ; stipules large, slightly cordate, pointed, toothed, persistent. Autumn tint yellow.

A deciduous *tree*, 20–30 ft. ; *Bark* in flakes ; *Twigs* glabrous, terete, easily snapped above articulation ; produces long stout shoots when stumps cut down, much used for wicker-work ; *Buds* elongated, flat at apex, smooth.

Of frequent occurrence in England, Scotland, and Ireland. Known as French Willow and Three-stamened Osier (Gr. *treis*, *tria*, three ; *aner*, *andros*, a male).

### BEDFORD WILLOW, *Salix viridis*.

Woods. May, June. Grows well in cold upland situations.

*Flowers* diœcious ; *Catkins* on short, leafy, lateral branches, spreading or recurved, cylindrical, dense in flower, lax in fruit ; *Ovary* tapering, stalked, longer than scales, style as long as stigmas.

*Leaves* lanceolate-elliptic, petioles sometimes glandular, attenuated at base.

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acuminate, or equally attenuated at each end, glandular-serrated, glabrous, glaucous beneath, young ones silky, 4 ins. long,  $\frac{5}{8}$  in. broad.

A deciduous *tree*, 30–50 ft. ; *Branches* long, straight, slender, young branches downy ; *Twigs* green, flexible, glabrous ; growth very rapid ; salicine abundant ; *Bark* used for tanning ; *Wood* said to be more valuable than any other species, light, tough, elastic, unlikely to crack or split, unflammable.

Called Bedford Willow after Francis, Duke of Bedford, who first brought it into notice. Synonymous with *S. Russelliana*. By some considered a hybrid between *S. fragilis* and *S. alba*.

### GREAT WHITE POPLAR, *Populus alba*.

Moist woods, borders of streams. March, April. Prefers open soil, well exposed to air and sunlight. Does well in smoky towns, and in poor sandy soil. The Poplars are propagated by cuttings of firm shoots, 8 ins. long, in ordinary soil outdoors, October or November ; layering of shoots in October ; suckers, October—February ; seeds in ordinary soil in moist border in autumn.

*Flowers* dioecious, anemophilous, terminal on dwarf shoots ; *Male catkins* 2–4 ins. long, drooping, membranous, very deciduous, scales jagged, hairy ; *Perianth* (or inner united scales) a small, flat, oblique cup ; *Stamens* about 8, anthers purple ; *Females* shorter, dense ; *Ovary* 1-celled, placentation parietal, styles 0, stigmas 2, bipartite, segments linear, yellow ; *Fruit* a small oval, glabrous, recurved capsule, opening in 2 reflexed valves ; *seeds* small, black, oval, with a tuft of long silky hairs, ripe in June.

*Leaves* alternate, very variable, roundish cordate, those of young shoots 5-lobed, acute, margin sinuate, upper surface smooth, underside white and cottony, 1–3 ins. long,  $2\frac{1}{2}$  ins. broad, shed early ; petioles slender, flattened from sides. Autumn tints dark brown.

A deciduous *tree*, 60–100 ft. ; *Branches* spreading, slender, rod-like, with upward tendency ; growth rapid ; *Bark* smooth, light grey or ash-coloured, young shoots hairy ; *Buds* cottony, not viscid ; suckers freely produced, bearing lobed and toothed leaves, 2–4 ins. broad ; *Wood* white, soft, light, not easily

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splitting when nailed; does not easily burn; used for utensils and trays, paling rails, and general carpentry.

Very generally planted, and probably indigenous.

Name Poplar from O.F. *poplier*, F. *peuplier*; L. *populum*, acc. of *populus*, a poplar. Also known as Abele; said to be derived from *Abeel*, the Dutch name of the tree; said by some to take its name from Arbela, in plains of Nineveh.

*Injurious Insects*:—*Foliage*—Red Spider (*Acarus telarius*); *Wood*—Goat Moth (*Cossus ligniperda*); innumerable moth-larvæ feed on leaves.

*Fungoid Pest*:—Sulphury Wood Rot (*Polyporus sulfureus*).

### BALSAM POPLAR, *Populus balsamifera*.

River banks, moist places. March, April. Best not exposed, owing to brittle character of the branches.

*Flowers* diœcious; *Male catkins*, disk oblique; *Stamens* 20–30, filaments short, anthers red; *Females* lengthening to 4–5 ins., disk cup-shaped; *Ovary* ovate, 2-lobed, stigmas 2, sub-sessile, lobes broad; *Fruit* a capsule, 2-valved, ovate-oblong, acute, often curved, light brown, shortly pedicelled.

*Leaves* alternate, oval, approaching lanceolate, acuminate or acute, finely crenately serrated, revolute, upper side yellow-green, smooth, underside whitish, 3–5 ins. long, 1½–3 ins. broad, very fragrant, expand very early; petioles terete.

A deciduous tree, 40–70 ft.; *Branches* round, stout, erect, contorted at extremities, very brittle; *Twigs* red-brown and orange to grey tinged yellow-green; *Buds* large, ovate, covered with fragrant resin, scales brown, shining; *Wood* comparatively worthless, light brown.

Introduced from N. America, 1692. Leaves attacked by Black Poplar Rust (*Melampsora populina*).

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## ONTARIO POPLAR, *Populus balsamifera*, v. *candicans*.

Parks, gardens. March, April. Best in moist situations, as on margins of lakes.

*Flowers* dioecious; *Stamens* 20–30; red; *Fruit* a 2-valved capsule.

*Leaves* alternate, more or less cordate, broader than *P. balsamifera*, acute, coarsely glandularly serrate, ciliate, pubescent when young, and later along principal veins, underside pale, 7 ins. long, 5 ins. wide; petioles usually hairy.

A deciduous *tree*, 50–70 ft.; broad and open head; *Branches* spreading, somewhat brittle; *Buds* pointed, viscid, scales red-brown; growth rapid; *Bark* greyish; *Wood* heavier than the type.

Naturalised in some parts of Northern U.S.A. and Canada; very commonly planted in Britain. Also called Balm of Gilead. Name *candicans* presumably refers to the hoary appearance of the under surface of the leaves.

## GREY POPLAR, *Populus canescens*.

Moist woods in S. England, parks, gardens. March, April. Propagated by suckers.

*Flowers* dioecious; *Male catkins* dense, scales obovate-cuneate, incised, ciliate, bright brown; *Stamens* 4–12; *Females*, *Styles* 2, stigmas purple or greenish, 2–8 lobed, wedge-shaped; *Fruit* a capsule.

*Leaves* alternate, roundish cordate, thin, toothed, waved, grey-cottony or glabrous beneath, leaves of young shoots entire, those of young suckers cut into angles and teeth.

A deciduous *tree*, 80–90 ft.; *Shoots* and buds cottony; *Wood* not liable to split.

Indigenous in S. England. A supposed hybrid between *P. alba* and *P. tremula*. Possible age one hundred years.

Shoots distorted by silvery-white galls, the work of *Hedya aceriana*.







BLACK POPLAR (*Populus nigra*)

A. Foliage. B. Male catkin. C. Young female catkin. D. Mature female catkin. E. Male flower. F. Female flower (longitudinal section).

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### COTTONWOOD, *Populus deltoidea*.

March, April.

*Flowers* diœcious; *Male catkins* dense, 3–4 ins. long,  $\frac{1}{2}$  in. diam., disk oblique, revolute; *Stamens* 60 or more, filaments short, anthers dark red; *Females* lax, lengthening to 12 ins., disk cup-shaped; *Ovary* sub-globose, stigmas 3–4, sub-sessile, dilated or lobed; scales scarious, light brown, glabrous, filiform lobes; *Fruit* a capsule, 3–4-valved, oblong-ovate, pitted.

*Leaves* alternate, broadly deltoid-ovate, acuminate, truncate, slightly cordate or cuneate at base, coarsely crenately serrate, teeth glandular, thick, firm, pubescent when young, fragrant, 3–5 ins. long and broad, bright shining green, paler beneath; petioles slender, laterally compressed,  $2\frac{1}{2}$ – $3\frac{1}{2}$  ins. long, stout.

A deciduous tree, 150 ft.; *Branches* large, pendulous at extremities, on young trees nearly erect above, spreading almost at right angles below; *branchlets* terete or angled; *Bark* on old trunks somewhat rough, ashy-grey or yellow tinged with green on young stems; *Buds* ovate, acute, resinous, scales brown.

Native of North America.

### CANADIAN POPLAR, *Populus monilifera*.

River banks, moist places. March, April. Resists smoke and chemical fumes. The wood is short grained, and the tree liable to be damaged in stormy weather. “The male displays a vigour and attains to a size which the female never equals, and is for this reason frequently looked upon as belonging to a different species, and has become known as the Virginian or the Swiss Poplar.”  
—*The Garden*.

*Flowers* diœcious, appearing before leaves; *Male catkins* sessile, glabrous, 5 ins. long,  $\frac{1}{2}$  in. diam.; *Stamens* 20–30, anthers red; scales triangular, yellow, incised, ciliate; *Females* 2–3 ins. long; *Ovary* stalked, globose, stigmas usually 4, sessile, deeply lobed, reflexed; scales very caducous; *Fruit* a capsule, globoid, naked, 3–4-valved, catkins up to 10 ins. long.

## TREES AND SHRUBS

*Leaves* alternate, on young plants and suckers cordate, 7–8 ins. long and wide; those on older trees about  $\frac{1}{4}$  the size, commonly without sinuses, crenate, with obtuse teeth.

A deciduous *tree*, 120–150 ft.; very erect, rapid in growth; *Branches* acutely angled or winged.

Native of N. America; introduced to Europe 1769, and to England from the Continent 1772. Probably a variety of *P. nigra*; given in Kew Hand-list as synonymous with *P. canadensis* and *P. deltoidea*. Called Necklace Poplar from the fact that the female catkins resemble a string of beads; also sometimes called Black Italian Poplar.

### BLACK POPLAR, *Populus nigra*.

River banks and moist places. March, April. Will grow in damp, boggy soil and on exposed sites.

*Flowers* diœcious, appearing before leaves; *Male catkins* lax, pendulous, dark red, 2–3 ins. long, drooping, scales hairy at tips; *Stamens* 12–30, usually 8, anthers purple; *Female catkins* shorter, not drooping, greenish, cylindrical, 4 ins. long; *Ovary* ovoid-conic, stigmas 2, sessile, 2–3-lobed at apex, lobes short and broad, yellow; *Fruit* a capsule, ovoid,  $\frac{1}{4}$  in. long, glabrous, pedicelled, 2 valves, recurved, widely divaricating; *seeds* cottony, ripe in May.

*Leaves* alternate, nearly triangular, crenated, teeth small, acuminate, thick, tough, green on both sides, glabrous beneath, rhombic, silky and ciliate in young state, 1–4 ins. long, 2 ins. broad; petioles slender, compressed,  $1\frac{1}{2}$ –2 ins. long.

A deciduous *tree*, erect, 50–80 ft.; *Branches* large, massive, ascending, smaller ones ramifying, greenish-white, young shoots smooth, shining yellow or light bronze; *Bark* dark ash-grey, with large swellings, yellowish on young trees; *Buds* very viscid, sharp-pointed, thick, yellowish; *Suckers* rarely produced; rapid in growth; *Wood* white, soft, tough, not easily split; used for carving and charcoal; bark for tanning.

Not indigenous, but long naturalised.



## SALICINEÆ

Leaves attacked by Black Poplar Rust (*Melampsora populina*) and Poplar-leaf Blister (*Taphrina aurea*). Large green and pinkish galls on petioles produced by an Aphis (*Pemphigus bursarius*).

### LOMBARDY POPLAR, *Populus nigra*, v. *pyramidalis*.

Parks, gardens, hedges. March, April. It is characterised by rapid growth and early decay.

Trees in England almost invariably bear male catkins only; *Stamens* 12–20.

*Leaves* resembling *P. nigra*; young leaves glabrous.

A deciduous tree, 100–150 ft.; *Branches* growing straight upwards, giving a spire-like shape, young shoots smooth; growth very rapid; *Bark* rough, deeply furrowed; *Buds* viscid; *Wood* tough and light, of little value; trees often unsound, though apparently healthy, and liable to fall without warning.

Native of Asia; thought to be a variety of *P. nigra*; introduced to England from Italy by Lord Rochford in 1758, and planted near the priory of St. Osyth, not far from Clacton-on-Sea. Syn. *P. fastigiata*, from *L. fastigiatus*, sloping up to a point,—*fastigo*, to make pointed.

### ASPEN, *Populus tremula*.

Moist woods, gardens. March, April.

*Flowers* dioecious; *Catkins* sub-sessile, curved, dense, cylindrical, 2–3 ins. long, scales ciliate, with jagged edges; *Stamens* 6–12, anthers purple-red; *Stigmas* 2, deeply bifid, purple-red, arms radiating crosswise; *Fruit* a capsule, stalked, greenish-brown, valves recurved, catkin 5 ins. long.

*Leaves* scarcely cordate, nearly orbicular or rhomboidal, small, often not 1 in. broad, 1–4 ins. long, irregularly and rather coarsely sinuate, with incurved teeth, acute, thin in texture, underside glabrous and sometimes pale, but not cottony; petiole slender, causing constant trembling; leaves on suckers cordate, entire, acute.

A deciduous tree, 40–80 ft.; *Branches* slender, spreading, compressed; shoots

## TREES AND SHRUBS

downy, generally reddish; *Bark* grey, smooth; *Buds* pubescent, not viscid; *Suckers* numerous, pubescent; *Wood* white, soft, not very useful; employed for paper-pulp. Heartwood begins to decay after about 50 years, often hastened by larvæ of Goat Moth and Wood Leopard Moth.

Indigenous throughout British Isles; somewhat slow of growth. Galls on petioles produced by larvæ of *Diplosis tremulæ*, a Gall-gnat. Name Aspen from A.S. *æspe*, *æps*, the Aspen-tree.

### AMERICAN ASPEN, *Populus tremuloides*.

March, April.

*Flowers* dicæcious; *Male catkins*  $1\frac{1}{2}$ – $2\frac{1}{2}$  ins. long; *Stamens* 6–12, inserted on disk, disk oblique, entire, scales acute, 3–5-lobed, hairy; *Females* lengthening to 4 ins.; *Ovary* conical, nearly sessile in bottom of crenate disk, style short, thick, stigmas 2, erect, club-shaped, each 2 linear diverging lobes; *Fruit* a 1-celled, 2-valved capsule, oblong-conical, green.

*Leaves* alternate, ovate or nearly orbicular, acute, glandular, serrate, thin, firm, glabrous, dark shining green above, pale yellow-green below,  $1\frac{1}{2}$ –2 ins. long and broad; petioles slender, laterally compressed.

A deciduous tree, 20–50 ft.; *Branches* slender, often contorted, pendulous at extremities, glabrous; *Twigs* red-brown to grey; *Bark* thin, pale, roughened; *Buds* conical, acute, resinous, scales red-brown, glabrous; *Wood* light brown.

Native of North America.

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CLASS I.	.	.	.	.	<i>Dicotyledons</i>
DIVISION IV.	.	.	.	.	<i>Incompletæ</i>
NATURAL ORDER.	.	.	.	.	<i>Empetraceæ</i>

Heath-like evergreen shrubs, with alternate, exstipulate leaves, and small, regular, unisexual axillary flowers; *Perianth* of 4–6 persistent scales, in 2 whorls, often considered as sepals and petals; *Stamens* 2–3, alternate with petals, hypogynous; *Ovary* 2–9-celled; *Fruit* a drupe, with 2–9 bony, 1-seeded stones.

