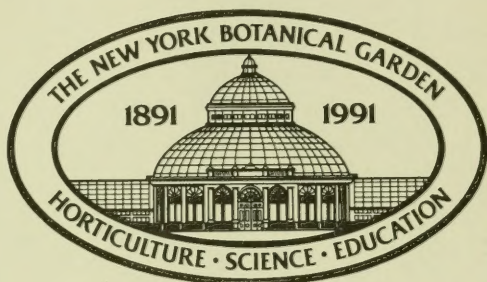


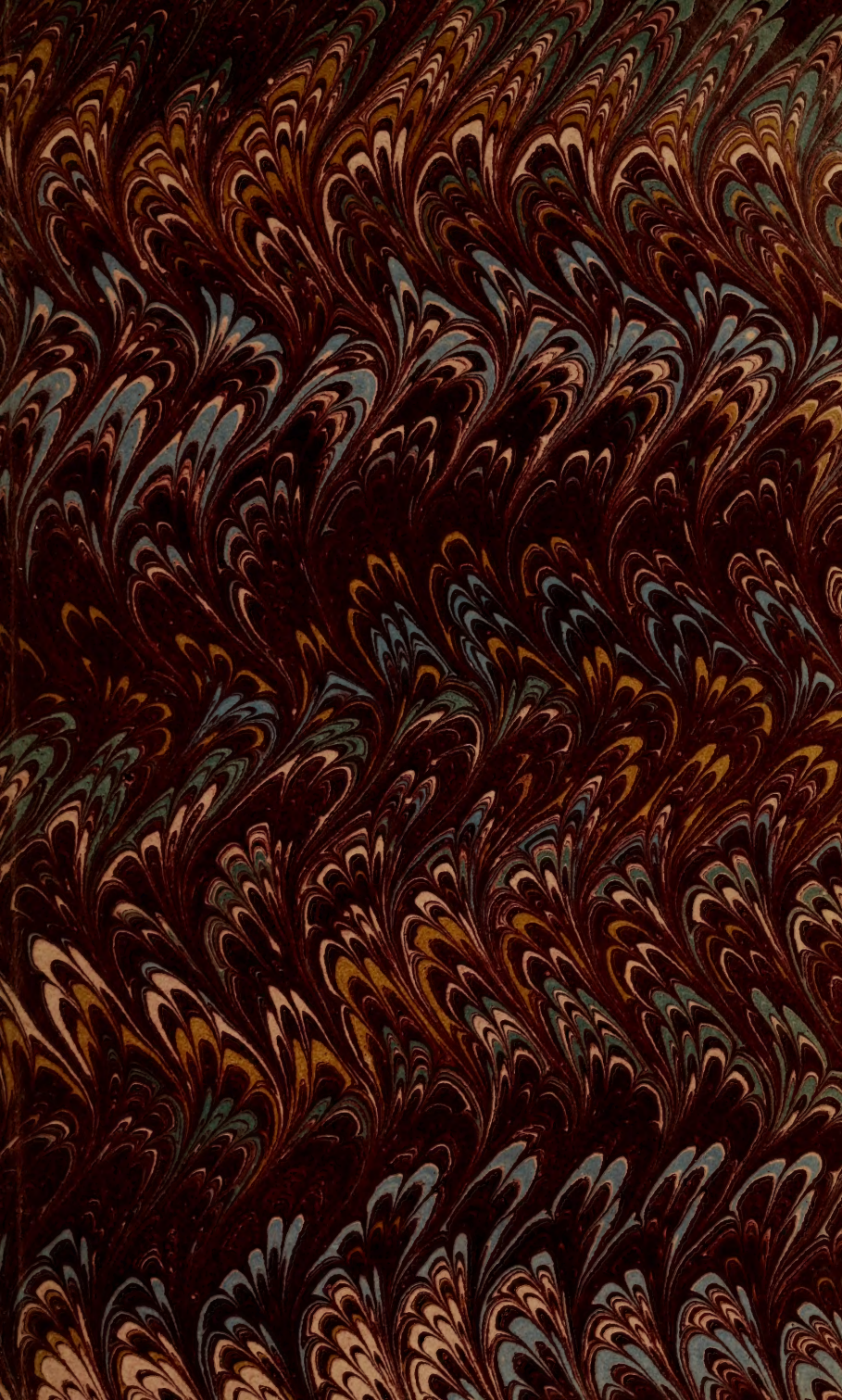
BOTANICAL NOTES
AT
BARTON & MILDENHALL, SUFFOLK
BY
SIR CHARLES J. F. BUNBURY, BART.
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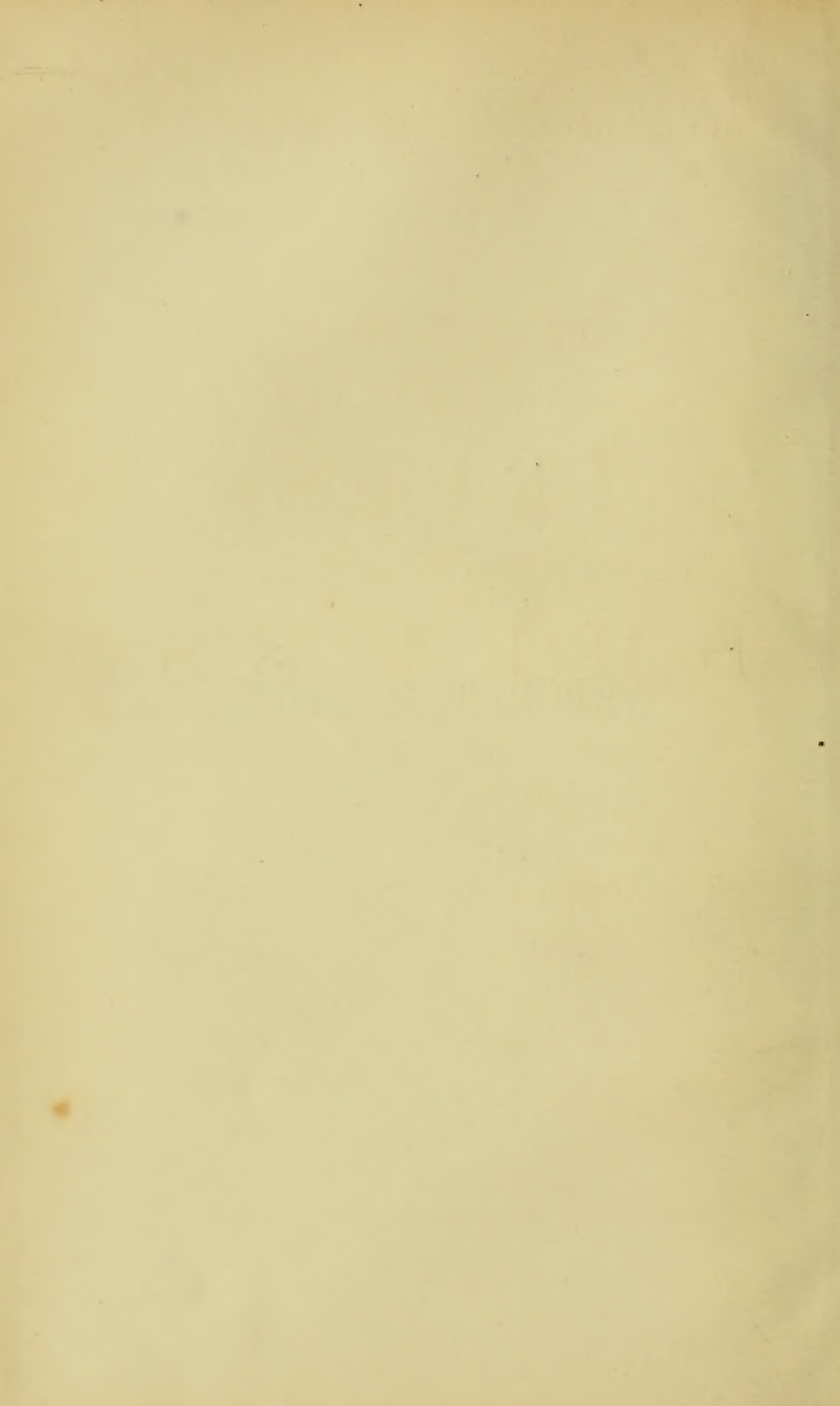
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ARBORETUM NOTES.



ARBORETUM NOTES.

NOTES

ON THE

TREES

AND

SHRUBS

CULTIVATED AT BARTON

BY

SIR CHARLES J. F. BUNBURY, BART.

Printed by

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1889.

