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# FAMILIAR TREES







OAK.



# FAMILIAR TREES

BY

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## PREFACE.

MAY we hope that, with more detailed study of some species of our familiar trees, the desire to know others will arise? "If we find 'our warmest welcome at an inn,'" writes Oliver Wendell Holmes, "we find our most soothing companionship in trees among which we have lived, some of which we may ourselves have planted. We lean against them and they never betray our trust; they shield us from the sun and from the rain; their spring welcome is a new birth which never loses its freshness; they lay their beautiful robes at our feet in autumn; in winter they 'stand and wait,' emblems of patience and of truth, for they hide nothing, not even the little leaf-buds which hint to us of hope, the last element in their triple symbolism."

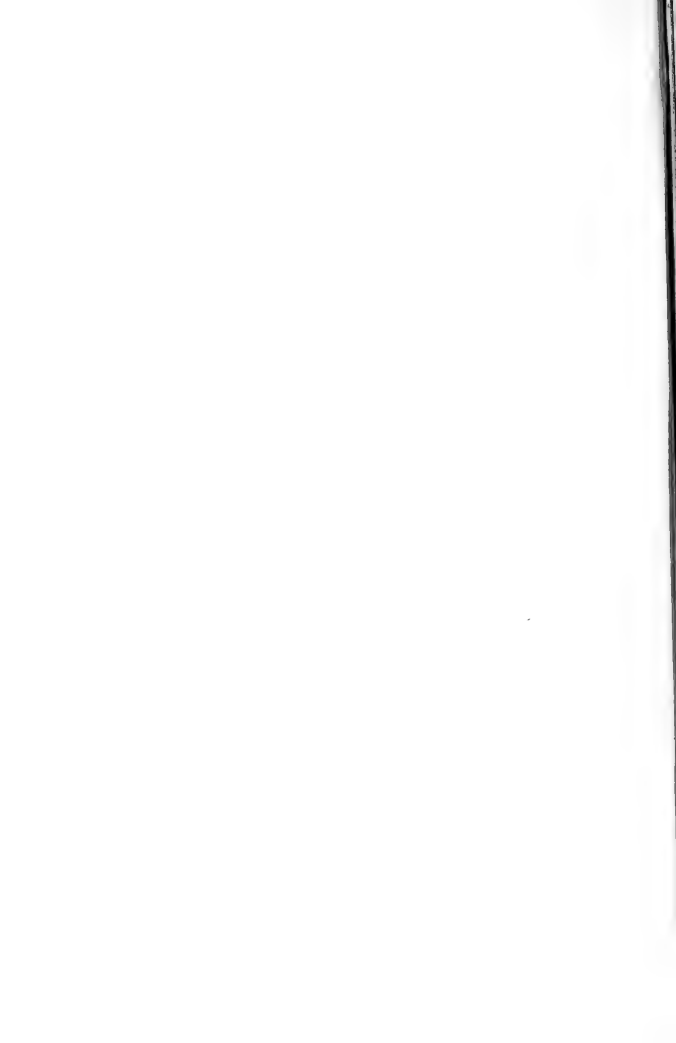
In these pages we have not dealt with the different kinds of trees in any particular order; but at the close of the next series, which will complete the work, we shall give a botanical synopsis of them all in a scientific arrangement.

I must, as in the first series, acknowledge my indebtedness to many writers whose works I have laid under contribution, but more especially to the artists, the results of whose labours form the main attraction of this book, to Messrs. W. H. J. Boot, R.B.A., and A. Fairfax Muckley, who have painted the originals of the coloured plates: to Messrs. J. A. Weale and F. W. Saxby, who have made and photographed the microscopic sections of woods and pine-needles; and to Messrs. F. Mason Good, H. Irving, and E. J. Wallis, from whose photographs the uncoloured plates of trees are taken.

G. S. BOULGER.

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# FAMILIAR TREES.

## T H E O A K.

*Quercus Robur* L.

THE Oak is justly the tree on which England prides herself with more reason than upon those representative, but scarcely indigenous, animals, the lion and the unicorn. Whatever we may think of the other productions of the poetaster of whom Byron wrote—

“ Let hoarse Fitzgerald bawl  
His creaking couplets in a tavern hall ”—

probably everyone will endorse the one line quoted from him in the parody in “Rejected Addresses”—  
“The tree of freedom is the British Oak.”

So closely, indeed, is the tree associated in our minds with the bygone triumphs of those “wooden walls of England,” the “hearts of oak,” that the chief ideas suggested by the beauty of the tree are apt to be those of naval warfare, sailors’ pluck, and England’s weathering many a storm. There are, nevertheless, suggestions of a less warlike character which occur to the contemplative man as he gazes on the monarch of the forest.

The massive trunk, whose noble proportions suggested to Smeaton the design of his Eddystone Lighthouse, is an emblem of majestic and sublime

endurance which can hardly be better described than in the following passage by Oliver Wendell Holmes :

“There is a mother-idea in each particular kind of tree, which, if well marked, is probably embodied in the poetry of every language. Take the Oak, for instance, and we find it always standing as a type of strength and endurance. I wonder if you ever thought of the single mark of supremacy which distinguishes this tree from all our other forest trees? All the rest of them shirk the work of resisting gravity; the Oak alone defies it. It chooses the horizontal direction for its limbs, so that their whole weight may tell, and then stretches them out fifty or sixty feet, so that the strain may be mighty enough to be worth resisting. You will find that, in passing from the extreme downward droop of the branches of the Weeping Willow to the extreme upward inclination of those of the Poplar, they sweep nearly half a circle. At ninety degrees the Oak stops short: to slant upward another degree would mark infirmity of purpose; to bend downwards, weakness of organisation.”

The forester may condemn as “stag-headed” the aged tree whose boughs, in Shakespeare’s language, are

“mossed with age,  
And high top bald with dry antiquity.”

It may even be hollow, the mere shell of bark supporting a sadly-reduced tale of branches that struggle gallantly to put forth year by year leaves, dwindled in size, from their knotty twigs, and acorns whose very abundance argues an infirmity of general health. Still it will, perhaps, be found to be diligently striving to stem the advance of the inner canker of decrepitude by a slight formation of new wood beneath the bark; and we may thus witness the dying efforts of the aged monarch. The hollow shell may be now supported by the strong clasping arms of the Ivy, ever young; or the stem, bared of its bark, may lift its blackened, blasted arms in sad protest to the heavens whence fell the fatal lightning.



Few of our trees have a wider geographical range than the Oak. Whilst the great Order of broad-leaved trees to which it belongs, the *Cupuliferae*—those, that is, that have their nut-like fruits enclosed in a more or less leafy husk, “involucre,” or “cupule” (the “cup” of the acorn)—is distributed throughout the temperate regions of both hemispheres, the Oaks, of which there are nearly three hundred species, are almost confined to the northern. Many forms are well known to us in our plantations, or by their products, such as the Turkey Oak (*Quercus Cerris* L.), the Evergreen Oak (*Q. Ilex* L.), the cork of *Q. Suber* L., the galls of *Q. infectoria* Oliv. and other Levantine species, the cups of *Q. Ægilops* L. imported as valonia, the quercitron bark of the American *Q. tinctoria* Bartr., and that of many other species used in tanning. But as a native of Great Britain there is but one distinct species, though two, if not three, well-marked varieties are generally recognised.

The English Oak (*Q. Robur*) ranges from the Urals and the Caucasus, from Mount Taurus and Mount Atlas, almost to the Arctic Circle, growing at an altitude of 1,350 feet in the Highlands of Scotland; its limit nearly coinciding with that of successful wheat cultivation. Vast forests of Oak covered the greater part of Central Europe in the early ages of history. It was the favourite timber of the Greeks and Romans; with it the Northmen built their long ships, and the Anglo-Saxons such churches as that at Greenstead, in Essex; and with it was smelted the Sussex iron

which supplied the cannon of Elizabeth's navy. When in sheltered situations, or massed together in forests, it may reach a height of from sixty to one hundred feet, with a straight stem of from thirty to forty feet, and a girth which is commonly eight or ten feet, though many fine old trees are from three even to seven times that circumference. In exposed situations it is generally shorter and less straight in its growth, and then also has the hardest wood, though this may be rather a characteristic of one of the three varieties than the effect of the situation.

Of these varieties, the White Oak, the *chêne blanc* of the French (*Q. Robur pedunculata* Ehrh.), is the most abundant in the southern and midland counties. Its leaves have no stalks, and are only downy on the under-surface when young; while its flowers, and consequently its acorns also, are generally two or more together, on long peduncles. It reaches a less height, but is said to be less liable to the defects known as "cup-" and "star-shake" than the sessile-fruited varieties.

These last are commonly united under the names Durmast Oak and *Q. Robur sessiliflora* Salisb., which should be applied to distinct forms. They agree in having stalked leaves and stalkless acorns; but the true *Q. sessiliflora* is more abundant in the north and west, its fine straight stems being seen at the best in the Forest of Dean; whilst the true Durmast Oak (*Q. intermedia* D. Don) is a dark-fruited variety, occurring in the New Forest, the under-surfaces of



OAK APPLE AND ACORNS.



the leaves of which remain downy, and stay longer on the tree, hanging in melancholy russet late into the spring. Its timber is of inferior quality, and resembles Chestnut wood in appearance and, it is said, in being distasteful to spiders. Parts of the roof of Westminster Abbey are said to be of this cobweb-proof material.

In a growing Oak notice will be taken of the outward spreading of the stem at its base; of the rugged bark; of the curiously tortuous branchlets, twisting in zigzag fashion almost rectangularly towards every point of the compass, owing to the central shoots becoming abortive; and of the uniquely waving outline of the yellowish-green leaves. The leaves generally make their first appearance in the south of England towards the end of April, when the young shoots blush with a ruddiness almost autumnal; and, if at all sheltered from the glare of July and August, a constant succession of the pink and bronze-tinted glories of the young leafage is kept up in our moist summers till late in autumn, when the first formed leaves are beginning to change. Then the green loses its olive-yellow tints for clear gold, mottled with clear grass green, fading to the sober pallid russet which lasts through the winter. This indescribable hue has none of the coppery richness of the dead leaves of Beech, nor the warm umber of the Horse-chestnut: it is the grey ghost of a brown that has been.

The catkins appear shortly after the leaves: the male ones pendulous, the female erect. The

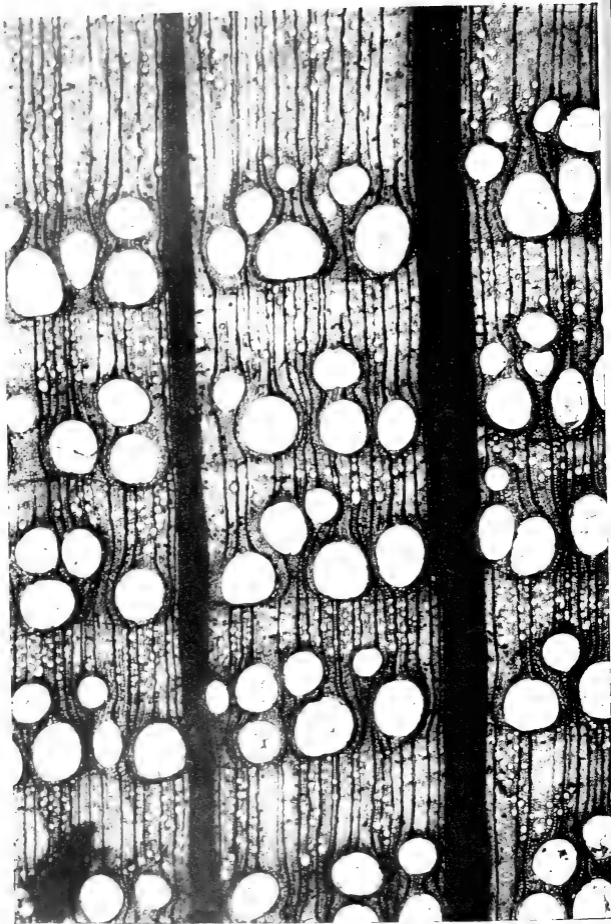
former are two or three inches long, bearing at intervals stalkless clusters of inconspicuous flowers, each consisting of a six- or seven-lobed calyx and ten stamens. The female flowers, on the other hand, are solitary, each being surrounded by the numerous overlapping scales, or bracts, which afterwards form the cup. The flower itself is but the ovary enclosed by the adherent calyx, divided internally into three chambers, and surmounted by a triple style. In each chamber there are two ovules; and it is a noteworthy fact that from these six only one is matured into the single seed that every acorn contains. A similar circumstance occurring in the case of other trees suggests the explanation that perennial plants, trees more especially, require to produce fewer seeds in order to ensure the permanence of the species than do annuals, whose individual existence is so many times shorter.

What country boy has not a love of acorns equal to that of the squirrel? Possibly he may not eat them, preferring chestnuts or beech-masts; but there is a joy in knocking down the glossy green fruit, destined perchance to be converted, with the addition of some cotton-wool, into reverend seigneurs, with flowing beards and locks rivalling those of the Druid, who cut in bygone ages the sacred mistletoe with golden knife from the Oaks of Avalon. Before English commerce had extended the leather trade beyond the needs of home consumers, and English naval enterprise had caused a drain upon our Oak forests



Photo : F. Matson Good, Winchfield.

OAK.



TRANSVERSE SECTION OF WOOD OF OAK (X 30 DIAMETERS).



for shipbuilding, these same acorns, now despised by the advanced agriculturist, constituted the chief value of the Oak. Thus in the Domesday Survey the woodlands are estimated at the number of swine for which their acorns and masts afforded "pannage."

Whatever may be the extension of the use of iron, Oak timber will always be of peculiar value for many purposes, though that important by-product, the bark, is of sufficient consequence considerably to influence the English forester's treatment of his woods. There is more tannin in the bark in spring, when the sap is rising, than at any other season, and it is, therefore, the common practice to fell the trees at that season instead of in winter, though for timber only it is admittedly preferable to fell in the latter period.

The most expert judges cannot separate the woods of the two best varieties. Few woods are so durable under all circumstances, few so generally useful. "Oak," says Professor Marshall Ward, "is neither the hardest and heaviest, nor the most supple and toughest of woods, but it combines in a useful manner the average of these qualities."

The broad, lustrous, light-coloured pith-rays, and the pore-circle of large vessels in the spring wood are the most striking features of Oak wood when magnified. Even the crooked branches are valuable in boat-building; but the familiar inky stains round the nails of many a park-fence show that the tannic acid in the wood is detrimental to iron, converting it, in fact, into ink, as it does in the

manufacture of that commodity from oak-galls and green vitriol, or in its union with the bog-iron of peat-mosses that yield the well-known black bog-oak.

The Oak is attacked by a great variety of insects. Of the galls produced by these, the commonest are the marble-gall, whose brown spheres, clustered together especially on the branches of pollards, form quite a feature among the russet leaves of autumn; the oak-apple, those soft, rosy-cheeked excrescences which are popularly associated with the escape of Charles II.; the oak-spangles that stud the under surfaces of the leaves, at first with crimson and then with amber-brown; and the artichoke-gall, which makes the overlapping scales of the diseased bud closely simulate the bracts of the vegetable from which it is named.

Like all our finest trees, the Oak is seen at its best when standing alone in the park. The straight stem of a tree not yet aged; its rugged bark, flecked with many tints; the broken but rounded outlines of its well-leafed top; the pink Lammas shoots of summer and the russet leaves of autumn; all add their various beauty to the majesty of the forest monarch. There is a solemn grandeur about such venerable, if somewhat decrepit veterans as the great Newland Oak, which exceeds forty-seven feet in girth; but for true beauty vigorous maturity must always surpass the appeals of decadent glories to a half-pitying admiration.



HOLLY.



## THE HOLLY.

*Ilex Aquifo'lium* L.

IN northern regions evergreens are not numerous, and the short days of winter are better fitted for festivities round the warm hearth within doors than for industrial occupations in the chill open air. Thus, during the comparatively gloomy reign of winter, the old agricultural festival of the melancholy god Saturn was kept by the Romans with houses decked with boughs, and with free licence of speech and jest for even the slave; whilst our ancient Teuton ancestors seem to have propitiated those "good people," "the lubber fiend" and other woodland sprites, by offering them warm sheltering boughs around the ingle-nook when their wonted haunts were bare of leaves. Among the Kelts the unbroken life of "Madre Natura" was symbolised by the evergreen branches of the weird mistletoe, that parasitically decked the boughs of the sacred monarch Oak of the forest, and of the surrounding Apple-groves of Arthur's Avalon when their leaves had fallen. Ancient canons of the Church forbade Christians to deck their houses with evergreens according to these Pagan customs—not, at least, at the same times as the heathen; but it was the wise policy of men like Gregory and Augustine to Christianise these rites, although the mistletoe seems to have been too closely associated with the arcana of Druidism ever to receive the same full ecclesiastical

sanction as the Holly and the Yew. The spinous leaves and blood-red berries of the former might well be taken by the Christian symbolist as a mystic foreshadowing of the Passion at the celebration of the Nativity, and the name of the tree, which originally referred mainly to its pointed leaves, may have suggested something holy.

Our poets naturally abound in allusions to the bright green of the leaves and the crimson of the berries of the Holly, associating it generally with Ivy and Yew; but in the following curious carol, dating from the year 1456, and preserved among the Harleian manuscripts, the Holly is accorded the pre-eminence:

“Nay, Ivy! nay, it shall not be I wys;  
 Let Holy hafe the maystry, as the maner ys.  
 Holy stond in the halle, fayre to behold;  
 Ivy stond without the dore; she ys full sore a-cold.

“Holy and hys mery men they dawnsyn and they syng,  
 Ivy and hur maydenys they wepyn and they wryng.  
 Ivy hath a kybe\*; she laghtit with the cold,  
 So mot they all hafe that wyth Ivy hold.

“Holy hath berys, as red as any Røse,  
 The foster and the hunters kepe hem from the does.  
 Ivy hath berys as black as any slo;  
 Ther com the oule and ete hem as she go.

“Holy hath byrdys, a ful fayre flok,  
 The Nygthyngale, the Poppyngy, the gayntyl Lavyrok.  
 Good Ivy! what byrdys ast thou?  
 Non but the howlet, that cryes ‘How! how!’”

Many popular superstitions still linger round the use of Holly at Christmas. In Rutland it is deemed

\* Kybe, chilblain.

unlucky to bring it into a house before Christmas Eve; in Derbyshire it is said that, according as the Holly brought into the house at this season be prickly or smooth, the husband or the wife will be master during the year. In some western counties the boughs removed from churches are treasured like the palms at Passion-tide, for luck throughout the year following; and in Germany, like the tapers used at Candlemas, they are looked upon as a sure protection against thunder.

The name Holly is probably derived from the root *hul*, or *kul*, connected with the Latin *cul'men*, a peak, and *culmus*, having reference to the same character as its modern specific name *aquifolium*, or "needle-leaved." Though known as *Stechpalme* in modern German, it was formerly in that language termed *Hulis*, *Hulst*, or *Hülse*. William Turner, in the "Libellus de re Herbaria" (1538), his earliest botanical work, speaking of it under the head of *Ruscus*, says, "Procerum aut galli housum, angli an holy tre et an Huluar tre nominant, hec etiam arbor, si Ruellio credimus, ilex aquifolia dicitur, è cujus corticibus ipse admodum puer viscum confeci." "But the French call the tall kind *housum*; the English, an holy tre and an Hulvar tre. This tree also, if we believe Ruellius, is called *Ilex aquifolia*, from the bark of which I have formerly, when a boy, made birdlime." The old French *houlx* still retains its Teutonic form in the modern *houx*, and the name *hulver* is in use in the Eastern Counties, not to mention the name *knee-hul* for the Butcher's Broom (*Ruscus aculeatus*); whilst many a modern school-

boy has followed Turner's example in the manufacture of birdlime by chewing holly-bark. Under the form *holm*, the name of the Holly enters into many of our early English place-names, such as Holmesdale and Holmswood; and no one has ever doubted the indigenous character of the species, which is still represented by ancient trees in the oldest portions of our English forests.

On the poor, sandy soil of the Millstone Grit, in the old forest of Kingswood, now better known as the Bristol coalfield, the Hollies flourished so luxuriantly that chatty old Aubrey suggests that they derive benefit "from the effluvia of that mineral." The Speech-house in the centre of the Forest of Dean is surrounded by ancient Hollies, boughs cut from which used, down to within the last seventy years, to take the place of the Testament in every oath sworn in the Verderer's court. Evidence has been brought forward to show that this Speech-house is a most ancient rendezvous, and that the Holly was planted as a sacred tree round the villages of the Kelts, even on the bleak downs of Cornwall. Holly forms a great part of the undergrowth in the older parts of Epping Forest, where its evergreen foliage excited the admiration of Peter Kalm, the pupil of Linnæus, who visited England in 1748, and who expressed his regret at the absence of this beautiful tree from Sweden. The New Forest is also noted for its Hollies. One of the largest individuals in the kingdom is probably that at Claremont, eighty feet in height, which, considering the extremely slow growth of the tree, may be a relic of the primeval forest of North Surrey.





LEAVES, FLOWERS, AND FRUIT OF HOLLY.



The Holly will grow in any soil in which water is not absolutely stagnant ; but it prefers a rather dry sandy loam, and, whilst it not only "outdares cold winter's ire," but seems to flourish in the bleakest situations, it does not do well under the shade of other trees. It is generally from ten to forty feet in height, and not more than two or three in girth ; but Hollies at Bleak Hill, Shropshire, are stated to attain a circumference of fourteen feet. The slow-growing, even and hard-grained wood is, except at the centre, as white as ivory, and is valued for turning and inlaying. It stains well, and is therefore used in place of ebony for the black handles of tea-pots, while for engraving it is perhaps second only to boxwood.

One of the great charms of the Holly is its silvery bark. Smooth on the old stems as in the Beech, but without the glossy sheen of the beautiful Birch, it yet affords a most pleasing contrast to the dark foliage. The young twigs are light green, and slightly downy.

It is the foliage, however, contrasting alike with the bright greens of surrounding trees in summer, and with their leafless branches in winter, that gives the chief picturesque value to this "incomparable tree," as Evelyn terms this handsomest of our native ever-greens. The glossy green leaves are associated in Shakespeare's lyric with the pleasures of forest life :—

"Heigh-ho! the green Holly!  
This life is most jolly."

Southey's well-known poem has popularised the fact that the leaves on the lower boughs are more spinous than those on the upper, suggesting a reason

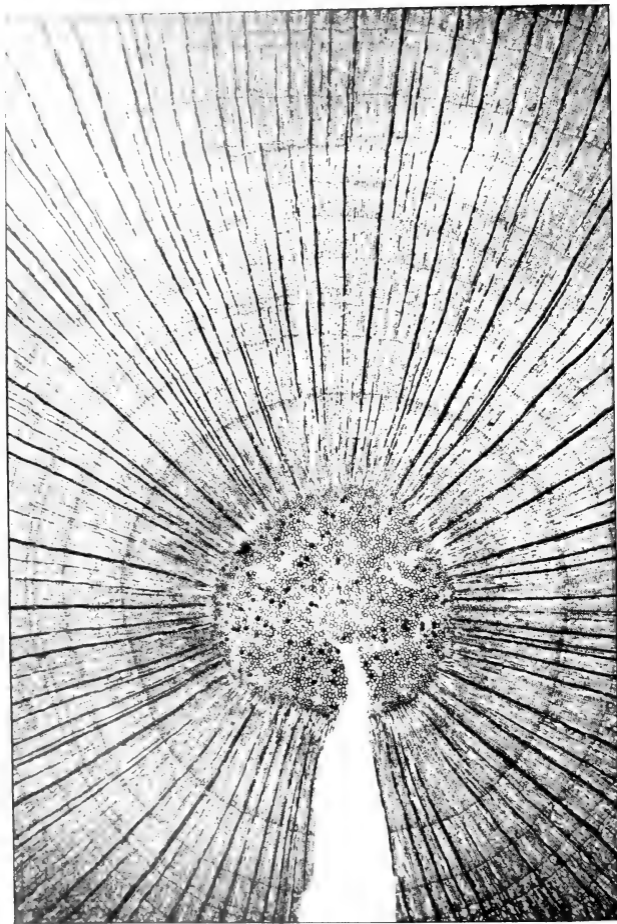
in accordance with that newer teleology which has been evoked by the teaching of Darwin. The spines of the lower branches do indeed protect them from cattle, though not from deer; whilst a sort of innate tendency to spinousness must account for the one terminal point for the upper leaves. Another poetical reason has been given for its general exemption from attack—namely, that, “unknown before, the Holly sprang up in perfection and beauty beneath the footsteps of Christ when He first trod the earth, and that, though man has forgotten its attributes, the beasts all reverence it, and are never known to injure it.” Nevertheless, the Holly has other enemies besides the deer, for a species of aphid (*Aphis ilicis*) lives on the young shoots, and a fly (*Phytomyza ilicis*) burrows, when in the larval stage, under the epidermis of the leaves.

From May to August the tree bears clusters of small, wax-like, white flowers, which seem peculiarly attractive to bees; and, as the species is almost dioecious—that is, has on one tree flowers in nearly all of which the ovary is aborted, and on another those in which the four stamens bear hardly any pollen, it is by these insects that its fertilisation is mainly effected. This is also, of course, the reason why certain trees, being male, never produce berries; though an opinion has been expressed that male Hollies become female with age, a point deserving further attention. Many of the variegated forms grown in gardens produce little or no fruit, though one of these (var. *laurifolia*) bears a profusion of fragrant flowers. This absence of fruit argues a



*Photo: E. J. Wallis, Kew.*

LLY.



TRANSVERSE SECTION OF HOLLY WOOD (X 10 DIAMETERS).

certain want of vigour, which is borne out by the fact that variegation is apparently produced by a deficiency of potash in the soil. Whether, as has been suggested, this ornamental partial chlorosis be due to some parasitic alga within the cells of the leaf or not, and whether, as has also been suggested, it be contagious or not, are points yet to be decided.

The berries are generally red, but sometimes yellow, white, or, without the aid of Jack Frost, black; and though eaten with impunity by birds, may be said to be poisonous to man, being extremely emetic and cathartic in their effects. Owing, however, to a bitter principle that they contain, known as *ilicin*, the leaves were formerly used medicinally in cases of fever and rheumatism. It is probably this or an analogous principle that gives its flavour to the *yerba* or *maté* tea of South America, which is prepared from the leaves of an allied species (*Ilex paraguayensis*); and Holly leaves are still used as tea by the charcoal-burners of the Black Forest.

Though beautiful anywhere, and especially as a separate specimen standard, it is as a hedge-forming tree that, since the days of Evelyn, the Holly has been most valued. His lamentation over the hedge in his garden at Sayes Court, Deptford, through which Peter the Great amused himself by trundling a wheelbarrow, is well known. "Is there under the heavens," he asks in his "Sylva," "any more glorious and refreshing object than an impregnable hedge of about four hundred feet in length, nine feet high, and five in diameter, which I can still show at any time of the year in my ruined garden at Sayes Court (thanks to the Czar of

Muscovy), glittering with its armed and varnished leaves blushing with their natural coral? It mocks the rudest assaults of the weather, beasts, and hedge breakers." For this purpose the variety known as Hodgen's Holly, or *latifolia*, is the best adapted, as it has fine broad and deep-coloured leaves and a close compact habit of growth, without that tendency to become thin below and to run up into standards that is shown by some common varieties.

Hollies can be readily raised from cuttings, which are preferably set in April or May; but, as Evelyn says, seedlings are better. The berries for seed should be mixed with sandy loam for a twelve-month, as they do not germinate till their second spring.

Few objects on a lawn are more beautiful than a clump of Hollies, with red or yellow berries peeping from among the glossy leaves flecked with ivory-white, while a Brier-rose clambers among its boughs, or the autumnal glories of Virginian creeper relieve the more sombre green.





SICAN PINE.



## THE CORSICAN PINE.

*Pinus Laricio* Poirét.

*Pinus Laricio*, considered in a comprehensive sense, is believed to be the *πέυκη ἰδαία* (*peú'ke' idai'a*) of Theophrastus, which he is at pains to distinguish from *πέυκη παραλίας* (*peú'ke' para'lias*), the Cluster Pine. It is interesting to note in this connection that Theophrastus was a native of Lesbos in the Ægean, and that Philip Barker Webb, in 1818, found this Pine, or probably the variety *Pallasia'na*, of which we shall have more to say presently, on Mount Ida, in Phrygia, from which Theophrastus's name was probably taken.

In a wild state *Pinus Laricio* extends from Asia Minor, the Caucasus, and the Crimea to Crete, Sicily, Spain, and the Cevennes, to Lower Austria, Hungary, the Banat, and Transylvania. The form represented by this name, in a restricted sense, belongs mainly to Corsica and the Maritime Alps: the variety *tenuifolia*, of Parlatore, represents the western development of the species: his *Pallasiana*, from Dalmatia, Servia, and Thessaly, is perhaps not identical with trees called by that name from farther east; but his variety *ni'gricans* is the form generally known as *austri'aca*, the inland, or Central European, type. These local forms differ widely in habit and in the elevations at which they grow—from 1,000 to 3,500

feet in Spain, 2,500 to 3,000 feet in Albania, and 3,000 to 5,000 feet in Corsica to 4,000 to 6,000 feet on Mount Taurus and 4,000 to 6,500 feet on Etna.

The Corsican Pine was first introduced into England in 1759, and was described as a maritime variety of the Scots Fir (*Pinus sylvestris*  $\eta$  *maritima*) by Aiton, in the first edition of the *Hortus Kewensis*, in 1789. In the second edition he called it *P. maritima*, and, though it was named *P. Laricio* by Poiret in 1804, that name was not adopted in England until eighteen years later. The fine specimen near the principal entrance to Kew Gardens was probably planted before 1774, the date when the tree in the Jardin des Plantes at Paris was planted, the species having, at that time, attracted the attention of Turgot's Ministry. The French Government had great difficulty in obtaining seeds in Corsica, since the cones were only produced in small numbers near the summits of the lofty but doubtless thriving trees. This led the dealers to adulterate the seed with that of the Cluster Pine. In 1788, however, the Corsican Pine was adopted for masts for the French navy. Many trees were felled, and cones were thus procured in greater numbers. Between 1822 and 1830 this species was grafted on many thousand stocks of *P. sylvestris* in the forest of Fontainebleau. Poiret's specific name, *Laricio*, which is sometimes rendered literally in English as "Larch Pine," seems to be the Corsican name for the species.