# EMPETRACEÆ

## CROWBERRY, *Empetrum nigrum*.

Mountain heaths, bogs, gardens. May, June. Thrives in damp peaty soil. Propagated by cuttings in sandy peat under bell-glass, June—August.

*Flowers* purple, diœcious, minute, sessile, in the axils of the upper leaves; *Perianth* of 6 segments, in 2 whorls, scale-like; *Sepals* (the outer whorl) rounded, concave, entire; *Petals* sub-spathulate, scarious, reflexed, hypogynous; *Stamens* 3, alternate with petals, hypogynous, exserted, filaments long, anthers red; *Ovary* superior, on fleshy hypogynous disk, 6-9-celled, globose, style short, stigma with 6-9 radiating arms; *Fruit* a fleshy drupe, globose,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long, brownish-black or purple, edible, 2-9 bony, 1-seeded stones.

*Leaves* in whorls of 3-4, or crowded and alternate at the tips of shoots, linear, linear-oblong or acicular,  $\frac{1}{4}$ - $\frac{1}{3}$  in. long, sub-sessile, semi-terete, revolute, margins recurved to midrib, glabrous or slightly ciliate and coriaceous, shining green above, paler beneath, with whitish midrib.

An evergreen *shrub*, 6-18 ins.; *Stem* procumbent, much branched, glabrous; *Branches* slender, wiry, spreading, trailing, red-brown.

Native of British Isles. Generic name from Gr. *en petron*; *en*, upon, *petros*, a rock, from growing in stony places. Also called Crakeberry. It is the badge of the clan M'Lean in Scotland.

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CLASS II.	.	.	.	.	<i>Monocotyledons</i>
DIVISION I.	.	.	.	.	<i>Petaloidæ</i>
NATURAL ORDER.	.	.	.	.	<i>Liliaceæ</i>

Usually herbs, sometimes frutescent and arborescent; *Leaves* usually narrow, flowers showy; *Perianth* usually 6-partite in two series, rarely 4, 8, or 10 segments; *Stamens* 6, hypogynous or epiphyllous, anthers usually introrse; *Ovary* superior, 3-celled, placentation axile; *Fruit* a capsule or berry, usually 3-celled.

## TREES AND SHRUBS

An Order of nearly 200 genera and about 2500 species.

Distinguished by the 3-celled, superior ovary and the 6 stamens with introrse anthers.

### COMMON BUTCHER'S BROOM, *Ruscus aculeatus*.

Copses, woods, gardens. February—April. The bright red berries make this an ornamental shrub in autumn. It will thrive under the shade of trees where little else will flourish. Pruning should be done in April. Propagated by suckers, September or October; division of roots in October.

*Flowers* greenish, diœcious, 1–2, borne on a pedicel arising from axils of minute scales—the true leaves, but apparently sessile on the middle or margin of broad, flat, leaf-like branches (*cladodes*). The true upper surface on which the flowers rest is usually turned downwards by a twist at base. *Perianth*  $\frac{1}{8}$  in. diam., of 6 segments, spreading, inner ones smaller; *Males* on narrower cladodes; *Stamens* 3, filaments connate in a short column, anthers sessile; *Females*, stamens sterile; *Ovary* 3-celled, superior, style short, stigma capitate; *Fruit* a globose, succulent berry, bright red or rarely yellow,  $\frac{1}{3}$  in. diam., usually 1-celled, sometimes 3-celled, 2 seeds in each cell.

*Leaves* (*cladodes*) alternate, ovate, acuminate, mucronate (spinescent), rigid, parallel-veined,  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long, coriaceous, pungent.

An evergreen *shrub*, 1–2 ft.; *Stem* much branched, tufted, erect, stout, rigid, angled, green, young shoots scaly.

Native of England and S. Wales; naturalised in Scotland and Ireland; the only woody Monocotyledon indigenous in Britain. Specific name *L. aculeatus* = prickly, pointed, sharp,—*aculeus*, a prickle,—*acus*, a needle,—*acies*, a sharp point.

### DOUBLE TONGUE, *Ruscus Hypophyllum*.

Gardens. May, June. A valuable shrub for shady spots.

*Flowers* 5–6, in an *umbel*, in middle of under surface of lower cladodes; *Fruit* a berry.





BUTCHER'S BROOM.

*Lamium album.*



## LILIACEÆ

*Leaves (cladodes)* oblong or oblong-lanceolate, upper ones alternate, lower ones opposite, ternate or verticillate, distinctly ribbed, 3–5 ins. long, rigidly coriaceous.

An evergreen *shrub*, 1–1½ ft.

Native of Mediterranean region; introduced 1640. *R. Hypoglossum* is thought to be a form of this species, having the flowers on the upper side of the cladode.

### ALEXANDRIAN LAUREL, *Danaya Laurus*.

Gardens. May. This does well in sheltered gardens near the sea. The graceful leafy stems will last several weeks if cut and placed in water indoors.

*Flowers* greenish-yellow, hermaphrodite, in a terminal *raceme*; *Fruit* a berry, red.

*Leaves (cladodes)* alternate, oblong-lanceolate, acute, rounded at base, glabrous, lucid green, sessile, rigidly coriaceous, 2 ins. long.

An evergreen *shrub*, 4 ft.

Native of Portugal; introduced 1739. Syn. *Ruscus racemosus*.

### NARROW-LEAVED YUCCA, *Yucca angustifolia*.

Gardens. July, August. This is well suited for sunny nooks and rock-work. The Yuccas are all hardy, but do best in sunshine and loamy soil. They are propagated by cuttings of roots in sand in bottom heat in spring; offsets or suckers in March or April; division in March.

*Flowers* white, greenish outside, campanulate, in a terminal *panicle* or simple *raceme*, 3–5 ft. long, branches ascending, pedicels  $\frac{1}{2}$ –1 in. long, stout, erect; *Perianth* segments oblong, acute, 2  $2\frac{1}{2}$  ins. long,  $\frac{3}{4}$ –1¼ in. broad; *Style* short, stigmas shorter than ovary; *Fruit* a capsule, 2–3 ins. long, 1 in. diam., 6-sided; *seeds* very flat,  $\frac{1}{2}$  in. broad.

*Leaves* 100 or more, in a dense rosette, linear, pungent, pointed, channelled

## TREES AND SHRUBS

above, rigid, thick, smooth, pale green,  $1\frac{1}{2}$ –3 ft., long,  $\frac{1}{4}$ – $\frac{3}{4}$  in. wide, margins pale reddish-brown, copiously filamentose, threads 4 ins. long.

An evergreen *shrub*, nearly stemless, 3 ft.

Introduced from Western N. America, 1811.

### SILK GRASS, *Yucca filamentosa*.

Gardens. June—August. A very distinctive and attractive species, with a rosette habit.

*Flowers* white tinged with green; *Panicle* rhomboid, much branched, 4–8 ft. long, branches flexuous, ascending, 6 ins. long, pedicels drooping,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long; *Perianth* segments oblong or oblong-lanceolate,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ins. long; *Stigmas* slender, shorter than ovary; *Fruit* a capsule, oblong,  $1\frac{1}{2}$ –2 ins. long,  $\frac{5}{8}$  in. diam.

*Leaves* 30–50, in a dense rosette, outer ones spreading, central ones erect or slightly curved, ensiform, acuminate, firm, apple-green, slightly glaucous,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ft. long, 1½–2 ins. broad, margins whitish with grey filaments 2–3 ins. long.

An evergreen *shrub*, stemless or nearly so, 2 ft.; *Suckers* freely produced.

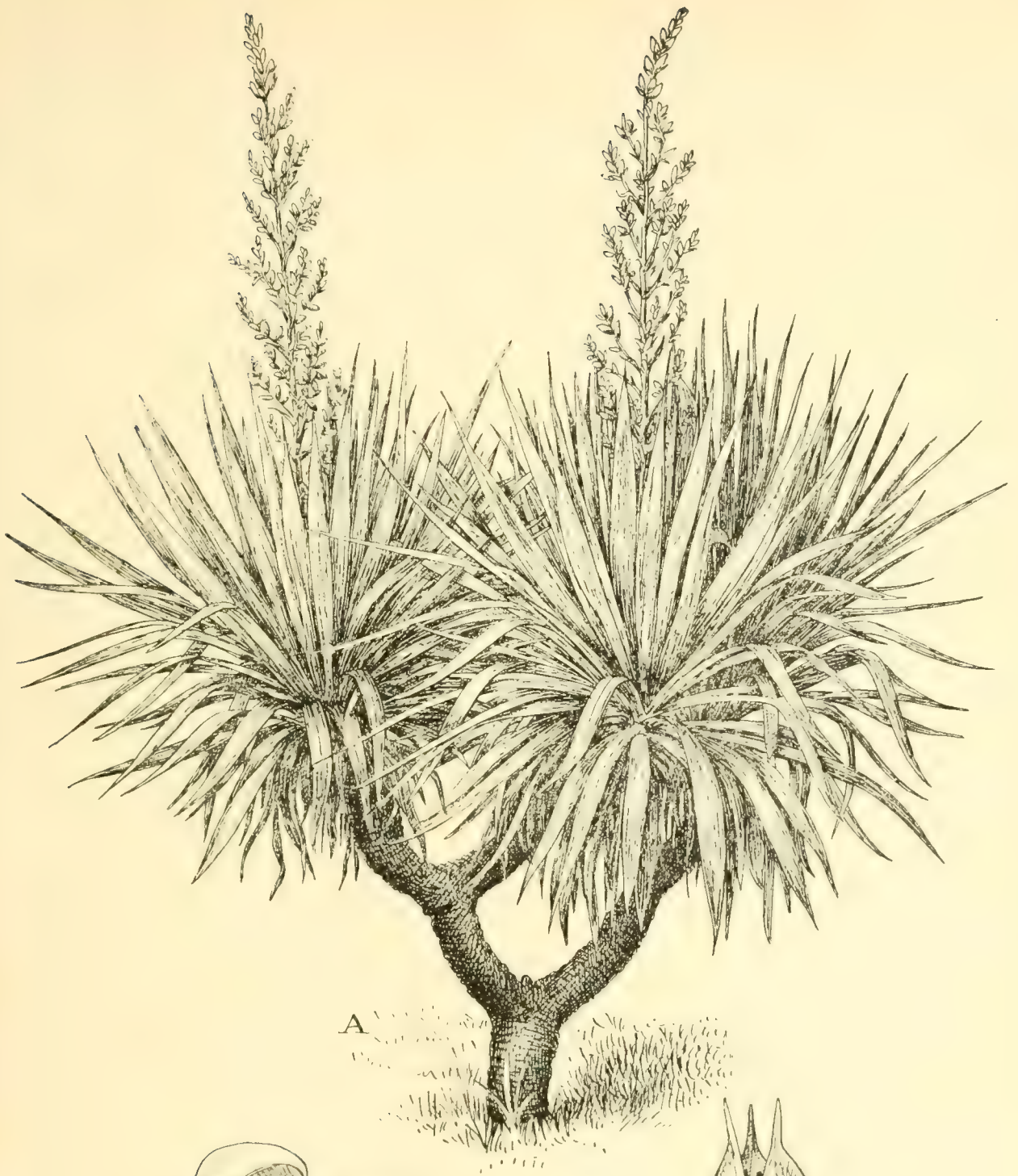
Introduced from N. America, 1675.

### ADAM'S NEEDLE, *Yucca gloriosa*.

Gardens, lawns. July, August. The hardiest and most popular of the *Yuccas*; it sometimes bears blossoms in mild winters.

*Flowers* white, tinged with red, green, or purple, campanulate,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ins. long,  $3\frac{1}{4}$ –4 ins. diam., entomophilous, in a *panicle*, 4–9 ft. long, of perhaps 250 blossoms, branches 1– $1\frac{1}{2}$  ft. long, glabrous or pubescent, pedicels 4–12 ins. long, bracts small; *Perianth* of 6 segments, in two series, slightly united at base, thin, ovate, acute; *Stamens* 6, in two series, as long as ovary, filaments fleshy, hispid or papillose, slightly 3-lobed, anthers deeply emarginate, attached at back; *Ovary* superior, 3-celled, 6-sided, nectar-glands between partitions, narrowed towards apex, stigma 3-lobed; *Fruit* baccate, seldom produced.





ADAM'S NEEDLE (*Yucca gloriosa*)

A. Tree, with flower spikes in bud. B. Flower, open. C. Flower in usual half-closed state. D. Fruit dehiscent.



## GRAMINEÆ

*Leaves* 100 or more, in a dense rosette,  $1\frac{1}{2}$ –3 ft. long, 2–3 ins. broad, gradually narrowed above the broad clasping base, widest near middle, thin, flat, or concave towards apex, rigid, erect, pungent pointed, serrulate towards base, teeth deciduous, scabrous at back, dull green, often glaucous, margins red-brown.

An evergreen *shrub*, or small *tree*, 4–6 ft.; few branches; *Bark* smooth, light grey.

First plants said to have been received by Gerarde from the West Indies, 1593. Also called Mound Lily.

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CLASS II.	.	.	.	.	<i>Monocotyledons</i>
DIVISION II.	.	.	.	.	<i>Nudifloræ</i>
NATURAL ORDER	.	.	.	.	<i>Gramineæ</i>

Usually herbaceous plants, rarely suffrutescent or arborescent; *Stems* fistular, septated at nodes; *Leaves* alternate, narrow, with a ligule at base of blade, and a sheath forming a tube enclosing the stem; *Flowers* usually hermaphrodite, seldom monœcious (as in Maize), mostly arranged in a panicle or spike, bearing spikelets enclosed by bracts or glumes; *Perianth* absent or represented by scales; *Stamens* 1–6 or more, usually 3, anthers versatile; *Ovary* superior, 1-celled stigmas 1–3; *Fruit* a caryopsis.

### GREAT REED, *Arundo Donax*.

Gardens. September, October. Requires protection during winter in colder counties.

*Flowers* reddish, ultimately whitish, in a compact *panicle*, 12–16 ins. long, of numerous spikelets enveloped in silky hairs and containing 2 or more perfect florets, florets awned, lower palea entire; *Fruit* a caryopsis, free from palea.

*Leaves* alternate, lanceolate, acute, entire, glaucous green, arching.

A hardy ornamental grass, 10–12 ft.

Native of S. Europe, Egypt, and Asia; introduced 1648.

# TREES AND SHRUBS

GROUP . . . . . *Gymnospermæ*

NATURAL ORDER . . . . . *Coniferæ*

Trees or shrubs, usually resinous, with rigid, linear, subulate or scale-like leaves; *Flowers* monœcious or diœcious, without perianth; *Males* (in catkins) of numerous closely-packed scales, bearing two or more anther-cells; *Females* (cones) of ovuliferous scales and bract-scales; ovules and seeds naked, either concealed by scales or solitary and exposed.

## MAIDEN-HAIR TREE, *Ginkgo biloba*.

Parks, gardens. April, May. The glossy green fan-shaped leaves, cut up like some of the species of *Adiantum* Ferns, make this a very distinctive tree. It does well in smoky towns. Propagated by seeds sown in pans of light sandy soil in cold frame, October or March.

*Flowers* diœcious; *Male catkins* axillary, slender, sessile, yellow,  $1\frac{1}{2}$  in. long; *Females* solitary or terminal clusters, foot-stalks long; *Fruit* drupaceous, globular or ovate, 1 in. diam., light green or yellowish fleshy pulp, edible, sweet; *seed* globular, hard bony shell.

*Leaves* clustered on branchlets, distinct and alternate on young shoots, broadly fan-shaped, cuneate at base, 2-4-lobed, lobes toothed or irregularly notched, resembling Maiden-hair Fern, flat, coriaceous, glabrous, margins thickened, numerous parallel nerves; foot-stalk as long as blade, yellowish-green, glabrous, glossy.