ARBORETUM NOTES.

LEGUMINOSÆ.

SOPHORA JAPONICA.—*Loudon*, v. 2, 563.

Two trees in the arboretum,* planted November, 1825. Neither of them has yet shewn any disposition to flower. The foliage is rather thin, and the tree altogether, at least as it appears here, shows no particular beauty. It is said by Lindley (in the *Gardeners' Chronicle*), to be poisonous.

Sophora
Japonica

VIRGILIA LUTEA.—*Loudon* 2, 565.

One in the American Garden;† one in the arboretum; both planted about 1832. Both are dwarf trees, not above 10 feet high, branching at a small height from the ground and forming thin roundish heads. Neither has yet shown any disposition to flower. The foliage is handsome in summer, and turns to a beautiful amber yellow colour in the autumn.

Virgilia lutea

* One of them since cut down.

† This has since been rooted out, being in a dwindling condition. The tree in the arboretum is flourishing (1868), though it has not yet flowered.

LEGUMINOSÆ.

Virgilia lutea

In May, 1875, I saw several trees of this species in flower in the Jardin des Plantes at Paris. They were much larger trees than ours; I dare say nearly 20 feet high; the flowers pure white, in long, lax, pendulous racemes, not unlike those of the common white Robinia, but the racemes thinner, and the individual flowers larger. The bark of the trunk blackish.

This species was separated from *Virgilia* and named *Cladrastis*, by an author of the name of Rafinesque; and he has been followed in this by Torrey and Gray (*Flora of N. America*) and by Bentham and Hooker (*Genera Plantarum*). These latter authors, however, remark that both *Cladrastis* and *Calpurnia* might perhaps be better considered as sections of *Virgilia*. Those who admit *Cladrastis* as a genus, restrict the name *Virgilia* to the one South African species, *Virgilia Capensis*.

SPARTIUM JUNCEUM.—*Loudon*, v. 2, 576.

*Spartium
Junceum*

All the plants of this species at Barton, of which there were several of considerable age and size, were killed by the winter of 1860-61.

CYTISUS LABURNUM.—*Loudon*, v. 2, 590.

*Cytisus
Laburnum*

The Laburnums here do not appear to have

LEGUMINOSÆ.

been hurt by the winter of 1860-61; they flowered well in the following May; but the blossoms of the Laburnum are sometimes entirely killed in the bud by late frosts in April. This happened to a great extent in 1859, when the fine old Laburnums at Mildenhall lost almost all their flower buds: the promise of blossom had been great, but violent and cold east winds set in towards the end of April, and hardly a flower-bud escaped.

The only place where I distinctly remember to have seen the Laburnum growing wild, was in the woods around the Lake of Albano.

CYTISUS LABURNUM.

var. Adami or purpurascens.

Loudon v. 2, 520.

One planted 1869, on west side of pleasure ground, flourishing in 1877. Has flowered pretty freely for some years past; but the flowers are very inferior in beauty to those of the Laburnum. If worth cultivating at all, it is only as a curiosity. The curious sport or anomaly in the character of the flowers of this variety, first observed by Mr. Rivers in 1836 (see Loudon), has since occurred several times, and in various places; that is to say, a plant of this hybrid has produced some flowers of the true character of the Laburnum, and others agreeing both in colour and

Cytisus
Laburnum

inflorescence with *Cytisus purpureas*, as well as others of the intermediate character of *var. Adami*.

Here, however, I have not been able to see any such deviation; all the flowers our tree has yet borne, are true *Adami*.

CYTISUS ALBUS.—*Loudon*, p. 589.

Cytisus Albus

Killed at Barton, by the severe winter of 1860-61; but some young plants, which we bought from Veitch, and planted in the pleasure-ground in 1861, are thriving exceedingly well and blossoming abundantly. All that Loudon says about the beauty and the rapid growth of this plant, is perfectly correct.

CYTISUS ALPINUS.—*Loudon*, v. 2, 591.

Cytisus
Alpinus

The characters which distinguish the Alpine from the common Laburnum, are certainly clear and decided enough to mark them as distinct species, as species are generally understood among botanists; supposing that no intermediate and connecting forms occur to break down the distinctions. The broader and more glossy leaves and the smaller or more crowded flowers of the *Cytisus alpinus*, give it a different look at first sight; and the pods are markedly different. It is

LEGUMINOSÆ.

said (in Henfrey's *Vegetation of Europe*), that these two species exactly represent or replace each other on opposite sides of the Eastern Alps; *alpinus* abounding on the northern face of the mountains, *Laburnum* on the southern. But this fact, supposing it correct, would admit of two different interpretations, according to the different views of naturalists concerning species.