In 1793 or 1794 the great German traveller Pallas sent seeds from the Crimea to Messrs. Lee and Kennedy, of the Hammersmith Nursery, of

that form of the species which they distributed as *P. tatar'ica*, but which is now known, after its introducer, as *Pallasiana*.

The variety *monspeliensis*, better known as *pyrena'ica*, which Parlatores considers a mere form of his *tenuifolia*, was introduced from the mountains of Southern Spain in 1834 by Captain Samuel Cook, who afterwards took the name Widdrington; and the variety *austriaca*, from Austria, by Messrs. Lawson in 1835.

The typical Corsican Pine is somewhat slender in the trunk, reaching 80 or 120 feet in height, and more than three feet in diameter, with a pyramidal outline, but often becoming umbrella-like in old age. In Corsica it is said to reach 150 feet in height. The bark is reddish-grey, not unlike that of the Scots Fir, and cracks and scales off in large thin plates, much as it does in that species, exposing a paler reddish-brown inner cortex. The branches are given off in whorls of five or six, horizontally or downwards, but often turning upward at their extremities, much as in the Cluster Pine, from which it is distinguished, however, by a general lateral twist of the branches round the tree, as it were. The twigs are at first pale green, becoming reddish-brown at the end of the second year. The buds are incrustated with a copious white resin, the scales fringed with silvery hairs. Like those of other Pines, each of these buds is, as Professor Marshall Ward puts it, "a bud of buds," each of its many spirally-arranged scales, with the exception of a few at the base, having in its axil the bud of a dwarf shoot. This consists of a few minute brown

scales wrapped round the base of two green needle-leaves, placed face to face, and as yet very short and slender. At the base of these twin needles there can be detected between them the arrested apex of the dwarf shoot that bears them.

The needle-leaves vary much in length, according to the age of the tree and the soil in which it grows, the shortest being about four and the longest about eight inches long. Their dark green colour on both surfaces, their length, and their more crowded arrangement, together with the pyramidal outline of the whole tree, serve to distinguish it from the Scots Fir. Semicircular in section, these needles are finely striated with sixteen rows of stomata down their convex surfaces and eight rows down the inner flat surfaces. They have very finely toothed edges and a blunt apex, and remain on for three or four years. In section they exhibit a number of resin-ducts all round the leaf, each surrounded by sclerenchyma, and two vascular bundles in a wide central band of tissue.

The staminate flowers are densely clustered near the ends of the shoots and are of a pale yellow colour. Each flower is cylindrical and from an inch to an inch and a half long, surrounded at its base by several membranous bracts, and having its stamens arranged spirally and each furnished with a rounded "connective" or "crest." When the two anther-chambers have split longitudinally they discharge an abundance of pollen of a beautiful sulphur-yellow colour, and the male catkins then drop off, leaving that part of the young shoot to which they were attached in a naked state, so that, as in the Cluster Pine and



FLOWERS, CONES, AND NEEDLES OF CORSICAN PINE.





some other species, the older shoots have their leaf-bearing dwarf shoots in tufts alternating with bare regions of stem.

The female catkins or young cones are either solitary or two or three together at the ends of the shoots of the preceding year, springing from the axil of a scale-leaf, as do the dwarf-shoots or leaf-spurs. They are reddish in colour, egg-shaped, about half an inch long, and borne on short stalks surrounded by membranous scales. Their spirally-arranged bract-scales are not prominent and, at an early stage, coalesce with the "cone-scales," or "ovuliferous scales," in their axils. Each of these last terminates in a blunt, triangular point which persists as the "umbo," or structural apex, of the mature cone-scale. The cones become two or three inches long and usually a little more than an inch in diameter above the base, reaching their full size in the November of the second year. When ripe they are of a tawny colour externally, polished and almost always curved towards the summit. The "apophysis" is rhomboidal with a transverse keel and a small central depression from which rises the very small terminal prickle or umbo already mentioned. When, in the April of the third year, the cone-scales spread outwards to liberate the now ripe seeds, they disclose a purplish inner surface. The seeds are oval, grey, or mottled with black, and twice as large as those of the Scots Fir. They have a reddish-brown wing three or four times as long as the seed and almost semi-elliptical in outline, being straight on one side and rounded on the other, and widening below the middle. This is, in

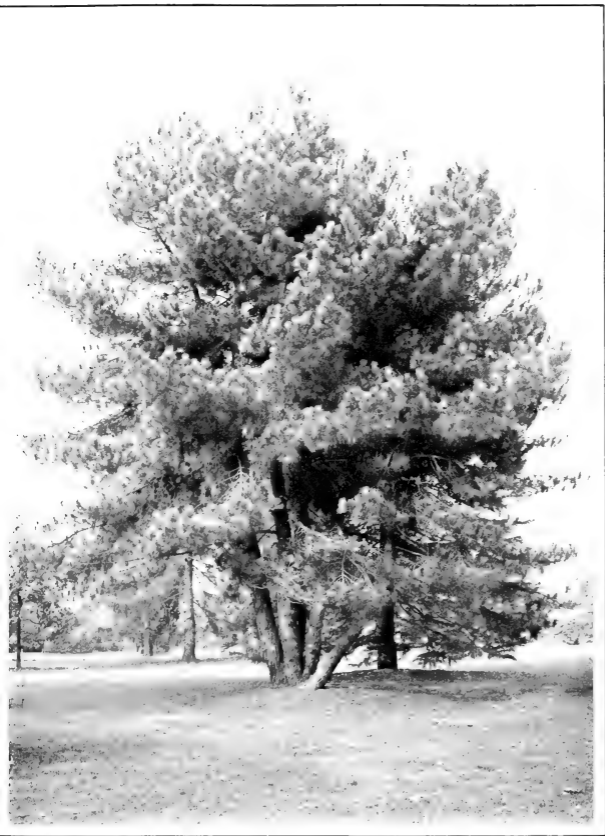
contrast to the small wing of the large seed of the Stone Pine, an effective mechanism for seed-dispersal.

It is most important that the true Corsican Pine should be accurately discriminated from its varieties or geographical forms: in few cases, indeed, is what is known as "critical" botany of greater practical import. Practical experience has shown the typical form to be one of our valuable forest trees, while some of the other varieties do not share its useful characteristics. Thus, J. Nelson, writing as "Johannes Senilis" in 1840, says of it:—

"All things considered, it is one of the most valuable and generally useful species of the genus *Pinus* which has yet been planted in the British Isles, being thoroughly hardy, sound in constitution, of tolerably large dimensions, and of a very rapid and regular growth; and will not only grow, but will produce both quantity and quality of timber equal to any and superior to many of its congeners, when grown under the same conditions. We have it in almost every description of loam, clay, sand, gravel, peat, and compound earths—all, of course, made sweet and healthy by efficient drainage; and in situations the most sheltered and exposed, in maritime and inland localities, on high and low altitudes, and everywhere—unless, indeed, in close, soft peat and spongy marsh—it is doing well. I know of no Pine less subject to the attacks or ravages of insects, fungoid enemies, game, or vermin; for frequently have I seen its congeners, the Austrian and the Scots Pines, cropped by hares, nipped by conies, and disbudded by black cocks and grey hens, while the Corsican remained untouched. This, doubtless, is accounted for by the peculiarly bitter, aromatic flavour with which its sap is impregnated."

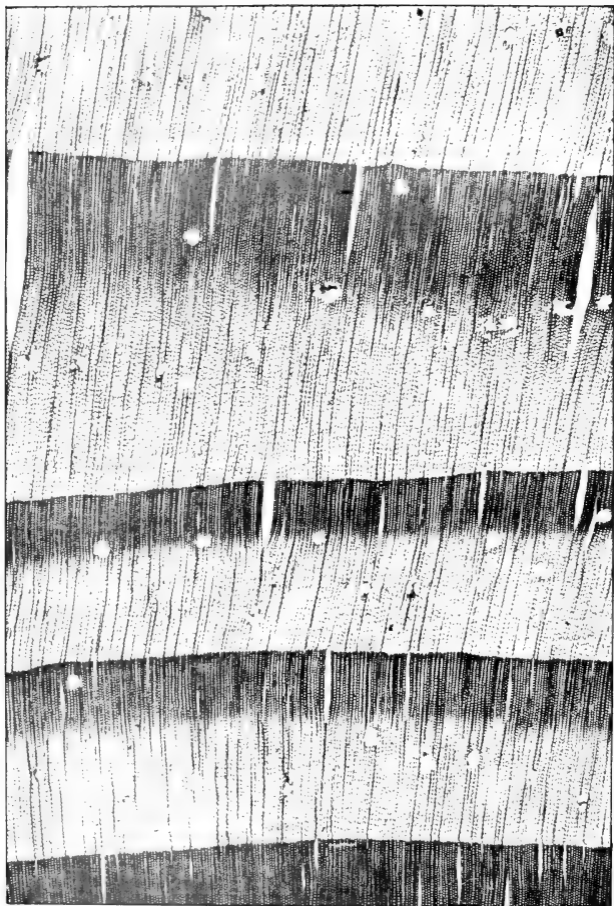
Mr. John Simpson writes of it that it "appears to have all the good qualities of the Scotch Fir, with the advantage that it beats the latter in bulk of timber from the first."

This most valuable form is distinguished by its



*Photo. E. J. Wallis, Kew.*

CORSICAN PINE.



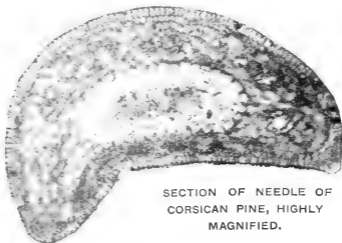
TRANSVERSE SECTION OF CORSICAN PINE WOOD (X 10 DIAMETERS).

somewhat cylindrical, thin habit of growth, its branches being few and slender; and especially by its needles, which are from four to six inches long, slender, and waved. It reaches greater dimensions than any other form: it is said to attain to an age of nearly six hundred years, and its wood is described as better than that of the other varieties. This wood is creamy-white when freshly cut, but becomes brownish-yellow when seasoned: it is tough, elastic, long but rather coarse in grain, very resinous, easily worked, susceptible of a fair polish, and very durable. It may be doubted whether this tree can stand sea-breezes as well as the Cluster Pine, but it will grow on calcareous soils. Some of the finest plantations of the species in England are at Wortley Hall, Yorkshire, and Newstead Abbey, Nottinghamshire.

The Austrian or Black Pine (*P. Laricio*, var. *austriaca* Endl.; *P. Laricio nigricans* Parl.; or *P. austriaca* Höss.) is distinguished by its denser habit, with more, longer, and stouter branches than the Corsican Pine, and shorter, thicker, and more rigid leaves. These are seldom much over four inches in length, quite straight, and of a very dark brownish shade of green, and have a hard, yellowish tip. In Austrian forests the tree attains a height equal to the Corsican Pine; but in the British Isles it is smaller. It is a fast-growing form, and most accommodating as to soil. Where it grows wild it shows a preference for calcareous soils, and especially for magnesian limestone; but, coming from countries with warm summers, a warm, southern exposure suits it best. It is coarser grained than the Corsican Pine,

and its timber is very knotty and rough. The wood is, however, very resinous, more so than that of the Corsican Pine or any other species grown in Austria. This resin renders its wood more durable than that of the true *P. Laricio*, and more valuable also as fuel. It is largely extracted in Austria, and forms part of the Venice turpentine of commerce.

The Tartarian Pine (*P. L. Pallasiana* Lamb., also known as *P. taurica*) approaches the Corsican Pine in its dimensions, but is a broader tree with long, thick branches springing from near the ground. The needles may be six or seven inches in length, but they are rigid as in the Austrian Pine, though of a much lighter shade of green. The cones are commonly produced three or four together, and each five inches in length; they are ovate and generally bent at the apex, and the tubercles in the centre of their ash-coloured apophyses are yellow, and bear a small spine. The tree grows rapidly, and is well adapted for thin, chalky soils and for planting near the sea; but it is not very often seen in England.



SECTION OF NEEDLE OF  
CORSIKAN PINE, HIGHLY  
MAGNIFIED.



ALDER BUCKTHORN.





## THE BUCKTHORNS.

*Rham'nus cathar'ticus* L. and *R. Frangula* L.

THE Family *Rham'neæ*, which is not a large one, belongs mainly to the Warmer Temperate Zone, and consists chiefly of shrubs or small trees. Not a few of its members have their branches, like those of our common Buckthorn, terminated in spines, to which, of course, our species owe the second syllable of their names.

The leaves in all the Family are simple in outline and stalked, and there are two minute stipules at the base of each leaf-stalk.

The flowers are invariably small and generally green or yellow, and would be individually insignificant; but they are often massed together and contain honey, so that, unlike those of the true forest trees, they have their pollen carried by bees and other insects, and not by the wind. As in the Spindle-tree and its allies, there is a tendency in these flowers for the parts in each whorl to be reduced from the typical five to four, so that there are four sepals, four petals, four stamens, and often four chambers to the fruit; and the green sepals are commonly larger than the petals between them; but one of the main technical distinctions between the two Orders is that, whilst the sepals of the Spindle-tree overlap, those of the Buckthorn Family touch in the bud without doing so, or are, as it is termed, "valvate." The

sepals are generally united into a distinct cup below, the fleshy inner surface of which secretes the honey, whilst the petals and stamens spring from its margin. Another leading characteristic is that the stamens each stand in front of one of the petals, instead of between them, which latter is the case in the Spindle-tree.

The fruit in most members of the Order is fleshy externally, whilst internally it consists of three, or less commonly two or four, hard one-seeded stones. It is the fleshy portion of the berries of the Buckthorns that yields the various colouring substances which constitute one of the chief economic products of the group; and fruit, bark, and, to some extent, the whole plant contain bitter, and sometimes astringent, principles often strongly purgative and employed as such medicinally. Thus a Mediterranean species, *Rhamnus infectorius* L., is much grown at Kaisaryeh in Asia Minor, the ancient Cæsaræa in Cappadocia, and its unripe fruits are exported from Smyrna under the name of Persian or Yellow Berries. Other species, such as *R. saxatilis* L., from South-Eastern Europe, *R. alaternus* L. and *R. oleoides* L., from the Western Mediterranean area, and our British species *R. catharticus*, yield some of the berries of commerce, those from France, known as Avignon Berries, being considered inferior to the Asiatic. These fruits are used to give a yellow colour to morocco leather. The ripe berries of the British and Asiatic species alike, with the addition of alum or lime-water and gum arabic, form the sap-green or bladder-green of painters. Ripe Buckthorn-berries

are collected in Hertfordshire, Buckinghamshire, and Oxfordshire for this purpose, and for the manufacture of the purgative Syrup of Buckthorn. About fifty years ago considerable quantities of a beautiful green dye known as Lo-kao, or Chinese Green Indigo, were imported from China to Lyons for dyeing silk. It proved to be extracted from the bark of *R. tinctorius* W. R. and *R. dahuricus* Pall., though a similar dye has been obtained from our own species *R. catharticus*, and both are now alike superseded by the aniline colours.

Whilst the English name is merely an early mistranslation of the German *Buxdorn*, the thorn-bearing Box, the scientific name *Rhamnus*, or rather its Greek equivalent *Rhamnós*, goes back to the very dawn of the science, to Theophrastus and Dioscorides. It is a nice question of philology to decide whether, as has been alleged, this name has anything to do with the Latin *ramus*, a branch, in reference to the much-branched habit of most members of the group.

Both our British species were growing in the garden of the apothecary John Gerard in Fetter Lane, Holborn, in 1596. In his "Herball," published in the following year, he speaks of finding the Buckthorn "in Kent in sundrie places"; and of the Alder Buckthorn he writes, "I found great plentie of it in a wood a mile from Islington in the way from thence toward a small village called Harnsey, at Hampstead, and in most woods in the parts about London." Another London apothecary, in the next generation, John Parkinson, in his "Theatrum Botanicum," published in 1640, classifies both species among purgative plants; and

his description is so characteristic as to be worth transcription at some length.

“ 1. *Rhamnus solutirus vulgaris*. The common purging thorne.

“ The purging thorne, that is frequent in our owne Land, is for the most part but a low shrubbe or hedge bush, seldome growing any thing bigge or like a tree, having many stemmes or branches rising from the roote, covered with a smooth blackish red barke on the outside, and greene on the inside, the innermost being yellow, the wood whereof is of a whitish yellow, toward the outside, and of a reddish yellow inward, and at the heart strong, and not easie to bend or to breake, whereof strong bowes may be made, and hath beene in times past: the smaller branches are furnished with many leaves like unto those of the crab tree, but smaller, with small long straight thornes in many places set with the leaves, the ends of the branches ending in a thorne also; among the leaves come forth many flowers, every one upon a severall foote stalke, consisting of foure leaves a peece, of a whitish greene colour; after which come small red round berries, greene at the first, and blacke when they are ripe, full of pulpe or juyce that is greene, with one or two small graines within them of an unpleasant taste. . . .

“ *The Place.*

“ The first groweth in many places of this land, but especially in Kent, as at the hither end of *Dartford* next unto *London*, *Farningham* upon the Connie burrowes, and in a narrow Lane neere *South Fleete*, and in many other places. . . .

“ *The Vertues.*

“ The berries hereof dryed and a drame of the powder, given in wine or the broth of flesh; doth purge both flegme and grosse thicke humors also, yet *Pena* saith it rather draweth forth thinne flegme, and that from the joints and Arteries, and therefore is singular good for dropsies; some doe make an Electuary and some a Syrupe of the juyce of the berries clarified, and Sugar or Honey put thereto, but because it worketh a little troublesomely, some spices are to be added thereto to aromatise it, as Cinamon, Ginger and Cloves, and some adde Masticke and roses also, which doth correct the evill quality therein, and cause it to worke without paine: an ounce or more of either Electuary or Syrupe may be given at a time, dissolved either in wine or in the broth of flesh, which will draw forth raw



LEAVES, FLOWERS, AND FRUIT OF ALDER BUCKTHORN.



whayish humors, and choller abundantly, as also thicke clammy flegme: . . . Of these berries are made three severall sorts of colours, as they shall be gathered; that is being gathered while they are greene and kept dry, are called Sappe-berries, which being steeped in some Allome water, or fresh bruised into Allome water, they give a reasonable faire yellow colour, which painters use for their workes, and Bookebinders to colour the edges of bookes, and leather dressers to colour leather, as they use also to make a greene colour called Sappe greene, taken from the berries when they are blacke, being bruised and put into a brasse or copper kettle, or pan; and there suffered to abide three or foure dayes, or a little heated upon the fire, and some beaten Allome put unto them, and after pressed forth, the juyce or liquor is usually put up into great bladders, tyed with strong thred at the head, and hung up untill it be drye, which is dissolved in water or wine, but sacke is the best to preserve the colour from starving as they call it, that is from decaying and to make it hold fresh the longer: the third colour (whereof, none that I can finde hath made mention, but onely *Tragus*) is a purplish colour which is made of the berries suffered to grow upon the bushes, untill the middle or end of November, that they are ready to droppe from the trees."

Our second British species of Buckthorn, *R. Frangula*, growing in wet places, side by side with the Alder, got the name of the Black or Berry-bearing Alder or Aller tree, though it has but very little in common with the true Alder and is far removed from it in true kinship. Once more we will quote Parkinson's description:—

"*Frangula sive Alnus nigra baccifera.* The blacke Alder tree.

"The blacke Aller or Alder tree, riseth seldome to be of any great bignesse, but for the most part abideth like a hedge bush or tree, spreading into branches, the wood of the body being white, and of a darke red at the core or heart, the outward barke being of a blackish colour, whereon many white spots are noted to be seene; but the inner barke next unto the wood is yellow, which being chewed will turne the spittle yellow, as much or more than Rubarbe. neare unto a Saffron colour, the leaves are somewhat like unto those of the ordinary Alder tree, or those of the female Cornell or Dogge

berry tree, but blacker, and not so long but rather rounder, the flowers are white coming forth at the joints with the leaves which turne into small round berries, greene at the first, and red afterwards, but blackish when they are thorough ripe, divided as it were into two parts, wherein is contained two small round and flat seedes: the roote runneth not deepe into the ground, but spreadeth rather under the upper crust of the earth."

At the present day, owing to the violence and uncertainty of its action, medical practitioners have quite discarded Syrup of Buckthorn, its place having been taken during the last quarter of a century by preparations of the so-called *Cuscará Sagrada*, or "Sacred Bark," the inner bark of *Rhamnus Purshia'nus* D.C., a native of the Pacific slope of North America, more especially Oregon.

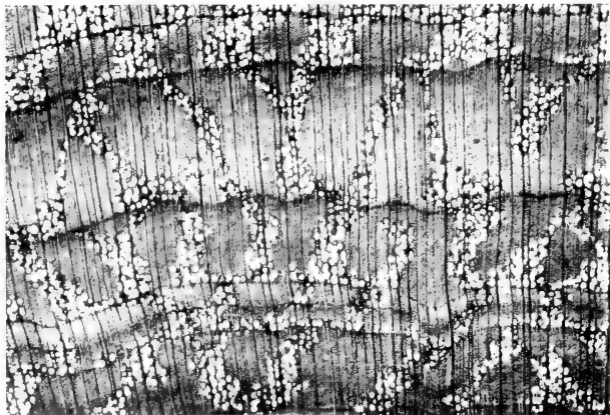
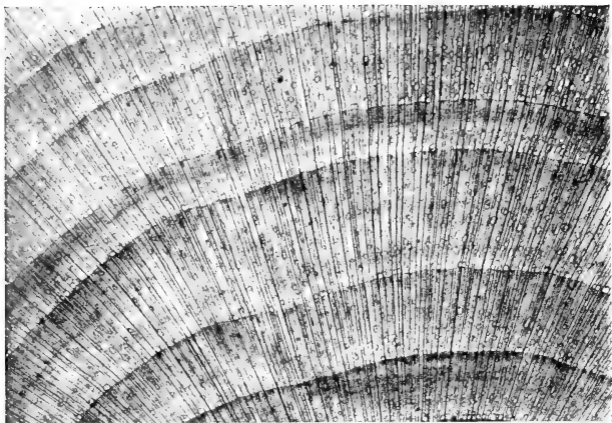
To the non-botanical observer it may well at first be puzzling to understand the association of our two British Buckthorns in one genus. With the same general geographical distribution, extending into Siberia and Northern Africa, and alike rare in Ireland and absent in the north of Scotland, they grow in very different situations. The true Buckthorn, *R. catharticus*, that is, occurs chiefly upon chalk and other limestones, whilst the Alder Buckthorn, *R. Frangula*, prefers clay or wet alluvial soils. Though they are of approximately the same size, whilst the Buckthorn is a stiff much-branched shrub, giving off its spine-terminated branches in almost opposite pairs, the Alder Buckthorn has a far looser habit of growth, with slender branches, given off singly and destitute of spines. The dark, pointed buds of the Common Buckthorn are erect and pressed against the stem in almost opposite pairs,





*Photo : H. Irving, Horley.*

ALDER BUCKTHORN.



TRANSVERSE SECTIONS OF WOOD OF (1) ALDER BUCKTHORN (X 10 DIAMETERS),  
(2) COMMON BUCKTHORN (X 30 DIAMETERS).

and are enclosed by seven or eight pairs of overlapping scales, which are stipules in origin. The leaves have their margins rolled inwards in the bud and are in crowded tufts on the dwarf shoots and in sub-opposite pairs on the long shoots; they are elliptical, with sharply-toothed margins and a short abrupt point, downy on the stalk and under-surface when young, and of a dark green, which becomes yellowish towards autumn. Their midribs give off two or three secondary veins on either side at an acute angle which sweep towards the apex in an elliptical curve. On the other hand, the slightly angular, violet-tinged twigs of the Alder Buckthorn bear small grey hairy buds without scales; and its leaves, when unfolded, are reversedly egg-shaped, with no teeth on their margins and with eight or nine secondary veins on either side of their midribs. The two species agree in having small half-moon-shaped leaf-scars, each marked by the terminations of three veins; and, as we have seen, the lenticels are sufficiently prominent to have attracted the notice of Parkinson, who speaks of them as "white spots."

The flowers of both species are alike individually minute, but those of *R. catharticus* are yellowish-green, and generally in dense clusters on the dwarf shoots of the previous year; they are dicecious, having, that is, staminate and pistillate blossoms on distinct bushes; and their parts are in fours—four sepals, four petals, four stamens, a style generally four-branched, and a four-seeded ovary. The few greenish-white blossoms in the axils of the leaves of the Alder Buckthorn, though similar in the cup-shaped base of the

calyx, have their parts mostly in fives, and have stamens and pistil in the same flowers. The style in this species is unbranched, and the ovary contains only two seeds. The small globular fruits of the two species are similar externally, but those of *R. Frangula* reach a larger size. Both are fleshy and berry-like, and become ultimately black.

It is a somewhat exceptional fact that these many differences in external anatomy are associated with quite as wide a divergence in the character of the wood of the two shrubs, though there is a resemblance in colour. The soft spongy wood of the Alder Buckthorn is largely used, under the name of "Black Dogwood," for the manufacture of gunpowder charcoal. It has a yellowish-red heart, with a narrow light yellow sapwood; but there is nothing very remarkable about its appearance under the microscope. The harder and heavier wood of *R. catharticus*, however, is not only more orange at the heart and more greenish in its sapwood, but shows a distinct zone of pores in the spring wood of each annual ring, and remarkable flame-like groups of pores tapering outwards through the autumn wood in a manner well nigh unique.

If this tree has no great beauty of its own, it is the source of one of the loveliest sights of our English summer; for the Brimstone Butterfly (*Gonepteryx Rhamni*) feeds in its larval stage upon the leaves of the Alder Buckthorn; and we may apply to this lovely insect the language used by Burke with reference to Marie Antoinette: "Surely never lighted on this orb, which she hardly seemed to touch, a more delightful vision!"



APPLE.





different fruit-bearing plants, such as Thorn-apples and Love-apples. The Anglo-Saxon name for the Blackberry, for instance, was Bramble-apple; and that rare old traveller, Sir John Mandeville, speaking of the Cedars of Lebanon, says, "they beren longe Apples, and als grete as a man's heved." Though both Apples and apples of gold are spoken of in several parts of the Bible, the tree now so called is believed not to have been cultivated by the Hebrews, the Citron or some other fruit being referred to.

Darwin propounds the suggestion that our cultivated varieties are derived from the wild Crab of the Caucasus; but this origin dates probably from a remote antiquity, before the time when perhaps the Druid cut with golden knife the mistletoe bough in the Ynys yr Avallon, the Island of Apples, afterwards known as Glastonbury; for its carbonised remains indicate the use of the Apple as food by the prehistoric inhabitants of the Swiss lake-dwellings. Just as the Romans used both the words *malum* and *pomum* for the fruit and for the tree, besides extending both terms to other fruits, so with us in a wild state the fruit of the Apple, or the tree itself, is known by the probably Keltic name "crab" or "crab-apple," a name apparently having the original signification of sour.

The Apple seldom occurs of a large size in a wild state in England, and is often exposed to the indignity of being cut down with the hedgerow. In our orchards the short stems slope in every direction, not being rooted in the ground with sufficient firmness to resist being blown to one side by the gale—an accident to which they are rendered more liable by the custom



of cutting off the tap-roots to facilitate transplanting. Where the soil is poor or badly drained, or the trees are crowded, the bark is often lichen-covered, and the gnarled and knotted branches are the chief habitat, or "host," as the botanists facetiously term it, of that unwelcome guest, the Mistletoe. The parasite grows as freely upon the crab-apple as on the cultivated varieties, and preying on the life-fluids of the tree, is able to maintain its own verdure all the year round, whilst it is not unfrequently absolutely fatal to young Apple-trees in our western orchard counties.

The Wild Apple has its dwarf shoots irregularly curved, rough with crescent-shaped leaf-scars, and sometimes almost thorny, though not distinctly so as in the Pear. There are generally three principal branches, which spring from the trunk at an angle of from ninety to a hundred and twenty degrees, so as to produce a habit more spreading than that of the Pear; and the subsequent branches and twigs spread out from one another at angles slightly exceeding a right angle, giving the tree an irregularly rounded head, which is so characteristic as to be recognisable at a distance.

The leaves make their appearance rather before the flowers, which do not generally open before May, by which time the Pear has usually lost its blossoms and completed the growth of its foliage. The leaves of the Apple have at first a brownish tinge, and though individually pretty, are not effective among the flowers, whilst they subsequently become a dull darkish green, which has not much beauty. They are oblong and rounded, with an abrupt point—

“acuminate,” as it is technically termed—not egg-shaped and tapering gradually or “acute,” as are those of the Pear—and they dry brown, not black, when dead.

Far beyond the pale white beauty of the Pear-blossom, however, which seems cold in the yet early spring, is that of the delicately blushing, rosy and white-streaked, round buds of the Apple. Even in May, that time of flowers, when—

“The meadow by the river seems a sea  
Of liquid silver with the cuckoo-flowers”—

that season of Marsh-marigolds and Cowslips, of wild Hyacinths and purple Orchids, of the Horse-chestnut, the Lilac, and the Guelder-rose, of Pæonies and Tulips—there is no more beautiful sight than the far-stretching orchards of Somerset, Hereford, or Worcester. In the exquisite folding of the petals in each short-stalked flower over its golden heart of stamens, we have a bloom far more becoming to an English bride than the ivory pallor of the exotic orange-flower. When we look for the deeper meaning of and reason for all this lavished beauty, we must confess ourselves as yet to be much at a loss. The succession of variously-hued flowers as spring advances into summer, and summer into autumn (so that blue flowers, as a rule, precede white ones, whilst these in their turn open before the purple, yellow, and red blossoms of the summer), would seem to be due in some imperfectly explained manner to the increasing intensity of the sun’s light as it travels northward from the winter to the summer solstice.