A deciduous tree, 60-80 ft.; *Branches* alternate, mostly ascending or horizontal; *branchlets* terete, very short, spur-like; *Bark* rough, furrowed, scaly, greyish.

Native of China and Japan; introduced 1754. Chinese name *Ginkgo* = full of leafless buds in winter. Also named *Salisburia adiantifolia*, in honour of R. A. Salisbury, F.R.S., an eminent English botanist; *adiantifolia* = leaf like Maiden-hair Fern, the specific name of which is *Adiantum*.



## CONIFERÆ

### PLUM-FRUITED CEPHALOTAXUS, *Cephalotaxus drupacea*.

Shrubberies, gardens, sheltered borders or lawns. April. The curious purplish, plum-like fruits render this both distinctive and interesting. It is best in equal parts of loam and peat. Propagated by cuttings of shoots 3 ins. long in sandy soil in shady cold frame or under bell-glass or handlight outdoors in autumn; seeds in light soil in cold frame, September or March, transplanting outdoors a year after.

*Flowers* diœcious; *Males* 6–11, in axillary globose heads (compound catkins), with involucre of small bract scales, flowers in axils of membranous bracts; *Stamens* 7–12, each with 2–3 anther cells; *Females*, small pedunculate cones in axils of bracts at base of terminal shoots, scales 6–20, on fleshy axis of cone; *Fruit* drupaceous, fleshy, purplish, elliptical, 2–3 in a head,  $1\frac{1}{4}$  in. long,  $\frac{3}{4}$  in. diam.; *seeds* solitary, nut-like, shell hard, bony.

*Leaves* linear, crowded, in 2 rows, opposite, stiff, falcate, twisted, coriaceous, yellowish glossy green above, nerved along middle, glaucous green below, with 2 silvery bands, 1–2 ins. long, much resemble the Yew.

An evergreen *tree*, 6–8 ft.; *Branches* horizontal, whorled, spreading, flat, stiff; *Buds* small, scales acute, imbricate.

Native of China and Japan; introduced 1844. In Japan called *Kaja*. Generic name from Gr. *kephale*, a head; *taxis*, arrangement.

### FORTUNE'S CLUSTER-FLOWERED YEW, *Cephalotaxus Fortunei*.

Shrubberies, gardens. April. Best in light, peaty soil, and sheltered.

*Flowers* diœcious; *Males* in axillary globular heads, shortly pedunculate; *Fruit* a drupe, fleshy, purplish, elliptical, tapering both ends,  $1\frac{1}{4}$  in. long,  $\frac{3}{4}$  in. diam.; *seeds* solitary, shell thin, brittle.

*Leaves* linear-lanceolate, on principal branches mostly alternate, scattered, on laterals and branchlets in two rows, mostly opposite, acute, straight, flat, deep glossy green above, ribbed, glaucous white below, margins bright green, 3 ins. long.

## TREES AND SHRUBS

An evergreen *tree*, 6–8 ft. ; *Branches* horizontal, whorled, slender, spreading, pendent, laterals and branchlets in 2 rows, frequently in opposite pairs, filiform.

Introduced from N. China by Fortune, 1848.

### LORD HARRINGTON'S YEW, *Cephalotaxus pedunculata*.

Shrubberies, gardens. April.

*Flowers* dioecious ; *Males* pedunculate, oval, in globular heads shorter than bracts ; *Females* in axillary heads, peduncles 4-angled ; *Fruit* drupaceous 2–3 in a head, peduncles long ; *seeds* solitary, erect, shell smooth, hard, thin.

*Leaves* linear, in 2 rows, mostly opposite on branchlets, spiral and alternate on principal branches, slightly falcate, thick, coriaceous, revolute, bright glossy green above, raised straight nerve, 2 broad glaucous white bands below,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ins. long.

An evergreen *tree*, 6–8 ft. ; *Branches* numerous, spreading, mostly in whorls, *branchlets* in 2 rows, horizontal, mostly opposite ; *Buds* with persistent imbricated scales.

Cultivated in Japan under name of *Inukaja* ; introduced to Britain, 1837. Syn. *Taxus Harringtoniana*.

### YEW, *Taxus baccata*.

Mountainous woods, parks, gardens. February, March. Prefers limy soils. Valuable for forming hedges or planting under the shade and drip of larger trees. Very attractive when laden with its bright red fruits. Hedges may be trimmed in April or September. Propagated by cuttings in sandy soil in cold frame or under handlight, September ; layering in September ; seeds in light soil outdoors in March, or in pans or boxes of light soil in cold frame or greenhouse in March, transplanting to nursery bed when large enough to handle.

*Flowers* dioecious, very occasionally monœcious ; *Male flowers* almost spherical,  $\frac{1}{4}$  in. diam., clustered in axils of leaves, bending backwards so as to appear on under side of branch, scales dry, imbricated, about 6 stamens, each

## CONIFERÆ

with 3-8 anther-cells, yellow; *Females* solitary, on sides of branches, 1 ovule, surrounded by fleshy disk enclosed by small scales; *Fruit* a hard seed, olive-green, ovoid, with bony testa imbedded in a red wax-like cup, mucilaginous and sweet.

*Leaves* in 2 rows, lying in 1 plane, linear, flat, thin,  $\frac{1}{2}$ - $1\frac{1}{2}$  in. long, coriaceous, acute, convex and shining above, pale and unpolished below; petiole very short, with half twist.

An evergreen *tree*, 15-50 ft.; *Trunk* massive by coalescence of numerous shoots; *Branches* spreading, nearly horizontal; *Twigs* numerous; *Bark* red, thin, flaking; growth very slow; *Wood* hard, close-grained, elastic, heartwood red.

Native of Britain. Latin name *baccata* from *bacca*, a berry; English name from A.S. *cow*, the Yew. Reputed to be the longest-lived tree. Leaves poisonous.

### PLUM FIR, *Prumnopitys elegans*.

Parks, gardens. May. Will thrive satisfactorily in smoky and dusty localities. Its Yew-like appearance has earned for it the name of the Plum-fruited Yew. Propagated by cuttings in pots of sandy loam under bell-glass in 60°-70° in summer.

*Flowers* in an axillary spike, peduncle 2-3 flowered, 1-fruited by abortion, antheriferous scales numerous, imbricate, 2 cells on the under side, bract scales small, sessile, receptacle oval, on end of long neck, slightly 3-lobed, smooth, purple, persistent; *Fruit* drupaceous, globular, smooth, fleshy, succulent, dark purple, without foot-stalk, size of Cherry; *seed* with hard bony shell.

*Leaves* scattered or in 2 rows, linear, tapering both ends, appressed, coriaceous, rigid, glabrous, deep glossy green above, edges rusty, glaucous beneath,  $\frac{3}{4}$ - $1\frac{1}{2}$  in. long.

An evergreen *tree*, 40-50 ft.; pyramidal; *Branches* numerous, erect, spreading, lower ones drooping and often sweeping the ground; *branchlets* short, stout, spreading; *Bark* brown; *Wood* hard, yellow, beautifully veined.

## TREES AND SHRUBS

Native of Southern Chile ; introduced by Messrs. Veitch, 1860. Generic name from Gr. *pous*, *podos*, a foot ; *karpos*, a fruit, the fruits in most species having a foot-stalk. Syn. *Podocarpus andina*.

### CHINESE JUNIPER, *Juniperus chinensis*.

Parks, gardens. April. The most beautiful of the Junipers, the male plants growing erect, and the female specimens being more spreading in habit. The Junipers are propagated by cuttings of young branches in sandy soil in cold frame or under handlight in September or October ; seeds in light soil in cold frame in April, transplanting into pots when 2 inches high, planting out a year afterwards.

*Flowers* usually dioecious ; *Male catkins* very numerous, bright orange-yellow ; *Females* axillary, bracteate ; *Fruit* baccate, very small, variable in shape, glaucous, violet-brown, 1-2-seeded.

*Leaves* in male form in whorls of 3, lanceolate, acute, stiff, channelled upper side, convex below, glaucous or bright green, without foot-stalks ; on female plants in twos, opposite, four-rowed, scale-like, ovate, acute, oblong sunken gland on back, closely imbricated ; the leaves are often much alike on both sexes when young, and when mature exhibit transition from one form to another.

An evergreen tree, 20 ft. ; *Branches* in males numerous, irregularly alternate, spreading, higher ones nearly erect ; in females scattered, spreading, smaller ones quadrangular, seldom forked, often pointing downwards.

Introduced from China and Japan in 1804.

### SAVIN, *Juniperus Sabina*.

Gardens, rockwork. April. Thrives best in light soil and dry situations.

*Flowers* dioecious ; *Fruit* a berry (galbule), oval, smooth, generally 1-seeded, blackish-purple, somewhat glaucous, about size of small currant,  $\frac{1}{3}$  in. diam. borne on recurved peduncle-like branchlets.





YEW.

(*Taxus baccata.*)



## CONIFERÆ

*Leaves* in opposite pairs, scale-like, imbricated, oval, acute, keeled, or subulate and minute, disagreeable odour, bitter to taste.

An evergreen *shrub*, 6–8 ft. ; *Branches* trailing.

Native of S. Europe ; introduced 1548.

### RED CEDAR, *Juniperus virginiana*.

Parks, gardens. April. The largest of the *Junipers* grown in this country.

*Flowers* diœcious, or rarely monœcious, in minute axillary cones ; *Males* solitary, oblong-ovate, stamens 10–12, each with 4–6 anther cells ; *Females* ovoid, seminiferous scales violet, acute, spreading, 1–2 ovules, bract scales 2–6 ; *Fruit* a cone, baccate, sub-globose,  $\frac{1}{4}$ – $\frac{1}{3}$  in. diam., greyish-brown, glaucous bloom, sweet, resinous, usually 1–2 seeds.

*Leaves* in opposite pairs, united at bases, usually subulate and spreading in young plants, minute, scale-like, closely imbricated, glandular or eglandular at back, usually acute or acuminate,  $\frac{1}{16}$  in. long, dark blue-green or glaucous, persistent for several years, on young plants and branches  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, linear-lanceolate.

An evergreen *shrub* or *tree*, 30–50 ft. ; usually somewhat pyramidal outline ; *Branches* at first erect, ultimately decumbent ; *branchlets* numerous, crowded, 4-angled ; *Trunk* erect, varying shades of brown and red, scaly ; *Wood* bright red, close, firm, easily splitting, aromatic ; much used for cedar pencils.

Native of N. America, West Indies, and Japan, reaching 60–90 ft. in U.S.A. ; introduced 1664. Known as Virginian Juniper.

### COMMON JUNIPER, *Juniperus communis*.

Downs, and rather dry, barren hills. May. Very variable as regards height, shape, and foliage.

*Flowers* diœcious ; *Male* flowers axillary, solitary or crowded ; *Stamens* numerous, about 15, anthers 3–6-celled, pollen pale yellow ; *Females* in axils, 3–6 scales, fleshy, 1–2 ovules under each, several empty scales at base ; *Fruit* a cone



## TREES AND SHRUBS

of false drupes (each a galbulus), baccate, globose, sub-sessile, very fleshy, 4–6 rudimentary, scarious, empty scales at base, blue-black, glaucous bloom, pungent, ripe in second year, 3 angular, hard seeds, each with several resin blisters.

*Leaves* opposite or whorls of 3, subulate, rigid, concave, margins thickened, sharply pointed, glaucous above, green below,  $\frac{1}{2}$ –1 in., fragrant when bruised.

An evergreen *shrub*, much branched, 2–5 ft.; or small *tree*, 10–25 ft.; *Bark* fibrous, red-brown, flaking; *Wood* finely-veined, yellowish-brown, aromatic.

Native of Britain. Name Juniper a corruption of Fr. *genévrier*; L. *juniperus*,—*juvenis*, young, and *parere*, to bring forth, because it brings forth younger berries while those of previous year are ripening.

### MONTEREY CYPRESS, *Cupressus macrocarpa*.

Parks, gardens. February, March. Grows exceptionally well near sea; suitable for damp or marshy ground. The species are propagated by cuttings of young branchlets 2 ins. long in sandy soil in cold frame or under handlight, September or October; seeds in pans of light soil in cold frame in April, transplanting into small pots in following spring, planting out a year afterwards.

*Flowers* monœcious, minute, terminal, yellow, on separate branchlets; *Males* with 6–8 stamens, connectives bearing 4–5 anther cells; *Females* oblong, scales 6–10, thick, decussate, seminiferous scales bearing numerous ovules in several rows; *Fruit* a cone,  $1\frac{1}{2}$ –2 ins. long, 1 in. diam., light brown, clusters of 3–4, bosses of scales prominent, scales 8–12, ovate; *seeds* about 20 under each scale, angled, chestnut-brown.

*Leaves* closely imbricated, very dark grass-green,  $\frac{1}{8}$  in. long, on young plants  $\frac{1}{4}$ – $\frac{1}{2}$  in. long, ovate, thickened, rounded, glandular on back.

An evergreen *tree*, 50–60 ft.; *Branches* reddish, close set, numerous, horizontal, extremities ascending; *branchlets* generally lateral, opposite, long; growth very rapid; *Bark* dark red-brown on young stems and branches, white on old trunks; *Wood* heavy, hard, strong, durable, close-grained, yellow, takes fine polish.



## CONIFERÆ

Native of California; seeds first sent to Europe, 1838: said to grow better here than in its native home on Pacific Coast. Syn. *C. Lambertiana*. Specific name from Gr. *makros*, long, *karpós*, fruit.

### EVERGREEN CYPRESS, *Cupressus sempervirens*.

Parks, gardens. May. Thrives best in warm, sandy, or gravelly soil.

*Flowers* monœcious; *Males* numerous, yellow,  $\frac{1}{4}$  in. long, stamens 10–12, decussate, bearing 3 pollen-sacs; *Females* fewer, 2–5 polyhedral, about 12 polygonal scales in decussate pairs, ovules several; *Fruit* a cone, globular, 1–1½ in. diam., light brown, scales angular, peltate, corky outside, woody within, arranged in whorls separating at maturity; *seeds* several under each scale, yellowish-brown, angular,  $\frac{1}{4}$  in. long, covered with thin membranous skin.

*Leaves* small, closely imbricated, in opposite pairs, smooth, shining, yellowish-green, persistent 5–6 years, acicular on main stem.

An evergreen *tree*, 50–60 ft.; usually flame-shaped, tapering, stem below branches very short; *Branches* erect, close to trunk, much divided, in one plane, forming frond-like sprays; *branchlets* quadrangular; *Bark* scaly, reddish-brown; *Wood* hard, close-grained, resinously fragrant, reddish-brown, practically indestructible.

Native of S. Europe, Asia Minor, and Persia. Believed to have been brought from Italy by Turner and planted at Syon House sometime before 1548; in Italy reaches 120 ft.; two specimens still living planted by Michael Angelo (1475–1563).

### LAWSON CYPRESS, *Cupressus lawsoniana*.

Parks, gardens, plantations. April, May.

*Flowers* minute, monœcious, terminal, on separate branchlets; *Male* flowers numerous, at tips of short branchlets of previous year, cylindrical, bright crimson, stamens with 2–6 anther cells, usually produced when tree is young; *Females* of few alternating whorls of small dark, ovate, acute bract scales, ovules several

## TREES AND SHRUBS

(2 4); *Fruit* a cone, about size of large pea, clustered on upper lateral branchlets, 8 peltate, angular scales, very numerous, persistent; *seeds* slightly winged, 3 or more to each scale.

*Leaves* very minute, closely imbricated, in alternate opposite pairs, obtuse or acute, usually an obscure tubercle towards apex, dark glossy green tinged with glaucous hue, persistent for 3-4 years.