Cytisus
Alpinus

The alpine or "Scotch" *Laburnum*, though most certainly not a native of Scotland, is much cultivated in that country, much more, I think, than in these parts of England.

ROBINIA VISCOSA.—*Loudon*, v. 2, 626.

Two good specimens, planted about 1825, in two different clumps on the lawn; the one most to the east the larger. They both flower every year, usually in July (always later than the common *Robinia*), more or less abundantly, but seldom profusely; and now and then, in favourable seasons they have borne pods. These are rather peculiar in appearance, being thickly beset with dark, red stalked glands.

Robinia
Viscosa

Robinia Viscosa has flowered this year (1879), much more profusely than I ever saw it before, so as to be very ornamental; and its season of blossoming (like that of almost all

LEGUMINOSÆ.

Robinia
Viscosa

trees and shrubs), has been later than in ordinary years; so that it was not in full beauty until very near the end of July.

WISTARIA CHINENSIS. D. C.—*Loudon*, v. 2, 648.

Wistaria
hinensis

The oldest *Wistaria* here is one against the garden wall near the greenhouse, planted, I believe, in 1825, but I can find no note of it in my father's papers. The height of the wall is not great, but the branches spread along it to a great length, and on the other side along the roofs of the range of greenhouses; and the growth is most luxuriant and beautiful. One branch has been trained *into* the greenhouse through a small opening, and it is striking to see that this branch always comes into flower and leaf some weeks earlier than the rest of the plant to which it belongs.

This statement is no longer correct, since the construction of our new greenhouses and the demolition of the old (1875).

This plant suffered very much in the earlier part of 1875; not so much I think from actual frost, as from the long-continued drought of the previous summer, followed up by the dry, cold of the winter and early spring.

Two very fine *Wistarias* are in the arboretum;

LEGUMINOSÆ.

the one against the wall at the east end, planted 1826, has the largest stem of all here, a trunk quite tree-like in thickness and robustness, and ruggedness, and dividing into branches which are so curiously flattened and fluted and contorted, as to remind one of the woody climbers of the tropical American forests. The other, near this, but against the wall facing south, is, I believe, some years younger, and has not so large a stem, but it is of very vigorous growth; some of its branches spreading over the top of the wall, have laid hold of a spruce fir tree growing on the other side of it, and have climbed up this to its top; so that the leaves, and in favourable seasons the blossoms, of the *Wistaria* are seen high up among the branches of the fir, producing a singular and pretty effect. A younger *Wistaria*, in another part of the arboretum, has fastened in like manner on a Scotch pine.

Wistaria
Chinensis

The winter of 1860 affected these *Wistarias* so much, that they hardly flowered at all the next year, and their foliage was comparatively scanty; but they soon recovered completely. Almost always, they flower twice in the year; most profusely in April (or May, in late seasons); again, sometimes pretty copiously, in July, when the blossoms have a still more beautiful effect than in the spring, from being relieved against the fine

LEGUMINOSÆ.

*Wistaria
Chinensis*

grass green of the leaves. It is curious that, of so many myriads of flowers as are produced every year, all are abortive; I have never seen the least tendency to the formation of a fruit. The *Wistaria* is certainly one of the most beautiful climbers that we have in cultivation.

Mr. Bentham tells me (November, 1875), that he has never seen the *Wistaria* bear fruit in England, but he has specimens of the pods from China. He suggests that its barrenness in this country may be owing to the absence of some insect which may be necessary to its fertilization.