In the Apple-blossom the stigmas are, as a rule,



APPLE FLOWERS AND FRUIT.



mature before the pollen is ripe, a condition known technically as "proterogynous," so that self-fertilisation cannot usually take place in this species; and by their beauty and their abundant honey the flowers attract many kinds of bees and other insects. We have yet much to learn, however, as to the individual tastes in colour of the various insects, and as to whether we can connect in any way, by the theory of sexual selection, their own colouring with that of the flowers they frequent. With regard to the plant, the advantage to the species of an occasional cross has been conclusively shown.

The wealth of beauty of the Apple in flower, whether massed together in our orchards, or happened upon as a pleasing surprise in a hedgerow, or "deep in the thicket of some wood," is succeeded by another charm, perhaps not equal, but at least not despicable—that of the tree in fruit. In the wild state crab-apples are mostly of a deep red tint, as that accurate observer the poet Clare describes them:—

"Crabs sun-reddened with a tempting cheek.

There would seem, however, to be more than one variety in England in this respect, since crabs are occasionally found of a pure golden yellow, reminding us of Phillips's "Pippin burnish'd o'er with gold."

Whatever its form in other respects, the Apple is easily distinguished from the pear by its "umbilicus," or depression at the base to receive the stalk. Its rounded outline, with one side perchance "sun-reddened," has often caused it to suggest the plump and rosy cheeks of an English maiden; but when we

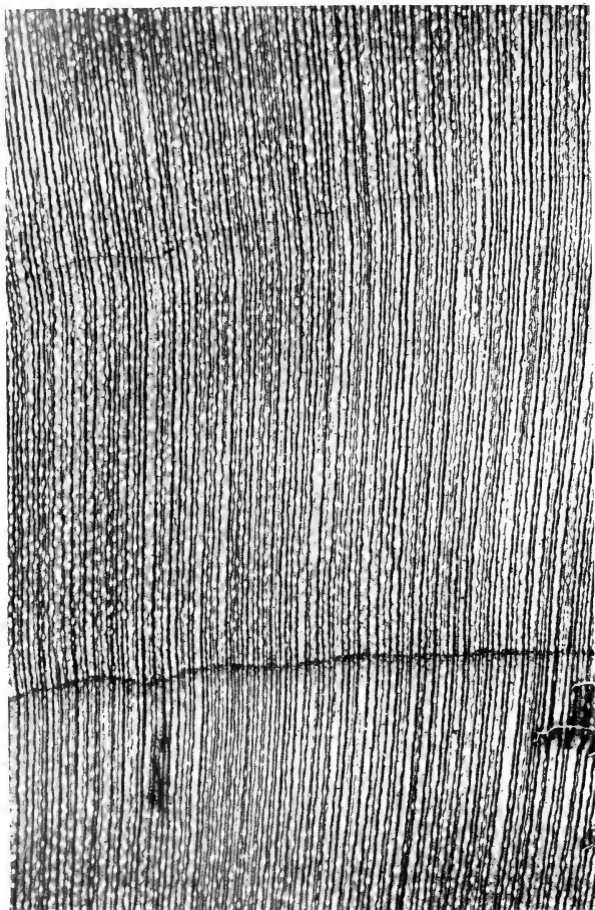
ask the *raison d'être* of this rosy-cheeked, succulent and juicy fruit, we are again met by some of the most interesting problems of modern botany. The act of fertilisation or impregnation seems to have an effect comparable to that of the puncture of a gall-fly in determining the flow of nutriment in the direction of the fertilised seeds and their enclosing ovary: the petals and stamens wither and fall; and in nearly every fruit enlargement of the ovary, and often of some adjacent structures, takes place. A succulent fruit is thus produced, often having some gay autumn tint, red, gold, or purple, attractive to the bird-world by its colour, and by its lusciousness when ripe. In the Apple the five ovaries are not at first united, but are subsequently overgrown and completely joined by the development of the so-called "calyx-tube," an outgrowth from the flower-stalk, which shuts in the parchment-like core, and carries up with it the withered calyx-leaves to form a crown on the summit of the fruit.

The ripe Apple falling to the ground, reminding us in its fall of the somewhat apocryphal tale of Newton and the discovery of gravitation, must often have become the prey of the wild boars, deer, and cattle of the primeval forests of Europe. The Crab-tree, in fact, owes its preservation in our forests to protective regulations for the sake of the deer. Its firm skin may for some time keep the decaying pulp together so as to manure the germinating seed; and the tough dark brown skin of the seed itself offers such resistance both to damp and to the digestive process as to secure to it a fair chance of sprouting in due



Photo : H. Irwin, H. Irwin.

APPLE.



TRANSVERSE SECTION OF APPLE WOOD (X 10 DIAMETERS).



time and place—not too early, and away from the overshadowing of its parent tree, so that it may have a good start for success in the struggle for existence. If we have wet weather during the forty days at the end of July and in August traditionally connected with the Translation of Swithin, sainted Bishop of Winchester, whose feast is July 15th, the Apples will have the means of becoming large and juicy before they ripen.

Though it is impossible here even to enumerate the chief cultivated kinds of Apple, it may be noted that botanists distinguish two varieties of wild English Crabs: *Pyrus Malus acerba* D.C., the commoner, having the young branches, calyx-tube, and under side of the leaf smooth and the fruit drooping, and *P. M. mitis* Wallr., having the same parts downy and the fruit erect.

The unripe fruits of the wild Apple are used in the manufacture of verjuice, now chiefly made in France, which, when fermented and sweetened, makes a pleasant drink; but in the sixteenth century the fruit was in more esteem than it now is. Christmas was then the season

“When roasted crabs hiss in the bowl,”

they being served in hot ale; nor was this from any want of cultivated Apples. Even Pliny speaks of twenty-two varieties; and Shakespeare mentions, besides the Crab, the Pippin, the Pomewater, the Apple-john, the Codling, the Carraway, the Leathercoat, and the Bitter-sweeting; whilst his contemporary, Gerard, says that in his time “the stocke or kindred

of Apples was infinite." John Parkinson, in his "Paradisus Terrestris" (1629), enumerates fifty-seven sorts; and though Ray in 1688 only mentions seventy-eight as grown round London, his friend and contemporary, Samuel Hartlib, alludes to the existence of two hundred kinds. At the present day there are stated to be five thousand varieties in cultivation.

The sapwood is a dull white, but the heart a dark brown, heavy, very hard and taking a high polish. Crab-tree cudgels are proverbial for their hardness and the wood is also used for mallets and turnery; but is brittle and apt to warp.

In many an old manor-house, where a generation ago there was no lawn, as at present, or at most a green bowling-alley, shut in by a Yew hedge, the orchard of cider-apples, in whose long grass grew Winter-aconite, Snowdrops, and Daffodils, was planted close to the parlour windows, and the trees may yet remain to give an old-world charm to the spot.



SWEET CHESTNUT



## THE SWEET CHESTNUT.

*Casta'nea sati'va* Mill.

WITH but small claims to be considered a native of the British Isles, the Sweet, or Spanish, Chestnut is so generally planted in woods, parks, and shrubberies that it is as common and as familiar to us as many of our more truly indigenous species.

Its name and origin are alike somewhat doubtful. It is most abundant in an apparently wild state in Southern Europe, extending eastward to the Caucasus, and occurring in the islands of the Mediterranean at moderate elevations above the sea. A similar or identical form occurs in the mountains of Virginia, Georgia, and the Carolinas. There are forests composed of this species in Alsace and Rhenish Prussia; and it is common, though possibly planted, in Normandy and around Paris. Its fruit does not ripen fully every year with us; but this is by no means an infallible proof that a species is not indigenous.

The name occurs twice in the Authorised Version of the Bible; but there is little reason to suppose that it is rightly employed, though no doubt its starchy nuts must have been widely used for food from the earliest times. The town of Kastana in Thessaly is generally referred to as the source of the Latin, if not of the Greek name; but, as

De Candolle has pointed out, considering that names which are virtually identical are applied to the tree in all the most ancient languages of Central Europe, it is more probable that the town took its name from the trees which surrounded it. Thus the Breton *Kistenen*, for the tree, and *Kistin*, for its fruit, and the Welsh *Castan-wyddlen* and *Sataen*, are closely related to the French *Châtaigne* and to the Latin name which is still the scientific appellation of the genus.

According to Pliny, the Greeks obtained the tree from Sardis in Asia Minor, at least five centuries before the Christian era, a statement which De Candolle doubts, since he considers the tree undoubtedly wild in Greece, where, as early as the fourth century B.C., Theophrastus, "the Father of Botany," speaks of it as covering the slopes of Olympus.

Old Chestnut-trees, especially when once lopped close to the ground, seem often to exhibit a growing together or fusion of many stems into one, a circumstance that explains many of the instances of enormous circumference which have led authors not only to assert the indigenous character of the species, but also to claim for it an almost fabulous longevity.

The largest Chestnut-tree in the world is undoubtedly the *Castagno di cento cavalli* ("Chestnut of a hundred horses") in the forest of Carpinetto, on the east side of Mount Etna. It is 160 feet in circumference, and entirely hollow, a kiln for drying chestnuts—an article of food of considerable

local importance—having been built inside it. Supposing each annual ring of wood to be a line in thickness, a fair estimate for an unsplit tree, the circumference of this giant of the forest would indicate from 3,600 to 4,000 years of life. Other trees in the neighbourhood of Etna, where Chestnuts are cultivated with great care, approach the dimensions of the giant; and, among other historical trees on the Continent, one in the department of Cher, in France, is noticeable as having been celebrated as a large tree for five or six centuries, though only thirty feet round.

Though the rope-like stems and glossy foliage of the Chestnut are more familiar objects in the sunny south, whilst with us the tree is most commonly seen as mere coppice-wood, we are not without our giant specimens, which, no doubt, have had great weight in the minds of those who have claimed this species as a native of Britain, such as John Evelyn, the immortal author of "Sylva." In Earl Ducie's park at Tortworth, in Gloucestershire, is the remnant of a tree spoken of as old in the time of King Stephen, as, indeed, it might well be, even if the Chestnut be of Roman introduction. This Tortworth Chestnut is portrayed in Strutt's magnificent "Sylva Britannica," having in 1766 a circumference of fifty, and in 1830 of fifty-two feet, at a height of five feet from the ground; but it is now a mere fragment. At Burgate, near Godalming, in Surrey, is a grove of some twenty splendid trees, two of which exceed nineteen feet in girth, their enormous

twisted trunks recalling bits of Spain, or of Salvator Rosa's Calabrian landscape. In the immediate neighbourhood of the metropolis there are no specimens to surpass the fine trees in Kensington and Kew Gardens.

Turner, in his "Names of Herbes" (1548), writes:—"Nux castanea is called in Greeke Castanon, in Englishe a chestnut-tree, in Duch Castene, in French Ung Chastagne. Chesnutttes growe in diverse places of Englande. The maniest that I have sene was in Kent." From Shakespeare's allusions to it in *Macbeth* and the *Taming of the Shrew*, it would seem to have been a common article of food in his time.

Below the rounded, slightly-pointed buds in spring may be seen the projecting bracket-like scars which supported the heavy leaves of the previous year. The bark of the young saplings, and of the pollard shoots that are grown for Hop-poles in the South-east of England, is smooth and of a rich vinous maroon or red-brown tint; but in older trees it becomes grey, and splits in vertical lines so as to allow of the expansion of the wood within. These vertical cracks widen, deepen, and sometimes, as the trees grow, become twisted, thus often giving to the full-grown Chestnut stem a most distinctive rope-cable-like appearance. The tree attains a height of fifty, eighty, or even one hundred feet, and single stems may no doubt exceed twenty feet in girth. The branches are given off alternately and nearly horizontally, but, spreading outwards, bend





LEAF, FLOWER, AND FRUIT OF SWEET CHESTNUT



downwards at their extremities so as sometimes to sweep the ground. The whole outline of an unpollarded tree is remarkably round-topped, even more than is that of the Oak; but its bright pendent foliage, reflecting the sunlight, prevents the general effect from being heavy. William Gilpin notices how Salvator Rosa makes use of this, his favourite tree, in all its forms, breaking and disposing it in a thousand beautiful shapes, as the exigencies of his composition required.

The Chestnut is a valuable avenue tree. Across an ordinary carriage-drive the opposite trees will meet in a few years, and the foliage effects will be pleasing during the greater part of the year—the long, pointed, and sharply-toothed leaves seem to partake of the evergreen character of so many of the trees of the south in their thickness and gloss. When young they are often of a beautiful red colour, and when mature of a very pleasant shade of green, without the blue tint common to many grasses, and though perhaps as brown as the leaves of the Buckthorn, they are redeemed from dulness by their shining surfaces. They are very much the colour of the Hornbeam, or of the Beech when no longer young and emerald-hued though not yet opaque and dull. The venation is pinnate, the midrib giving off about twenty secondary veins on each side, between which is a fine meshwork of tertiary veins. In the bud the leaves are folded plicately along the secondary veins. These fine leaves, sometimes eight or nine inches long, are to

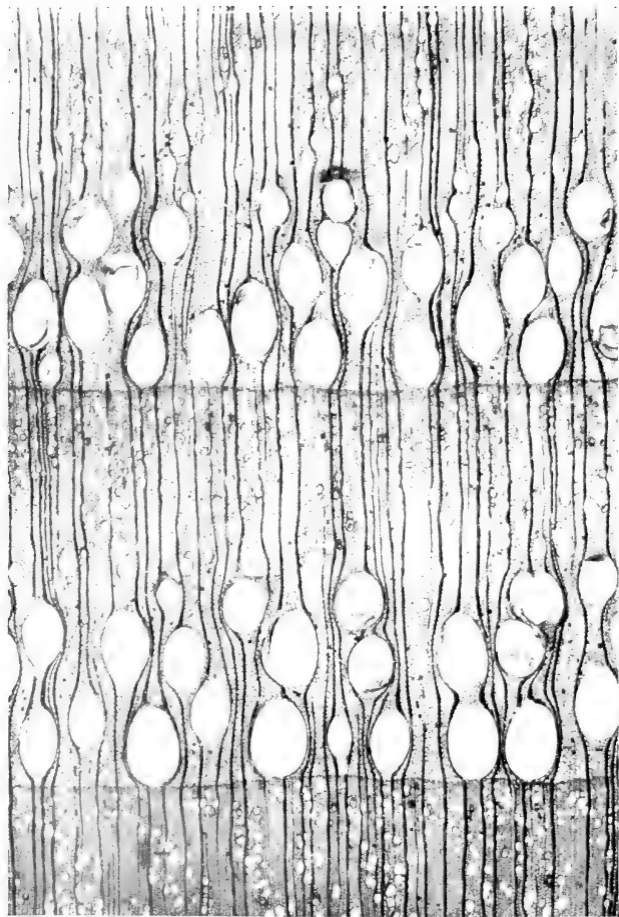
some extent crowded so as to form tufts at the ends of the branches, and from their "axils," *i.e.* the angles where they are given off from the stem, spring the long pendulous catkins of flowers. In a favourable autumn the leaves turn to a clear lemon-yellow, stained with orange and brown where damp decomposes the, as yet, perfect texture. Some of the leaves seem, however, first to clear their green, light green patches occurring at the base of "the sere, the yellow leaf," and the whole tree gaining a varied and revived aspect, the forlorn hope of life before the winter death.

Flowers of both kinds are borne on every tree. The slender yellowish catkins are five or six inches long, hanging from the axils of the young leaves in May. Each catkin bears a series of small scale-like "bracts," some little distance apart, and in the axil of each of these scales there are either seven staminate or three pistillate flowers. Each kind of flower is surrounded by a calyx of six minute greenish leaves, which in the female blossoms form a tube enclosing and adhering to the ovary. There are from eight to twenty stamens in each male flower, which discharge an enormous quantity of pollen, like a cloud of sulphur. So abundant is this pollen that, if it has not contributed, as has that of the Pine, to our traditional folk-lore concerning rains of sulphur, it will certainly cover the water of any neighbouring pond with its film of yellow dust, which is perhaps sufficient reason for not planting the tree on the margin of any small piece of ornamental water. At



EET CHESTNUT.

*Photo : H. Irving, Horley.*



TRANSVERSE SECTION OF SWEET CHESTNUT WOOD (X 30 DIAMETERS).

the season when the pollen is ripe the flowers produce a very powerful and somewhat hircine odour.

The "cupule," formed from the four bracteoles of the two lateral florets, corresponds to the cup of the acorn, the leafy husk of the Hazel-nut, or the hook-covered casing of the Beech-mast. Until the fruit is ripe it is entirely invested by this husk, which is thickly beset with prickles, each of them said to represent an abortive branch. This ball-like *chateau-de-frise* of protection ultimately splits into its four constituent bracteoles, disclosing the glossy brown fruits within. The ovary contains from five to eight chambers, and there are an equal number of stigmas, which are easily recognised, as they spread outwards in a radiating manner above the calyx which, even in the fruit stage, surmounts the ovary. There are generally two ovules in each chamber of the ovary, out of all of which one only, or three at the most, is matured into a seed.

The well-known fruit, so often confused by the botanical tyro with the seed of the Horse-chestnut, a tree with no real relationship to our present subject, does not often in this country reach eatable proportions, though the gales of every autumn blow down the bright green fuzz-balls of spines, bursting them open and liberating the three brown fruits, more or less shrivelled, within. Upwards of 50,000 bushels of chestnuts are annually imported into England; and they still form a staple article of food in the central plains of France and the valleys of the Alps, for they contain so large a

percentage of starch and so little oil or fat that they might fairly be classified among farinaceous bread-stuffs. The tough, leathery "pericarp," or outer skin of the fruit, resembles the "testa," or outer skin of the seed, in the Horse-chestnut, but differs from it in terminating in a point, where the remains of perianth and stigmas can often be detected. Removing the woolly coats of the seed, we find the edible cotyledons, or seed-leaves which are considerably crumpled.

The timber of the Chestnut resembles Oak, being brown, moderately hard, fine-grained, and rather porous; but, being of slower growth, its rings are narrower; the "medullary rays" are not traceable, nor is there any distinction between the heart-wood and the sap-wood. Our photo-micrograph shows the marked contrast in each annual ring between the large vessels of the spring wood and the smaller ones formed later. It was formerly supposed that the roof of Westminster Hall and other old woodwork in London was of this timber, a fact which would have been an argument for the antiquity of the growth of the Chestnut in England; but upon examination these buildings have proved to be of Oak. Beyond the use of its saplings as Hop-poles, Chestnut timber is applied to no special purpose; but, growing as it will even in poor, sandy soil, or under the shade of Fir-trees, it is a good deal planted as cover for game.





COMMON LAUREL.



## THE COMMON OR CHERRY LAUREL.

*Prunus Laureocerasus* L.

POPULAR names and their suggestiveness of error cannot be better illustrated than by a consideration of the trees known as Laurels. The name is said to be connected with the Latin word *laus*, "praise"; but the origin of the associations of the name is Greek. Apollo, having slain the Python, the ancient serpent formed from the slime left after Deucalion's flood, fled for purification to the Laurel-groves of the vale of Tempe. Here he became enamoured of the nymph Daphne, the daughter of the river Peneus, and on his pursuing her she took refuge in her paternal stream, and was metamorphosed into a Laurel. Apollo, returning to Delphi, instituted the Pythian games to commemorate his victory, and the prizes there awarded were chiefly crowns of the leaves and berries of the shrub, which henceforth was looked upon as sacred to the god—the *Laurea Delphica* or *Apolinaris*. Apollo being the god of poetry, his emblem, that of victory and clemency, became the favourite of the poets, and hence of scholars generally, so that successful graduates of universities or other learned men became known as "laureates," or "baccalaurei," from the berried crown. Such graduates, like the fellows of colleges down to our own time, were not allowed to marry, lest the duties of husband and father should take them from their literary pursuits,

and hence the term "bachelor" became extended to unmarried men in general.

The Laurel was also believed to be a protection against lightning; and accordingly, the Emperor Tiberius, when it thundered, wore a Laurel-wreath made from the tree at the imperial villa on the Flaminian Way, which sprang from a shoot said to have been miraculously sent from heaven to Livia Drusilla. Used as an emblem of truth, like the Olive, both trees were equally forbidden to be put to any profane uses; but the crackling of burning Laurel-leaves was also employed as a means of divination.

Dr. Lindley argued that the true Delphic Laurel was *Ruscus racemosus*, sometimes called the "Alexandrian Laurel," a low-growing, berry-bearing shrub, with glossy green leaf-like branches, akin to our English Butcher's-broom; but it is more generally considered that the Daphne of the Greeks was our Bay-tree (*Laurus nobilis* L.), fine trees of which now adorn the banks of the Peneus. This, no doubt, was Chaucer's

"Fresh grene laurer tree,  
That gave so passing a delicious smelle,"

and was the only Laurel generally known in Europe in Shakespeare's time. Its popular name has now, however, been completely transferred to a totally different and unrelated plant, the "Cherry Bay" or "Cherry Laurel" (*Prunus Laurocerasus* L.). There is little in common between the two plants beyond the evergreen character of their leaves.

The Cherry Laurel was referred by Linnæus to the genus *Prunus*, and is retained in that position

by Bentham and Hooker. The genus *Prunus* is characterised by its fruit being a "drupe"—a succulent fruit, formed from one carpel, with a strong inner layer, or "endocarp," and containing two pendulous ovules, only one of which commonly matures into a seed. The calyx falls off with the petals. The Cherry Laurel differs from the Plums, and agrees with the Cherries, in the absence of "bloom" from the surface of the fruit; but, together with the Bird-cherry (*P. Pa'dus* L.) and the Portugal Laurel (*P. lusita'nica* L.), it constitutes a distinct sub-genus (*Laurocerasus*), characterised by having "conduplicate" leaves and "racemes" of flowers, which appear after the leaves, whilst the rest of the genus have their flowers either solitary or in "fascicles." A "fascicle" is a tuft of flowers whose stalks spring nearly from one point, whilst a "raceme" has an elongated main stalk or peduncle, giving off successive lateral "pedicels" or flower-stalks.

The Cherry Laurel is exceptional among its congeners in having green shoots, and the yellowish-green tint of its leathery evergreen leaves is also characteristic. They somewhat resemble those of the Orange or of the Magnolia. They are "ovate-lanceolate" in outline, are provided with a few scattered teeth along their margins, and (like those of many allied "drupaceous" or "stone-fruit" trees) have from two to four glands on their under surfaces. The "racemes" are shorter than the leaves, and the fruits are "ovate-acute" in outline.

The species is one of rapid growth, increasing from one foot to three feet in height in a single year; but

with us it is somewhat more susceptible to the action of frost than its congener the Portugal Laurel (*Prunus lusitanica*). Its long racemes of small white flowers are produced after the young leaves, during April or May; and the fruit, which is green at first, ripens to a pure black by October. This fruit, though insipid, is perfectly harmless.

The Cherry Laurel is wild in sub-alpine woods in Persia, the Caucasus, and the Crimea, and was first introduced into Europe by Clusius in 1576. He received it from David Ungnad, who was at that time ambassador of the Emperor at Constantinople, and it is related that all the plants sent home by Ungnad to Vienna perished with the exception of one Horse-chestnut and one Laurel, the latter tree being then known as *Tra'bison curma'si*, the Trebizonde Date or Plum. Clusius's plant died without flowering; but a cutting from it flowered in 1583. The earliest mention of the plant in England is in "Paradisi in sole Paradisus Terrestris; or, a Garden of all Sorts of Pleasant Flowers, which our English Ayre will admitt to be noursed up: By John Parkinson, Apothecary of London" (1629). It is as follows:—

"Laurocerasus. The Bay Cherry. This beautiful Bay, in his naturall place of growing, groweth to be a tree of a reasonable bignesse and height, and oftentimes with us also, if it be pruned from the lower branches; but more usually in these colder countries it groweth as a shrub or hedge bush, shooting forth many branches, whereof the greater and lower are covered with a dark grayish green barke, but the young ones are very green, whereon are set many goodly, fair, large, thick and long leaves, a little dented about the edges, of a more excellent, fresh shining green colour, and far larger than any Bay leaf, and compared by many to the leaves of



LEAVES AND FRUIT OF COMMON LAUREL





the Pomecitron tree (which, because we have none in our country, cannot be so well known) both for colour and largenesse, which yeeld a most gracefull aspect; it beareth long stalkes of whitish flowers, at the joynts of the leaves, both along the branches and towards the ends of them also, like unto the Birds Cherry or Padus Theophrasti, which the Frenchmen call Putier and Cerisier blanc, but larger and greater, consisting of five leaves with many threds in the middle; after which cometh the fruit or berries, as large or great as Flanders Cherries, many growing together one by another on a long stalke, as the flowers did, which are very black and shining on the outside, with a little point at the end, and reasonable sweet in taste, wherein is contained a hard, round stone, very like unto a Cherry stone, as I have observed as well by those I received out of Italy, as by them I had of Master James Cole, a merchant of London lately deceased, which grew at his house in Highgate, where there is a fair tree which he defended from the bitterness of the weather in winter by casting a blanket over the top thereof every year. . . . I had a plant hereof by the friendly gift of Master James Cole, the merchant before remembred, a great lover of all rarities, who had it growing with him at his countrey house in Highgate aforesaid, where it hath flowred divers times, and born ripe fruit also. . . . Dalechampius thinketh it to be Lotus Aphricana, but Clusius refuteth it. Those stones or kernels that were sent me out of Italy came by the name of Laurus Regia, The King's Bay.'

In the appendix to Johnson's edition of Gerard's "Herball" (1633) is a similar description, illustrated by two very fair woodcuts. The bark is described as "swart green," and the leaves as "snipt lightly about the edges"; and it is added that—

"It is now got into many of our choice English gardens, where it is well respected for the beauty of the leaves, and their lasting or continuall greenness. The fruit hereof is good to be eaten, but what physicall vertues the tree or leaves thereof have it is not yet knowne."

In the first edition of his "Sylva" (1664), Evelyn speaks of it as "resembling (for the first twenty years) the most beautiful-headed Orange in shape and

verdure, and arriving in time to emulate even some of our lusty timber-trees ; so as I dare pronounce it to be one of the most proper and ornamental trees for walks and avenues of any growing." "The leaves," he continues, "boiled in milk, impart a very grateful taste of the Almond ; and of the berries, or cherries rather (which poultry generally feed on), is made a wine, to some not unpleasant. . . . and of the wood are said to be made the best plough-handles."

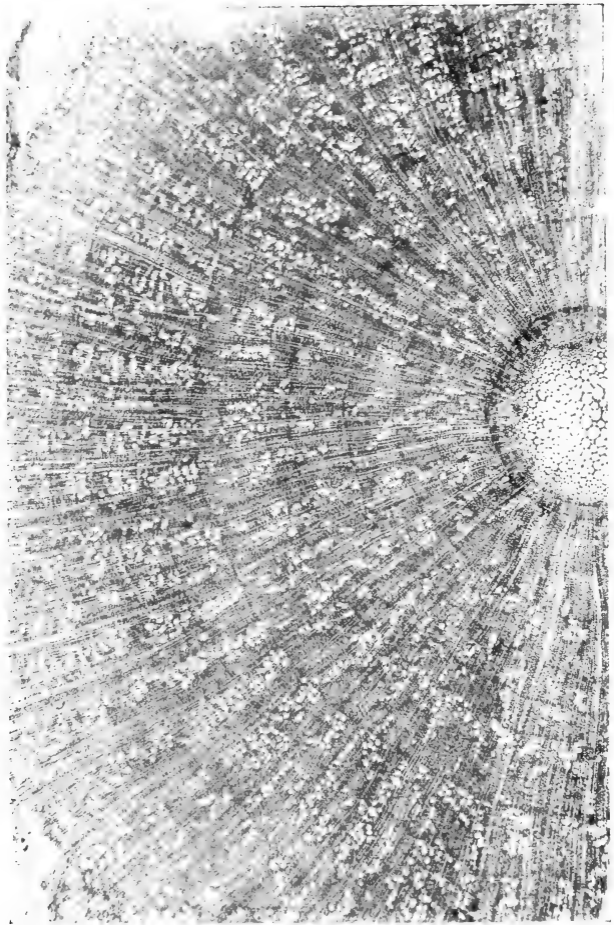
He then relates, with speculations of his own as to the tree having come more probably "from some colder clime," the not unlikely story that the Laurel was introduced "from Civita Vecchia in 1614, by the Countess of Arundel, wife to that illustrious patron of arts and antiquities, Thomas, Earl of Arundel and Surrey." The Countess certainly did return from Italy that year, which would be consistent with Parkinson's possession of the shrub prior to 1629, and there are still a number of very old Laurels at Wardour Castle, the family seat.

Ray, in 1688, in his "Historia Plantarum," speaks of the Laurel as being then very common in gardens and shrubberies, and remarkably hardy and quick in growth, braving our winters even in exposed situations, but, on account of its thick and woody branches, not fitted for the close-clipt "topiary-work," then so much in fashion. We may, perhaps, attribute to the introduction of the Laurel, and the naturally rapid increase in the popularity of its bright foliage, the victory of a more natural and less formal style of gardening over the Dutch taste for mazes, alleys, peacocks, and teapots in Yew or Box.



COMMON LAUREL.

*Photo. H. Irving, Har'03.*



Philip Miller, in that storehouse of the botanical and horticultural knowledge of his time, the "Gardener's Dictionary" (Sixth Edition, 1752), speaks of the Laurel as being susceptible to frost if "pruned up in order to form them into stems," and recommends as preferable the massing or clumping of many plants together, as then first carried out by the Duke of Bedford at Woburn Abbey. He also mentions that near Paris, where it is not as hardy as with us, it was grafted on the Cherry or Plum—a practice which has, he says, but little, if anything, to recommend it; and he also states that "the Berries have long been used to put into Brandy, to make a sort of Ratafia, and the leaves have also been put into Custards."