An evergreen *tree*, 75-100 ft.; *Branches* short, spreading, horizontal, much divided at extremities, curved, feathery, drooping; *Bark* brown, thick, round scaly ridges; *Trunk* comparatively slender. *Wood* yellow, light, close-grained; much used in N. America.

Native of N. America, where it reaches height of 120-200 ft. Believed to have been first discovered by Jeffrey, 1852-53. Named after Charles Lawson of Edinburgh, who first raised trees from seed. Synonymous with *Chamaecyparis lawsoniana* (Gr. *chamai*, the ground, *i.e.* dwarf, and *kuparissos*, the Cypress).

### YELLOW CYPRESS, *Cupressus nootkatensis*.

Parks, gardens. April.

*Flowers* monœcious, minute; *Males* on lateral branchlets of previous year, 8-10 stamens, sulphur-yellow; *Females* clustered near ends of upper branchlets, dark reddish-brown, scales bearing 2-4 ovules; *Fruit* a cone, sub-globose,  $\frac{1}{2}$  in. diam., nearly sessile, red-brown, scales 4-6, peltate, angular bosses erect, prominent; *seeds* 2-4 under each scale,  $\frac{1}{4}$  in. long, red-brown, wings broad.

*Leaves* opposite in pairs, rounded, closely appressed, dark blue-green, sometimes glandular-pitted on back,  $\frac{1}{4}$  in. long, on leading branchlets elongated, acute, begin to die end of second year, fall in third, pungent when crushed.

An evergreen *tree*, 50-100 ft.; with narrow pyramidal head; *Branches* horizontal, spreading, ramifying, distichous, terete or flattened; *branchlets* drooping, light yellow tinged red at first, afterwards red-brown, very aromatic resinous exudation; *Bark* light grey tinged brown, fissured, scaly; *Wood*

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hard, brittle, close-grained, durable, yellow, fragrant with resinous odour, takes good polish.

Native of N. America, 120 ft. high. Named from Nootka Sound. Introduced in 1851 from Botanical Gardens, St. Petersburg.

### OBTUSE-LEAVED JAPAN CYPRESS, *Cupressus obtusa*.

Parks, gardens. April.

*Flowers* monœcious; *Males* terminal, cylindrical; *Females* solitary at ends of same branchlets; *Fruit* a cone, globular, about size of a grape, scales 8–10, cuneate at base, brown; *seeds* short winged, 2 at base of each scale, in sunken grooves.

*Leaves* mostly in whorls of 4, decussate, ovate-rhomboid, blunt, seldom pointed, closely adpressed, adhering nearly to points, only lower part visible, light green, persistent on young plants for several years.

An evergreen *tree*, 30 ft.; *Branches* spreading, laterals fan-like, shining green; *Wood* heavy, fine-grained, white, taking high polish.

Introduced from Japan, 1850; there 70–100 ft. Called by Japanese “Fu-si-no-ki,” tree of the Sun, and dedicated to God of the Sun. Syn. *Chamaecyparis obtusa*. Generic name from Gr. *chamai*, on the ground, and *kuparissos*, the Cypress. Known in gardens as *Retinospora obtusa*.

### PEA-FRUITED RETINOSPORA, *Cupressus pisifera*.

Parks, gardens. April.

*Flowers* monœcious; *Males* terminal on upper branchlets, cylindrical, obtuse; *Females* terminal; *Fruit* a cone, ovate-globose, about size of large pea, scales 10–12, in opposite cross pairs, imbricated, ovate-rhomboid, acute, crenulated, cuncate, resinous, woody, smooth, yellowish-brown; *seeds*, 2 at base of each scale, wings membranous, brown.

*Leaves* in 4 rows, decussate, upper and lower ones ovate-lanceolate, tapering to hard point, keeled on back, smooth, lateral ones falcate, acute, 2 white glaucous bands beneath, all scale-like, imbricated.

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An evergreen *tree*, somewhat pyramidal; *Branches* numerous, thickly covered with slender, feathery, light-green branchlets.

Introduced from Japan, 1850. Name *Retinospora* from Gr. *rhetime*, resin, and *sporos*, seed, *speiro*, to sow, the seeds being coated with resin. Generic name from L. *pisum*, a pea, and *fero*, to bear. Syn. *Chamæcyparis pisifera*.

### AMERICAN ARBOR-VITÆ, *Thuja occidentalis*.

Parks, gardens. April, May. Will thrive in damp soils. Pruning may be done in April or September. The species are propagated by cuttings in sandy soil under bell-glass or in cold frame in September; seeds in sandy soil in temperature of 55° in spring, transplanting to open ground when large enough to handle.

*Flowers* monœcious, minute, terminal, solitary, on different branchlets; *Males* ovoid, stamens 4–6, sub-orbicular, peltate, anther cells 2–4; *Females* oblong, scales 8–12, oblong, acute, in opposite pairs, seminiferous scales bearing 2 ovules; *Fruit* a cone, ovoid-oblong,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long, pale cinnamon-brown, scales oblong, acute, thin, coriaceous; *seeds*  $\frac{1}{8}$  in. long, wings thin.

*Leaves* scale-like, decussate, acute, yellowish-green,  $\frac{1}{12}$  in. long, on leading shoots appressed or spreading, rounded or keeled on back, acuminate, usually glandular, on laterals compressed, prominently keeled, brownish-green in growing season, brownish-purple in winter.

An evergreen *shrub* or *tree*, 40–60 ft.; *Branches* stout, distant, horizontal; *branchlets* spreading, lateral short and pendulous, yellow-green to cinnamon-red, then dark orange-brown, smooth, lustrous; *Bark* red-brown tinged orange, fissured, scaly; *Wood* light, soft, brittle, coarse-grained, durable, fragrant, pale yellow-brown; sometimes called White Cedar.

Native of N. America; introduced 1596. *Thuia* is old Greek name used by Theophrastus.



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### GIGANTIC ARBOR-VITÆ, *Thuya plicata*.

Parks, gardens. April. A fine graceful tree, which does well on exposed ground.

*Flowers* monœcious; *Male* catkins oval; *Females* solitary and terminal *Fruit* a cone, solitary at extremities of small branchlets,  $\frac{3}{4}$  in. long, oval, tapering both ends, scales tapering, rounded or obtuse at apex; *seeds* in twos at base of scales, little shorter than wings.

*Leaves* in alternate opposite pairs, scale-like, closely imbricated, without gland on back, those on branches distant, decurrent, acute, on branchlets very flat, in 4 rows, short, rounded, spiny pointed, glossy green above, silvery beneath.

An evergreen *tree*, 50–150 ft.; *Branches* spreading, flat, horizontal, scattered, slender, deep brown; *branchlets* crowded, flattened, 2 rowed, slender, flexible, straight, undivided; *Wood* fine-grained, yellow, soft, easily worked, moderately durable.

Introduced from N.W. America, 1851. Syns. *T. gigantea* (Nutt.), *T. Lobbi*, and *T. Menziesii* of gardens.

### HATCHET-LEAVED ARBOR-VITÆ, *Thuya dolabrata*.

Parks, gardens. April, May. Prefers cool, moist soil and shade; hardy in south of England; must be sheltered from cold winds.

*Flowers* monœcious, solitary and terminal; *Fruit* a cone, sessile and terminal, ovate, squarrose, small,  $\frac{3}{4}$  in. diam., scales 8–10, woody.

*Leaves* in 4 rows, decussate, scale-like, broad, thick, ovate, rounded at point, hatchet-shaped, adpressed, imbricated, flat, furrowed along middle, margins concave, deep shining green above, silvery-white beneath.

An evergreen *tree*, 40–50 ft.; pyramidal; *Branches* vertical, pendulous at ends; *branchlets* 2-rowed, 2-edged, alternate, flattened.

Introduced from Japan, 1861. Syn. *Thuyopsis dolabrata*.

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## CHINESE ARBOR-VITÆ, *Thuja orientalis*.

Parks, gardens. April.

*Flowers* monœcious, terminal and solitary; *Fruit* a cone, solitary at ends of branchlets, ovate-elliptic, 6-valved,  $\frac{1}{2}$  in. long, light brown, scales 6, 2 central and 4 around sides.

*Leaves* in 4 rows, ovate-rhomboid, scale-like, imbricated, adpressed, decurrent, acute, shining green and glaucous when young, afterwards dull green, glandless.

An evergreen *tree*, 18–20 ft.; or pyramidal bush; *Branches* at first horizontal, afterwards fastigate; *branchlets* in 2 rows, flat.

Native of China and Japan. Many varieties in cultivation. Known in nurseries and gardens as *Biota orientalis*.

## INCENSE CEDAR, *Libocedrus decurrens*.

Parks. January. Best on deep moist loam. Propagated by cuttings of firm shoots or branchlets in sandy soil in cold frame or under handlight, August or September; seeds in pans of sandy soil in cold frame or greenhouse, October—April.

*Flowers* monœcious, solitary, terminal, on different branchlets; *Males* ovate, nearly  $\frac{1}{4}$  in. long, stamens 12–16, connectives with 4 anther cells; *Females* oblong, 6 seminiferous scales, bearing 2 ovules, bract scales 2–6 pairs, ovate, acute, yellow-green; *Fruit* a cone, oblong, 1 in. long, erect, light red-brown, scales 2–3 pairs, sub-coriaceous; *seeds* oblong-lanceolate,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long, ripening in 1 year.

*Leaves* in 4 ranks, oblong-obovate, scale-like, small, decurrent, adnate to branches except at apex, deep glossy green,  $\frac{1}{2}$  in. long on leading shoots, those of lateral ranks keeled and glandular on back.

An evergreen *tree*, 35–40 ft.; columnar; *Branches* slender, erect, lower ones curved; *branchlets* flattened, laterals 4–6 ins. long; *Bark* cinnamon-red, scaly;

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*Wood* light, soft, close-grained, durable in contact with soil, light reddish-brown.

Native of N. America, reaching 150 ft. in height. Discovered by Colonel Fremont; seeds sent home by Jeffrey, 1853. Generic name from Gr. *libanos*, incense, and *cedrus*, a Cedar, in reference to the resinous character of the wood. Specific name from L. *decurro*, I run down, referring to leaves. Known in nurseries as *Thuja gigantea*.

### UMBRELLA PINE, *Sciadopitys verticillata*.

Parks, gardens. May. Requires leaf-soil or peat and moisture. Propagated by imported seeds sown in pots of moist sandy loam in cold frame or greenhouse, transplanting outdoors in following spring; or sown outdoors in moist sandy loam in April, transplanting one year afterwards.

*Flowers* monœcious; *Male catkins* terminal, somewhat globular, anther lobes 2; *Females* solitary, bract scales arranged spirally, seminiferous scales growing out from them and exceeding them in length, ovules 6–9; *Fruit* a cone, elliptical or cylindrical, obtuse,  $2\frac{1}{2}$ –3 ins. long,  $1\frac{1}{2}$  in. diam., scales regularly imbricated, thin, bracts shorter than scales, cones produced after about 20 years; *seeds* seldom ripening in England.

*Leaves* alternate, 30–40 at extremities of shoots, forming a sort of whorl like an open parasol, linear, 2–4 ins. long,  $\frac{1}{6}$  in. broad, sessile, slightly falcate, blunt or slightly notched, glabrous, coriaceous, double ribbed channel underside, yellow-green when young, afterwards deep green, persistent about 3 years.

An evergreen *tree*, 70–80 ft.; conical; *Stem* straight; *Branches* horizontal, spreading, mostly in whorls, stiff, twiggy, young shoots cylindrical, leaves only at top, growth very slow.

Native of Japan; seeds first sent to England by Mr. J. G. Veitch, 1861; attains height of 120–150 ft. in native country. Name from Gr. *scias*, *sciados*, a shade, an umbrella; *pitys*, *pityos*, a Pine-tree; Low Latin *verticillatus*—*verticillus*, dim. of *vertex*, a whirl.

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### WELLINGTONIA, *Sequoia gigantea*.

Parks. April, May. A very ornamental tree in the early stages of growth. Propagated by cuttings of shoots in sandy loam under bell-glass, handlight, or cold frame, September or October; seeds in well-drained pans of sandy loam in cold frame in spring, transplanting to nursery bed when large enough to handle.

*Flowers* monœcious; *Males* terminal, in great profusion all over tree; *Females* with 25–40 pale yellow scales, keeled, slender points; *Fruit* a cone, ovate-oblong, 2–3½ ins. long, 1½–2¼ ins. diam., dark reddish-brown, 25–30 scales with long reflexed tip; *seeds* linear-lanceolate,  $\frac{1}{8}$ – $\frac{1}{4}$  in. long, light brown, wings broad, solitary at ends of branchlets, maturing in second year.

*Leaves* spirally arranged, lanceolate or ovate and acuminate, rounded and thickened on lower surface, concave on upper surface, midrib obscure, rigid, acute, decurrent below,  $\frac{1}{8}$ – $\frac{1}{4}$  in. long, light bluish-green on young plants, on leading shoots becoming dull grass-green,  $\frac{1}{2}$  in. long.

An evergreen tree, 100 ft. or more; conical; *Branches* short, thick, horizontal; *branchlets* slender, slightly drooping, reddish-brown tinged purple; *Bark* red, scaly; *Wood* light, soft, not strong, brittle, coarse-grained; some from trees grown in England has proved to be firm and tough, not easily cut with a chisel.

Native of California, 270–320 ft.; introduced by William Lobb, 1853. Known as Big Tree or Mammoth Tree. Synonyms *S. Wellingtonia*, *Wellingtonia gigantea*.

### RED WOOD, *Sequoia sempervirens*.

Parks. April. Best in deep, rich soil, and sheltered.

*Flowers* monœcious, minute; *Males* terminal, in axils of upper leaves, ovate, obtuse, numerous filaments bearing 2–5 globose 2-valved anther cells, bracts imbricated, ovate, acute; *Females* terminal, ovoid or oblong, seminiferous scales bearing in 2 rows 5–7 pendulous ovules, bract scales about 20, ovate-acute with incurved points; *Fruit* a cone, oblong, solitary, terminal, 1 in. long, 15–20 scales, cuneiform; *seeds*  $\frac{1}{16}$  in. long, light brown.







YELLOW CYPRESS (*Cupressus nothkalensis*)

A. Frond, showing cones. B. Longitudinal section of cone. C. Transverse section of cone.

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*Leaves* linear, falcate, resembling Yew, spirally alternate, spreading in 2 ranks by half-turn at base, acute or acuminate, slightly thickened on revolute margins, obscurely keeled, midrib conspicuous, decurrent at base,  $\frac{1}{4}$ – $\frac{1}{2}$  in. long, on leading shoots in many ranks, ovate or ovate-oblong, rounded and thickened on lower surface, concave, dying and turning brown at least two years before falling.

An evergreen *tree*, 80–100 ft.; *Branches* slender, horizontal, much divided, frequently pendulous; *Bark* thick, spongy, scaly, inner bark cinnamon-red; *Bud-scales* ovate-acute, imbricated; *Suckers* produced; *Wood* light, soft, not strong, close-grained, easily split, durable in contact with soil, light red.

Native of California, there reaching height of 200–340 ft.; free of branches for 75–100 ft., 90–100 ft. circumference, bark 18 ins. thick; some probably 1300 years old. Specimens brought home by Menzies, 1795; seeds first sent to Europe by William Lobb in 1853. Generic name in honour of Seequayah, a Cherokee Indian chief (1770–1843).

### JAPAN CEDAR, *Cryptomeria japonica*.

Parks, gardens. May. Best in deep, rich soil with abundant moisture, and sheltered from cold winds. Propagated by cuttings of side shoots 2–3 ins. long in sandy soil under handlight or cold frame, September or October; seeds in sandy loam in temperature of 55° in March, or outdoors in April.

*Flowers* monœcious; *Males* in axillary spikes at ends of branchlets, mixed with young cones, oval or oblong, anther cells 3–5 at base of scales; *Females* mostly solitary, some in clusters at extremities of branchlets, sessile, erect, globular, about size of a cherry; *Fruit* a cone, globular,  $\frac{3}{4}$  in. diam., erect, singly or in clusters, scales cuneate, loose, brownish-red, margins rough and fringed; *seeds* 3–5 under each scale, crustaceous, ripe in September, October.

*Leaves* spirally arranged in 5 rows, linear, 4-angled, falcate, rigid, sessile, decurrent at base, glabrous, bright bluish-green in summer and spring, bronzy-green in winter,  $\frac{1}{2}$  in. long.

An evergreen *tree*, 50–100 ft.; *Branches* erect or horizontal, spreading,

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frondose, brittle; *branchlets* usually alternate, bright green; *Bark* brownish-red; *Wood* heavy, soft, yellowish-white, easily worked, fragrant.

Introduced from Japan, 1844; there called "Suga" = evergreen, or "Sugamats" = evergreen fir.

### DECIDUOUS CYPRESS, *Taxodium distichum*.

Parks and gardens by banks of streams or marshy ground. May. A tree of great beauty, distinct among Conifers by reason of its red autumn foliage and peculiar root protuberances. Propagated by cuttings of shoots in sandy soil under handlight or in cold frame in September; layering in September; seeds in light soil outdoors in March, or pans or boxes of light soil in cold frame or greenhouse in March, transplanting to nursery bed when large enough to handle.

*Flowers* monœcious; *Males* in long, flexible, pendulous panicles, 4-5 ins. long, pyramidal; *Stamens* 6-8; *Females* 2-3 together near males, semiferous scales formed by an outgrowth from the upper side of the bract scale, each bearing 2 erect ovules; *Fruit* a cone, ovate, about as large as pigeon's egg, pendent at ends of branches, scales thick, dull brown; *seeds*  $\frac{1}{3}$  in. long, 2 at base of each scale.

*Leaves* deciduous, in 2 opposite rows (distichous), linear-lanceolate, flat, rather distant, pectinate, horizontally spreading, twisting at base, linear, sharply pointed, somewhat arching, convex outwards, bright yellow-green,  $\frac{1}{2}$  in. long,  $\frac{1}{12}$  in. broad. Autumn tint dull red.

A deciduous tree, 80-90 ft.; *Branches* stout, stiff, horizontal, ascending at ends, laterals rather pendulous; *branchlets* short, very slender, feathery; *Stem* usually hollow at base, deep longitudinal furrows; *Roots* with conical excrescences 1½-2 ft. high, 4-5 ft. thickness, always hollow (cypress knees), smooth, soft, reddish bark, produced in greatest abundance in situations subject to inundations; *Heartwood* of reddish colour, light, not strong, soft, durable, little resin.

Native of N. America, in swampy regions, hence name of Swamp Cypress;



## CONIFERÆ

introduced 1640. Name from *Taxus*, the Yew; *idos*, appearance or resemblance, from similarity of leaves; *distichos*, arranged in 2 rows; *dis*, twice; *stichos*, a line.

### CHILI PINE, *Araucaria imbricata*.

Parks, lawns. shrubberies. June. Requires sun, moisture, and drainage. Propagated by seeds sown in light soil in temperature of 65°, February—April.

*Flowers* usually diœcious; *Male flowers* cylindrical, 4–5 ins., pedunculate, singly or clusters of 6–7, yellow, scales numerous, long, imbricate, recurved, sometimes persistent for several years; *Females* at ends of branches, 4 ins., almost spherical, broader at base, scales wedge-shaped, narrow, imbricate, brittle points; *Fruit* a cone, 6 ins. diam., globular, dark brown, scales easily detached, falling to pieces when ripe, 1-seeded, 200–300 seeds,  $1\frac{1}{2}$  in. long, thin, hard shell, winged, inverted, partly attached to scales.

*Leaves* verticillate, 7–8 in a whorl, ovate-lanceolate, sessile,  $1\frac{1}{4}$  in. long, imbricate, closely encircling branches, thickened at base, coriaceous, stiff, keel-shaped below, sharp-pointed ends turned towards branches, concave, glabrous, shining, marked with longitudinal lines, dotted on both surfaces, persisting 15 years.

An evergreen *tree*, 80–100 ft.; *Branches* in whorls, curved, with upward tendency, entirely covered by leaves, lower branches often dying off, general outline pyramidal; *Bark* thick, corky; *Wood* white, hard, heartwood bright yellow.

Native of S. Chili; discovered by Don F. Dendariarena, 1780; introduced by Arch. Menzies, 1796. Generic name from Arauco, in Chili.

### INDIAN HEMLOCK FIR, *Tsuga brunoniana*.

Parks, gardens. April. Requires a sheltered position. Propagated by seeds in sandy loam in temperature of 55° in March, or outdoors in April.

*Flowers* monœcious; *Males* lateral; *Females* terminal; *Fruit* a cone, solitary and terminal, sessile, pendent, ovoid, pale brown,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, scales

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broadly elliptic, obtuse, loosely imbricated, persistent; *seeds* small, angular, wing obovate.

*Leaves* solitary, somewhat distichous or scattered, linear, flat, spreading, obtuse or slightly acute, minutely toothed towards apex, margins reflexed, glossy green above, silvery white-mealy beneath,  $\frac{1}{2}$ –1 in. long, easily detached by winter winds.

An evergreen *tree*, 70–80 ft.; pyramidal, with round head; *Branches* numerous, slender, pendent.

Native of Bhotan; introduced 1838. Syns. *Abies* (*Pinus*) *brunoniana*, *A.* (*Pinus*) *dumosa*.

### HEMLOCK SPRUCE, *Tsuga canadensis*.

Parks, gardens. April. Best in rather strong, damp loam; good by a lake side. “Few evergreen trees can surpass the Hemlock Spruce for beauty and richness of foliage, or distinct and pleasing outline; and during spring and early summer the young drooping shoots, of a lively yellowish-green, contrast nicely with the dark and sombre hue of the older foliage, and form a combination that for beauty of effect is certainly hard to match.”—Webster.

*Flowers* monœcious; *Males* sub-sessile, solitary, in axils of upper leaves, globose, light yellow; *Stamens* numerous, anther cells sub-globose with short gland-like tips; *Females* solitary, terminal, erect, globose, pale green, scales nearly circular, stipitate, bracts shorter than scales, laciniate; *Fruit* a cone, ovate-oblong, acute,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, pendulous, stalks puberulous, scales about 25, orbicular-oblong, obtuse, minutely lacerate or entire; *seeds* very small.

*Leaves* spirally disposed, irregularly distichous, oblong, rounded at apex, rough at margins, obscurely grooved on upper surface, dark green above, silvery stripes beneath, downy when young,  $\frac{1}{2}$ – $\frac{3}{4}$  in. long, deciduous in third year, woody bases persistent.

An evergreen *tree*, 60–70 ft.; pyramidal, with rounded or flattened head; *Branches* slender, horizontal or pendulous, rather flat, downy when young; *branchlets* light yellow-brown, becoming glabrous and dark red-brown tinged

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purple; *Bark* cinnamon-red to grey, tinged purple, narrow rounded ridges, scaly; *Buds* obtuse, puberulous, chestnut-brown; *Wood* light, soft, not strong, brittle, coarse-grained, liable to wind-shake and splinter, not durable when exposed to air, light brown tinged red; astringent inner bark much used in U.S.A. and Canada for tanning.

Introduced from N. America, 1736. *Tsuga* is the Japanese name.

### MOUNTAIN HEMLOCK, *Tsuga mertensiana*.

Parks, gardens. April.

*Flowers* monœcious; *Males* on slender, pubescent, drooping stems, violet-purple; *Females* erect, bracts larger than scales, dark purple or yellow-green, tips slender, reflexed; *Fruit* a cone, sessile, oblong-cylindrical,  $\frac{1}{2}$ –3 ins. long, scales thin, cuneate, puberulous, margins erose, 4–5 times as long as bracts; *seeds* light brown, wings  $\frac{1}{2}$  in. long.

*Leaves* spiral, 2-ranked, remote on leading shoots, crowded on laterals, sometimes grooved on upper surface, slightly ribbed on lower, bluntly pointed, bluish-green,  $\frac{1}{2}$  in. long, persistent 3–4 years.

An evergreen *tree*, 70–150 ft.; *Branches* slender, pendant; *branchlets* thin and flexible, or stout and rigid, light reddish-brown, pubescent, becoming greyish-brown and scaly; *Bark* with rounded ridges, scaly, dark cinnamon-red tinged blue or purple; *Buds* acute, slender, deciduous subulate tips; growth rapid; *Wood* light, soft, not strong, close-grained, pale brown or red.

Introduced from N. America, 1851.

### JAPAN HEMLOCK SPRUCE, *Tsuga Sieboldi*.

Parks, gardens. April. A species of neat and elegant habit, suitable for planting in confined spaces.

*Flowers* monœcious; *Fruit* a cone, terminal and solitary, elliptic, blunt, 1 in. long,  $\frac{3}{4}$  in. diam., scales 20–30, imbricated, coriaceous, slender at base,

## TREES AND SHRUBS

obtuse at apex, thin, shining pale brown, bract scales narrow, truncate, irregularly bifid; *seeds* small, wings thin, membranous.

*Leaves* solitary, somewhat distichous, frequently alternate, slightly linear, flat, obtuse, rarely acute, entire, smooth, dark shining green above, 2 white glaucous bands beneath, short round foot-stalks.

An evergreen *tree*, 80–100 ft.; *Branches* numerous, irregularly spreading, drooping at extremities; *branchlets* slender, recurved; *Buds* minute; growth slow.

Native of Japan; introduced 1853. Syn. *Abies Tsuga*. Japanese name Tsuga = Yew-leaved.

### ALCOCK SPRUCE, *Picea alcockiana*.

Parks, gardens. May. The species of *Picea* are propagated by cuttings in sandy soil in cold frame, or in pots under bell-glass or handlight outdoors, August or September; layering of shoots or branches in autumn; grafting on Norway Spruce in March; seeds sown in sandy loam in temperature of 55° in March, or outdoors in April.

*Flowers* monœcious; *Fruit* a cone, solitary or sub-aggregate, oblong-cylindrical, obtuse both ends, 2 ins. long, scales oblong-ovate, loosely imbricated, cartilaginous, margins denticulate, shining; *seeds* small, cinnamon-coloured, wing obovate,  $\frac{1}{3}$  in. long.

*Leaves* spirally arranged, linear-oblong, 4-sided, falcate, rigid, mucronate, concave and deep green above, glaucous bands below, twisted at base,  $\frac{1}{2}$  in. long.

An evergreen *tree*, 90–120 ft.; pyramidal.

Native of Japan; introduced by Messrs. Veitch, 1861. Named in compliment to Sir Rutherford Alcock, British Minister at the Court of Yeddo, Japan.

### NORWAY SPRUCE FIR, *Picea excelsa*.

Woods, parks, plantations. May. Prefers moist soil and cold situation.

*Flowers* monœcious; *Males* on long stalks, isolated in leaf axils,  $\frac{3}{4}$  in. long, divoo or sub-globose when young; *Stamens* red, pollen-sacs yellow, scales thin,



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notched, striate, loosely imbricated; *Females* sessile at tips of preceding year's shoots,  $1\frac{1}{2}$ –2 ins. long, cylindrical, erect at first, scales thin, emarginate or toothed, purplish-red; *Fruit* a cone, terminal, cylindrical, pendent, 5–7 ins. long,  $1\frac{1}{2}$ –2 ins. broad, brown, scales 160–180, persistent, thin, flat, naked, truncate at summit,  $1-1\frac{1}{2}$  in. long,  $\frac{1}{2}$  in. broad; *seeds* small, 2 at base of each scale, wing five times as long, brown.

*Leaves* acicular, spirally scattered, quadrangular, persistent, needles  $\frac{3}{4}$ –1 in. long, very sharp, persisting 6–7 years; petiole short.

An evergreen *tree*, 80–100 ft.; *Branches* in regular tiers, ascending towards extremities when young, drooping when older, spray drooping, giving feathery appearance, leading shoot in young trees very prominent; *Bark* thin, smooth, brown in young stage, warty and shed in irregular scales later; *Buds* conical, not resinous; *Roots* given off horizontally very near surface; *Wood* light, even-grained, elastic, durable; used for masts, ladders, scaffolding, telegraph poles, deals, wood-pulp, &c. &c.; also furnishes Burgundy pitch; young plants often used for Christmas trees.

Native of mountainous parts of Europe and Asia; introduced about 1548.

Name Spruce Fir possibly of German (Prussian) origin, meaning the Fir-tree whose *shoots* were most used for making *spruce-beer* (Ger. *sprossen-bier*—*sprossen*, young shoots of trees—*sprriessen*, to sprout).

Pine-apple Galls resembling imperfect cones, bearing shoot at summit, produced by Spruce Cone Aphis *Adelges* (*Chermes*) *abietis*; shoots often distorted, sometimes killed; most frequent on young trees; galls said to be eaten by Laplanders.

### HIMALAYAN SPRUCE, *Picea Morinda*.

Parks, gardens. April. Best on cold soils.

*Flowers* monœcious; *Male catkins* usually solitary, cylindrical, sessile, 1 in. long; *Fruit* a cone, ovate-oblong to nearly cylindric, 4–6 ins. long,  $1\frac{3}{4}$  in. diam., pendulous, scales obovate, rounded, coriaceous, margin thin, dark brown,

## TREES AND SHRUBS

glaucous when young; *seeds* small, nearly black, wing obliquely spatulate, ripening in February of second year.

*Leaves* spirally arranged round branches, 4-sided, stiff, acutely pointed, scattered,  $1-1\frac{1}{2}$  in. long, dark green.

An evergreen *tree*, 80–120 ft.; pyramidal; *Branches* horizontal; *branchlets* pendulous, tassel-like; *Bark* greyish-brown, divided into small rounded or quadrangular scales.

Native of the Himalayas from Bhutan to Kafiristan; introduced 1818. Syns. *Abies Smithiana* and *Pinus Smithiana*.

### BLACK SPRUCE, *Picea nigra*.

Parks, gardens. May. Succeeds best in cool, moist loam.

*Flowers* monœcious, axillary; *Males* sub-globose; *Stamens* numerous, anthers dark red; *Females* oblong-cylindrical, scales obovate, purple, bracts oblong, purple, glaucous, rounded at apex; *Fruit* a cone,  $1-1\frac{3}{4}$  in. long, ovate, scales puberulous, rounded, toothed, purple when young, sometimes persistent 20–30 years; *seeds* oblong,  $\frac{1}{8}$  in. long, dark brown, wings  $\frac{1}{2}$  in. by  $\frac{1}{8}$  in.

*Leaves* spirally disposed round branches, linear, slightly incurved above middle, quadrangular, pale blue-green, glaucous,  $\frac{1}{4}-\frac{3}{4}$  in. long, hoary on upper surface.

An evergreen *tree*, 50–80 ft.; *Branches* short, drooping, lower tier often resting on ground; *branchlets* light green, pale pubescence, scaly; *Bark* grey-brown, scaly; *Buds* ovate, acute, reddish-brown; *Wood* light, soft, not strong, pale yellow-white.

Introduced from N. America, 1700.

### EASTERN SPRUCE, *Picea orientalis*.

Parks, gardens. May. Thrives on sandy soil; well suited for exposed situations.