The infusion of the leaves, known as laurel-water, seems first to have been recognised as "one of the most speedy and deadly poisons in Nature," about the year 1731, by the Abbé Fontana, whose experiments are described in the 70th volume of the Royal Society's "Philosophical Transactions"; but it was the murder of Sir Theodosius Boughton by his brother-in-law, Captain Donaldson, by means of it, in 1780, that first directed general attention to it; and it was not until 1802 that Schrader identified the results of the distillation of the leaves as oil of bitter almonds and prussic acid. Though a few crumpled leaves may produce sneezing, and will rapidly prove fatal from their fumes to moths and butterflies, they may, like Peach-kernels, be used with impunity in small quantities for flavouring.

The Laurel certainly flourishes best in sheltered situations, and in a deep and rather light soil. It is

invaluable as underwood, relieving the monotony of the bare stems of timber trees. When so grown it requires to be periodically cut back or pegged down, or its stems become naked below. A Laurel-bush may frequently be seen from twenty to thirty feet high, and with stems considerably over a foot in diameter; but perhaps the largest in the world are those described by Loudon in 1835, at Minward, in Argyllshire, and at Shelton Abbey. Of these, the former was then thirty-one feet high, six feet nine inches in the diameter of the trunk, and 176 feet in the circumference of the head, whilst the latter, then ninety years old, was forty-five feet high, six feet in the diameter of its trunk, and nearly 320 feet in the circumference of its head!

The allied Portugal Laurel is probably, as its name indicates, a native of Portugal, and of Madeira, where it reaches from forty to sixty feet in height, with a trunk sometimes two feet in diameter. Its leaves are narrower than those of the Cherry Laurel, and a much darker shade of green, free from the yellow tint of the allied species. Its buds and twigs also are purplish-red instead of green. In our gardens it generally forms merely a rounded bush.



HAZEL





## THE HAZEL.

*Cor'ylus Avella'na.*

THE Hazel seldom has the habit or dimensions of a tree. It is generally a shrub, sending up many slender limbs remarkable for their brown bark and their great flexibility. At Eastwell Park, Kent, however, it is a tree thirty feet in height, with a girth of three feet at the ground.

The young twigs are hairy and glandular and of a rusty-brown hue, and the blunt rounded buds have their scales fringed with reddish glandular hairs. The flowers appear in January, or exceptionally even as early as October, but are most frequently not open until March, whilst the leaves do not open until the end of April or beginning of May. The male and female blossoms occur on the same tree, but in distinct clusters or "catkins."

The male catkins are pendulous, first appearing as minute sausage-shaped buds of a dull brownish hue, but lengthening to two inches or more, and becoming, when the anthers are fully matured, of a pale greenish-yellow or primrose colour, which is more decidedly green when the pollen has been shed. Each catkin consists of a number of bract-like scales, each of these bearing eight anthers on its inner surface, so that a cloud of fine-grained yellow pollen is shaken from them by the March gales, after discharging which they drop off.

The female flowers are grouped in little egg-shaped, bud-like tufts, sessile on the branch, consisting of several overlapping green bracts, each of which bears two flowers on its inner face, the crimson stigmas forming a tassel at the top of the cluster. The flower itself is only a two-chambered ovary, surrounded by a velvety cup-like "bracteole" (which afterwards grows into the large leafy husk or "cupule" of the nut), and is surmounted by a short style and two of the long, crimson, tongue-like stigmas.

Concerning the nut, the Rev. H. N. Ellacombe writes :—

"There is a peculiarity in the growth of the nut that is worth the notice of the botanical student. The male blossoms or catkins (also anciently called 'agglettes' or 'blowinges') are mostly produced at the ends of the year's shoots, while the pretty little crimson female blossoms are produced close to the branch; they are completely sessile or unstaked. Now, in most fruit trees, when a flower is fertilised the fruit is produced exactly in the same place, with respect to the main tree, that the flower occupied; a peach or apricot, for instance, rests upon the branch which bore the flower. But in the nut a different arrangement prevails. As soon as the flower is fertilised it starts away from the parent branch; a fresh branch is produced, bearing leaves and the nut or nuts at the end, so that the nut is produced several inches away from the spot on which the flower originally was. I know of no other tree that produces its fruit in this way, nor do I know what special benefit to the plant arises from this arrangement."

Towards the solution of this problem it may be suggested that as it produces no petals the shrub has energy to form abundant pollen, some of which will certainly be wind-wafted on to the spreading stigmas if there are no leaves in the way. Hence

the advantage to wind-fertilised flowers of blossoming before the leaves appear. As the two kinds of flower in the Hazel often do not come to maturity simultaneously, the advantage of cross-fertilisation is thus secured. Again, a cluster or short spike of flowers (each of which is structurally a short branch), surrounded by bracts and sessile on a bough, will stand a better chance of keeping its place, in spite of spring storms, than a single flower. Moreover, the tufted stigmas secure the fertilisation of some of their number. Fertilisation acts as a stimulus. The male catkins have performed their function and have dropped off, so nourishment flows towards the female one. In order, however, that the fruit may not ripen too soon and so fall to the ground and rot before the winter's frosts, it must not develop thus early in spring. The food is, therefore, thus employed in producing a branch below the nascent bunch of nuts.

The leaves of the Hazel are three to four inches long, broadly ovate, heart-shaped, and somewhat one-sided at the base, with irregularly toothed edges, a long point, a downy under-surface, and a short stalk. In the bud they are folded into several longitudinal plaits, and when young are bright and pleasing in hue; but later on they take yellow-brown tints of green and a dull woolliness, that render the tree heavy as a feature in the landscape, except when relieved by the brown stem, the pale green clusters of unripe nuts, or their own autumnal changes into yellow, dull orange, or red.

The Hazel is found in North Africa, in Central and Northern Asia, and throughout Europe south of 63° N. latitude. It reaches an altitude of about 3,800 feet in the Alps, and 1,600 feet in the north of Britain.

The specific name of the Hazel (derived originally from Abella or Avellino, towns in the Neapolitan Campania, where the tree was much cultivated) becomes additionally interesting from its connection with that of the great tree-lover John Evelyn. He tells us himself that in some ancient records in his possession his ancestors' names were generally written, "Avelan, *alias* Evelin." Evelyn's account of the soil suited to Hazels is that they, "above all, affect cold, barren, dry and sandy grounds; mountainous, and even rocky, soils produce them; they prosper where quarries of freestone lie underneath, as at Hazelbury in Wiltshire, Hazelingfield in Cambridgeshire, Hazelmere in Surrey, and other places; but more plentifully if the ground be somewhat moist, dankish, and mossy, as in the fresher bottoms and sides of hills, holts, and in hedgerows." In Kent, where the Hazel is abundant both in a wild and in a cultivated state, it thrives best on a light calcareous loam, resting on the ragstone or the chalk; but in Scotland it often grows on a granite subsoil. It seems, in fact, to require at once abundant moisture and good drainage.

The name *Corylus* is of doubtful etymology, being variously derived either from the Greek *κόρυς* (*korus*), a cap, from the husk of the nut; or from



CATKINS, FRUIT, AND LEAVES OF HAZEL.



*κάρυον* (*karyon*), a nut. "Hazel" is said to come from the Early English "hæs," a behest, connected with the German "heissen," to give orders, the sceptre of authority among the simple chieftains of a more primitive time having been a Hazel-wand.

The wild Hazel has grown abundantly in Britain since prehistoric times, and its nuts appear to have formed part of the food of the Swiss lake-dwellers. Both the Hazel and the Filbert were cultivated by the Romans, who are said to have given Scotland the Latinised name of Caledonia, from Cal-Dun, the Hill of Hazel, whilst the Filbert was called by them *Nux Pontica*, having been brought originally from Pontus. Its modern name is almost certainly a barbarous compound of "feuille," a leaf, and "beard," referring to the long cupule projecting beyond the nut; but in very early times a more poetical origin was found for it. Phyllis, despairing at the prolonged absence of Demophoon, put an end to her life, but, as Gower tells us in his "Confessio Amantis"—

"Phyllis in the same throwe  
Was shape into a nutte-tree,  
That alle men it might see;  
And after Phyllis, Philliberde  
This tre was cleped in the yerde."

Many of the old vocabularies allude to the same fanciful etymology, and Spenser speaks of "Phillis' philbert."

Virgil states that Hazel-twigs were used to bind the vines; but that, the roots of the nut-tree being considered injurious to the vines from

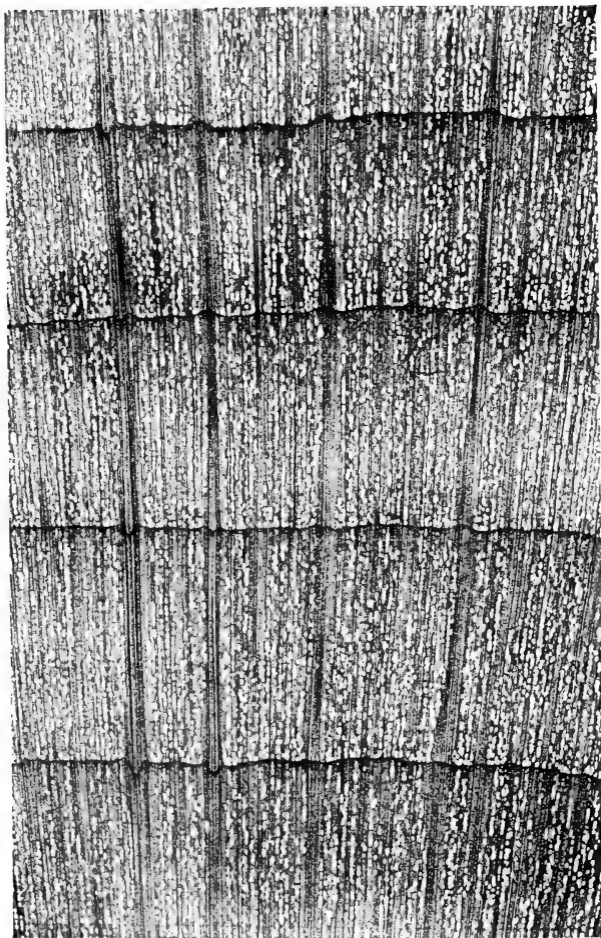
their spreading character, spits of Hazel were also used in the sacrifice to Bacchus of the goat that browsed on the plants sacred to him. In mediæval times considerable respect seems to have been paid to the Hazel, and many cases have been recorded, both in England and on the Continent, of the occurrence of Hazel-wands in the coffins of ecclesiastics, possibly in commemoration of a pilgrimage performed by the deceased. But its chief importance was for ages derived from its supposed magical powers of divination. The use of the divining-rod would seem, from Hosea iv. 12, to be of extreme antiquity, and the "virgula Mercurialis," as it was termed in Roman times, though sometimes, as now, made of Willow or other wood, or even of metal, was frequently of Hazel. Its virtue was supposed to depend upon its having two forks, which were so grasped in the fists, with the fingers uppermost, that the free end might turn downward towards the object sought. In other cases the rod was peeled and simply laid on the palm of the hand. In the fifteenth century this art of divination was named rhabdomancy. "It is," says Evelyn, "very wonderful, by whatever occult virtue the forked stick (so cut, and skilfully held) becomes impregnated with those invisible steams and exhalations, as by its spontaneous bending from a horizontal posture to discover not only mines and subterranean treasure and springs of water, but criminals guilty of murder, etc. . . . Certainly next to a miracle and requires a strong faith." Even Linnæus con-





Photo : H. Irving, Horley.

HAZEL.



TRANSVERSE SECTION OF HAZEL WOOD 1 X 10 DIAMETERS.

fessed himself to be half a convert to this belief, and the practice of "dowsing" as it is there called, is still common in Cornwall and other western counties. According to the local superstition, the rod is guided to the metalliferous lodes by guardian pyxies, the "kobbolds" of the German miner. It was no doubt this popular term "dowsing" which suggested to Scott the name of Dousterswivel, the charlatan in "The Antiquary," who uses a forked Hazel-rod in his magical performances. The rhabdomancist is stated to feel a sudden acceleration or retardation of the pulse, or a sensation of great heat or cold, at the moment of discovery.

In many places an ancient custom prevailed, which it was thought unlucky to omit, of going a-nutting on Holy Rood Day, September 14th; whilst the practice of burning nuts on All-Hallows Eve, October 31st, alluded to by Burns in his "Hallowe'en," and by Gay, was so general that the vigil was called Nutcrack Night. The Vicar of Wakefield and his neighbours, it will be remembered, religiously cracked nuts on All-Hallows Eve.

The wood of the Hazel is a whitish red, close and even in grain, soft, highly elastic and easily split, and has been used in turnery, whilst well-veined veneers are obtained from the larger roots. Under the microscope it exhibits some very broad pith-rays, radial lines of small vessels and nearly circular annual rings. The tree is mainly grown, however, as coppice, its shoots being useful for hampers, for "corf" rods (*i.e.* for baskets used in

Durham coal-pits, known as "corves"), for hoops, wattles, walking-sticks, fishing-rods, whip-handles, etc. Rustic seats and baskets for gardens made of Hazel-rods, varnished with the bark on, are found to be very durable. This coppice also makes good oven-wood, and its charcoal is suited for crayons or for gunpowder.

It is for its fruit, however, that the tree is most valued, and it is on this account that it is largely cultivated in "the Garden of England," round Maidstone. The rows of heavy, dull-leaved, close-growing shrubs cannot be considered ornamental, but in the autumn woods, when

"The scrambling shepherd with his hook,  
'Mong Hazel-boughs of rusty brown,  
That overhang some gulping brook,  
Drags the ripened clusters down,"

the Hazel gains the charm of association with the careless joys of our boyhood.

"The scrambling shepherd" will, however, often find, in lieu of the nut he seeks, that chariot of Queen Mab—

"An empty Hazel-nut  
Made by the joiner-squirrel or old grub,  
Time out of mind the fairies' coach-makers."

The grub in question is the Weevil (*Balaninus nucum*), a tawny-brown beetle that may be seen creeping along the boughs or flying round the nut-bushes in the early summer.



SERVICE-TREE.



## THE SERVICE-TREE.

*Pyrus torminalis* Ehrh.

IN addition to the Apples and Pears and the Medlar the genus *Pyrus* comprises some ten kinds of British trees. To all of these the name Service-tree may be applied, since they constitute the sub-genus *Sorbus*, and the name "Service," which might be supposed to be in some way connected with the Latin *cerevisia*, beer, is merely a corruption of *Sorbus*. Virgil uses the word *sorbum* for a fruit, and Pliny mentions four kinds of tree under the name *Sorbus*, all of which are probably members of the group as now recognised by botanists. The characters of the sub-genus are that the fruit is small, often having less than five chambers, the styles being accordingly from two to five in number, that the core is brittle, and that the flowers are small, white, and in branching, but flat-topped or "corymbose," clusters. The leaves may be simple, but are generally either deeply notched or pinnately compound.

Of the ten British forms which have been described, three only are at all commonly met with, the Wild Service, *P. torminalis* Ehrh., the White Beam, *P. A'ria* Ehrh., and the Rowan, Mountain Ash, or Fowlers' Service-tree, *P. Aucupa'ria* Ehrh., the others being either slight variations, possible hybrids, or trees of very local distribution. *P. rupic'ola* Syme is closely allied to the White Beam, as

also is *P. rotundifolia* Bechst. and presumably the variety described by Mr. N. E. Brown under the name *decipiens*. *P. minima* Ley, from Brecon, and *P. intermedia* Ehrh., from Arran, Wales and the West of England, may also be classed with *P. Aria* taken in a comprehensive sense. *P. fen'nica* Bab. may be a hybrid between the last-mentioned and the Mountain Ash; and *P. pinnatifida* Ehrh., chiefly known in cultivation, is also possibly the result of the crossing of some form of White Beam with the Rowan. We may, therefore, defer the consideration of these. *P. domestica* Ehrh., the True Service-tree, is a very distinct species; but, though common on the Continent, has no claim to rank as British. It was long represented by a single tree, and that probably introduced, in Wyre Forest, near Bewdley, in Worcestershire. The Wild Service-tree (*P. torminalis* Ehrh.) also occurs in the same locality, and both trees seem to be known there as "Whitty Pear," a name more appropriate to *P. domestica*, seeing that it only has a whitish under-surface to its leaves and a truly pear-shaped fruit. An attempt has been made to derive the name from the Old English word "witten," to know, meaning the wise tree, as there was formerly a belief in these trees and in the Rowan as protections against witches. The hard little fruits were hung up for this purpose in houses; but in Worcestershire the Rowan was distinguished as the Witchen tree and considered the less efficacious of the two.

The true Service-tree, known in France as *cormier*, grows from twenty to sixty feet high, and, contrary to statements which have been made, is



not slower in growth than most species of the genus *Pyrus*. Its shoots are smooth and gummy, its leaves are pinnate, like those of the Rowan, but larger and with more sharply serrate leaflets, which, however, are free from all serration along the basal third of their margins. There are from eleven to nineteen of these leaflets and they are downy beneath when young, but become smooth and paler later on. The individual blossoms are as large as those of the Hawthorn, and cream-coloured, and have always five styles. Of the fruit there are two forms, pear-shaped (var. *pyriformis*), the more common, and apple-shaped (var. *maliformis*). In France this species lives to a great age—perhaps upwards of a thousand years; its wood is harder and heavier than that of any other native tree. It is a reddish fawn colour, slightly veined, fine-grained, and susceptible of a high polish; but is chiefly in request for the teeth of mill-wheels, the screws of presses, mathematical rulers, turnery and coarse engraving. The fruit, which is known as “cormes” and is sometimes upwards of an inch long, is reddish, and is spotted with brown cork-warts, from which the English names “Chequers” and “Chess-apples” are applied to its allied species, *P. torminalis* and *P. Aria*. When unripe, this fruit is extremely austere, producing a very painful and lasting irritation in the throat; but, after it has been exposed to frost or has been kept for some time, it undergoes the fermentative process known as “bletting,” familiar in the case of the allied Medlar. As in this process the fruit not only becomes soft and eatable but also turns to a brown colour, it has been mistakenly supposed to be rotten.

The Wild Service-tree (*P. torminalis* Ehrh.) occurs somewhat locally in woods and hedgerows in the southern and midland counties of England; but not in Scotland or Ireland. It is slow in growth, and seldom reaches any very considerable size. The bark is smooth and grey, and the twigs are stiff and sub-angular, reddish to purplish-brown in colour, and polished, though dotted with numerous small, pale cork-warts. The buds are blunt, and almost globular, polished and dry, those terminating the twigs being larger than the lateral ones, the scales being few in number, broad, short and green with narrow brown margins.

The leaves, which are "conduplicate" in the bud, are borne on slender stalks about half the length of their blades, and are of a very characteristic form, though, perhaps, sufficiently like those of the Plane to justify the comparison made by such an ancient and uncritical observer as Pliny. The blade is from two and a half to four and a half inches long, ovate-deltoid in general outline, very slightly heart-shaped at the base, and divided into seven, or sometimes five, triangular lobes. The lobing extends from a third to a half of the distance from the periphery to the midrib, and the lobes and their veins—the secondary ribs of the leaf as a whole—are arranged pinnately, though the basal secondary ribs, and consequently the basal pair of lobes, diverge at a larger angle from the main rachis than the rest, thus giving the leaf a pseudo-palmate appearance. The lobes are sharply pointed, and the margins are irregularly serrate. The leaf-blade is firm and green on both



FLOWERS, FRUIT, AND LEAVES OF SERVICE-TREE.



surfaces when fully developed, and its upper surface is then shining, the network of finer veins being distinctly visible; but, when young, the leaves are downy, the under-surface being then bluish or grey. In autumn the leaves turn to a yellowish-brown.

The flowers appear, in April or May, in large flat clusters with downy stalks, and are individually about half an inch across. They are thus rather larger than those of the Mountain Ash, and they also gain in beauty by the greater looseness of their grouping in the often-branched corymbs which they form. Their styles vary in number from two to five, and are smooth, whilst the number of chambers in the fruit, of course, corresponds. The fruit itself is about a third of an inch across, or a little larger than a Hawthorn berry. It may be pear-shaped or more globose, but is generally somewhat oval. It is green, much dotted or chequered with brown, and is at first very hard and dry, but when "bletted" by frost is agreeably acid and wholesome. Ray even expressed a preference for them over those of the True Service (*P. domestica*). In some country markets these "chequer-berries" are regularly sold in November. Half a century ago Dr. Bromfield, indeed, recorded that they were offered for sale at Ryde, in the Isle of Wight, as "Sorbus-berries." Aubrey, in his "Natural History of Wiltshire," writes: "Dr. Gale tells me that *Sorbiodunum*, now Old Sarum, has its denomination from *sorbes*, but the ground below the castle is all turned to arable"; and many other references suggest that this tree was once far more frequent, before our primeval woodlands had given way on the one hand

to agriculture and on the other to plantations of more valuable timber.

In the woodlands of Kent, Sussex, and even Middlesex, this species forms a small standard tree; but on the rugged precipitous limestone cliffs that overhang the "sylvan Wye," as at the Great Doward, the Windeliff or the romantic heights of Lancant, opposite Percefield, amid grotesque Yews and gnarled Beeches, it is but a small bush. One of the most remarkable examples of the species, however, is in the south-west of England—in Warleigh Wood, near the mouth of the River Tavy. This tree is between thirty and forty feet high, and has its bole clear of branches for about six feet from the ground and four feet in girth at its base.

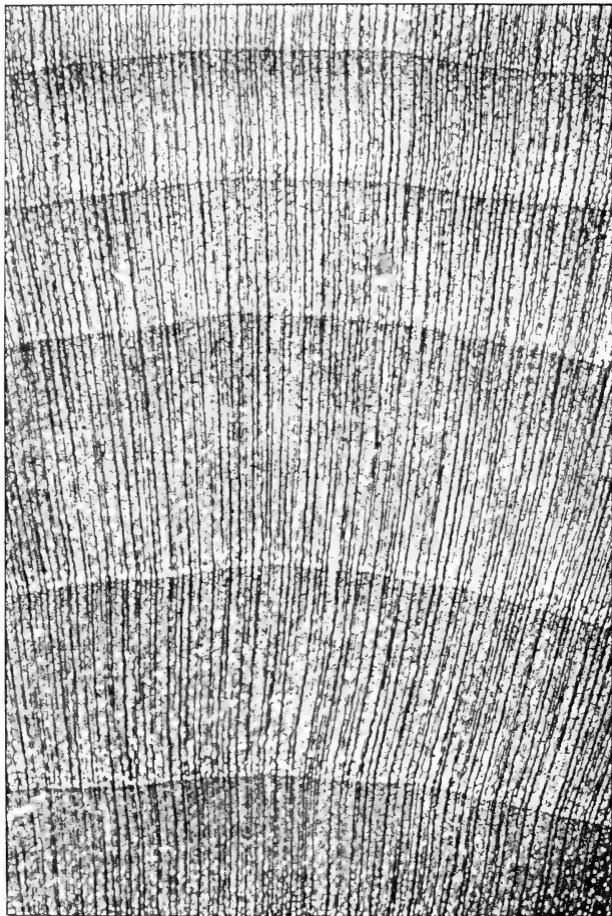
The wood of the Service is hard and tough. Under the microscope it exhibits its small vessels slightly more crowded towards the inner margin of each annual ring, but also distributed throughout the whole radius of the ring, almost in single rows between every two of the fine but distinct pith-rays. At Edenbridge, in Kent, where it is termed Chequer-wood, it used to be preferred to all other woods for flails; but hand-threshing of corn is now rarely seen.

Some of the other local names recorded for this species, such as "shir" in Surrey and "lezzory" or "lizzory" in the Cotswolds, are difficult to explain; but the name "Maple Service" seems to be merely a somewhat unhappy book-name, derived from some resemblance in the lobing of the leaf to some kind of Maple.



*Photo : H. Irving, Horley.*

SERVICE-TREE.



TRANSVERSE SECTION OF SERVICE-TREE WOOD ('X 10 DIAMETERS').



Gerard, in his "Herball," in 1597, speaks of *Sorbus torminalis* as growing in Kent "aboute Southfleete and Gravesend," and also of many small trees in a little wood a mile beyond Islington; and he had the species in cultivation in his garden in Holborn a year before this. Thomas Johnson enumerates it among the plants of Hampstead Heath in his "Ericetum Hamstedianum" in 1629; whilst eleven years later we find John Parkinson treating of it in his "Theatrum Botanicum," and very rightly placing *Sorbus* between the "Wild Ash or Quicken tree" (*Pyrus Aucuparia*) and the Medlars. The passage is too long to quote, but it suggests that, unlike their predecessors of a century or two earlier, the seventeenth-century botanists, of whom Parkinson is an excellent example, were no mere book-worms, mere jugglers with the words of Theophrastus and Dioscorides, but were constantly comparing the descriptions of earlier writers with the plants themselves. Though the relative value of characters in tracing the affinity of plants had not then been grasped, though they were ignorant of the physiology of pollination, and had not learnt how the vegetative organs especially are apt to be transformed in adaptation to their immediate environment, it is clear that they were keen and careful observers. If their language lacks the brevity of a technical terminology, it is not wanting in fundamental clearness; and even the simplicity of the binominal system of nomenclature commonly ascribed to Linnaeus was to a considerable extent in use among them. They studied plants in a wild state, and in their own

physic gardens, rather than in herbaria; and if the prominent place given to "the vertues" in their descriptions ranks them among students of applied botany rather than of pure science, it does not seem to have blinded them to the importance of anatomical investigation.

Botanists seem to have been generally at a loss for an apt comparison for the leaves of *P. terminalis*. We have already quoted the difference of opinion as to Pliny's reference to the Plane, and have alluded to the modern name "Maple Service." Caspar Bauhin, who classes the tree in the genus *Mespilus* (with the Medlars, that is), calls it *Mespilus Api folio sylvestris non spinosa*, or Thornless Wild Parsley-leaved Medlar; and Ray compares the leaves to those of the Water Elder or Wild Guelder-rose, adding the qualification, "*pedis anserini forma*" (shaped like the foot of a goose).

Without trying to match it among other plants, we may recognise that the form, the lightness, and the early autumnal colouring of the leaf give to the Wild Service-tree whatever claim it has on the score of beauty to a place in our shrubberies. The fresh green turns to light golden brown, and this, mingled with green, as yet unchanged, and patches of purer gold, is by no means a despicable contribution to the glories of autumn.



MEDLAR



## THE MEDLAR.

*Mes'pilus german'ica* L.

MODERN criticism unfortunately disproves Chaucer's authorship of that dainty little poem, "The Flower and the Leaf," which Professor Skeat attributes to a lady writer of the fifteenth century; so that the pretty little verse on a Medlar tree, which occurs in it, cannot now be assigned to the "well of English undefiled."

"And as I stood and cast aside mine eie  
I was ware of the fairest Medler tre  
That ever yet in all my life I sie,  
As ful of blossomes as it mighte be ;  
Therein a goldfinch leaping pretile  
Fro bough to bough ; and, as him list, he cet  
Of buddes here and there, and floures sweete."

We have, however, a mention of the fruit in Ælfric's vocabulary of the tenth century; and another Chaucerian reference, in the Reeve's Tale, shows that the father of English poetry was acquainted with it and its most striking characteristic, for he makes the elderly reeve compare old men to Medlars in a phrase which may have been in Shakespeare's mind when writing *As You Like It* :

"Till we be roten, can we not be rype."

In days when there was no foreign import trade in fresh fruit, such references, especially when they cannot be traced to any reminiscences of the Latin

poets, tell in favour of personal knowledge on the part of the writer.

After centuries of cultivation, it is extremely difficult to speak with any confidence as to the truly indigenous character of any plant from its present mode of occurrence. Buildings and gardens may have existed on spots where their former presence would not now be suspected: the non-human methods of seed-dispersal, the wind, the fleeces in which burrs become entangled, squirrels, dornice, and fruit-eating birds, have been in operation year by year, until we may almost imagine the seed of every species in the country to have had an opportunity of sprouting on every inch of our land. Woods, too, have been so artificialised by felling, clearing, and replanting, that we can hardly consider any of them much more truly primeval than our hedgerows; and plants once cultivated may have had time in the lapse of centuries even to degenerate to a more primitive wild type. If, however, we find a species, which is not likely ever to have been planted in woodlands, uniformly distributed over a wide area, growing in the heart of forests and woods of mixed species, and always presenting marked characteristics unlike its cultivated representative, there is some considerable *a priori* probability of its being wild. Judged by this test, we have little hesitation in considering the Medlar indigenous in northern France; but we are far less confident as to its having any claim to be so classed on this side of the Channel, unless, perhaps, in the extreme south of our island.

The name *Mespilus*, or rather its Greek original *Mespilon*, dates from Theophrastus, and it seems to

be admitted that the tree is wild in Asia Minor and Persia, if not also in Greece on the one side and in China on the other.

Such high authorities as Nyman and Sir Joseph Hooker doubt its being truly wild elsewhere; and Pliny, it must be admitted, says that the Medlar was unknown in Italy in Cato's time. He is, however, undoubtedly speaking of the cultivated fruit-tree. Fée considers the Medlar native in northern central Europe, and French botanists generally express no doubt as to its being truly wild in their own land. We have ourselves repeatedly found it in a very spinous, small-leaved, bushy form in dense thickets and extremely wild-seeming woods in Normandy. The late Professor Babington, in 1839, writes of it as "truly wild" in Jersey, where it still exists.

That the tree has been known, probably in a cultivated form, in northern Europe, from the earliest times of civilisation in that area, is clear from the changes which its name has gone through from the original Latin. Whilst the Italian *Mespoli* and the Dutch *Mespeboom* indicate the minimum of change, the German has become *Mispel*, *Mespe*, and *Nespebaum*, the Spanish *Nispero*, and the French has been modified from *Mesplier* and *Meflier* to *Néflier*. As the English name Medlar does not seem even to occur as early as the time of Chaucer, it would seem to be rather of old French than of German origin, and may indicate the Norman introduction of the cultivated tree. William Turner just enumerates "Mespilus, a Medlor tre," in his "Libellus de re herbaria," in 1538; but is more precise in his "Names of Herbes," ten

years later, "Mespilus," he says, "called in greeke mespile, is of two sortes, the one hath three stones in the fruite, and that kynde is not wyth us. The other kynde hath in the fruite, fyve stones, and thys kynde is commune in Englande, and it is called in englishe a Medler tree." This obviously does not amount to any reference to the tree in a wild state.