*Flowers* monœcious; *Fruit* a cone, sub-cylindrical, tapering towards apex, 3 ins. long,  $\frac{3}{4}$  in. diam., scales loosely imbricated, broad at base, rounded at



NORWAY SPRUCE FIR (*Picea excelsa*)

A. Branch with mature cone. B. Female flowers. C. Male flowers. D. Scale of cone with 2 winged seeds. E. Gall of *Chermes abietis* on young shoot. F. Leaf (enlarged).







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apex, sub-entire, bracts shorter than scales; *seeds* very small, nearly black, wing short and broad.

*Leaves* solitary, covering branches on all sides, sub-quadrangular, acute, deep green both sides,  $\frac{1}{2}$  in. long.

An evergreen *tree*, 70–80 ft.; *Branches* straight, slender, stiff.

Native of the Caucasus; introduced 1825.

### TIGER'S-TAIL SPRUCE, *Picea polita*.

Parks, gardens. May. This is one of the handsomest and hardiest of the Japanese Conifers, admirably suited for the lawn or park.

*Flowers* monœcious; *Fruit* a cone, solitary and terminal at ends of branchlets, ovate or ovate-oblong, rounded at both ends, glabrous, 3–4 ins. long, 2 ins. diam., erect at first, pendent later, scales numerous, persistent, closely imbricated, coriaceous, obovate, cuneate at base, entire, chestnut-brown; *seeds* small, nearly black, wings thin.

*Leaves* arranged round branchlets, straight or slightly falcate, stiff, somewhat quadrangular, acute or acuminate, entire, glabrous, glossy dark green,  $\frac{3}{4}$ –1 in. long.

An evergreen *tree*, 40 ft.; *Branches* horizontal, stiff; *branchlets* pendulous; *Bark* yellowish; *Buds* large, globose, reddish-brown; *Wood* almost white.

Native of Japan; there 80–100 ft.; introduced 1861. Japanese call it “Torano-wo-momi” (the ‘Tiger’s-tail Fir), because long pendulous branches on old trees bear resemblance to a tiger’s tail.

### BLUE SPRUCE, *Picea pungens*.

Parks, gardens. May.

*Flowers* monœcious; *Males* yellow tinged red; *Females*, scales oblong or obovate, pale green, apex denticulate, truncate or emarginate, bracts acute; *Fruit* a cone, oblong-cylindrical, 3 ins. long, sessile or short-stalked; *seeds*  $\frac{1}{8}$  in. long, wings  $\frac{1}{4}$  in. long, rounded at apex.

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*Leaves* stout, rigid, strongly incurved, acuminate, 1-1½ ins. long on sterile branches, on fertile branches about half as long, bluish-green or steel-blue, changing to blue-green after 3-4 years.

An evergreen *tree*, 50-80 ft.; *Branches* horizontal; *branchlets* short, stout, glabrous, bright orange-brown to light greyish-brown; *Bark* grey tinged cinnamon-red; *Buds* stout, obtuse or acute,  $\frac{1}{4}$ - $\frac{1}{2}$  in. long, scales chestnut-brown; *Wood* light, soft, close-grained, weak, pale brown or nearly white.

Native of Colorado, Utah, and Wyoming. Syn. *P. parryana*. It is the *Abies* (*Picea*) *Engelmanni* of gardens.

### MOUNT ATLAS CEDAR, *Cedrus atlantica*.

Parks, gardens. September, October. Suitable for limestone soils, doing well on bleak and exposed ground, and thriving in seaside towns. In its early stage it is much like the Cedar of Lebanon, but later is to be recognised by its more erect habit and rigid branches. The species are propagated by seeds sown in well-drained pans of light soil in cold frame in April, transplanting outdoors in following spring.

*Flowers* monœcious; *Males* solitary and terminal, cylindric, erect; *Females* solitary, erect, oval, obtuse; *Fruit* a cone, chocolate-brown when ripe, ovate, flattened or depressed at ends, erect on upper sides of branches, light brown, resinous, 2½-3 ins. long, scales closely appressed, smooth, broad, coriaceous, thin edges; *seeds* in twos under each scale, irregular or angular, wing thin, 1 in. or more long.

*Leaves* in tufts or singly on young shoots, cylindrical or flattened, acute, furrowed, rigid, straight, glaucous green or silvery hue,  $\frac{1}{2}$ - $\frac{3}{4}$  in. long.

An evergreen *tree*, 80-120 ft.; erect, pyramidal; *Branches* slender, ascending to horizontal, mostly opposite, terminal shoots not pendulous, growth rapid; *Wood* compact, fine-grained, durable.

Native of Atlas Mountains, Algeria; introduced 1843.

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### DEODAR OR INDIAN CEDAR, *Cedrus Deodara*.

Parks, gardens, shrubberies. September, October. This is a handsome tree at all times, but in the young stage it is made especially ornamental by reason of its pendulous leader and gracefully drooping branch-tips. It is not particular as to soil, but will not thrive in cold and exposed situations.

*Flowers* monœcious or diœcious, resembling *C. Libani*, at ends of arrested branchlets; *Males* erect, 2-3 ins. long; *Fruit* a cone, narrower and more lax than *C. Libani*, ovoid-cylindrical, shortly stalked, often in pairs, usually on upper sides of top branches, 3-5 ins. long, bluish when young, pale reddish-brown when mature, scales closely imbricate, deciduous; *seeds*  $\frac{1}{3}$ - $\frac{2}{3}$  in., wing triangular,  $\frac{2}{3}$  in. long.

*Leaves* fascicled, triquetrous, rigid, larger than *C. Libani*, dark bluish-green, light glaucous bloom.

An evergreen *tree*, 60-80 ft.; elongated pyramidal or conical outline; *terminal shoots* of branches slender, pendulous; *Branches* of young trees slender, very flexible, drooping.

Native of Western Himalayas, where it attains a height of 150 ft. or more, its timber being very durable, lasting for hundreds of years; used for railway-sleepers, bridges, &c.; owing to fragrance, Hindus burn wood as incense; seeds first introduced to England by Hon. W. L. Melville, 1831.

### CEDAR OF LEBANON, *Cedrus Libani*.

Parks, gardens. May. Best in deep soil where roots have access to water.

*Flowers* monœcious, not usually produced under 25-30 years; *Males* isolated,  $\frac{2}{5}$  in. long, erect, ovoid, yellowish, mostly near apex of tree, scales broad, thin, closely imbricated; *Females*  $3\frac{1}{5}$ -4 ins. long, ellipsoid-oblong, purple when young; *Fruit* a cone, erect, oblong, oval, pedunculate, purplish-brown, resinous,  $3\frac{1}{2}$  ins. long,  $1\frac{1}{2}$ - $2\frac{3}{4}$  ins. diameter, scales woody, thin, margin somewhat membranous, very compact, in young stage greyish-green tinged

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with pink ; *seeds* angular, wing cuneate, at least two years to ripen, persistent for several,  $\frac{1}{2}$  in. long, wings  $1\frac{1}{2}$  in. long, rounded cuneate.

*Leaves* singly on elongated branches, or fascicled on dwarf shoots, arranged spirally, but mostly on upper side, short, rigid, nearly cylindrical, acute, 1 in. long, dark green, persistent for 2 years, very slow in decaying.

An evergreen *tree*, 60–80 ft. or more under favourable conditions ; *Branches* horizontal, large, rigid, in distinct layers or stages, forming a broadly pyramidal head or flattened top ; *branchlets* flat, fan-like, numerous, thickly set ; *Bark* on branches greyish-brown, smooth, peeling in thin flakes, on trunk thick, rough, deeply fissured ; *Wood* in this country reddish-white with streaks, soft, apt to shrink and warp, not durable, sweet-scented for only first year after being felled.

Native of Lebanon and Taurus in Syria ; introduced about 1860. Name from O.F. *cedre* ; L. *cedrus* ; Gr. *kedros*, cedar-tree.

### COMMON LARCH, *Larix europæa*.

Woods, plantations, gardens. April, May. Best in elevated open situations, preferring alluvial sandy loam. Propagated by seeds sown in sandy soil in November, transplanting when two years old.

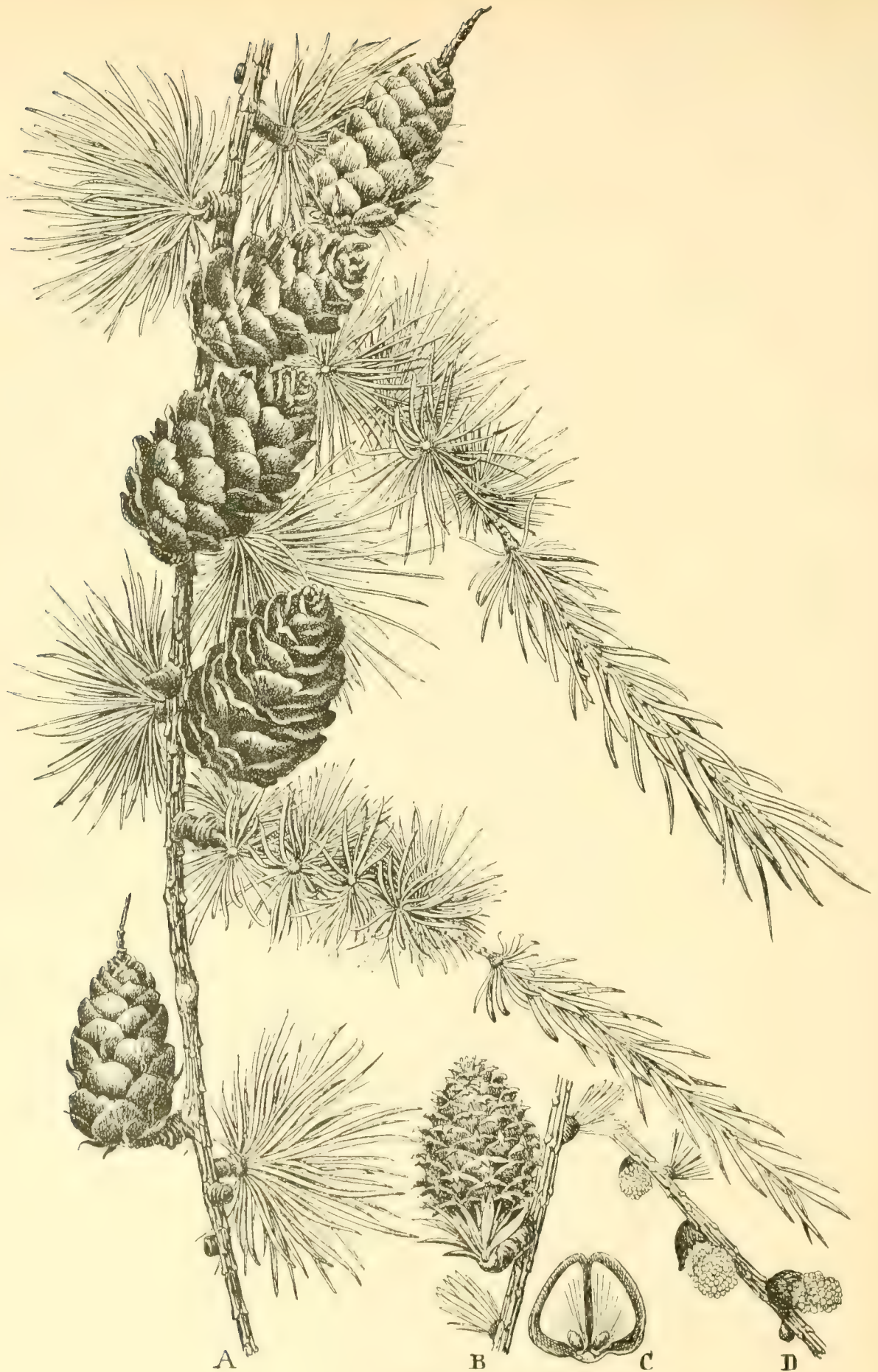
*Flowers* monœcious ; *Males* isolated, sessile, ovoid-globose to shortly cylindrical, pale green passing to yellow,  $\frac{1}{5}$ – $\frac{2}{5}$  in. long, scales thin, stamens almost peltate ; *Females* cylindrical, blunt, solitary,  $\frac{2}{5}$ – $\frac{3}{5}$  in. long, crimson-purple when young, pale brown later, scales thin, pointed ; *Fruit* a cone, lax, ovate, erect, brown, red when young, 1 in. long, ripe in late autumn, persisting for a long time, scales persistent, roundish, reddish-brown ; *seeds* ovate, winged ; cones along twigs in rows, numerous.

*Leaves* fascicled, 30–60 in a bundle, linear, soft, blunt, or rounded at point, spreading, slightly recurved, bright green, deciduous.

A deciduous *tree*, 80–100 ft. ; *Branches* spreading, horizontal, lower ones with a downward tendency, turning upwards at tips ; *Twigs* mostly pendulous ; *Bark* brown, separable into thin layers, deep longitudinal fissures ; quick in growth ; *Wood* reddish-brown or yellowish-white, durable, tough, with but







LARCH (*Larix europaea*)

1. Branch showing cones. B. Female flowers. C. Scale of cone, showing 2 winged seeds.  
D. Male flowers.

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few knots, withstanding alternation of wet and dry, susceptible of high polish ; used in carpentry and joinery, and for poles ; trunk furnishes Venice turpentine ; bark used in tanning.

Native of Europe ; introduced somewhere about 1629. Name Larch from Old French *larice* ; L. *laricem*, acc. of *lariæ* ; Gr. *lariæ*, a larch.

Bark attacked by a beetle known as Larch Blight (*Bostrichus laricis*) ; *Foliage*—Larch Aphis (*Chermes laricis*), Larch Miner (*Coleophora laricella*) ; *Timber*—Giant Sirex (*Sirex gigas*).

*Fungoid Pests* :—Sulphury Wood Rot (*Polyporus sulfureus*), Larch Canker (*Dasyscypha calycina*), probably caused by *Peziza Willkommii*.

### GOLDEN LARCH, *Pseudolarix Kämpferi*.

Gardens, plantations. May. "This is a distinctly ornamental Conifer, and that at three different periods of the year—early spring, when the tender green leaves are unfolding ; autumn, when they put on the lovely golden colour ; and during the leafless period, when the yellowish-green or golden-brown bark of the younger branches shows off to perfection, and renders the tree distinct from almost every other species in cultivation."—Webster. Propagated by seeds sown in well-drained pots of sandy loam in cold greenhouse or frame in April, transplanting outdoors in following spring ; or sown outdoors in moist sandy soil in April, transplanting in following year.

*Flowers* monœcious ; *Male catkins* shortly stalked, 20 or more, clustered in umbellate pendulous tufts at extremities of side shoots ; *Fruit* a cone, pendulous, 3 ins. long,  $2\frac{1}{4}$  ins. diam., scales 50–60, triangular, deciduous, diverging, cordate, woody ; *seeds* as large as scales ; cones break up at the least touch.

*Leaves* slender, linear-lanceolate, clustered on the adult branches, singly on leading shoots and young plants,  $1\frac{1}{2}$ – $2\frac{1}{2}$  ins. long, pale green when young, golden-yellow in autumn, deciduous.

A deciduous tree, 120 ft. ; *Branches* resembling *L. europæa* ; *Bark* dark grey, young shoots yellowish-green or golden-brown.

Native of China ; introduced 1846. First discovered by Kämpfer (1651–1716),



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and subsequently by Fortune. Name from Gr. *pseudo*, false, and *Larix*, a larch. Chinese call it *Kara-mats* (Pine full of buds) and *Kin-le-sung* (Common Golden Pine); Japanese name is *Seosa-mats* (deciduous Fir).

### SHORT-LEAVED SILVER FIR, *Abies brachyphylla*.

Parks, gardens. May. The species of *Abies* are propagated by seeds sown in sandy loam in temperature of 55° in March, or outdoors in April.

*Flowers* monœcious; *Males* axillary or terminal; *Females* solitary on short branchlets, cylindrical; *Fruit* a cone, solitary, purplish, oblong-cylindrical, obtuse at apex, sessile, erect, 3½ ins. long, 1¼ in. diam., scales reniform, resinous, margins entire, bracts cuneate, dentate; *seeds* cuneate, angular, full of turpentine, wings broad at top.

*Leaves* crowded, linear, straight or curved, flat, enlarged at base, obtuse or sub-emarginate, furrowed upper side, white glaucous stripes beneath, ⅓–½ in. long.

An evergreen *tree*, 40 ft.; pyramidal; *Branches* horizontal, whorled.

Native of Japan (120 ft.); introduced 1870.

### MOUNT ENOS FIR, *Abies cephalonica*.

Parks, lawns. May. Grows well in exposed situations; best in good clayey loam. A handsome tree, well adapted for the woodland, or as a specimen on a lawn.

*Flowers* monœcious; *Fruit* a cone, erect, cylindrical, green when young, reddish when maturing, brown when ripe, 5–6 ins. long, 1½ in. diam., scales broad, thin, rounded, shorter than bracts, bracts linear-oblong, attenuated below, unequally toothed, point sharp, reflexed.

*Leaves* regularly disposed, like stiff bottle-brush, around branches, subulate, flat, acute, dark olive-green above, two silvery lines beneath.

An evergreen *tree*, 50–80 ft.; *Branches* numerous, whorled; *Buds* quadrangular, acute, resinous; *Wood* hard, very durable, extremely resinous.

Introduced from Greece, 1824. Found on Mount Enos, or the Black Mountain, Cephalonia. Seeds first sent home by General Sir Charles Napier.



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### CILICIAN SILVER FIR, *Abies cilicica*.

Parks. May. A tree resembling the Common Silver Fir (*A. pectinata*), but with branches and foliage less plentifully produced; it is not very hardy.

*Flowers* monœcious; *Male catkins* pedunculate, cylindrical, rounded at ends; *Fruit* a cone, cylindrical, 6–8 ins. long, scales broad, entire, thin, coriaceous, bracts ligulate, crenated, hidden by scales; *seeds* three-cornered, full of turpentine, wings cuneate.

*Leaves* crowded in 2 ranks, linear, slightly curved or straight, dark green above, glaucous beneath, 1–1½ in. long.

An evergreen *tree*, 40–60 ft.; *Branches* mostly in whorls, lower ones horizontal; *branchlets* slender, short, flat, spreading, in 2 horizontal rows.

Introduced from Mount Taurus, in Asia Minor.

### COLORADO WHITE FIR, *Abies concolor*.

Parks, gardens. May. The yellow bark on the young branches makes this a very attractive tree. It is distinguished by its leaves being nearly of the same colour on both surfaces. It thrives well in exposed situations.

*Flowers* monœcious; *Males* red or rose; *Females*, scales broad, rounded; *Fruit* a cone, cylindrical, produced singly, obtuse both ends, 3–5 ins. long, 2–2½ ins. diam., scales numerous, imbricated, larger than short-pointed bracts; *seeds* ½–¾ in. long, dark dull brown, wings rose.

*Leaves* distichously arranged in double rows, those in lower rows 2–3 ins. long, upper ones shorter, channelled above, linear, flat, obtuse or emarginate on vegetative shoots, acute on shoots bearing cones, glaucous green, those on fertile branches often falcate.

An evergreen *tree*, 80–150 ft.; *Bark* on young branches yellow or orange, turning reddish-brown, then grey or greyish-brown, on old trunks thick, furrowed, irregular plate-like scales; *Buds* globose; *Wood* very light, soft, coarse-grained, not strong, pale brown, sometimes nearly white.

Native of Colorado, Utah, and Arizona; introduced 1851. Syn. *Picea lasiocarpa* (Balfour). In California reaches height of 200–250 ft.

## TREES AND SHRUBS

### JAPAN SILVER FIR, *Abies firma*.

Parks, gardens. May. Thrives best in light, rich loam, and sheltered from cold winds.

*Flowers* monœcious; *Fruit* a cone, cylindrical, stalked, blunt, slightly curved, 3–5 ins. long, 1 in. diam., scales cuneate at base, rounded and crenulate, membranaceous, deciduous, bracts acute; *seeds* triangular, wings broad.

*Leaves* solitary, somewhat 2-rowed, linear, flat, blunt at apex or bifid, slightly falcate, smooth, coriaceous, rich green above, silver lines below, 1 in. or more long, sometimes cleft at tips in young stage of growth.

An evergreen *tree*, 40–50 ft.; *Branches* whorled, horizontal, spreading, flat; *branchlets* opposite; *Buds* oval, smooth, in threes, scales imbricate, membranaceous.

Native of Japan; there called “Uro-Siro” (leaves white beneath) and “Sjura-Momi” (White or Silver Fir); introduced 1861. Syn. *A. bifida*.

### GREAT SILVER FIR, *Abies grandis*.

Parks, gardens. May. A handsome Conifer, well adapted for ornamental planting, and growing well on poor soils.

*Flowers* monœcious, usually on upper branches of tree; *Males* pale yellow, sometimes tinged purple; *Females* light yellow-green, scales semicircular, bracts short, oblong, apex broad, obcordate, emarginate, reflexed tip; *Fruit* a cone, cylindrical, bronzy-green, 2–4 ins. long, usually in pairs,  $1\frac{1}{2}$  in. diam., scales broad at apex, 3–4 times length of bracts; *seeds*  $\frac{3}{8}$  in. long, light brown, wings  $\frac{1}{2}$ – $\frac{5}{8}$  in. long, nearly as broad at apex.

*Leaves* thin, flexible, deeply grooved, dark green above, silvery-white beneath; on sterile branches remote, terete, emarginate; on fertile branches crowded, nearly erect, obtuse or notched at apex; on young trees acute or acuminate.

An evergreen *tree*, 70–100 ft.; *Branches* in flat horizontal tiers, somewhat pendulous; *branchlets* glabrous, pale yellow-green to brown; *Bark* smooth,

## CONIFERÆ

grey-brown or yellow-brown, broken into oblong plates; *Buds* globose; *Wood* light, soft, coarse-grained, not strong nor durable, light brown, very resinous, taking good polish.

Native of N. America, there attaining height of 250–300 ft.; seeds sent home by Douglas, 1831.

### BALSAM FIR, *Abies balsamea*.

Parks. June. Does well in cool, rather moist soil.

*Flowers* monœcious; *Males* dark indigo-blue, turning violet; *Females*, scales obovate, dark violet-purple, bracts long, reflexed, tips slender; *Fruit* a cone, oblong-cylindrical, truncate or depressed at apex, dark purple,  $2\frac{1}{2}$ –4 ins. long,  $1-1\frac{1}{4}$  in. diam., scales rounded and broad at apex, 3 times length of bracts, bracts obovate, red-brown, laciniate, long slender tips; *seeds*  $\frac{1}{4}$  in. long, wings nearly covering scales.

*Leaves* crowded, nearly erect by twist at base, on lower branches  $1-1\frac{3}{4}$  in. long, sometimes emarginate at rounded apex, on upper branches shorter, thickened, usually acute, pale blue-green.

An evergreen *tree*, 40–70 ft., with dense spire-like head; *Branches* crowded, short, tough, somewhat pendulous; *Bark* fissured, roughened with red scales, resin known as Canada Balsam; *Buds* sub-globose, scales orange-brown; growth slow; *Wood* light, soft, not strong, pale brown or nearly white.

Native of Canada and North-East U.S.A.; introduced 1696. Known also as Balm of Gilead.

### RED FIR, *Abies nobilis*.

Parks. May. The deep silvery glaucous foliage and regular branches make this perhaps the most beautiful of the Silver Firs.

*Flowers* monœcious; *Males* reddish-purple; *Females* scattered over upper part of tree, scales shorter than bracts, toothed, slender reflexed tips, bracts nearly orbicular; *Fruit* a cone, oblong-cylindrical, obtuse both ends, 4–6 ins. long,

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purple or olive-brown, pubescent, scales narrowed towards base, bracts spatulate, recurved, pale green; *seeds*  $\frac{1}{2}$  in. long, pale red-brown, wings about as long as seeds.

*Leaves* crowded in several rows, two ranked on lower side of branches, others incurved; on sterile branches 1–1½ in. long, flat, rounded, notched at apex; on fertile branches usually 4-sided, acuminate, two glaucous bands beneath.

An evergreen *tree*, 80–90 ft.; *Branches* short, rigid, laterals at right angles; *branchlets* slender, reddish-brown; *Bark* 1–2 ins. thick, fissured, scaly, red-brown; *Buds* ovoid-oblong, red-brown; *Wood* hard, light, strong, close-grained, pale brown streaked red; sapwood darker.

Native of N. America, where it attains height of 150–250 ft.; introduced 1831.

### NORDMANN'S SILVER FIR, *Abies nordmanniana*.

Parks, gardens. April, May. Prefers deep, heavy, rich loam on clay or rock. It is one of the finest and most valuable of the genus, scarcely to be surpassed as a park or lawn tree.

*Flowers* monœcious; *Males* in groups or clusters, generally pendent, abundant on old trees; *Females* generally solitary, erect, produced on young trees some years before males appear; *Fruit* a cone, erect, slightly ovoid, pedunculate, 4–6 ins. long, 2¼–2¾ ins. diam., scales obtuse, recurved, smooth, entire, deciduous, bracts large, coriaceous, 3-lobed, greatly exceeding scales; *seeds* triangular, about 160, 2 under each scale, wings membranous.

*Leaves* single, arranged spirally on shoots, on young trees spreading in 2 rows, with half-twist at base, linear, rigid, flat, minutely bifid at apex, dark shining green above, silvery beneath, 1 in. long.

An evergreen tree, 80–100 ft.; resembling Silver Fir; *Branches* whorled, lower ones horizontal, upper erect; *Wood* hard, closed-grained, durable.

Named after Professor Nordmann, who discovered the species in the Crimea, 1848.



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### SILVER FIR, *Abies pectinata*.

Parks, plantations. May. Best in moist, open soil; will grow beneath the shade and drip of other trees.

*Flowers* monœcious; *Males* crowded in leaf axils of shoots of preceding year, especially at tip of tree,  $\frac{3}{4}$  in. long, 2–3 whorls of overlapping pale green scales, enclosing greenish-yellow stamens; *Females* cylindrical, erect, on upper side of apex of last year's shoots of top branches (August), 1–1 $\frac{1}{4}$  in. long, numerous pale green bracts, scales pale green, obovate, toothed, tip prolonged beyond seminiferous scales; *Fruit* a cone, axillary, erect, cylindrical, 6–8 ins. long, 1 $\frac{1}{2}$ –2 ins. broad, brown, seminiferous scales falling with seeds, bract scales  $\frac{1}{2}$ –1 $\frac{1}{4}$  in. long, 1 $\frac{1}{4}$  in. broad; *seeds* triangular, abounding in balsam.

*Leaves* linear, solitary, flat, twisted at base so as to lie in two horizontal rows, obtuse, stiff, turned up at points, shining green above, two silvery-white lines for 6–9 years, one on each side of midrib beneath,  $\frac{1}{2}$ –1 in. long, persistent, brown scale-like leaves on buds, persisting at base of each year's growth.

An evergreen tree, 80–120 ft.; *Branches* horizontal, lower ones shed after 40–50 years; *Bark* smooth, greyish-brown, in old trees rugged, fissured longitudinally, silvery-grey; slow growth when young; *Wood* yellowish-white, strong, not warping, does not withstand weather; used for masts and in building, also for wood-pulp in paper-making; Strasburg turpentine obtained from resin cavities under bark.

Native of Central and S. Europe; introduced about 1603; lives about 400 years; specimens on Continent nearly 200 ft. high. Specific name from *L. pecten*, *inis*, a comb; *pecto*, I comb.

*Bark* and *Buds* attacked by Fir Weevil (*Hyllobius abietis*), Typographer Bark Beetle (*Bostrichus typographus*).

*Fungoid Pest*:—Spruce Nectria (*Nectria cucurbitula*).

### SPANISH SILVER FIR, *Abies Pinsapo*.

Parks, lawns. May. Well adapted for planting on chalk or limestone, doing well on exposed ground.

## TREES AND SHRUBS

*Flowers* monœcious; *Fruit* a cone, sessile, oval or oblong, 4–5½ ins. long, 2 ins. diam., purplish-green, scales rounded, entire, cuneate at base, bracts short, concealed by broad rounded scales; *seeds* angular, wings membranaceous.

*Leaves* disposed around branches, linear, rigid, thick, almost fleshy, nearly terete, entire at apex, prickly, bright green, faint silvery lines on inner side,  $\frac{5}{12}$  in. long.

An evergreen *tree*, 50–100 ft.; regular and symmetrical; *Branches* whorled, densely clothed with laterals; *Bark* darker and more scaly than Common Silver Fir; *Wood* hard, close-grained.

Introduced from S. Spain, 1839.

### DOUGLAS FIR, *Pseudotsuga Douglasii*.

Parks and plantations, gardens. May. Propagated by seeds sown in sandy loam in temperature of 55° in March, or outdoors in April.

*Flowers* monœcious; *Males* long-ovoid, orange-red, clustered at intervals on underside of previous year's shoots, anthers numerous, globose; *Females* small, at tips of lateral branches, pendulous, isolated or grouped, bracts acute, 2-lobed, midrib prolonged; *Fruit* a cone, ovate-oblong, pendulous, terminal, 2½–4 ins. long, 1½–1¾ in. broad, reddish-brown, scales broad, rounded, bracts large, 3-clawed, middle awn long; bears after about 25 years; *seeds* reddish-brown, wings dark brown, rounded at apex,  $\frac{3}{8}$  in. long.

*Leaves* flat, linear, falcate, blunt, entire, pectinate, 2-rowed, rich green above, two silvery lines beneath, 1–1½ in. long, persisting 6–7 years.

An evergreen *tree*, 80–120 ft.; pyramidal outline; *Branches* at lowest part bending downwards, those higher spreading horizontally, uppermost slightly ascending; *branchlets* mostly in opposite pairs; *Bark* thick, scaling, reddish-brown, deep irregular fissures; *Wood* hard, durable, susceptible of fine polish; heartwood yellow, fine-grained, light weight, or red, coarse-grained, and heavier; sapwood yellowish; used in shipbuilding; timber known as Oregon Pine.

Native of N. America; seeds first sent to England by Douglas, 1826;



SCOTCH PINE (*Pinus sylvestris*)

*A.* Branch with female flowers. *B.* Branch with male flowers. *C.* A stamen. *D.* Female flowers, enlarged.  
*E.* Scale of cone, showing the 2 winged seeds.





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in America reaches height of 300 ft.; mast in Kew Gardens 159 ft. long; the tree probably lives 750 years; most widely distributed of American trees. Originally called *Abies taxifolia*; afterwards named by Dr. Lindley as *Abies Douglasii*, in memory of Douglas, still often described under that name; more recently changed to *P. Douglasii* (Gr. *pseudēs*, false, and *Tsuga*, a genus of Coniferæ).

### COULTER'S PINE, *Pinus Coulteri*.

Parks. June. Best in deep sandy loam, and sheltered from south-westerly winds. The Pines are propagated by seeds sown in well-drained pots of sandy loam in cold greenhouse or frame in April, transplanting outdoors in following spring; or in moist sandy soil outdoors in April, transplanting one year afterwards.