When, in his "Herball," in 1597, Gerard mentions its occurrence, "often-times in hedges among briars and brambles," it is clear from his use of the name "Mespylus sativus" that he is speaking of the cultivated tree, or, as Parkinson calls it, "the great manured Medler," in an escaped condition, for in the earlier writers *sativus* is always used in this strict sense, as opposed to *sylvestris* for sylvan, or wild forms.

It is interesting to remember that it was just when Gerard was writing his "Herball" that Shakespeare was writing *Romeo and Juliet*, the first of his plays to contain any reference to the Medlar, whilst *Richard II.*, which contains so wonderful an epitome of the whole art of gardening, was printed in the very same year as Gerard's *magnum opus*. As, owing to its hard core, the seed of the Medlar takes about two years to sprout, the tree is at the present day commonly grafted upon a Pear stock; and we may almost believe that the myriad-minded Shakespeare was aware of such a practice when in *As You Like It* he makes Rosalind say to Touchstone, "I'll graff it with you, and then I shall graff it with a Medlar: then it will be the earliest fruit i' the country; for you'll be rotten ere you be half ripe, and that's the right virtue of the Medlar."





FLOWERS, FRUIT, AND LEAVES OF MEDLAR.



Within a few years of Shakespeare's time it was certainly the practice to graft the Medlar upon a Hawthorn stock, for Cowley writes of man that

“He does the savage Hawthorn teach  
To bear the Medlar and the Pear;  
He bids the rustic Plum to rear  
A noble trunk and be a Peach.”

Shakespeare was, as we have seen, following Chaucer and many others of his predecessors and contemporaries in speaking of the “bletting” of the Medlar as rotting. Green fruit, when growing, behaves physiologically like leaves, taking in considerable quantities of carbon-dioxide from the air, and giving off oxygen; but when growth ceases and ripening begins this is reversed. Carbon-dioxide and water are given off, oxygen is taken in, the temperature rises, tannin and acids are formed; and there may be some softening of texture. At this stage many fruits are eatable, and are considered ripe; for, as in the eating of freshly killed or “hung” meat, fish, or game, there is undoubtedly a certain amount of conventional taste or fashion as to the exact stage at which each kind of fruit is best fitted to be eaten. The Japanese, for instance, always eat peaches in a condition that we should consider unripe, and think those that we call ripe to be rotten. At a subsequent stage more oxygen is absorbed, and first the astringent tannin and afterwards the malic, citric, tartaric, and other fruit acids disappear, whilst the proportion of sugar increases. Further softening occurs at this stage, and there may be a change of colour, both internally and externally. This is “bletting,” and it is, no doubt, mainly because the change of the pale greenish or

yellowish tints of the flesh of a fruit to brown is a general concomitant of decay, that a bletted Medlar has been thought to be rotting. Soon after bletting, the sugar of the fruit begins to oxidise, and then it is that true decay has set in.

Parkinson, in his "Theatrum Botanicum" (1640), gives woodcuts of the three forms in which the leaves of the cultivated Medlar are represented as narrower and blunter than they are, and there is no adequate representation of the strong thorns terminating the branches which are so distinctive of the wild form.

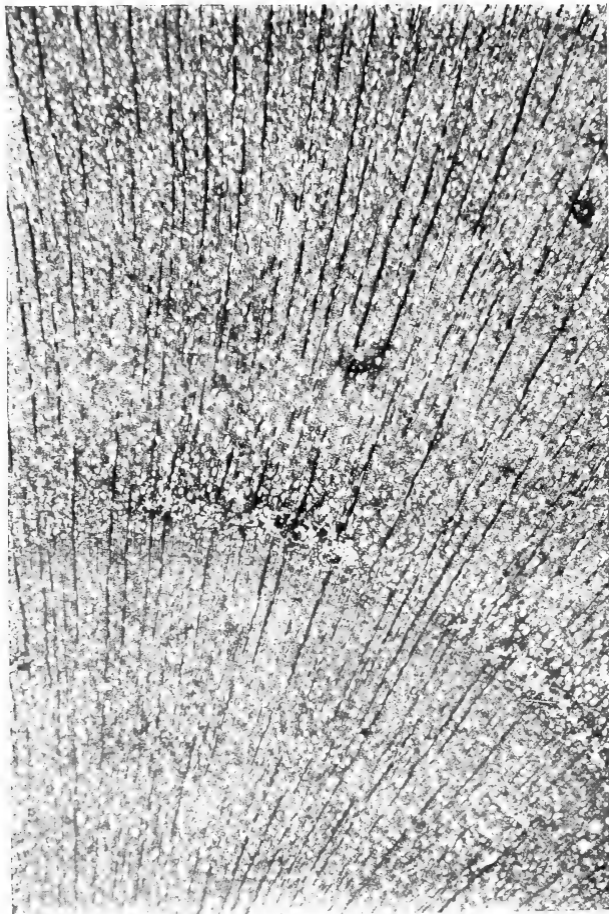
It is noteworthy that Caspar Bauhin in his "Pinax" (1623) speaks of the wild form under the name *Mespilus Germanica folio laurino non serrato, sive Mespilus sylvestris*"; and that when, in 1666, Christopher Merrett, in his "Pinax rerum naturalium Britannicarum," first mentioned any precise English localities for the Medlar, he did so under the name *Mespilus sylvestris spinosa*. His localities were "in the Hedges betwixt Hampsted-heath and Highgate, and in a Holt of Trees three Miles Westward from Crediton in Devonshire." Of these, the first has never been confirmed; but the late Rev. T. R. Archer Briggs recorded the spinous shrubby form as "possibly native" at several spots in east Cornwall and south-west Devon.

In his "Synopsis stirpium Britannicarum," John Ray (1690) ignored most of Merrett's records as untrustworthy; and the only locality he gives for the Medlar is "in all the Hedges about Minchiville; Mr. Du Bois." Charles Du Bois was probably a trustworthy observer, and on the strength of this record,



*Photo : F. Merson Good, Winchfield.*

**OLD MEDLAR TREE.**



TRANSVERSE SECTION OF MEDLAR WOOD (X 30 DIAMETERS).

which refers to Minshull in Cheshire, the Medlar has been constantly since quoted as wild in that county. It finds no mention, however, in the careful posthumous "Flora of Cheshire" by the late Lord de Tabley.

When, in 1828, Sir James Edward Smith published his "English Flora," he seems to have had no suspicion that the Medlar was not wild in this country. He speaks of it as "thorny in a wild state," quotes the Rev. J. Davies as having found it "about Ashburnham, Sussex, truly wild," and adds, "The thorns disappear by culture, and are not to be seen in gardens, though I have noticed them on foreign wild specimens, and my late friend, Mr. Davies, of Trinity College, Cambridge, observed them in Sussex. See also the wooden cuts of old authors." We venture to surmise, however, that this statement about thorns disappearing on cultivation is pure theory so far as Sir J. E. Smith is concerned; and we very much doubt whether anyone in modern times has subjected it to the test of experiment. The occurrence of the spinous variety in Sussex, Surrey (where it was recorded many years ago), and Devon may, perhaps, therefore, suggest that the bush is as truly wild in the south of England as in the north of France. It has not, like the Crab-apple, been carefully preserved in our ancient deer-forests, and is now certainly rare. On the other hand, it must be admitted that all hedge-row localities are suspicious, and that birds and, perhaps even more probably, squirrels may have contributed to its dissemination from gardens.

It is more as an ornamental than as a fruit-bearing tree that the Medlar is valued in our gardens to-day.

Its heavy foliage and close zigzag branching render it an excellent shade tree for the lawn, and its late white blossoms, each an inch and a half across, relieved by the five long points of the sepals, on their appearance in June and July redeem it from the charge of monotony. It is, however, in the autumn colouring of its foliage that the Medlar has more claim to beauty. The large, soft, lance-shaped leaves then present endless contrasts of green, yellow, orange, russet and red. Nearly all these colours may, indeed, be found on a single leaf, one as spots upon another, and among them appears a vivid but deep red, more rather as blood than as flame; though in sunshine it may truly be said—

“The drooping Medlar’s dusky shade,  
From summer’s suns a glad retreat,  
Lights up with crimson fire the glade,  
And warms the fleeting autumn’s feet.”

Some of the finest old Medlar trees in England are to be seen at Syon House, Ham House, and in various old gardens about Twickenham—trees upwards of thirty feet high and with heads nearly forty feet in diameter.





YEW.



## THE YEW.

*Taxus baccata* · L.

FOR botanist, artist, poet, or moralist, few trees have so unique an interest as the Yew. Its very name is mysterious in its simple brevity, and has been traced back to the sacred word יהוה, Jehovah, the Immortal. In Latin and Portuguese, *iva*; in Old German, *Iwa*; in Welsh, *yw*; in Anglo-Saxon, *ew*; in Old English, *iw*, *ew*, *ewe*, *eugh*, and *uhe*; in French, *if*; in Swedish, *id*; and in modern German, *Eibe*, “we find,” says Dr. Prior, “the Yew so inextricably mixed up with the Ivy that, dissimilar as are the two trees, there can be no doubt that these names are in their origin identical.”

In the discussions as to the reasons for its frequent presence in our churchyards several facts are commonly overlooked: first, for example, that the species is an indigenous one, and was formerly undoubtedly far more abundant in Britain and other parts of Europe than at present; secondly, that the trees may be older than the churches, and even than Christianity itself; and thirdly, that in most cases the venerable Yew is on the south or south-west side of the church.

Its hard, durable, reddish wood presents characters that enable us readily to recognise it in the peat-beds of prehistoric times. In the bogs of Ireland, Scotland, and Cumberland, in the

Cambridgeshire fens and the submerged "moor-logs" at the mouth of the Thames, it is as perfectly preserved as bog-oak, being of a rich brown tint; and under the microscope it exhibits in its woody fibres, as when alive, a unique combination of "bordered pits" and spiral lines. Whilst, moreover, we may often see trees in situations that suggest their having been planted, no one can have visited the groves of Yew in Cranborne Chase, or the Hampshire Downs, or the basaltic hill of Arely, in Staffordshire, or have noticed its sporadic occurrence round Coulsdon in Surrey, or Tunbridge Wells, without being convinced of its truly indigenous character. It is curious to follow with the eye a line of sombre Yews winding along the downs in Surrey or Kent, marking the so-called Pilgrims' Way—a road which leads not only to many a quaint, little sequestered Norman church, with perchance an exceptionally venerable Yew shadowing its silent graves, but also to many a far more ancient earthwork.

The wood of the Yew, which, from being susceptible of a high polish, used to be much valued in cabinet-work, is not, as is often thought, exceptionally slow in forming. The contrary opinion has been formed from a consideration of the slowly-increasing girth of those large trunks of aged Yews which are so disproportionately large, as compared with the extent of bough and leafage, that the formation upon them of the very thinnest growth of wood represents really a very fair total cubic amount. Unlike that of other Conifers, the wood of the Yew contains no resin.

From the measurement of the layers of annual growth in many Yews, De Candolle concluded that it was within the mark to reckon their increase in diameter at a line a year throughout their life, and it was from such measurements that he concluded that such trees as sometimes occur with a girth of twenty-seven feet, or more, may even have passed the age of two thousand years. An exaggerated estimate may, however, be formed of the age of a Yew tree from the fact that vertical branches given off near the base of the stem are apt to become enclosed within the bark, and so add considerably to the girth.

As an evergreen, overshadowing the crops, the Yew would do more harm than larger and perhaps more valuable deciduous trees, and the herdsman must soon have discovered that it was frequently fatal to his cattle, so that it is not to be wondered at that the species should have become less abundant in our hedgerows than it once was. Bearing the staminate and pistillate flowers on different trees, one individual would moreover, if solitary, be unable to reproduce itself by means of seed.

There were, however, many cogent reasons why some specimens of the tree should be preserved. Ages before Christianity had invested the gloomy evergreen with a glamour of superstitious veneration, the fancies of the uneducated had, no doubt, surrounded it with a halo of poetic romance; but we have no positive evidence connecting it with Druidical worship. It is not improbable, however, that its green boughs, "renewing their eternal youth," may have been connected with the spring festival of

Eostre, which the Christian Church was able to sanctify and adopt, as it adopted also the winter use of the Holly, which lent itself yet more readily to Christian symbolism; whilst it was unable to do the same for the Mistletoe, which social progress has gradually stripped of all its impropriety, and of nearly all its significance. As the pagan nations of antiquity in South Europe took the Cypress as a symbol of immortality, so the Yew may well have been adopted in the North; and certain it is that while the Holly lingers round ancient British earthworks, and has long effected its entrance into our churches, it does not occur in our churchyards. Even the additional argument that Yew twigs were used to sprinkle the holy water in the "Asperges" before mass will hardly be a sufficient answer to this objection.

Herrick's verses for Candlemas Eve are, however, worth reproduction in this connection:—

"Down with the Rosemary and Bayes;  
Down with the Mistleto;  
Instead of Holly, now upraise  
The greener Box for show.

"The Holly hitherto did sway,  
Let Box now domineere  
Until the dancing Easter Day,  
Or Easter's Eve appeare.

"Then youthful Box, which now hath grace  
Your houses to renew,  
Grown old, surrender must his place  
Unto the crisped Yew.

"When Yew is out, then Birch comes in,  
And many flowers beside;  
Both of a fresh and fragrant kinne,  
To honour Whitsontide."



FLOWERS, SEED, AND LEAVES OF YEW.





It is not only for Easter decorations that Yew boughs are utilised by the Church; for, out of the lands of Palms and Olives, the Catholic Church has to make shift with Willow and Yew on Palm Sunday, so that the latter tree has in many districts acquired the name of "Palm," though Willows are more generally so called. That staunch Protestant, William Turner, need not have opened, as he does, the vials of his wrath upon the Popish priests for this custom as a deception, since the prayers in the mass for the day expressly add the words, "and other trees," after mentioning Palm and Olive. In the Churchwarden's Accounts for Woodbury, Devon, in 1775, it is recorded that "a Yew or Palm tree was planted in the churchyard, ye south side of the church, in the same place where one was blown down by the wind a few days ago, this 25th of November."

The Yew was also used in funerals—a custom alluded to by Shakespeare in *Twelfth Night*, in the line—

"My shroud of white, stuck all with Yew";

and Sir Thomas Browne suggested that sprigs so used have taken root and grown into our churchyard trees. Again, in some parts of the country corpses were rubbed with an infusion of Yew leaves to preserve them.

Perhaps the best evidence, *faute de mieux*, to connect the Yew with Druidic times is the fact that it is particularly abundant in the churchyards of Wales and the West of England. In the churchyard at Maunhilad there are, for instance, twelve or thirteen

trees, one of which has a girth of more than thirty feet.

Man is apt in all ages to be utilitarian, and if the shade of the "dismal Yew" had once been a rendezvous for the clan where the Druid, as chief medicine-man, dispensed justice and wisdom, it was, no doubt, soon found desirable that the material for the chief weapons of the day should be enclosed, that it might not be browsed, with results possibly fatal, by the cattle. It is probably to this use of it for making bows that the tree owes its Latin name of *Taxus*. Thus, in his earliest botanical work, "Libellus de re herbaria" (1538), William Turner writes: "*Taxus* an, uhe tre *unde hodie apud nos fiunt arcus*"; and the poet Spenser, in 1590, speaks of it as—

"The engh, obedient to the bender's will."

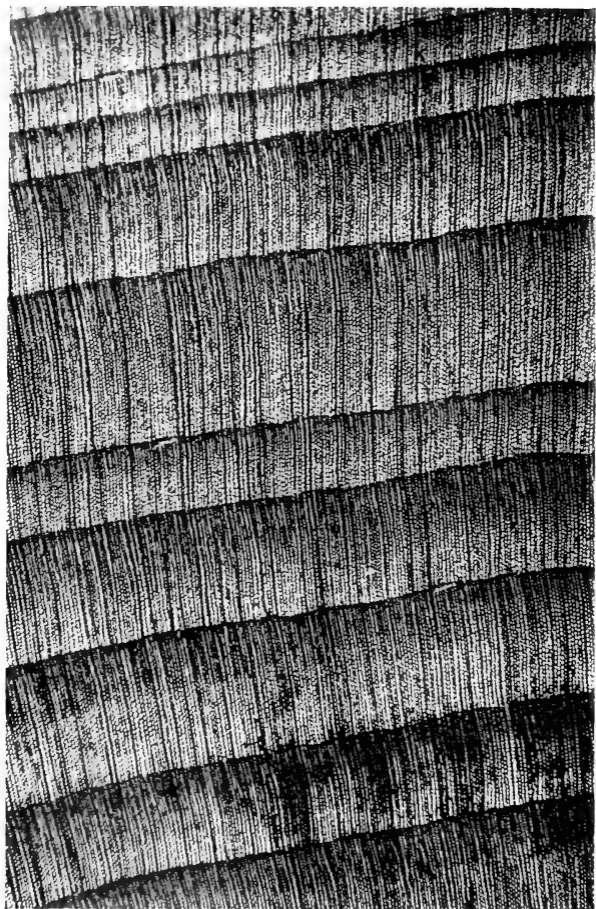
It was to bows of Yew that we mainly owed the victories of Crecy and Poitiers; and Edward IV. enacted that every Englishman should have a bow of his own height. English Yew-wood, however, for this purpose, only fetched one-third the price of that which was imported.

The position of the Yew to the south, or more strictly south-west, of the church, must probably be accounted for by some such belief as that referred to by Robert Turner, in his "Botanologia" (1664), as follows:

"The Yew is hot and dry, having such attraction that if planted near a place subject to poisonous vapours, its very branches will draw and imbibe them. For this reason it was planted in churchyards, and commonly on the west side, which was at one time considered full of putrefaction and gross oleaginous gasses exhaled



*Photo : H. Irving, Horley.*



TRANSVERSE SECTION OF WOOD OF YEW 'X 30 DIAMETERS'.

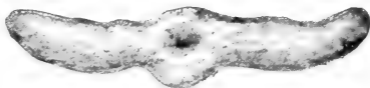
from the graves by the setting sun. These gasses, or will-o'-the-wisps, divers have seen, and believed them dead bodies walking abroad. Wheresoever it grows it is both dangerous and deadly to man and beast; the very lying under its branches has been found hurtful, yet the growing of it in churchyards is useful."

This belief in the fatal effect of even sleeping under the boughs of the Yew dates back from Galen and Dioscorides; whilst Cæsar records the death of Catibulus, king of the Eburones, from drinking its juice. Gerard, however, in his "Herball" (1579), rashly denies all this, saying, "All which I boldly affirm as untrue, because I have eaten my full of the berries, and slept in the branches, not once, but oft, without hurt."

The facts would seem to be that the seeds themselves are poisonous, but the fleshy pink cup, or "aril," as the botanists term it, of which children are so fond, is harmless. As to the boughs and leaves, it appears that cattle can be gradually accustomed to them when mixed with other food; but that, either when green or when cut and half withered, they have been repeatedly fatal to horses, oxen, sheep, and deer. Gilbert White was probably right when he said that it was "either from wantonness when full or from hunger when empty" that the Yew is eaten by them with fatal consequences. Though the leaves are believed to act as a vermifuge, they are likely to be equally fatal to children, the poison acting either on the cerebro-spinal nerves or directly on the heart.

The topiarian art in many an old farmhouse garden shows the Yew, patient under the shears,

tortured into peacocks, pyramids, teapots, and other unnatural shapes. Certainly it is a tree which in its varied surroundings reflects many aspects of our history, religion, and social life.



SECTION OF NEEDLE LEAF OF YEW



LINDEN.





## THE LINDEN.

*Tilia europæa* L.

SEVERAL forms of the Linden were lumped together by Linnæus under the scientific name *Tilia europæa*. Though these have been so extensively planted in England during the last two centuries as to be familiar to most people, only two of them, the Small-leaved Linden, *T. cordata* Mill., and the Large-leaved Linden, *T. platyphyllos* Scop., have any claim to be truly indigenous. The latter is confined to rocky woods in West Yorkshire, Radnorshire, and Herefordshire.

The genus, being confined to Northern Asia, America, and parts of Europe, would probably not have been known to the primitive Aryan race in their ancestral home in the uplands of Central Asia, so that their descendants have no common name for it. It was the *Philyra* of the Greeks, whilst the Romans named it *Tilia*; and the Teuton, perhaps aware of the tough "bast," or inner bark, reminding him of the "lin," or "lint"—*i.e.* the Flax (*Linum*)—named it also "linta," "linde," or "lind." Of these three names, the first is Old German, and the second is Modern, whilst the third is common to Early English, Swedish, and Icelandic. The modern name, Lime, is merely a corruption of Line, and belongs properly to the Sweet Lime, a species of *Citrus*, closely related to the Lemon.

To the ancients the Lindens seem to have appealed rather by their utility than by their beauty. It is doubtful whether Aristophanes, in the allusion to the tree in his "Birds," is merely speaking of a rival poet as being light as Linden-wood, or is accusing him more specifically of wearing an effeminate article of dress, strengthened in those days by laths of Linden-wood in place of the whalebone of modern times. Pliny, too, alludes to the lightness of the wood, as well as to the use of the inner bark for paper, when it was known as *liber* (so becoming extended to books, and giving us the word "library"), and also for tying garlands; whilst Virgil, in the words ("Georgics," Book i.)

"Cæditur et tilia ante jugo levis,"

("A light Linden-tree also is felled betimes for the yoke") is referring to the use of its wood in the making of the plough.

Botanists must ever look with reverence upon this tree; for whether or not a meadow encircled by a hedgerow of Lindens gave the family name to our own great botanist, Lindley, it is tolerably certain that one of these trees growing near the home of his ancestors furnished a cognomen to a far greater than Lindley—the immortal Carl von Linné, better known as Linnæus.

Apart from any associations, however, the Lindens are sufficiently beautiful and sufficiently useful to command attention. They are straight-stemmed trees, with smooth bark, either round-topped or, when more perfectly developed, draped in equal

drooping boughs from the ground to their summits eighty or ninety feet in height, so as to present a grand columnar aspect. Then, as the poet says—

“All about the large Lime feathers low—  
The Lime, a summer home of murmurous wings.”

They may reach five, or even nine, feet in diameter, the latter being the size of the famous tree that gave the town of Neustadt, in Würtemberg, the name of “Neustadt an der grossen Linden.” At Harste, near Göttingen, a tree known as the old Linden in 1425, measured  $27\frac{1}{2}$  feet in circumference in 1871. The delicate leaves are lop-sided, heart-shaped, and gracefully toothed along their margins; the greenish flowers, overflowing with honey and sweetly scented, are borne in stalked clusters of from three to seven on a curious adherent, leaf-like bract which becomes of a buff tint; and the fruits that succeed them are small spherical capsules, which but rarely, however, ripen in England.

Of the various forms, the Small-leaved Linden (*Tilia cordata* Mill.) occurs in our woods from Yorkshire southwards, and is also wild in Siberia and throughout Europe, with the exception of Turkey and Greece. It has smooth, yellowish-brown twigs; its smooth leaves are seldom more than two and a half inches across, and are smooth on their under surfaces, with the exception of tufts of yellowish hair at the forks of the veins; and the capsule is faintly marked with ribs when ripe. The Intermediate Linden (*T. intermedia* DC.), which is the one most largely planted, occurs over the same area as the last,

with the exception of the more northern parts. Its fruit is unribbed and downy, and its leaves are rather larger than those of *T. cordata*. The Large-leaved Linden (*T. platyphyllos* Scop.) has downy twigs, five prominent ribs upon its fruit, and leaves often more than four inches across. Along with its variety, the Coral Linden (*T. ru'bra* Stev.), which differs only in having reddish-brown bark to the young branches and smooth fruit, the Large-leaved Linden is only wild in Europe south of Denmark.

Though, owing to their retaining their leaves later into the autumn, some American species are recommended as preferable to the above for avenues—the great ornamental use of the Linden—it cannot be denied that our European forms have a choice beauty of their own. In early spring the red-tinted twigs, like branching coral, bear buds which throw off scales, or “stipules,” blushing pink and white, only to reveal the first delicate gloss of the tender leaf. The leaves then hang vertically downwards, and the older ones are so folded over the younger as in every way to protect them as far as possible from the nipping effects of excessive radiation in our frosty May nights. It is said, moreover, to be the mode of their arrangement in the buds that produces, as it were mechanically, the graceful one-sidedness in the outline of their base which is not uncommon amongst forest trees. The leaves are also at this season more gracefully tapered at the apex than later, when they increase in breadth; and the charm of their pendent position and bright and graceful greenery naturally suggested cheerful-



FLOWERS, FRUIT, AND LEAVES OF LINDEN



ness to Chaucer, when he wrote, in his "Clerke's Tale":—

"Be ay of chere as light as lefe on Linde."

It was, too, at this, the season of its virginal beauty, that Mrs. Browning paid her more explicit tribute to the Linden, of which she wrote:—

"Here a Linden-tree stood, bright'ning  
All adown its silver rind ;  
For, as some trees draw the lightning,  
So this tree, unto my mind,  
Drew to earth the blessed sunshine  
From the sky where it was shrined."

The twigs form a zigzag, the terminal bud being constantly suppressed ; but, lying in one plane and giving off their leaves in a strictly alternate or distichous manner, they form a flat spray. The flat, blunt buds project outwards from the branches, and when the leaves unfold, their outline and veining are well worth attentive study. The tothing of their edges is absent at the base, and the secondary veins given off from the base of the midrib on the larger side of the leaf are so big as to suggest rather a "palmate" than a "pinnate" arrangement. Fine tertiary veins are given off at right angles to the larger ones, so as to form cross-ties between them ; and from these, and from the forking marginal extremities of the larger ones, proceeds a complex polygonal meshwork of still finer or quaternary veins.

In summer the foliage of the Linden becomes duller in tone, as do most leaves, from the dense accumulation of their green colouring matter, or chlorophyll, and of other substances within their

cells. The tree, however, then acquires a new beauty—that of blossom. The curious membranous bracts, of a tint resembling the petals of the Mignonette—a tint which gave to the silk-mercer the name *tilleul* for one of his numerous novelties in aniline—then unfold their inconspicuous flowers. Inconspicuous they may be in their small, regular whorls of greenish organs; but their perfume, and their copious stores of nectar, render them as attractive to the insect world as the most gaily-coloured of blossoms, so that the whole tree hums like a vast hive of bees. The pale-coloured honey made from the Linden blossoms by the busy visitors is of excellent quality.

Autumn brings new grace as the foliage turns to yellow, clear in some years as the green of spring; but, alas, even more fleeting. The avenue which has been so full of green and golden light, and scented so sweetly, soon becomes strewn with fallen leaves, from which the green and gold have faded, as the hopes and happiness of youth fade in the autumn of disappointment.

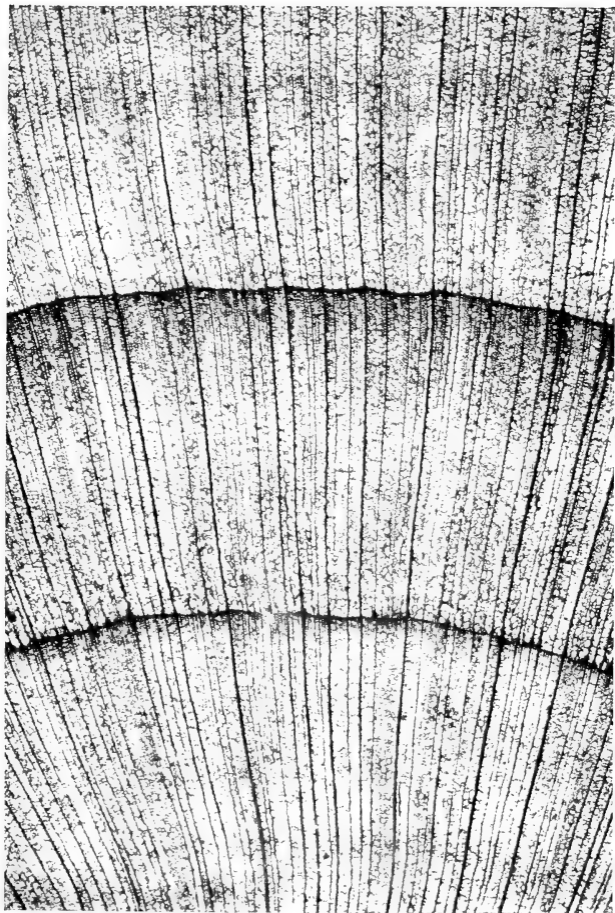
Ray speaks of the Linden as being considerably planted in his time; its culture was advocated by Evelyn, and it was the favourite tree of William III. This monarch's partiality for the species is said to have led to the planting of the fine avenue at Ashted Park, Surrey; and it may also account for the fine Lindens at Bushy Park and at Fulham Palace, whose lovely gardens owe so much to his sturdy supporter, Bishop Compton. The four rows of fine trees, mostly Lindens, which give the name *Unter den Linden* to





*Photo : E. J. Wallis, Kew.*

LINDEN.



TRANSVERSE SECTION OF LINDEN WOOD (X 10 DIAMETERS).

one of the finest streets in Berlin, are of world-wide fame, though not equal to the avenue, a mile and a quarter long, at Herrenhausen, near Hanover, planted in 1726; but one of the most beautiful of Linden avenues is that of Trinity College, Oxford, where the bare boughs in winter form a perfect Gothic arcade, like the roof-timbers of some cathedral aisle. One of the charms of such an avenue is the wreath of "adventitious" or supernumerary shoots that encircles the base of the trunk—a wreath of coral branchlets as they sparkle in the faint sunlight of spring, a wreath of verdure in summer, and a wreath of gold in autumn. There are fine Lindens also at Syon House, Isleworth, and at Ken Wood, Hampstead; but, from its position on the brow of a hill, surrounded by scenery of exquisite loveliness, and from the size of its trees, one of the finest avenues in the world must be that at Dromana, co. Waterford.