*Flowers* monœcious; *Males* yellow; *Females* dark reddish-brown; *Fruit* a cone, oval, acute, pendant, 10–14 ins. long, 6 ins. diam., weight 4–5 lbs., yellow-brown, scales thick, woody, broad, ending in flattened knobs, armed with incurved spines  $\frac{1}{2}$ – $1\frac{1}{2}$  in. long; *seeds* oval,  $\frac{1}{2}$  in. long, chestnut-brown, thick shell, wings about 1 in. longer than seed,  $\frac{1}{2}$  in. wide.

*Leaves* in tufts, usually 3, sometimes 4 or 5, terminal, stout, rigid, triangular, flattened, incurved, 9–12 ins. long, dark blue-green, persistent for 3–4 years.

An evergreen *tree*, 50–70 ft.; *Branches* wide apart, long and pendulous below, short and ascending above; *branchlets* stout, few, orange-brown, becoming nearly black; *Bark* dark brown, fissured, scaly; growth rapid; *Wood* light, soft, not strong, brittle, coarse-grained, light red.

Native of N. America; introduced 1832; seeds sent home by Douglas. Named in honour of Dr. Coulter. Also called *P. macrocarpa* (Large-coned Pine).

### CORSICAN PINE, *Pinus Laricio*.

Parks, gardens. May. Suited for deep, rich soils. This handsome species may be recognised by the straight and finely-rounded trunk and the narrow spread of the branches.

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*Flowers* monœcious; *Male catkins* at extremities of shoots, 6–15 in a cluster, 1–1½ in. long, yellow; *Females* solitary or 2–3 in cluster, ovoid, reddish, scales with blunt triangular point, bract scales scarious; *Fruit* a cone, solitary, or in pairs, or sometimes 3–4, pointing horizontally or slightly downwards, conical, straight or curved, yellowish-brown or tawny, 2–4 ins. long, 1½ in. diam. at base, bosses on young cones reddish-purple, scales elliptic, convex, short point; *seeds* oval, greyish, with black spots, ripe in third year, wing 3–4 times length of seed.

*Leaves* 2–5 in a sheath, slender, ascending, spreading, curved or wavy, often twisted, finely striated, finely serrated, obtuse at apex, flat on one side, convex on other, dark green, glaucous, 4–8 ins. long, persistent 3–4 years.

An evergreen *tree*, 80–140 ft.; erect, pyramidal; *Branches* not numerous, in whorls of 5–6, often twisted at extremities, with tendency to curve round tree and upwards; *Bark* reddish-grey, large plates; *Buds* ovate, acute, resinous; *Wood* white, becoming brownish-yellow when seasoned, coarse-grained, elastic, resinous, easily worked, durable, takes high polish.

Native of S. Europe; said to have been introduced in 1814, but probably first planted at Kew in 1759; said to live 600 years.

Bark and leading shoots attacked by Pine Beetle (*Hylesinus piniperda*).

### AUSTRIAN PINE, *Pinus Laricio*, v. *nigricans*.

Parks, plantations. May. Does well on poor soils and in bleak and exposed situations, making an excellent seaside tree; best on chalky soil. This is distinguished from the Corsican Pine by the much greater spread of the branches, the shaggy dark green foliage, and the light grey buds.

*Flowers* monœcious; *Male flowers* ⅔–1 in. long, brilliant yellow, cylindrical, sub-sessile in axils of scale-leaves; *Stamens* shortly stalked; *Female cones* on sides of shoots, sub-terminal, 1–3, sub-sessile, bright red; *Fruit* a cone, 2–3 ins. long, sessile, erect, with rounded base, lying almost horizontal, scales smooth and shining, bosses strong, yellowish-brown; *seeds* ripened in about 1½ year.

*Leaves* in pairs, dense, rigid, erect, straight, rounded on one side, slightly

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channelled on the other, sharp-pointed, rich, dark glossy brownish-green,  $2\frac{1}{2}$ –5 ins. long, toothed margins, sheaths persistent.

An evergreen *tree*, 60–80 ft.; somewhat pyramidal; *Branches* long, stout, lower ones horizontal or slightly pendulous; *Bark* dark, coarse; *Buds* light grey; *Wood* coarse-grained, very resinous, knotty, durable.

Native of Austria; introduced by Messrs. Lawson, 1835. A variety of the Corsican or Larch Pine (*Pinus Laricio*). Sometimes called the Black Pine.

Bark and shoots attacked by Pine Beetle (*Hylesinus piniperda*).

### CLUSTER PINE, *Pinus Pinaster*.

Parks, gardens. April, May. Grows well near the sea, and will grow on shingly gravel inland.

*Flowers* monœcious; *Males* crowded, ovoid,  $\frac{4}{5}$  in. long; *Stamens* golden-yellow, much rounded, irregularly toothed anther processes; *Females* small, lateral, in pseudo whorls of 4–8 at tips of shoots, red-violet, seminiferous scales slightly longer than bracts; *Fruit* a cone, nearly sessile in lateral clusters of 2–4, or whorls of 5–8, cylindric-ovoid, tapering at apex, base oblique, purplish to green to shining yellowish-brown, 4–6 ins. long,  $2\frac{1}{2}$  ins. diam. at broadest part, bosses prominent, scales pyramidal,  $1-1\frac{1}{4}$  in. long,  $\frac{3}{4}$  in. broad, umbo ash-grey, ending in sharp spine; *seeds* oblong, wings  $1\frac{1}{2}$  in. long, nearly 1 in. broad.

*Leaves* in twos, stiff, broad, fleshy, acute, slightly serrated, dark green, white lines beneath, 6–12 ins. long, sheaths  $\frac{3}{4}$  in. long, pale yellow, turning nearly black.

An evergreen *tree*, 60–80 ft.; round-headed; *Stem* with tendency to grow crooked; *Branches* slender, in whorls, turning upwards at extremities; *Bark* purplish, deeply fissured, plates 4–6 ins. long, 2 ins. wide; *Buds* whitish-brown, woolly, non-resinous,  $\frac{3}{4}$  in. long; *Wood* soft, reddish, not very durable; used in Naval work and carpentry.

Native of S. Europe; introduced about 1596. Called Cluster Pine from whorled clusters of cones. Specific name of Pin-aster or Star Pine said to have been given for same reason. Known in France as Maritime Pine, from extensive planting on coast.



## TREES AND SHRUBS

### STONE PINE, *Pinus Pinca*.

Parks, plantations. May, June. Best in sandy soil near sea, sheltered.

*Flowers* monœcious; *Male flowers* in axils of lower scale-leaves, forming a cylindrical, spicate cone,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long, each flower consisting of several yellow stamens; *Female flowers* solitary, or two together at top of lateral shoots, erect at first, pendulous afterwards,  $\frac{3}{4}$  in. long, scales pale green; *Fruit* a cone, solitary, orbicular, 4–6 ins. long, 3 ins. diam., red-brown, ripening in third year, scales stout, ligneous, hard, 2 ins. long, 1–1 $\frac{1}{4}$  in. wide, cuneate, with a rhomboid boss and broad blunt prickles; *seeds*  $\frac{3}{4}$  in. long, very short wing, enclosed in bony shell, ripening in fourth year.

*Leaves* on young trees single, short, later on in pairs, united at base by a pale sheath, semi-cylindrical, apex sub-acute, rigid, edges slightly scabrous, 6–8 ins. long, bright green, persisting 2–3 years.

An evergreen *tree*, 30–35 ft.; with rounded umbrella-like head; *Branches* spreading, mostly at top, stumps left as laterals decay; *branchlets* generally ascending; *Bark* red-grey, thick, rough, fissured longitudinally, often deeply peeling in patches; *Wood* soft, light, fine-grained, not durable; used in carpentry.

Native of Mediterranean, reaching 80 ft. in height. Often called Umbrella Pine. In Italy seeds eaten at dessert, and preserved as sweetmeats.

### YELLOW PINE, *Pinus ponderosa*.

Parks. May.

*Flowers* monœcious; *Males* yellow, persistent 4–5 years; *Females* clustered or in pairs, dark red; *Cones* 3–6 ins. long, ovoid, sub-terminal, singly or clusters 2–4, generally at extremities of smaller branches; *bosses* of scales with small recurved triangular subulate spines; *seeds* ovate, acute,  $\frac{1}{4}$  in. long, wings 1–1 $\frac{1}{4}$  in. by 1 in.

*Leaves* in twos or threes, 6–12 ins. long, sometimes twisted at base, rather rigid, 3-angled, compressed, edges rough, deep glaucous green, persistent sheaths 1 in. long, shrivelled on older ones, mostly deciduous in third season.







TWIGS AND WINTER BUDS (No. 1)

A. Elm. B. Plane. C. Laburnum. C'. Section of bud. D. Sycamore. D'. Section of bud. E. Ash. E'. Section of bud. F. Aspen. F'. Section of bud. G. Oak. G'. Section of bud. H. Lilac. H'. Section of bud. I. Lime. J. Elder.

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An evergreen *tree*, 100–150 ft., with tendency to twist; *Bark* light yellowish-brown (cork colour), large plates, 4–8 ins. broad, flat, smooth; *Branches* few, stout, in regular whorls, drooping when old; *smaller branches* widely spreading or somewhat drooping, marked with scales of fallen leaves; young trees of rapid growth; *Buds* bluntly domed, prominent point, very resinous, brown; *Wood* highly resinous, heavy, brittle, close-grained, said to sink in water.

Native of N. America, where it reaches 100–250 ft.; introduced by Douglas from California, 1827.

### SCOTS PINE, *Pinus sylvestris*.

Parks, gardens, plantations. May, June. Best in peaty soils.

*Flowers* monœcious; *Males* in spikes,  $\frac{1}{3}$  in. long, ovoid, shortly stalked, at base of young shoots, pollen pale yellow; *Females* egg-shaped,  $\frac{1}{4}$  in. long, reddish, tapering, at first erect and stalkless, usually 2–3, scales few; *Fruit* a cone, solitary, or 2–3 together, 2 ins. long, ovoid, conical, acute, recurved when young, shortly stalked, scales few, ends thickened into a quadrangular boss, small shield with deciduous point, persistent, ripe in about 18 months; *seeds*  $\frac{1}{2}$  in. long, wing cuneate, 2–3 times as long as seed, scales disarticulating from axis of cone.

*Leaves* in pairs, dense, 2–3 ins. long, shorter on old trees, acicular, acute, grooved above, convex beneath, glaucous in first year, dark green in second, shed in third, sheaths small, fimbriate, persistent, nearly black.

An evergreen *tree*, 50–100 ft.; flat topped, rapid in growth; *Branches* short, spreading, lower soon dying; *Bark* rough, red-brown, scaling; *Wood* in this country not very durable, red or white; tree yields pitch, tar, resin, turpentine.

Naturalised all over Britain, indigenous in Scotland. Often called Scots Fir. Name Pine from A.S. *pin-treo*, a Pine-tree; L. *pinus*, a pine.

Bark and leading shoots attacked by Pine Beetle (*Hylesinus piniperda*), shoots by species of Pine Shoot Moths (*Retinia*), which live in terminal buds and in resinous exudations from young branches; *Foliage*—Pine Beauty (*Panolis piniperda*), Pine Saw-fly (*Lophyrus pini*).

*Fungoid Pest*:—Pine Cluster Cups (*Peridermium Pini*).





## TREES AND SHRUBS

### SWISS STONE PINE, *Pinus Cembra*.

Parks, gardens. May. Best in a deep, rich loam on a porous subsoil.

*Flowers* monœcious; *Male catkins* sessile, ellipsoid,  $\frac{2}{3}$  in. long; *Stamens* bright yellow, anthers reddish-violet; *Females* long-ovoid, violet, ovuliferous scales ovate, closely imbricated; *Fruit* a cone, ovate, obtuse, erect, violet when young, brown when old, 3–4 ins. long, 2–2½ ins. diam., scales smooth, broad obtuse spine; *seeds* nut-like, edible, wingless,  $\frac{1}{2}$  in. long, ripening in November of second year.

*Leaves* usually in clusters of 5, sometimes 4 or 6, slender, flexible, triquetrous, 3-ribbed, one rib shining green, the other 2 white opaque, edges rough, sharp-pointed, 2–5 ins. long, sheaths small, deciduous.

An evergreen *tree*, 50 ft.; erect, blunt, pyramidal, slow of growth; *Branches* from base to summit, short, erect, shoots pubescent; *Bark* grey-brown, fissured, scaly; *Buds* globose, long narrow point, whitish, within resin; *Wood* soft, fine-grained, fragrant, resinous; much used in manufacture of Swiss toys.

Native of mountains of S. Europe. Known also as Arolla. First planted by Duke of Argyll, 1746; seeds introduced by Lawson, 1828.

### BHOTAN PINE, *Pinus excelsa*.

Parks, gardens. May. Best on light gravelly loam, well drained.

*Flowers* monœcious; *Male catkins* narrow-cylindrical,  $\frac{3}{5}$  in. long, dense clusters; *Fruit* a cone, in pairs, or whorls of 4, rarely solitary, conoid-cylindrical, obtuse, curved, smooth, erect at first, purple or violet-rose, afterwards pendulous and dull green, foot-stalk nearly 1 in. long, cone 6–9 ins. long, 2½ ins. broad at base, slightly recurved, rich bronze when ripe, unripe cones glaucous, full of turpentine and resin, scales wedge-shaped, loosely imbricated, thin, 1–2½ ins. long; *seeds* small, ovate, wing obliquely truncate, 1¼ in. long, ripe in October or November of second year.

*Leaves* in fives, slender, flexible, drooping, triquetrous, rough edges, glaucous on inner side, bluish-green and convex on outer, 4–8 ins. long.



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An evergreen *tree*, 60–150 ft.; *Branches* whorled, spreading, upper ascending, lower somewhat pendulous; *Bark* grey-brown, rough, scaly, on young stems smooth and nearly black, somewhat shiny, rapid of growth.

Native of the Himalayas. Discovered by Dr. Hamilton, 1802; and introduced by Dr. Wallich, 1827.

### WEYMOUTH PINE, *Pinus Strobus*.

Parks. June. Best in a gravelly loam, and sheltered.

*Flowers* monœcious; *Males* in pseudo whorls of 5–6 at base of young shoots, cylindrical,  $\frac{1}{3}$ – $\frac{1}{2}$  in. long, stalked, stamens numerous, yellow, scale bracts 3–6; *Females* singly or in pairs, slightly longer than males, scales thick, margins purple-red; *Fruit* a cone, 4–6 ins. long, loose, stalked, pendulous, cylindrical, acute, slightly curved, dark violet to brown, scales smooth, thickened at apex; *seeds*  $\frac{1}{4}$  in. long, narrowed at ends, red-brown mottled black, wings long and narrow.

*Leaves* in fives, acicular, 3–5 ins. long, slender, soft, bluish-green, silvery lines, glaucous, turning yellow, sheaths loose, deciduous.

An evergreen *tree*, 120 ft.; *Branches* horizontal or slightly ascending in regular whorls; *branchlets* slender, glabrous; *Bark* at first thin and smooth, at length rugged, ash-grey-slaty; *Wood* light, not strong, straight-grained, easily worked, light-brown tinged red; much used for masts and spars.

Native of N. America, 100–250 ft.; introduced by Lord Weymouth, 1705.

Bark and shoots attacked by Pine Beetle (*Hylesinus piniperda*).

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TWIGS AND WINTER BUDS (No. 2)

A. Sweet Chestnut. B. Mezereon. C. Black Poplar. D. Tree of Heaven. E. Birch. F. Mountain Ash,  
G. Beech. H. Alder. I. Hawthorn.





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