The sap of the Linden can be fermented into an agreeable wine; its wood makes a fine charcoal, and is used for musical instruments; while the bark is in Germany used in the manufacture of cordage. Apart, however, from its beauty, the main uses of the Linden are the application of its tough but flexible inner bark to the making of Russia matting, and that of its fine-grained wood to carving. Its value for the latter purpose has been supremely demonstrated by the marvellous work of Grinling Gibbons, whose use of wood makes one think of it as a plastic substance, most of his carving being in this material. Chatsworth, Trinity College, Cambridge, Windsor Castle and the choir of St. Paul's, possess the finest examples of his art.

It seems, however, mean and petty to be thinking of the uses to which its dead body can be put, when one is in the presence of the majestic beauty of a living Linden, rising in its columnar form like some gigantic Norman pillar of verdure from the park or lawn. Were it absolutely useless as timber or for other purposes, were it even destitute of its mellifluous flowers with their delicious perfume, the Linden would yet, for the sake of its form and its foliage alone, deserve to be a favourite tree; and it is fortunate that, though its excessive formation of honey-dew is somewhat of a drawback to its use in gardens, it is fairly able to withstand London smoke, and thus precedes the Planes and Poplars in enlivening our parks and squares. It submits meekly to the pruning-knife, and—*horribile dictu!*—the saw of the suburban gardener, and, as a consequence of this patience, may be seen in too many places butchered into carcasses that even the beautifying and healing hand of Nature in spring can hardly succeed in rendering aught but repulsive.

It is undoubtedly a regrettable circumstance that, as they precede many other trees in unfolding, so too the leaves of the Linden precede those of most other trees in falling, and remind us, as they litter our lawns, of the approach of autumn, when we are only just beginning to realise our too brief and tardy English summer. But at that season we still have our Planes in full verdure; and even Sycamores and Horse-chestnuts, not to mention Oaks and Elms, show no signs as yet of leaving us a mere mass of melancholy boughs.





## THE DOUGLAS FIR.

*Pseudotsu'ga Dougla'sii* Carr.

FEW men assuredly are commemorated by more lasting monuments than the Cherokee Sequoia and the Scottish botanical collector David Douglas. The latter was the son of a working mason at Scone, Perthshire, and was early apprenticed in Lord Mansfield's gardens at Scone Palace. Douglas was subsequently employed in the Glasgow Botanic Gardens, and in 1823, on the recommendation of Sir William Hooker, was sent out to the United States as collector by the Royal Horticultural Society. In the following year he landed at Fort Vancouver on the Columbia River and worked southward, re-discovering the tree which now bears his name in 1826, and bringing it home when, in 1827, he crossed the Rocky Mountains to Hudson's Bay, where he met Franklin, Back, and Richardson returning from their overland Arctic voyage. Sent out again in 1829, he explored California and the Fraser River, and in 1832 and 1833 visited the Sandwich Islands, where in 1834 he met his death. Falling accidentally into one of the pits which the natives were in the habit of digging as traps for wild cattle, he was gored and trampled to death by an infuriated bull.

Many as were the novelties which the ill-fated Douglas introduced into our gardens, the Douglas Fir was not exactly one of them. It had been originally

discovered in 1792, on the shores of Nootka Sound, by Archibald Menzies, another Perthshire man, who accompanied Vancouver in his voyage of circumnavigation. From specimens brought home by Menzies, without cones, Lambert in 1803 described the tree as *Pinus taxifolia*, a name which Poiret, recognising its affinities, altered in the following year to *Abies taxifolia*. David Don, in the 1828 edition of Lambert's work, while retaining the tree under the genus *Pinus*, renamed it in honour of its introducer *P. Douglasii*; and, retaining this specific name, it was referred once more to the genus *Abies* by Dr. Lindley in 1833, to *Picea* by Link in 1841, to his new genus *Tsu'ga* by Carrière in 1855, and to *Pseudotsu'ga*, a genus constituted for it, by the same botanist in 1867. Finally Mr. Kent has proposed to set aside the name *Pseudotsuga* as a barbarous mixture of Greek and Japanese in favour of *Abiétia*.

Writing of the tree in its original home, Professor Newberry says:—

“As it usually grows in its favourite habitat, about the mouth of the Willamette, it forms forests of which the density can hardly be appreciated without being seen. The trees stand relatively as near each other, and the trunks are as tall and slender, as the canes in a canebrake. In this case, the foliage is confined to the tuft at the top of the tree, the trunk forming a cylindrical column as straight as an arrow, and almost without branches for two hundred feet. The amount of timber on an acre of this forest very much exceeds that on a similar area in the tropics, or in any part of the world I have visited.”

This description is borne out by timber of this species now largely shipped from Puget Sound, and



by the well-known flagstaff in Kew Gardens. The wood now comes to market in clean, straight spars, forty to 110 feet in length and nine to thirty-two inches in diameter. These as a rule show no sign of branches, and are singularly free from the knots that mark the loss of them. The flagstaff or spar at Kew was felled in British Columbia, and was presented to Kew in 1861. It is 159 feet long, the tree from which it was made having been 180 feet high, and having about 250 annual rings, averaging eleven rings to each inch of its radius. It tapers from a diameter of twenty-two inches to one of eight inches, and weighs about three tons. British grown specimens on the other hand, twenty-five years old, have averaged only three rings per inch of radius.

The Douglas Fir is the most widely distributed of all American trees, extending over no less than thirty-two degrees of latitude, from  $55^{\circ}$  N. near Lake Tacla in British Columbia to the neighbourhood of San Luis Potosi, in Mexico. It thus possesses a constitution, as Professor Sargent says, that

“enables it to endure the fierce gales and long winters of the north, and the nearly perpetual sunshine of the Mexican Cordilleras, to thrive in the rain and fog which sweep almost continuously along the Pacific coast range, and on the arid mountain slopes of the interior, where for months every year rain never falls.”

It reaches its greatest dimensions, however, in the humid lowlands of southern British Columbia, Vancouver Island, Western Washington, and Oregon, especially round the shores of Puget Sound, and on the western slope of the Sierra Nevada, where there is an abundant rainfall from the Pacific. Here it attains

a height of 300 feet, and a diameter of from six to twelve or, it is stated, even twenty feet. In these plains the stems are free from branches for more than 200 feet from the ground; and their canopy of foliage is so dense overhead as completely to shut out the light of the sun. On the steep slopes of the mountain cañons, on the other hand, trees often stand alone, and are clothed with branches from base to summit. On the Californian Sierras it seldom grows at an altitude of more than 5,000 or 6,000 feet above sea-level; but in Northern Arizona it forms forests at a level of between 8,000 and 9,000 feet; and in Colorado it even extends to an elevation of 11,000 feet. At all these high levels, however, it attains dimensions far less than those it reaches in the plains, and at its highest vertical limit it is but a low shrub. The "Douglas Fir" and "Douglas Spruce" are the names most commonly applied to it in the European pinetum; but "Oregon Pine" is the name by which the timber is chiefly known in our market, though it was at one time known as the "Nootka Fir." In the Uintah Mountains it is known as "Swamp Pine" and "Bear River Pine," while such misleading appellations as "Western Pitch Pine" and "Hemlock" are natural to the non-botanical pioneer who sees slight resemblances. "Black Fir" or "Black Spruce" refers probably to the dark green of the foliage; but "Red Fir" and "Yellow Fir" seem to belong to different varieties of the wood, the produce most probably of different conditions of growth.

The sapwood is generally narrow and yellowish; but the heart is sometimes also yellow, fine-grained



CONES AND LEAVES OF DOUGLAS FIR



and light in weight, or it may be red, coarse-grained, and heavier. The wood is close, straight and regular in grain, firm, tough, and elastic, not in the least liable to warp, and very durable. In appearance it more nearly resembles the wood of the Canadian Red Pine (*Pinus resinosa* Sol.) than any other species; but, under the microscope, a longitudinal section shows a structure that distinguishes it from all allied woods. Its "tracheids," or elongated vessel-like elements, have spiral lines of thickening, especially in the spring-wood of each annual ring. Such spiral thickening occurs throughout the somewhat similiar wood of the Yew; but the Yew is non-resinous, while the Douglas Fir produces an abundance of resin. The transverse section shows the sap-wood and heart-wood, resembling those of the Larch, but that the latter is of a more rosy red. The annual rings are sharply defined by the broad and darker band of autumn-wood. This character places the wood of the Douglas Fir commercially with the "Hard Pines." The bark, thin, smooth, and greyish on young shoots and warty with resinous pustules a little later, becomes from three to five inches thick on old trees, splitting into broad, rounded ridges and breaking up at its surface into reddish-brown scales. Through its longitudinal fissures it discloses a redder inner bark.

In the leaves, and to a less extent in the cones, we have those resemblances and differences which justify us in making separate genera for the Hemlock Spruces and the Douglas Spruce, and at the same time excuse the use of the word Spruce in their popular names.

The Hemlock Spruces (*Tsuga*) have but one central resin-canal in the leaf, the true Spruces (*Picea*) have one or two lateral ones, and the Douglas Fir (*Pseudotsuga*), like the Silver Fir (*Abies*), has always two lateral ones. The leaves of the Douglas Fir are arranged singly and spirally as in both Spruces and Firs, but though twisted so as to form a two-sided spray, they do not lie as flat in two rows as do those of the Silver Fir, but are rather in three or four rows. They are of a bright shining green above, and remain on for six or seven years. Three-quarters of an inch to an inch and a quarter long, they are flat, narrowly linear in outline, bending slightly upwards at the apex, and varying considerably in the sharpness or bluntness of that extremity. The stomata are confined to two silvery lines, which are fainter than those of the Silver Firs. In section the leaf is elliptical, without the thinner areas on either side of the midrib characteristic of *Abies* and *Tsuga*, or the four-sidedness of *Picea*. The hypoderm varies, but is generally only slightly developed; there is a large-celled mesophyll and a single undivided vascular bundle, much as in *Picea*.

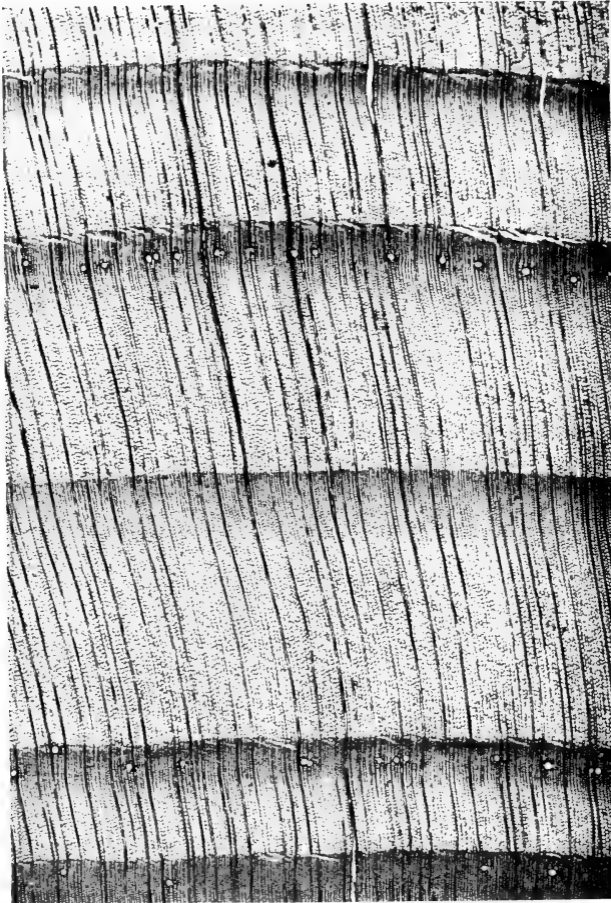
The staminate flowers are mostly on the under side of the twigs of the preceding year, forming axillary egg-shaped masses. The pollen-grains have not the air-bladders that occur in the Pines.

The tree generally bears cones from about its twenty-fifth year. These very distinctive features are borne at the apex of the twig, hanging downwards, first appearing in May, ripening in their first year, and falling off whole. They are egg-shaped, from two



*Photo : H. Irving, Horley.*

DOUGLAS FIR



TRANSVERSE SECTION OF DOUGLAS FIR WOOD (X 10 DIAMETERS).



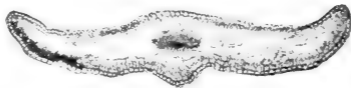
and a half to four inches long, and an inch or more in diameter and of a reddish-brown colour. The ovuliferous scales are rounded, with slightly wavy margins, but the most striking character is the bract-scale, which is longer than the ovuliferous and is three-lobed, the two lateral lobes diverging slightly and the central one prolonged into a rigid acute awn. This type of cone has been termed "feathered." The true Hemlock Spruces (*Tsuga*) have smaller cones, the bract-scales of which are not longer than the ovuliferous ones. The seeds of *Pseudotsuga* are small and winged.

The resinous wood of the Douglas Spruce is largely used in its native area for fuel as well as for all kinds of carpentry, house-building, and engineering work. It is excellently adapted for the lower masts, yards, and bowsprits of sailing vessels, though inferior for topmasts, which are much exposed to friction, to Kauri Pine, or the Riga and Dantzic varieties of *Pinus sylvestris*. Puget Sound now exports it largely to South America, Australia, the Sandwich Islands, China and India, as well as to Great Britain. Time has hardly as yet permitted an adequate test of the durability of British-grown timber of this species. Its much more rapid growth here suggests considerable inferiority as compared with the Oregon wood; and yet it appears to compare favourably with Larch for such purposes as railway-sleepers.

No exotic species of tree introduced within the last hundred years has, perhaps, attracted so much attention, from a utilitarian point of view, as the Douglas Fir, and that not only in Britain but also

in France and Germany. This has been owing in great measure to its rapid growth during early youth and its supposed immunity from insect and fungoid attacks.

Probably the most interesting specimen of the Douglas Fir in England is that in the celebrated pinetum at Dropmore, close to Burnham Beeches, Buckinghamshire. It was raised from some of the first seed brought home by Douglas, in December, 1827. It bore its first cone in 1835, when only eight years old, and in 1837 it was nineteen feet high. In 1871, *i.e.* at forty-four years of age, it was 100 feet high and nine feet seven inches in girth at three feet from the ground, and in 1897 it was 108 feet high, giving an average growth in height of twenty-five and a half inches a year for fifty-one years, a rate probably unprecedented in this country. Such specimens, in favourable soil and with full room to develop, are believed to have laid on a mean annual increment of wood of as much as three cubic feet, as against one cubic foot as the most that could be anticipated from a Larch. It is an interesting fact that the finest specimens in Scotland are growing close to the birthplace of Menzies, the discoverer, and Douglas, the introducer of the species, *viz.* at Castle Menzies, Murthly Castle, Seone, and Taymount, all in Perthshire.



TRANSVERSE SECTION OF NEEDLE LEAF OF DOUGLAS FIR.



BEECH IN AUTUMN.



## THE BEECH.

*Fagus sylvatica* L.

It must surely be difficult to resist enthusiasm for our British trees when standing, at the close of April or beginning of May, under the young foliage of a Beech. This grand tree may not have full claim to rank as a native of Britain, since we find no prehistoric remains of its wood; but we have no records of its introduction, and certain it is that the Beech-groves of our chalk and limestone hills need not yield, so far as the grandeur or beauty of their existing trees is concerned, to those of any other region.

Belonging to the same family as the Oaks, the Beeches occur over a great part of the world. They are absent from Africa and Southern Asia, but clothe the hills alike of Japan, New Zealand, South Australia, Tasmania, Tierra del Fuego, North America, Norway, Spain, and Asia Minor, our own species, *Fagus sylvatica*, occurring in the three last of these regions.

The name Beech is in early English *boc*, *bece*, or *beoce*; in German *Buche*, and in Swedish *bok*, and signifies either "book" or "tree," the two senses being supposed to be connected by the fact that the ancient Runic writings were engraved upon beechen boards. "The origin of the word," says Dr. Prior in his "Popular Names of British Plants,"

“ is identical with that of the Sanskrit *bókó*, letter, *bókós*, writings; and this correspondence of the Indian and our own language is interesting as evidence of two things, viz. that the Brahmins had the art of writing before they detached themselves from the common stock of the Indo-European race in Upper Asia, and that we and other Germans have received alphabetic signs from the East by a northern route, and not by the Mediterranean.” This last remark of the learned Doctor’s refers, of course, to our old black-letter Gothic characters and not to our modern Roman alphabet.

As to the name *Fagus*, it is possible that this may be of Celtic origin; and, in the time of Pliny, the Britons, as well as the Gauls, may, as he describes, have mixed the ashes of Beech-wood with goat’s-fat to make a red dye for their hair and moustaches; or this name may then have pertained to the Sweet Chestnut, to which tree Cæsar may have referred when he wrote that in Britain there was every kind of timber as in Gaul, except “*fagum*” and the Fir.

The Beech requires a thoroughly drained soil, and accordingly flourishes on high ground, whether calcareous or sandy. Its grey stems may thus be seen—often of great girth—throwing out their spreading roots on the earthworks of an ancient British camp on the greens and hills of Kent, as at Oldbury, near Ightham, while but a few miles off a fine clump crowns the conspicuous chalk summit of Knockholt; and in Surrey we have as fine trees on the sands of Haslemere, Hascombe,

and Tilburstow as on the chalk at Betchworth and Norbury. The hills of Gloucestershire on either side of the Severn, though of very different geological ages, bear some splendid woods of Beech; the chalk hills of Buckinghamshire (a county that owes its names to its former wealth of "buck" or beechmast) still supply the chairmakers of High Wycombe; and the Londoner glories alike in the grand old pollards of Burnham in that county, and in the mostly younger, but often unlopped, trees in the forest of Epping, in Essex—both now preserved to him and his successors in perpetuity by the City Corporation.

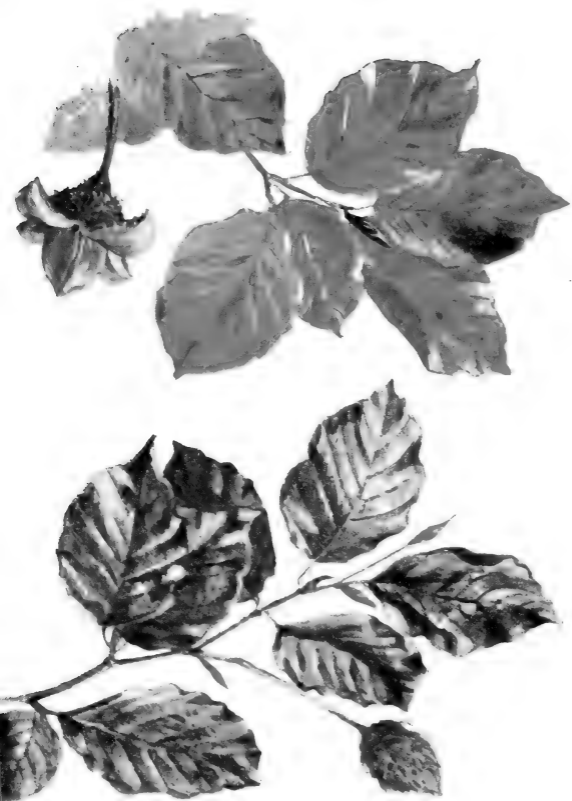
Though not glossy, like that of the Birch, the smooth, olive-grey bark of the Beech gives it a charm even in the winter months. Then, too, though the lower boughs are often still decked with the crisp, dead leaves of the previous year, which reflect each transient sunbeam from their surfaces of polished copper, we can see most clearly the splendid outlines of this king of the forests. Its roots spread far and close together to gain a firm footing that the gale can seldom overcome, and above them towers the smooth, unbroken, pillar-like stem, often seen with a girth of from fifteen to twenty feet, and reaching as many feet in height without a branch. When not pollarded, the Beech frequently bifurcates naturally, each branch, of which there may sometimes be three or four, rising vertically, "each in itself a tree," like the clustered columns of a Gothic aisle. From the main branches sweep outwards the more knotted

branchlets and twigs, bending slightly downwards, and giving to the whole tree a rounded outline. The head of the fine Beech at Knole Park, near Sevenoaks, called the King's Beech, is 352 feet in diameter.

It is in April, however, that the beauty of the Beech generally first commands our attention. The pointed, dull-brown buds assume a more glossy hue. They swell almost visibly from day to day under the influence of the genial sunshine, warmth, and moisture. As the sunlight falls on a sloping Beech-wood from a white cloud hanging in the deep blue of an April sky, it will be seen to glow like a sheet of bronze; and just before bursting the buds will be almost red. Then on one particular tree, year after year, often on one particular branch, the first leaves burst forth as the clearest emeralds, heralds of the coming of the full springtide glory. As they grow in size the leaves deepen in tint. To enjoy them in their fullest beauty, we should walk under the trees when the sun is shining brightly through them, and we can then see each pellucid sunshade to be fringed with a row of most delicate silky hairs—hairs that protect it from undue moisture or the radiating cold of the late frost.

When the leaves of each emerald tier of verdure lose these silky hairs, the tree has parted with one of its charms, though when the leaves are more opaque, as they then are, their glossy surfaces, reflecting every glint of sunshine, still render the tree, as a whole, anything but a heavy feature in





FLOWER, FRUIT, AND LEAVES OF BEECH.



the landscape. Then it was, in early summer, Pelleas

“Riding at noon . . . .  
 Across the forest call'd of Dean,  
 . . . . . , . saw  
 Near him a mound of even-sloping side,  
 Whereon a hundred stately beeches grew,  
 And here and there great hollies under them,  
 But for a mile all round was open space,  
 And fern and heath: and . . . .  
 It seem'd to Pelleas that the fern without  
 Burnt as a living fire of emeralds,  
 So that his eyes were dazzled looking at it.  
 Then o'er it crost the dimness of a cloud  
 Floating . . . .”

The Beech generally flowers in May; but neither its long-stalked globular clusters of male flowers nor its smaller assemblages of female ones, are conspicuous among the foliage. The male catkins hang from the axils of the lower leaves on the shoot, whilst the female inflorescences, each consisting of two or three flowers invested by a single “cupule,” rise erect from those of the leaves nearer the growing end of the shoot. When the four-sided “cupule” of rigid bracts, covered with recurved hooks and enclosing two or three triangular fruits of a rich chestnut colour, grows to a larger size and turns brown, it not only becomes conspicuous, but causes a greater litter on the lawn on which the tree may chance to stand.

The closely matted roots and the dense shade rather perhaps than any poisonous exhalations, or even than mere drip, render the Beech generally fatal to grass, and injurious even to evergreens

growing beneath it. The well-drained soil in which it delights is by it drained yet more thoroughly; so that it has a marked power of holding the ground against other species, as noticed by both Evelyn and Gilpin. This has earned for it the evil reputation of symbolising selfish ambition, the ambition of a forest prince in his rivalry of the monarch Oak. Though its leaves enrich the soil, this characteristic renders it perhaps better suited to the grove, the wilderness, or a corner of the park than to the garden lawn. Hollies and other evergreens, bracken and brambles will grow beneath its shade, and it must not be forgotten that it is a tree which, for the development of its highest beauty, should occupy an isolated position.

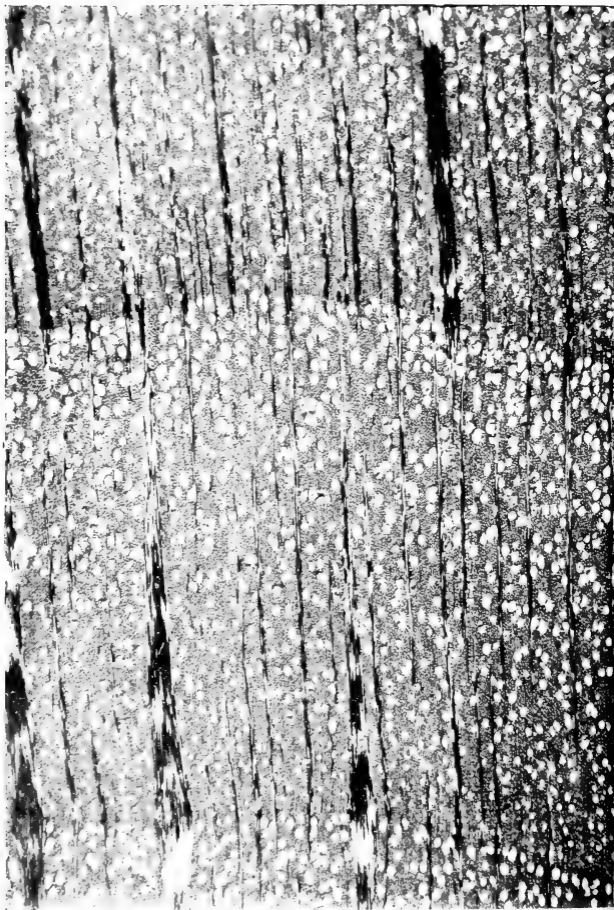
The modern scientific forester looks upon the Beech as "the mother of the forest," attaching the very highest value to it as undergrowth protecting the soil from drought and denudation, and enriching it with its fallen leaves.

In spring and summer beneath the Beech-tree's shade wander those abusers of "our young trees," who, from the time of Paris and CEnone to that of Orlando and Rosalind and onwards, have been tempted by its smooth bark to make it the medium of perpetuating their love. Well might Campbell put into the mouth of a Beech-tree the complaint that

" Youthful lovers in my shade  
Their vows of truth and rapture made,  
And on my trunk's surviving frame  
Carved many a long-forgotten name."



*Photo : H. Irving, Horley.*



TRANSVERSE SECTION OF BEECH WOOD (X 30 DIAMETERS).

As the tree grows, the letters engraved upon it grow also. As Ovid says:—

“Incisæ servant a te mea nomina fagi,  
Et legor *Ænone*, falce notata tua;  
Et quantum trunci, tantum mea nomina crescut.”

(“The Beeches, faithful guardians of your flame,  
Bear on their wounded trunks *Ænone’s* name;  
And as the trunks, so still the letters grow.”)

The annual growth of bark strives to hide the wound of the knife, and ultimately the inscribed name will become buried in the heart of the old tree, to remain ages after that of the lover shall have ceased to beat.

It is in autumn, however, that the beauty of the Beech stands pre-eminent. As Dr. Edwin Lees has eloquently put it, “The autumnal splendour of every other tree fades before that of the Beech, which continues the longest of all, and under particular circumstances is of the most brilliant description. This arises from its lucid leaves, which vary in hue from auburn to gold colour and amber, reflecting back the level rays of the descending sun, and thus burning with pre-eminent lustre, like a sudden illumination. Blazing characters irradiate the grove wherever the Beech presents, in spectral pomp, its vivid outline; and if a passing rain-cloud, shrouding for a moment the tree-tops, bear upon its purple breast the glowing Iris, with one limb intermingled with the golden foliage, the splendid effect will long rest upon the memory of the spectator.”

The light brown, hard, and moderately heavy

timber of the Beech is close and even in texture, with a fine silky grain, and, being easily worked and fairly strong and durable, is in demand for a variety of purposes. If wholly submerged or quite dry it keeps well, and has therefore been used for keels and for piles, whilst on the continent it is much used for railway-sleepers, for sabots and for charcoal. Though used in turnery, its chief use with us now is chair-making. As the stem commonly reaches a girth of ten or twelve feet, and occasionally of from eighteen to twenty feet or more, and adds perhaps on an average an inch to its diameter in five and a half years, this species seems to reach the age of from 250 to 400 years. The Bicton Beech in Devonshire has a girth of twenty-nine feet; the King's Beech, at Ashridge, Herts, is 118 feet in height; and one of those in Norbury Park, Surrey, is stated to reach 160 feet; but many of the trees of largest girth are gouty old pollards, like those at Burnham, whose decapitated trunks have grown out into gnarled excrescences that are very misleading as to age.

The brown nuts or "mast," once so valuable a source of rustic wealth, when Gurth and Wamba pastured the swine of the Saxon thane in the forest, are still used in France as a food for poultry and pheasants, and are stated to contain from seventeen to twenty per cent. of an oil suitable for burning, and used occasionally instead of butter in cooking. It is by this "mast" that the Beech is commonly propagated.





DOGWOOD.



## THE CORNELL.

*Cornus sanguinea* L.

IN the Cornel we have to do with the one woody British representative of a small group allied on the one hand to the Ivy and Umbelliferous families, and on the other to the Honeysuckles. This is the *Corna'cea*, an Order belonging mainly to the temperate regions of the Northern Hemisphere, and familiarly represented in our gardens by the so-called Japanese Spotted or "Cuba" "Laurel" (*Au'cuba japon'ica*). They are mostly woody plants with simple exstipulate leaves in opposite pairs, and clusters of small flowers having the petals valvate in the bud, meeting, that is, without overlapping, and the "inferior" ovary forming a fleshy fruit with a bony stone. The genus *Cornus* is specially characterised by having most of the parts of its flowers in whorls of four and by the stone of the fruit being composed of two one-seeded chambers.

There can, in fact, hardly be a better lesson in the geometrically regular symmetry of the flower than to examine in June one of the little creamy blossoms of the Dogwood. In the bud it is enclosed by four minute sepals, which soon disappear. Alternating with these are the four narrow-pointed creamy-white petals. They are, as we have said, valvate in the bud, and afterwards bend downwards. Alternating with these again, and thus each stand-

ing in front of one of the sepals, are the four awl-shaped stamens which spread outward and upward, springing from beneath a honey-secreting ring-shaped glandular disk which surmounts the ovary. In the latter alone do we have a departure from the symmetrically alternating whorls of four, the two chambers of which it consists, each representing a carpel, being placed with their midribs and seed-bearing placentas in front of the sepals and stamens of what is termed the median plane—a plane passing from back to front of the blossom through the bract in the axil of which the flower springs.

Though its congener, the Cornelian Cherry (*Cornus mas* L.), is mentioned by Homer, Virgil and Theophrastus, the earliest botanical history of our hedge-row shrub is not quite so clear. As Parkinson puts it, "There is much doubt and question among many of our later writers about this female Cornell, whether it should be the *Virga sanguinea* of Pliny, or the *Hartriegell* of Tragus, or his *Faulbaum*, some referring it to the one, some to the other, but the general tenet of the most is, that in most things it answereth both to the *Thelycrania* of Theophrastus, and may well enough agree with the *Virga sanguinea* of Pliny."

It must be explained that *Thelycrania* is the Greek equivalent for *Corn'us fœ'mina*, since *kranon* or *krania* are the old Greek names of the Cornelian Cherry, names connected with a root signifying hardness, just as the Latin *cornus* is most probably connected with *cornu*, a horn, with reference to the horny texture of the wood of one species. *The'lus*

means female ; but, as is familiarly brought to our recollection by the old names " Male Fern " and " Lady Fern," the ancient application of these sex terms to plants had a purely figurative significance, generally meaning only robust and less robust in growth.

Though the wood of the Dogwood is not nearly so hard as that of the Cornelian Cherry, we should hardly term it spongy or useless ; so that commentators have suggested that Pliny is referring to a very different plant, one of the Honeysuckles. *Hartriegell*, meaning hard rail, is also obviously only applicable to a hard wood : but there can be little doubt that Matthioli was right in interpreting *Virga sanguinea* or Bloody Twig, in another passage in Pliny, as referring to the shoot or autumn leaves of our common Dogwood. This interesting old commentator upon Dioscorides not only records that the people of Trent extracted an oil by boiling the berries of the Dogwood, and used it in their lamps ; but he adds that if persons bitten by mad dogs hold twigs of this tree in their hands until they become warm they are driven mad. To this startling statement Parkinson adds that " If one that is cured of the biting of a madde dogge, shall within one twelve moneth after touch the *Cornus famina*, or Dogge berry tree, or any part thereof, the disease will returne againe."

No doubt before these " facts " were imagined the bush had acquired the name of Dogwood, and some explanation of that name was felt to be wanted. In Ælfric's tenth-century vocabulary *cornus* is merely translated " corn-treow," and in one of the

fifteenth-century as "pet-tre," a name I have found nowhere else.

Turner, in his "Names of Herbes," gives the first botanical mention of the species in England. Under "Cornus" he writes: "The female is plētuous in Englande, and the buchers make prickes of it, some cal it Gadrise, or dog tree, howe be it there is an other tree that they cal dogrise also." He seems here to recognise "rise" as meaning tree or rather under-shrub; but to have no suspicion of the meaning of Gadrise or its connection with Dogrise. Neither apparently had Gerard, when, enumerating it as the Dogberrie-tree in the Catalogue of his garden, he says in his "Herball" (1597), "In the North countrey they call it Gaten tree, or Gater tree, the berries whereof seem to be those which Chaucre calleth Gater berries."

It is interesting to come across this reference to Chaucer in Gerard's "Herball"; but the passage in the "Nonnes Preestes Tale" to which it relates has the further importance that it indicates the use of the berries of the Dogwood as a laxative in the fourteenth century, while Philip Miller in the eighteenth tells us that they were often brought to market and sold as those of the Buckthorn. Partelote, the hen, in Chaucer's poem, recommends Chaunticlere, the cock, to have "laxatives . . . of gaitre-berries."

Parkinson, too, evidently thinks the popular name requires explanation, and adopts a bold one. "We for the most part," he says, "call it the Dogge berry tree, because the berries are not fit to be eaten, or to be given to a dogge. I heare they call this in the



FLOWERS, FRUIT, AND LEAVES OF DOGWOOD.





North parts of the Land, the Gatter tree, and the berries Gatter berries, yet some say they call the *Euonymus* so."

Even Loudon makes an essay in the same direction, suggesting that the name was given "from the astringent properties of the bark and leaves, a decoction of which was formerly used as a wash for curing the mange in dogs." No doubt such a wash was employed, primarily perhaps on account of the name of the tree, though in this matter, as in most of its names, there is a very general confusion of this tree with the Spindle-tree (*Euon'y mus europæ'us* L.) and with the two British species of Guelder-rose (*Viburn'um*); but assuredly this wash was not the origin of the name Dogwood.

As the late Dr. Prior pointed out, these hard, tough and horny hedgerow woods were those most handy and suitable for the making of dags, skewers, and goads, and hence came the original names Dagwood, Dag-tree, Dag-timber, Prickwood, Prick-tree, Prick-timber, Skiver-wood, Skewer-wood, Gad-rise, Gad-treow, Gatten-tree or Gaitre-tree. Gatter Bush is simply Gad-tree bush, and perhaps Gatteridge may represent "Gaitre rouge," the red-shooted Goad-tree. Cat tree and Catteridge are, of course, easily explained corruptions, whilst Hound's Tree and Houndberry Tree are, no doubt, more modern names, dating from a period when the origin of the name had been forgotten. Thus nearly all the many names of this tree, which in themselves prove its former utility, can be reduced to a very simple series, practically three in number.

The confusion of name and use, however, between this and other small woods is still reflected in one trade—the manufacture of gunpowder. The name Dogwood has been shared between *Cornus sanguinea*, *Euonymus europæus*, *Rhamnus Frangula* and *Viburnum Opulus*: the wood of all of them probably has been employed in the manufacture of a fine-grained charcoal, such as is used for some gunpowder: that of the Spindle-tree is said to be the best for drawing-crayons; but for gunpowder it is *Rhamnus Frangula* which retains the name Dogwood.

It is more particularly on a chalk or limestone soil that this bush abounds in thicket and hedgerow, and it does not occur in Scotland and is uncommon in Ireland; so that, speaking of the country generally, it is not so frequent as we might think from our experience of it in the south-eastern counties. It grows from four to eight, or even fifteen or twenty feet in height, its round straight branches springing in opposite pairs from the leaf-axils and spreading in a horizontal or ascending direction. Their small slender buds are enclosed by a few velvety scales, and the surface of the young twigs is also pubescent. These twigs may be olive-green, faintly, if at all, tinged with red; but in spring and winter, when affected by frost, they glow with the blood-red hue that has given the shrub its specific name—*sanguinea*. As they get older they lose their down and their redness, becoming grey and then olive-brown, and corks-warts make their appearance, fissuring the hitherto smooth bark into scales. This bark and the leaves, when bruised, have a strong fetid odour, to which the



Photo : H. Irving, H. Arley.

DOGWOOD



TRANSVERSE SECTION OF WOOD OF DOGWOOD TREE (X 30 DIAMETERS).

French names *puine* and *bois punais*, "bug-wood," are said to be due.

The opposite leaves are short-stalked, somewhat broadly egg-shaped and pointed, with entire margins. Though they are generally not much more than two inches long, we have found them on suckers nearly three times as long. Their veining is characteristic, though not unlike that of the Buckthorn (*Rhamnus catharticus*). The veins are not only prominent in appearance, but are so exceptionally tough that, as in the case of the common plantain, if a leaf be snapped asunder in several places, the vascular bundles will hold the fragments together, and can be drawn out unbroken. When young the leaves are hoary or silky, but they become perfectly smooth later. In spring they may, like the twigs that bear them, be suffused with a fainter tinge of the rich vinous colour which they are destined to exhibit in all its perfection at a later season. They then become a somewhat dull yellowish or sap green, resembling the foliage of the Buckthorns. It is in early autumn, however, that they show themselves in a mingled richness of colour that challenges comparison with American Maples or with the Muscat Grape-vine. Mixed with the unaltered green of summer, deep crimson, light rose-red, a dark maroon approaching the purple of a plum, may then be seen, side by side with yellow and orange leaves, and with those that blend several of these tints on a single blade. Later on in the season of change whole bushes of deep purple or blood-red may be seen, but the more varied charm belongs to the earlier time.

The somewhat rounded clusters of cream-white flowers terminate the branches in June and July. Rich in honey, and freely visited by a variety of insect life, they have a pungent unpleasant smell. The pointed form of the petals, and the fact that each of the four is distinct, and not united into a tube as in the Guelder-roses and Elders, give a distinctive character to the inflorescence. There is no structural obstacle to prevent self-pollination, though, no doubt, the many flies and small beetles that visit the blossoms often bring pollen from a distance and so effect a cross.

The flowers are succeeded by small green berries, which are nearly globular, and are surmounted by the much-withered traces of the calyx and honey-disk. In September they ripen to a purple-black, and, like every other part of the plant, are intensely bitter; but they are eagerly devoured by thrushes. Whilst, as we have already seen, they were formerly boiled for lamp-oil, they are stated to be used in France at the present day for soap-making, yielding about a quarter of their weight of oil.

There are, doubtless, many shrubs more beautiful than the Dogwood; but its close-growing habit, its clusters of starry blossoms and polished berries, and, above all, its autumn colouring, justify its claim to a place in the shrubbery with Danewort, Spindle-tree, and Snow-berry.

A small plantation of this species by itself has recently been made, chiefly for the sake of its autumn colouring, by the margin of the Pen Ponds in Richmond Park.



SPEN.





## THE ASPEN.

*Populus tremula* L.

THE chief structural characters of the Aspen are that its shoots are downy, and its leaves on very long stalks; those on the suckers heart-shaped, pointed, but not toothed; those on the branches rounded, with incurved teeth; and all of them silky on the under surface when young, though generally becoming smooth later. Its buds are slightly viscid, and the flowers in the female catkins are densely crowded together. The lobed catkin-scales are fringed with hairs; the two stigmas are each divided into two erect segments; and in the male plant each catkin-scale bears generally eight stamens in its axil.

The Aspen is not usually a large tree, though Loudon records a specimen at Castle Howard, in Yorkshire, 130 feet high, and three and a half feet in diameter, and various other examples reaching diameters of four feet, and one at Bothwell Castle, Renfrewshire, 117 feet in the spread of its branches. This latter tree was eighty years old; but the species is not a long-lived one, and, like all Poplars, is very liable to rot from the tearing off of boughs by wind, and to subsequent attacks by various insects. As the tree gets older its horizontal branches become pendulous. The young shoots are generally reddish, with prominent brown hairs—or both these shoots

and the root-suckers may be hoary—but they are never cottony as in some other species.

Like all trees having a wide geographical range, the Aspen, though not now much esteemed as timber, has been applied to a variety of uses. In Asia it occurs mainly in the north and in Asia Minor; it is abundant throughout Russia from the White Sea to the Caucasus, and throughout Northern Africa and the South of Europe; and it is indigenous in Ireland and as far north as Sutherland. The Aspen grows at an altitude of 1,600 feet in Aberdeenshire. Its bark has been employed in tanning, and its wood is used in turnery and cooperage, as well as for many minor purposes, such as sabots and clogs, and to a small extent for gunpowder charcoal.

During the last thirty years the wood, in common with other species of Poplar, has come into extensive use in the manufacture of paper-pulp, for which purpose wood has all but superseded the Alpha or Esparto grass of the Western Mediterranean.

Formerly, however, it must have been more valued than it is now, for in the reign of Henry V. an Act of Parliament was passed (4 Hen. V., c. 3) which was not repealed until the reign of James I. to prevent its consumption otherwise than for the making of arrows, with a penalty of 100 shillings if used for making pattens or clogs. Spenser alludes to it as "the Aspine good for staves."

Its roots, running near the surface, are apt to impoverish the soil, and its leaves, when fallen, kill the grass, though, whilst on the tree, their constant motion so permits the passage of light as to render

its shade but very slightly injurious to any plants beneath it. The profusion of suckers springing from its roots, however, makes the Aspen an undesirable tree for lawns, meadows, or hedgerows. They yield an abundant supply of faggots, or poles, if the tree be treated as coppice-wood, and cut down either every seven or eight, or every fifteen or twenty years. The rapid growth and usefully-moderated shade of this species adapt it well to act as a "nurse" in moist woodlands for the Oak or Beech; and it may be propagated either by cuttings or, more readily, by seed.

It is, however, chiefly for the grace and beauty of the grey bark of its stem and its rustling leaves that the Aspen is now valued. This rustling of the leaves, which are scarcely ever still even in the stillest air, is the most striking feature of the tree, and the point of most allusions to it in literature. Mr. Ruskin, in whose "Modern Painters" the Aspen is treated with such loving detail, when discussing Homer's treatment of landscape, writes as follows on the scene between Ulysses and Nausicaa:

"The spot to which she directs him is another ideal piece of landscape, composed of a 'beautiful grove of Aspen Poplars, a fountain, and a meadow,' near the roadside; in fact, as nearly as possible such a scene as meets the eye of the traveller every instant on the much-despised lines of road through lowland France—for instance, on the railway between Arras and Amiens: scenes to my mind quite exquisite in the various grouping and grace of their innumerable Poplar avenues, casting sweet tremulous shadows over their level meadows and labyrinthine streams. We know that the princess means Aspen Poplars, because soon afterwards we find her fifty maid-servants at the palace, all spinning, and in perpetual motion, compared to the 'leaves of the tall Poplar'; and

it is with exquisite feeling that it is made afterwards the chief tree in the groves of Proserpine, its light and quivering leafage having exactly the melancholy expression of fragility, faintness, and inconstancy which the ancients attributed to the disembodied spirit. The likeness to the Poplars by the streams of Amiens is more marked still in the Iliad, where the young Simois, struck by Ajax, falls to the earth 'like an Aspen that has grown in an irrigated meadow, smooth-trunked, the soft shoots springing from its top, which some coach-making man has cut down with his keen iron, that he may fit a wheel of it to a fair chariot, and it lies parching by the side of the stream.'

In spite, however, of Mr. Ruskin's decision, Professor Daubeny was of opinion that Homer's *Aigeiros* was not the Aspen, but the Black Poplar (*Pó'pulus ní'gra* L.), on the ground that the latter is common, the former not common, in Greece. Fraas, however, found Aspen at an altitude of 1,800 feet on the north side of Parnes and on the Achelous, and Sibthorp records it in Bœotia. But we cannot help thinking that any species of Poplar has sufficiently mobile leaves to suggest the poet's language.

From Homer to Thomson is indeed a fall; but there is true observation in the latter's description of

"A perfect calm; that not a breath  
Is heard to quiver through the closing woods,  
Or rustling turn the many-twinkling leaves  
Of Aspen tall."

The grace of the whole tree would seem more than once to have suggested the fair sex to writers on the Aspen, though their remarks are hardly complimentary. Thus Gerard says of it: "In English Aspe and Aspen-tree, and may also be called Tremble, after the French name, considering it is the



CATKINS AND LEAVES OF ASPEN.



matter whereof women's tongues were made (as the poets and some others report), which seldom cease wagging." Among many other allusions to this tree Scott's address to woman in *Marmion*, as

"Variable as the shade  
By the light quivering Aspen made,"

is one of the best known. Far more strikingly poetical is the old Scottish and English legend on the subject, so beautifully told by Mrs. Hemans :

". . . a cause more deep,  
More solemn far, the rustic doth assign  
To the strange restlessness of those wan leaves ;  
The cross, he deems, the blessed cross, whereon  
The meek Redeemer bowed His head to death,  
Was formed of Aspen wood, and since that hour  
Through all its race the pale tree hath sent down  
A thrilling consciousness, a secret awe,  
Making them tremulous, when not a breeze  
Disturbs the airy thistle-down, or shakes  
The light lines of the shining gossamer."

A very different version was thus strikingly narrated by a contributor to *Notes and Queries* many years ago :—

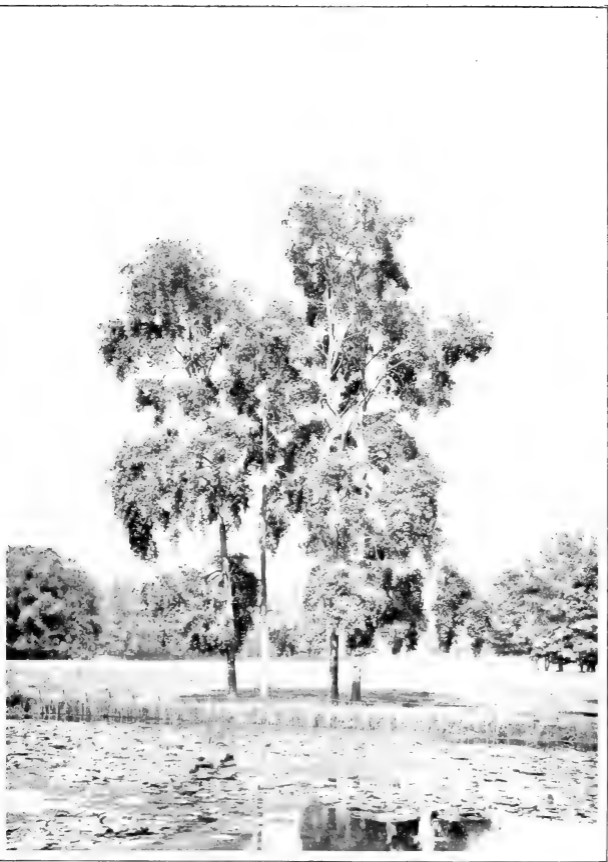
"At that awful hour of the Passion, when the Saviour of the world felt deserted in His agony, when—'The sympathising sun his light withdrew, And wonder'd how the stars their dying Lord could view'—when earth, shaking with horror, rang the passing bell for Deity, and universal nature groaned, then from the loftiest tree to the lowliest flower all felt a sudden thrill and, trembling, bowed their heads, all save the proud and obdurate Aspen, which said, 'Why should we weep and tremble? We trees, and plants, and flowers are pure and never sinned!' Ere it ceased to speak, an involuntary trembling seized its every leaf, and the word went forth that it should never rest, but tremble on until the day of judgment."

This constant agitation of the foliage by the least breath of wind, owing to the unusual length and flattened form of the leaf-stalk, though common to the whole genus, is most conspicuous in the case of the Aspen. To it the tree owes its French name, and it is explained scientifically by the length of the slender leaf-stalk and its lateral compression, so that the broad and heavy leaf is suspended on a support which is itself readily acted on by the smallest atmospheric movement. The rustling noise, as of a babbling brook, is, of course, produced by the friction of the leaves on one another.

In March or April the bare grey boughs or brownish shoots are thickly covered with catkins, and the male ones produce a general effect of warm vinous red. When the foliage appears, associations of refreshing coolness and of laughing mirth, suggested by the resemblance of the sound made by the leaves to the music of a brook, mingle, as we gaze at their pallid colour, and as the rising wind changes the rippling laugh into a long drawn sigh, with those of the deepest melancholy. When autumn, its "gold hand gilding the falling leaf," spread its badge of splendid decay over each leaf in succession, the tree gains in variety of colour, but its rustling gives it even a more melancholy effect than it had before.

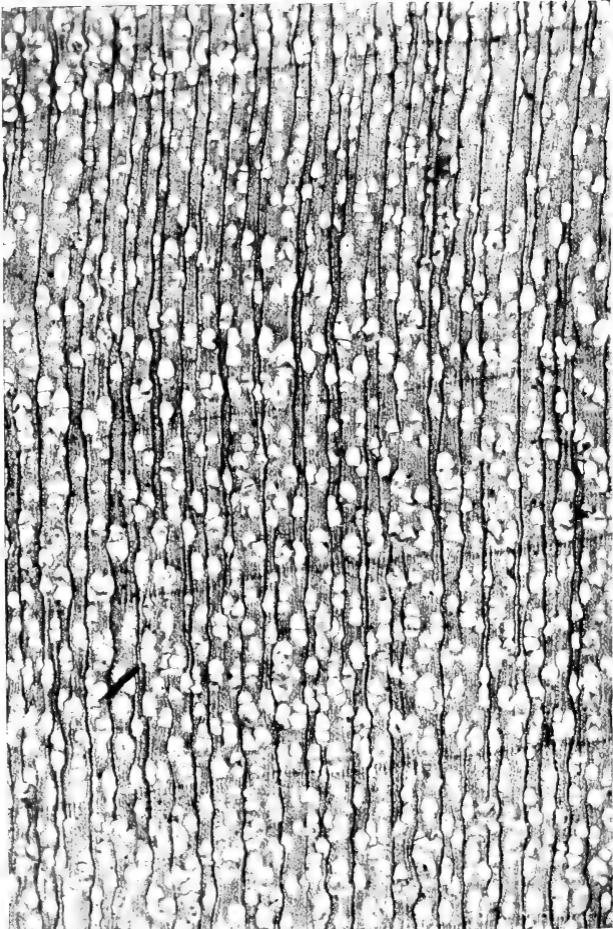
The soft woods of all the Poplars are naturally very liable to the burrowing of insect larvæ. The caterpillars of the Goat-moth (*Cos'sus ligniper'da*) and the Wood Leopard (*Zeu'zera a'sculi*) are among the most destructive. Entomologists also associate the Poplars with the beautiful Poplar Hawk - moth





*Photo : H. Irving, Horley.*

ASPENS.



TRANSVERSE SECTION OF ASPEN WOOD (X 30 DIAMETERS).

(*Smer'inthus populi*) and the Continental Poplar Butterfly (*Limen'itis populi*), resembling our own White Admiral.

From its more spreading habit of growth the Aspen has none of the formality in landscape effect of the Lombardy Poplar, and, though useful, along with its congener the Abele (*Pó'pulus al'ba* L.), in the marshy wood, it deserves a place in the foreground of the copse bordering a lake or stream. A row of Aspens in such a situation would prove very effective, reflecting, as it were, in their quivering leaves the ripple of the water at their feet.

In open heathy glades in Epping Forest, where careless or incendiary fires have laid bare the surface, and where formerly the Birch only was wont to sow itself, this species now springs freely. Its readily dispersed plumed seeds may be derived originally from cultivated specimens of the tree somewhere on the borders of the woodland ; but, once sown, they are certainly showing themselves capable of holding their own. Similarly it is recorded that in 1813, after the burning of Moscow, seedling Aspens sprang up over the ruins of the whole city.

The roots of the Aspen spread mostly at a small distance below the surface of the moist ground in which it delights, and it has thus but a slight power of resisting wind.

It has been suggested that the Grey Poplar (*P. canes'cens* Sm.) may be a hybrid between the Abele and the Aspen. It grows to the same size as they do, but is of slower growth, and accordingly Mr. James Crowe, of Lakenham, Norfolk, who, about

the close of the eighteenth century, noticed this form growing wild in various parts of his county, recommended its wood for flooring. Poplar wood in general has the advantage over resinous woods of not readily igniting. The leaves of the Grey Poplar are thin, rounder than those of the Abele and less deeply toothed, with bluntly triangular lobes and apex and a general outline approaching the orbicular. Their under surfaces are grey rather than white, and they become smooth, or nearly so, later. The veins are pinnately arranged, but the two lower secondary ones are nearly as large and prominent as the midrib, thus producing a slight development of that "pseudo-palmate" condition which is more marked in the more lobed leaves of the Abele. The buds and shoots are cottony, much as are those of the Abele. The most distinctive feature of the form is the stigma, which is not merely two-lobed or four-lobed, as in other Poplars, but, as Mr. Crowe discovered, eight-lobed and purple.



PEAR.



## THE PEAR.

*Pyrus communis* L.

SPRING, with the bursting of green leaf-buds and the joyous opening of many blossoms, is essentially the season of hope. The colours of summer have not yet come: many of the trees put forth their blossoms, as it were, prematurely upon leafless boughs, and those blossoms are often of a chilly whiteness that might be expected to depress the spirits so recently emancipated from the dull thralldom of winter frosts; but the promise of verdure and warmer colour is here, and man refuses to be depressed.

The Pear puts forth its snowy blossoms at a date when snow can hardly be assumed to be a thing entirely of the past, so that the trees massed in orchards suggest lingering snowdrifts; but before the blossoms fall the green leaves have generally made their appearance among them, and the likeness to snowdrifts is gone.

The Pear (*Pyrus communis* L.), so well known in our orchards, is by no means common in a wild state, and does not occur in the extreme North of England or in Scotland. No doubt it is in many cases an escape from gardens, its seeds being often swallowed and dropped by fruit-eating birds, so that some botanists deny its claim to rank as an indigenous British tree, and date its introduction from the time of the Roman occupation of our island. Nevertheless,

one can with difficulty persuade oneself that all three of the varieties of Wild Pear recognised by our botanists, with fruits seldom two inches long, and so harsh in flavour as to be as unpalatable as a Crab-apple, are merely the results of rapid degeneration. Nor is there any *a priori* reason against the native character of the Pear. It is in its distribution confined to a limited area in Europe, not occurring south of the Balkans, nor in the northern parts of Russia, Sweden, and Norway. This agrees with its absence from the North of Scotland; whilst its presence in a wild state in Ireland, which was never conquered by the Romans, is a difficulty in the way of the theory of its introduction by them. Though there can be no doubt that the cultivated varieties all have a common origin, it seems highly probable that this primitive stock diverged into several distinct races whilst still uncultivated, and that their cultivation throughout Europe, from Ireland to the Caucasus, may date from a time anterior to the Roman Empire.

It is found—apparently as an article of food—in the Swiss lake-dwellings, and is mentioned, under the names “Akra,” “Onkne,” and “Apios,” in the oldest Greek writers as common to Egypt, Syria, and Greece. The absence of any Sanskrit name for the tree, and the lack of similarity of those in use by Chinese, Persians, Arabs, and the Slavonic nations of Europe to those of the West, are most simply explicable on the theory of a primitive limitation of its range. The Latin *Pyrus*, the French *Poire*, the English *Pear*, and even the German *Birn*, can all be affiliated with the Keltic *Peren*. The late Professor Karl Koch



derived all cultivated Pears from three species: *P. persica*, the ancestral form of the Bergamot Pears; *P. elæagnifolia* Pall., the Oleaster-leaved Pear of the Caucasus and Asia Minor; and *P. sinensis*, the Sandy or Snow Pear of China and the gardens of India and Japan. Professor Decaisne, however, recognised six races, descended from a single species: the Mongolic, represented by *P. sinensis*; the Indian, including *P. variolosa* and others; the Pontic, represented by *P. elæagnifolia*; the Hellenic, including *P. parviflora*, a red-flowered form occurring in Crete, *P. sinaica*, which is perhaps identical with *P. persica*, the Wild Bergamot Pear, and others, such perhaps as *P. nivalis* Jacq., the Snowy-leaved species of the Austrian Alps, from which some of the cultivated sorts used in France in the manufacture of perry are probably derived; the Germanic, including our two commoner forms, *P. A'chras* Gaertn. and *P. Pyras'ter* Borkh.; and lastly, the Keltic, represented by *P. cordata* Desv., formerly known as *Briggsii* Bosw.-Syme.

This last-mentioned form, with leaves which are heart-shaped at the base, and almost smooth, and with very small globose, Apple-like fruit, is most interesting, as occurring in a wild state in Devonshire, Cornwall, and Brittany, and as, in the opinion of competent authorities, being perhaps the "Apples" of the "Inis yr Avalon"—the Isle of Apples in the Arthurian traditions.

Pliny describes the varieties of Pear in cultivation in his time as exceedingly numerous, including both early and winter sorts, and mentions thirty-two;

whilst Gerard says of them that "the stocke or kindred of Pears are not to be numbered; every country hath his peculiar fruit, so that to describe them apart were to send an owle to Athens, or to number things that are without number."

Among the Pears of the sixteenth century were the Popering Pear, mentioned by Mercutio in *Romeo and Juliet*, probably a Flemish variety, named from Popering in Flanders, and possibly introduced by Leland the antiquary, who was made Rector of Popering by Henry VIII.; and the Warden or Lukewards Pear. This last-mentioned variety seemingly originated in the horticultural skill of the Cistercians of Warden Abbey, in Bedfordshire, which was founded in the twelfth century. Three of these fruits appear in the arms of the Abbey. They were probably called Lukewards from ripening about October 18th (St. Luke's Day), and were eaten in the "Warden pies" coloured with saffron (as we now colour stewed Pears with cochineal), to which allusion is made in *A Winter's Tale*. More than two hundred and fifty sorts were known at the end of the eighteenth century, and nearly seven hundred in 1831.

The most remarkable cultivated Pear-tree in England is probably that at Holme Lacy in Herefordshire, which by the rooting of its branches once covered more than an acre of ground, and produced as much as fourteen hogsheads of perry in the year.

In a wild state the Pear is but a small tree, sometimes a mere shrub, more often twenty feet high than forty; but its rough bark, its upright growth and pyramidal shape, with pendulous boughs, give it a



FLOWERS, FRUIT AND LEAVES OF PEAR.



grace that does not belong to the more straggling Apple-tree, though the rosy blossoms of the latter may be more attractive than the wan bloom of its congener. The dwarf shoots or spurs of the Wild Pear are generally spinous, and marked with crowded ring-scars. The branches spring from the main stem in an ascending manner at an angle of less than forty-five degrees, afterwards curving outwards and downwards.

The leaves are scattered alternately along the young shoots, but crowded together in bunches or "fascicles" on the old wood. Country-bred folk learn to distinguish at a glance the leaves of the Pear from those of the Apple. The leaves of the Pear are generally on a longer and more slender stalk than those of the Apple, and are consequently more pendulous. Speaking only of our wild forms, they are also slightly smaller, not exceeding one and a half inches in length. They are sometimes heart-shaped at the base, and vary in general outline from "ovate," *i.e.* broadest near the base, through "oblong," *i.e.* with approximately parallel sides and broadest across the centre, to "obovate," *i.e.* broadest near the point. On young trees the leaves are often lobed, as in the allied Service-trees, and in all cases they are at first pubescent, at least on the under surface. They vary, however, in different soils, especially on the Continent, where those of several of the mountain forms are as white on their under surfaces as those of the White Beam (*P. A'ria* L.), and the form is sufficiently variable to acquire such names as "Willow-leaved" and "Sage-leaved" for some of

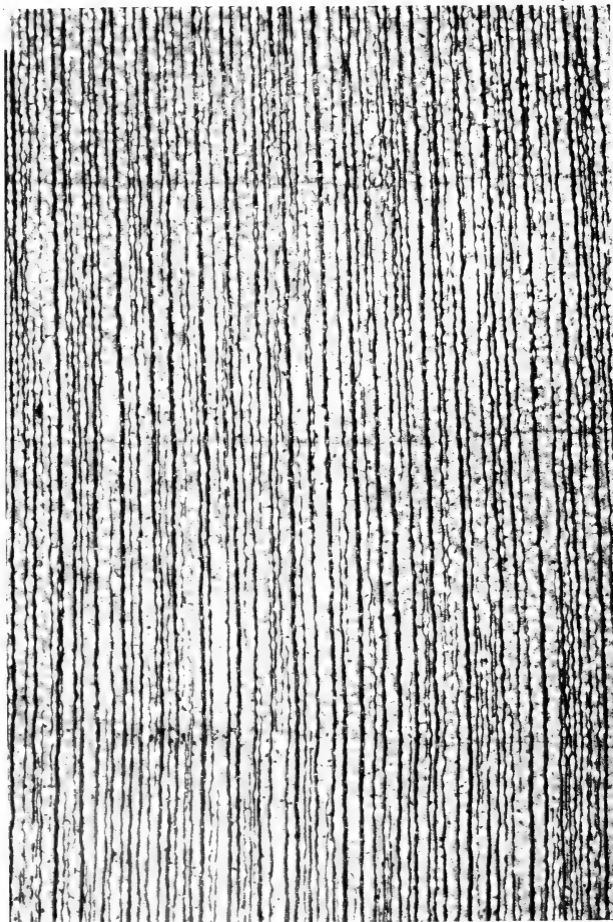
the varieties. The leaves are always acutely pointed, though the apex varies from an abrupt point ("cuspidate") to a long and tapering one ("acuminate"). They turn black when dried.

By about the middle of April the Pear-trees of our suburban orchards ought, in favourable seasons, to spread over the landscape the snowy sheet of their full bloom. The flowers, however, continue for some time, lasting generally until about the middle of the following month, thus preceding the warmer-tinted Apple-blossom by about a fortnight. Though the flowers of the Pear are as "precocious" in their first appearance on the bare branches as those of the Blackthorn, the white mass of bloom is soon relieved by a delicate background of tender green. The flowers are grouped in flat-topped, or "corymbose," clusters, and each one of the bunch is an inch or an inch and a half across—the same size, that is, as those of the Apple, from which they are technically distinguished, not by their colour, but by having their styles distinct to the base instead of being united below. This union, of course, takes place later, when the so-called "calyx-tube" binds together the five carpels into a single Pear. As the study of the not uncommon specimens of abnormal fruits shows, this structure, which is essentially nothing more than an expansion of the flower-stalk or "floral receptacle," contributes far more largely to the fruit than is the case in the Apple. It grows first as a thickened cylinder below the flower, and then expands in a globular form around the five carpels or "core" which it imbeds. This "core," it should be observed,



*Photo: H. Irving, Horley.*

PEAR.



TRANSVERSE SECTION OF PEAR WOOD (X 30 DIAMETERS).



occupies a higher relative position—*i.e.* is farther from the stalk—in the Pear than in the Apple. The outline of the fruit, tapering gradually, as it generally does, into its stalk, though very characteristic of the Pear, is no more absolutely so than is the depression into which the stalk is usually inserted in Apples. A more universal distinction in structure between the fruits of the two species is the presence in that of the Pear only of the well known “grittiness,” due to small clusters of cells, thickened with woody deposits in their walls, which are scattered throughout the fleshy part of the fruit. Few Wild Pears produce fruits one quarter the size of the common cultivated varieties; nor does their texture or flavour render them fit to eat.

In some favourable autumns the Pear exhibits beauties that perhaps surpass those of the pure white and virginal green of spring, its leaves turning to a vivid crimson. Though the tough and indestructible character of its fallen leaves may render the Pear undesirable on a lawn, it well deserves for its beauty alone a place in the cottage-garden, the farm-close, or the shrubbery. Few more delightful surprises await us in our rural walks than to come upon a well-grown Pear-tree standing apart in a small woodland clearing, whether it be decked in the snow of spring or the crimson of autumn.

Of our three wild varieties, none of which can be termed common, *P. Pyraster* Borkh. has “acuminate” leaves, which, though downy beneath when young, become smooth, and a typically Pear-shaped or “turbinate” fruit, tapering gradually into its stalk; *P.*

*Achras* Gaertn. has broader leaves, more abruptly pointed, which always remain downy or flocculent below, and a more globular fruit, rounded at its stalk end; whilst *P. Briggsii* Bosw.-Syme, as has already been stated, has almost smooth "cordate" leaves and a very small globose fruit.

The wood of the Wild Pear is heavy, strong, compact, fine-grained, and of a reddish-brown tint. Though inferior to Box and Hawthorn for engraving, it has long been used for this and kindred purposes. Gerard says it "likewise serveth to be cut into many kindes of moulds, not only such prints as these figures are made of, but also many sorts of pretty toies, for coifes, breast-plates, and such like, vsed among our English gentlewomen."

It is commonly employed for T squares and other drawing instruments, or is stained black in imitation of ebony; and it is said to be excellent as fuel, and to yield good charcoal.



STONE PINE.



## THE STONE PINE.

*Pinus Pi'nea* L.

PLINY, speaking in his "Natural History" of the *Pinus*, which he identifies with the *pitus* of Dioscorides, says that it was common about Rome in his time, that its nuts were eaten, and that it sends out branches at the top. This description would of itself make us identify the tree in question with *Pinus Pinea*, which is to-day a conspicuous feature in the landscape of Rome; but it is curiously confirmed by a letter of the younger Pliny describing the great eruption of Vesuvius in A.D. 79 which destroyed the cities of Herculaneum and Pompeii and was fatal to his uncle the naturalist. In this letter he compares to this Pine the form of the mass of smoke which rose from the volcano, and nothing could well be more apt. Just as the mingled steam and dust rise from the crater in a vertical column, and then, under the influence of gravitation, spread out laterally on all sides, so does the Umbrella Pine, as it is called in Italy, rise unbranched to a considerable height and then send out its branches in a more or less flat mass at its summit.

The Cluster and Stone Pines have several points in common. In both the needles are long, straight, rigid, and comparatively broad; the cones are large and pointed, and have pyramidal apices in the centres of their rhomboid tessellæ; and the buds are

woolly and free from resinous exudations, whilst the scales become reflexed. The two species differ, however, in that *P. Pinaster* has, as its name of Cluster Pine indicates, its cones generally in whorls of from three to eight; each cone being not more than two and a half inches wide, and of a brightly polished light brown; the scales about an inch long and three-quarters of an inch broad, and terminating in a hard, sharp point; and the needles from six to twelve inches long; whilst *P. Pinea* has solitary cones, sometimes four inches wide, of a lighter colour, the scales about two inches long, an inch or more in breadth, and terminating in a broad blunt prickle, and the needles five to eight inches long.

Whilst the abbreviated, parasol-like habit is undoubtedly the most striking peculiarity of the species, it has many other botanical characters which, if not individually distinctive, are when taken together what we mean by the species *P. Pinea*. The bark of the trunk is reddish-grey, fissured longitudinally, sometimes to a considerable depth, so as to expose a light reddish-brown inner cortex. In this country the stem commonly divides at no great distance from the ground into several large limbs spreading with an upward curve and themselves soon forking in the same manner, as is well seen in the small but typical tree at Kew. The twigs are pale brown and rather slender, and long retain the bristle-like bases of the fallen leaf-spurs; and the buds are cylindrical and slightly pointed, but less so than those of the Cluster Pine, which they resemble in many points. They are also more woolly and entirely without

resinous excretion. The needles are of a dark green, but brighter than those of *P. Pinaster*, semicircular in section, with finely serrulate edges and sub-acute points, but soft to the touch. They remain on for two or three years. Internally they exhibit a row of resin-canals all round the leaf at some depth below its surface, each surrounded by a layer of hard tissue or "sclerenchyma." The stomata occur on both the flat and the convex surfaces, and are deeply sunk in the epidermal tissue. The scale-leaf or "basal-sheath" is whitish and half an inch long the first year, but is reduced to half its length, much lacerated, and darkened in colour during the second year. The dwarf shoots, or leaf-spurs, are so arranged as to form a triple spiral series round the branch that bears them.

The catkins of staminate flowers are yellowish, and are grouped in bunches near the apex of slender shoots of the current year, surmounted by some slightly developed leaves. Each catkin is about half an inch long, cylindrical, and very short-stalked, having a number of scale-like bracts at its base. Each stamen has a prominent "connective" or "crest" projecting between its anther-lobes, which in this species is rounded and toothed. The female catkins are placed, two or three together, at the extremity of the strongest shoots; they are oval and about half an inch long, are short-stalked, and enveloped in reddish membranous scales. The cone-scales themselves are at first whitish-green; but they

become gradually reddish from their apices downwards before reaching maturity. The seed is larger than in any other European Pine, and it has a hard stony "testa," or envelope, which gives the tree the name of Stone Pine; whilst its hatchet-shaped wing is so small as to appear to be a merely "vestigial" structure, useless, that is, for that purpose of seed-dispersal for which this structure has presumably been evolved in allied forms. The entire cone is much lighter in colour than those of the Cluster Pine, and the "apophyses," or "tessellæ," differ in having keel-like ribs proceeding from each of their four-rounded angles, instead of the one diagonal keel in those of that species. In the centre of each tessella is a greyish rhomboidal depression, from the centre of which rises the broad, blunt prickle.

Young plants of the Stone Pine exhibit a peculiarity not noticed in other species of the genus. After branching has begun, and some of the dwarf shoots with paired needles have been produced, the plant puts forth long slender twigs bearing single, *i.e.* not paired, needles, without scale-leaves or "basal sheaths," half the length of those of the typical adult foliage, and of a bluish-grey-green. Later on, shoots bear these so-called "primordial" or "protomorphic" leaves mixed with the ordinary dwarf shoots; and then the former cease to appear.

The Stone Pine may perhaps be a native of China, where it is plentiful, as in the South of Europe it is seldom seen in situations far removed from habitations. It occurs in the South of France





CONE AND LEAVES OF STONE PINE.



in Spain, where it flourishes at an altitude of 4,000 feet, in Greece, and in Barbary; but it is most closely associated in our minds with Italy. The brilliant skies of the landscapes of Claude have their effect frequently heightened by the contrast with its heavy masses of dark foliage. Gilpin is most enthusiastic in its praise:—

“After the Cedar,” he says, “the Stone Pine deserves our notice. It is not indigenous to our soil, but, like the Cedar, it is in some degree naturalised; though in England it is rarely more than a puny half-formed resemblance of the Italian Pine. The soft clime of Italy alone gives birth to the true picturesque Pine. There it always suggests ideas of broken porticos, Ionic pillars, triumphal arches, fragments of old temples, and a variety of classic ruins, which in Italian landscape it commonly adorns. The Stone Pine promises little in its infancy in point of picturesque beauty; it does not, like most of the Fir species, give an early indication of its future form. In its youth it is dwarfish and round-headed, with a short stem, and has rather the shape of a full-grown bush than of an increasing tree. As it grows older it does not soon deposit its formal shape. It is long a bush, though somewhat more irregular, and with a longer stem; but as it attains maturity its picturesque form increases fast. Its lengthening stem assumes commonly an easy sweep. It seldom, indeed, deviates much from a straight line; but that gentle deviation is very graceful, and, above all other lines, difficult to imitate. If, accidentally, either the stem or any of the larger branches take a larger sweep than usual, that sweep seldom fails to be graceful. It is also among the beauties of the Stone Pine that, as the lateral branches decay, they leave generally stumps which, standing out in various parts of the stem, break the continuity of its lines. The bark is smoother than that of any other tree of the Pine kind, except the Weymouth; though we do not esteem this among its picturesque beauties. Its hue, however, which is warm and reddish, has a good effect; and it obtains a kind of roughness by peeling off in patches. The foliage of the Stone Pine is as beautiful as the stem. Its colour is a deep warm green; and its form, instead of breaking into acute angles, like many of the Pine race, is moulded into a flowing line by an assemblage of small masses. As age comes on its round clumpish

head becomes more flat, spreading itself like a canopy, which is a form equally becoming; and thus we see what beauty may result from a tree with a round head, and without lateral branches, which requires, indeed, a good example to prove. When we look on an Ash or an Elm from which the lateral branches have been stripped, as is the practice in some countries, we are apt to think that no tree with a head placed on a long stem can be beautiful; yet in Nature's hands, which can mould so many forms of beauty, it may easily be effected."

Valued for its shade, it is sometimes called the Umbrella Pine, the "Pin Parasol" of Southern France, though this name now belongs rather to the Japanese *Sciadop'itys verticilla'ta* S. & Z. The Stone Pine is more abundant on the Riviera di Levante than on the Riviera di Ponente; but, says the author of "Riviera Nature Notes,"

"If the Riviera di Ponente has few Stone Pines, we make up for the deficiency by possessing the finest specimen of the tree. The famous Pin de Bertaud, which grows on the high-road between Cogolin and St. Tropez, is the largest in Europe—at least, so the guide books say.

"What a strange region is this, where the tropic and the Arctic floras meet; where the Pine, son of the snowy north, stands side by side wide with the Palm, daughter of the burning south! Here is realised the dream of Heine's Fir Tree:

"'Ein Fichtenbaum steht einsam  
Im Norden auf Kahler Höh;  
Ihn schla/efert, mit weisser Decke  
Umhüllen ihn Eis und Schnee.

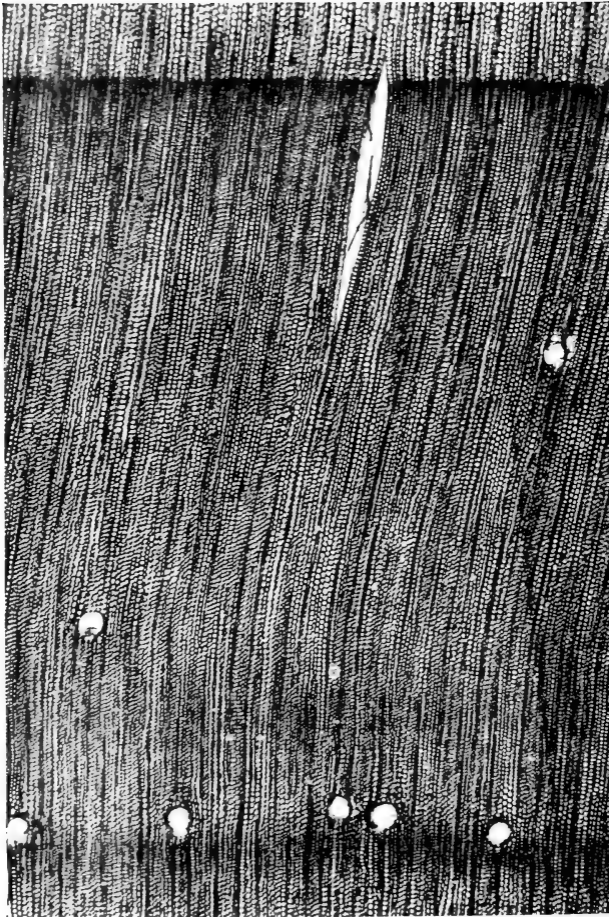
"'Er trua/emt von einer Palme  
Die fern in Morgenland  
Einsam und schweigend trauert  
Auf brennender Felsenwand.'"

Writers, slavishly copying one another, say that the Stone Pine was cultivated in England previous



*Photo: E. J. Wallis, Kew.*

STONE PINE.



TRANSVERSE SECTION OF WOOD OF STONE PINE (X 30 DIAMETERS).

to 1548 because it is mentioned in Turner's "Names of Herbes," published in that year. The passage in question runs as follows:—

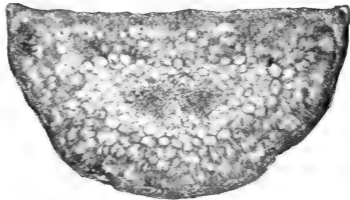
"Pinus, as Theodore translateth, is called in greeke Peuce, in englishe a pyne tree, in duche Ein forthen, in french Ung pin. Pines growe fayrest in gardines. There groweth one fayre one in Richmond. Pine nuttes are hote and drye."

This passage may, as Mr. Britten, the editor of the modern reprint of Turner's scarce work, considers, refer to the Scots Fir (*Pinus sylvestris*). In the sixteenth century the Scots Fir was probably rare enough in Southern Britain for one tree growing at Richmond to call for special mention, and its seeds, like every other known vegetable substance, native or foreign, would be tested by the careful apothecaries of that age. Turner knew Italy and its plants well, but may not have recognised a distinction between the two species. It is doubtful, therefore, whether the Stone Pine was grown in England before the time of Evelyn, or even before 1750, about which date Peter Collinson planted it, together with all the Conifers he could collect, at his house at Mill Hill.

In the South of Europe its soft, light, fine-grained wood is used for masts and general carpentry; but it is not durable, and the tree is chiefly valued for its large edible seeds, which are used as food wherever the species grows. They do not ripen until the fourth year, and are then three-quarters of an inch long without their wings, and about half as broad, and, being entirely free from resin, have a sweet taste, resembling that of the Hazel-nut. In Pliny's time they were preserved in honey, and

now they are commonly used at dessert, or in sugar-plums and cakes instead of almonds. If not kept in the cone, however, the abundant oil they contain becomes speedily rancid. They are known in French as "pignons," whence the tree gets its name of "Pin pignon." On the islands in the Sea of Marmora, where the tree is very common, the cones are exposed to fire to make them open and drop out the seeds, which are known in Turkish as "fistik." Besides being much eaten by squirrels, they form the chief food of the cross-bill, a bird which occasionally visits this country, and whose beak is specially modified for their extraction from the cone.

Where this Pine occurs in large groves of fine trees, such as those which form one of the great beauties of the ancient city of Ravenna, "Queen of the Marshes," where these trees extend for miles, the rustling and sighing of the boughs in the wind has often arrested the attention of the poet.



TRANSVERSE SECTION OF NEEDLE LEAF OF STONE PINE.





PLANE.



## THE PLANES.

*Plat'anus orienta'lis* L., and *P. occidenta'lis* L.

LORD CHANCELLOR BACON'S contribution to the progress of modern science is still, to some extent, a matter of controversy. If, however, the tradition that it is to him we owe the introduction of the Plane-tree into England were well founded, there can be no doubt that for this alone we should owe him much gratitude, especially in London.

The genus *Platanus*, which undoubtedly derives its name from the Greek πλατύς, broad, in reference either to its broad leaves or to its spreading shade is, according to the best authorities, almost the sole representative of a very isolated type of catkin-bearing trees, the five or six forms which it includes constituting a distinct Natural Order, the *Platana'ceæ*, though they may be related to *Liquidambar*. They are trees which commonly reach a considerable height, up to even a hundred feet; with nearly cylindrical stems—in old specimens of enormous girth—and with wide-spreading branches. It was probably with reference to the general outline of the Oriental Plane that Spenser, in his "Faërie Queene" (1589), borrowing his epithet, no doubt, as was his wont, from some classical authority, speaks of "the Platane round."

The manner in which the bark flakes off in

rectangular scales is very characteristic, and is, perhaps, a main reason for the impunity with which the Plane thrives in the soot-laden atmosphere of our metropolis. A copious annual crop of smoothly-polished leaves, readily washed by the slightest shower, and thus presenting a large surface to the food-giving light and air, and a bark which thus yearly throws off all impurity, constitute an ideal city tree.

We can hardly, perhaps, expect the enthusiasm of the poet to be quickly roused by the foreign charm of exotic trees, so that it is naturally the poets of America, the native home of one variety of the Plane, who sing its praises. It is to the appearance produced by this shedding of the bark that Bryant alludes when he writes of the Green River :

“Clear are the depths where its eddies play,  
And dimples deepen and whirl away;  
And the Plane-tree's speckled arms o'ershoot  
The swifter current that mines its root.”

The leaves are large, with stalks of some length, and prominent veins, generally five in number, radiating to the acute points of their gracefully-lobed outline. They are, however, “pseudo-palmate,” only three veins radiating from the base, and the other principal ones being branches of these, unlike the Sycamore, in which five or more radiate from the base. Individual leaves may be as much as nine inches long and eight in breadth, and though a certain general character of outline distinguishes the different geographical “races,” the variety of

detail, even on a single bough, is practically infinite. No leaf rebels more against the misrepresentations of the geometrical school of draughtsmen.

The bark is by itself sufficient to distinguish the Plane from the Sycamore (*A'cer Pseu'do-platanus*), which is commonly confounded with it, especially in Scotland; but the Sycamore has also its leaves in opposite pairs and far less smooth, whilst in autumn they are almost always marked with the round blots of an ink-black parasitic fungus.

When the foliage is yet young, the drooping flower-stalks are produced, the pollen-bearing flowers being on distinct branches from those that yield fruit, though either kind is collected together into the characteristic "buttons," or globular catkins.

The Oriental Plane is first mentioned, among English writers, by William Turner, in his "Herbal," printed at Cologne in 1568; and in 1596 John Gerard had it growing in his garden in Holborn, the history of his specimen being subsequently given by him in his "Herball" (1597), p. 1304, as follows:—

"My seruant *William Marshall*, whom I sent into the Mediterranean Sea as chirurgion vnto the Hercules of London, found diuers trees heerof growing in Lepantæ, hard by the sea side, at the entrance into the towne, a port of Morea, being a part of Greece, and from thence brought one of those rough buttons, being the fruit thereof."

Our Transatlantic neighbours still call the Plane the Button-ball, or Button-wood.

One of the most striking structural peculiarities of the Planes is the fact that during the

summer the axillary buds are entirely concealed in a conical hollow in the base of the leaf-stalk, being only revealed at the fall of the leaf.

The flowering branches are from two to six or more inches long, bearing from one to five, but most commonly three, of the buttons. Those that produce pollen are simply collections of short-stalked stamens mixed with a few narrow-pointed scales, and, as is generally the case with catkin-bearing trees, the whole branchlet falls when the pollen has been discharged. The fertile florets, too, are of the simplest structure possible, being merely one-chambered and one-seeded ovaries, each prolonged into a style, curved at its apex, and with a sticky stigma down one side; whilst as this ovary enlarges into a little nut, a tuft of bristles grows up from its base, giving the burr-like character to the whole catkin.

The timber of the Plane is fine-grained and of a brownish-yellow oak colour, somewhat resembling Beech, prettily marked, and thus well adapted for ornamental use. It is almost exclusively used by carriage-builders and pianoforte-makers, for the sides of wagonettes and the bridges in the piano, the manner in which it "takes paint" fitting it for the former purpose, and its toughness and hardness, by which the pins are securely held, for the latter. When old, the wood sometimes has dark veins in it, like those of Walnut.

One of the most interesting points connected with the Plane is the geographical distribution of its various forms, which most botanists treat as



FLOWERS, FRUIT, AND LEAVES OF PLANE.





distinct species, though they have utterly failed to bring forward any one strongly distinctive character. No Planes are known to the east of Kashmir, though, on the analogy of the distribution of Tulip-trees—if the theory of the eastward retreat of the European flora of Miocene times towards America be well founded—we might expect them to occur in China or Japan. In this connection it is interesting to note, though the evidence must be but slight, that the fossil Plane-leaves found in the Miocene rocks of Europe were believed by Dr. Oswald Heer of Zürich to be more nearly related to the Occidental than to the Oriental form. There can be little doubt that the Oriental Plane is indigenous in Persia, though it has also been cultivated in that country—where it is known as *chinar*—from a very early period; whilst if of human introduction in the Balkan peninsula, that introduction must probably date back more than 2,000 years. In Spain, and even in our own country, it seems that its short history has permitted of the origin of tolerably distinct varieties. The Occidental Plane was first brought into England from Virginia, in 1640, by the younger Tradescant to his father's garden at Lambeth, where was that remarkable collection of curiosities which afterwards constituted the Ashmolean Museum at Oxford. It is indigenous in the United States from Mexico to Canada, and from the Atlantic to the Rocky Mountains. Its place is taken in Mexico by two forms considered as species by De Candolle, *P. lindenia'na* and *P. mexica'na*; and in California by a third, *P. racemo'sa* Nutt.

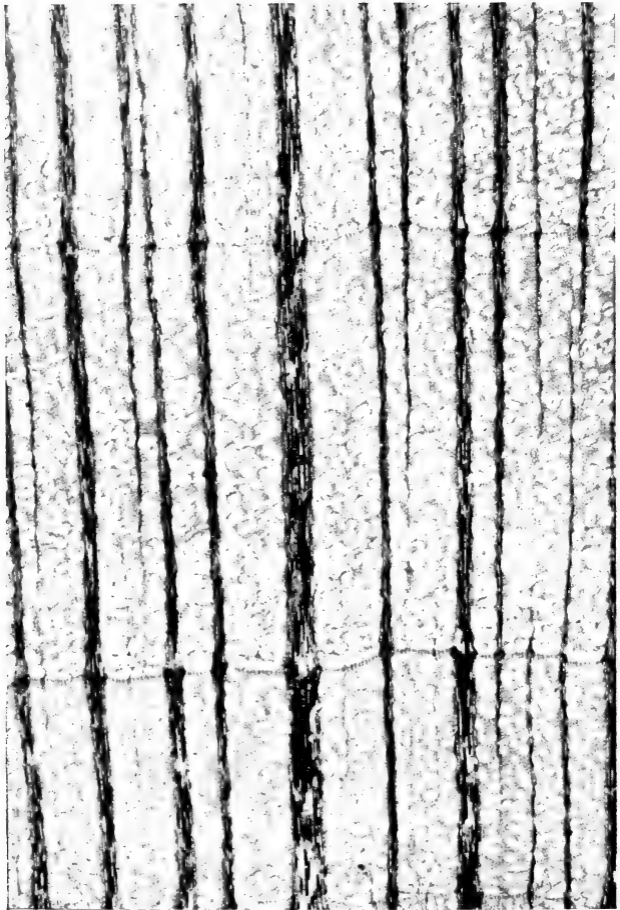
It seems that the American Plane does not attain the size or age of its Oriental brother. Neither form occurs commonly in forests or even in large groups; but single trees growing in plains or in river alluvium, in which it rejoices, sometimes reach enormous dimensions, and, from the gratefulness of their shade, in hot countries have long been venerated. At Caphyæ, in Arcadia, a beautiful Plane-tree was shown to Pausanias, which was said to have been planted, 1,300 years before, by Menelaus, the husband of Helen, before his departure for the Trojan War. When Xerxes invaded Greece, another Plane so delighted him by its size, that he—somewhat unkindly, but no doubt with good intentions—encircled it with a collar of gold, stamped a figure of it on a gold medal which he continually wore, and tarried so long beneath it as to ruin his chances of success. Pliny speaks of a Plane in Lycia over eighty feet in circumference, so that eighteen persons could dine within it; whilst at Buyukderé, three leagues from Constantinople, there still exists a tree of this species 100 feet high, 165 feet in girth, and 130 feet in the spread of its branches, being, perhaps, over 2,000 years old.

To the student of philosophy the Plane must always be associated with the groves of the Academe, in which walked the earliest of the peripatetic philosophers. This may have been in the mind of Tennyson, when he associated the Princess Ida's female Academe with "the thick-leaved Platans of the vale." Even in England, where it was thought in 1633 that it would only flourish if "cherished and



PLANE TREE IN WINTER.

*Photo: E. J. Wallis, Kew.*



TRANSVERSE SECTION OF PLANE TREE WOOD (X 30 DIAMETERS).

watered with wine; and it is found by experience that the same is very comfortable to the roots," we have some notable specimens, as at Highclere, and at Weston Park, in Shropshire, where there is a tree eighty feet high, spreading 100 feet, and having a girth of eighteen and a half feet at five feet from the ground.

The true Oriental Plane has a rounded outline, a leaf with a wedge-shaped base, and deeply five-lobed, and generally two or more "buttons" in the fructification. The Spanish variety has very slightly divided leaves, and most of our London Plane-trees belong to an intermediate form (*P. orientalis acerifolia*) somewhat resembling the Sycamore in its leaf-outline. Of this form there are many fine specimens in and around the metropolis, as in Berkeley, Bedford, and Mecklenburg Squares, and the well-known trees in Wood Street, Cheapside, and in Stationers' Hall Court. The latter was planted by Mr. Broome, treasurer of the Company, about seventy-five years ago. There are also fine specimens, over 100 years old, at Stanwell Place, Staines, and at Shadwell Court, Norfolk; and down to 1881 a magnificent tree of equal age was standing in the garden of Lambeth Palace, where a fine representative still lingers.

The Western Plane is far less common with us. It has a looser outline, differing, it has been said, from the Oriental kind in this particular, as a Pear-tree does from an Apple; its leaves are divided to a moderate depth, and are scarcely at all wedge-shaped or tapering at the junction of the blade with the stalk; and the fruiting branch commonly

bears but a single "button." In its native country it rejoices in damp river-valleys, often growing actually on the banks, and affording, in consequence, a more quickly-grown timber than the Oriental, though inferior to it in quality. Specimens are recorded with a girth of over forty-seven feet, and it sometimes grows to a great height without branching.

So much confusion has arisen from the similarity of the Occidental to the Maple-leaved Plane (*P. orientalis acerifolia*), that it is impossible to sift the evidence as to their relative hardiness; but neither kind seems to compare for longevity with the true Oriental form. Philip Miller, indeed, who was gardener to the Apothecaries' Company at Chelsea from 1722 to 1771, states that he knew from his own observation that the Maple-leaved Plane was only a seedling variety of the Oriental; in which case the former has, perhaps, been too short a time in existence to be fairly tested.

All kinds are now raised from either seed, cuttings, or layers, the last method being, on the whole, the most satisfactory. Considering its pre-eminent excellence as a shade-giving tree, capable of withstanding the most vitiated atmosphere, the cultivation of Planes may, it is to be hoped, be greatly increased in the future, especially in our towns. In the pure air of the country, however, where smoke has not to be taken into consideration, the facts that it is late in coming into leaf, and is somewhat opaque in colouring, may cause some of our native trees to be preferred to it.