CERCIS SILIQUASTRUM.—*Loudon*, v. 2, 657

*Cercis
Siliquastrum*

Two fine specimens, one in the arboretum, the other on the east side of the pleasure ground, both planted by my father in 1826; several smaller and younger ones in various parts of the grounds. The two largest plants both of them divide near the ground into several stems, which rise up like trees, but in oblique and crooked or tortuous directions, branching out into leafy heads at some height from the ground. In the gardens of France and Italy, where the Judas tree is now very much cultivated, I have generally seen it take more decidedly the form of a tree, with a single trunk, and (as Loudon says), a flat spreading head. On the other hand, where I have seen it growing wild (as near Tivoli and

LEGUMINOSÆ.

between Terracina and Fondi), it has been always in the form of a bush. Edward* tells me that the same is the case in Greece, where it is one of the most common of plants over all the wild uncultivated lands. Cercis
Siliquastrum

The modern Greeks, according to Sibthorp, call it by the name *Kotzoukounari*;—a name of which it is difficult to guess the origin. *Kerkis*, which Linnæus adopted (in its Latinized form of *Cercis*), as the name of the genus, appears, according to Liddell and Scott, to be a name of doubtful application; some suppose it to have meant the aspen poplar, others this Judas tree. This is now a favourite object of cultivation in the gardens and public walks of France and Italy, and certainly nothing can be more ornamental when in flower. At Paris, in April, 1857, we saw the gardens full of it, making a most beautiful show; and when we travelled through France in April, 1866, we observed it to be the great ornament of all the gardens along the line of railway from Chalons to Lyons and thence southward.

Our Judas trees here flower well in favourable seasons (but we are seldom here to see them); and some of them bear abundance of pods, especially the large one in the arboretum, which is near a wall. The branches of this one are at present (October, 1868), loaded with seed vessels.

* His brother, Edward Herbert Bunbury.

LEGUMINOSÆ.

Cercis
Siliquastrum

I have not yet ascertained whether the seeds are actually ripened. The pods are remarkably flat and thin, like leaves, and some which have been given me from Constantinople are as thin as those produced here.

The leaves of the *Cercis* are (at least apparently) of a form very unusual in the Leguminous order; but it is probable that we may consider them as not really simple and single, but formed of *two* leaflets united throughout their length. They would then be analagous to the leaves of the great tropical genus *Bauhinia*, to which *Cercis* is, as Mr. Bentham remarked to me, in other respects nearly allied. *Bauhinia* has leaves composed of two leaflets, which in some of the species are quite distinct, but in most are united for more or less of their length, so as to produce the appearance of a two-lobed leaf; and the arrangement of the principal veins is much the same as in *Cercis*. At this season (October 22), I observe that one can easily distinguish on the branches of the *Cercis* the buds from which flowers will proceed next spring. They are of a red colour, and are seated on the small branches, below the leaves of this year.

CERCIS CANADENSIS,—*Loudon*, v. 2, 659.

One, in the arboretum, planted 1826. It has the same general form of growth (between shrub

Cercis
Canadensis

LEGUMINOSÆ.

and tree), as the Judas tree to which it stands Cercis
Canadensis opposite ; but its stem is less robust. It has flowered only two or three times in all the years it has been growing here, and then sparingly, and has borne no fruit. The flowers are smaller than those of *Cercis Siliquastrum*, and their colour paler, and with less of a purple tint in it.

ROSACEÆ.

PRUNÆÆ.—*Amygdalus nana*.*Loudon*, v. 2, p. 673.*Amygdalus
nana*

Thrives very well here: we have several plants in various parts of the pleasure ground. Flowers regularly and plentifully in April. The flowers are very lovely, especially in the bud, a little before expansion, when they are of an exquisitely pure deep carmine; when fully expanded, their colour is a beautiful delicate rose, deeper than that of the peach blossom. I have never known the species produce fruit here. When in leaf, its appearance is very much like that of a miniature willow.

The geographical range of *Amygdalus nana* is very carefully investigated by M. Alphonse de Candolle, in his *Geographie Botanique Raisonné*. It appears to be extensively spread through the southern parts of Siberia and of Russia, not further north than 51 degrees of latitude in the former country, and 54 degrees in the latter. From Russia it ranges south-westward into Transylvania and Hungary, and its westernmost natural limit is on the frontier of Hungary and Austria, within a short distance of Vienna.

A dry climate, and one of an *extreme* character—of great summer heat and winter cold—seems to be the best adapted to it: but in cultivation it bears very well our more temperate and cloudy skies.

ROSACEÆ.

ROSEÆ.

Rosa Banksiæ, Robert Brown.

Loudon v. 2. 777.

This is a very pretty climber of astonishingly Roseæ. rapid growth; I hardly know any other which makes such long shoots in the season. It bears our ordinary winters without any injury; but the two which were planted by my father against the walls of the house, and which had grown to great height and bulk, were killed to the very ground by the winter of 1860-61. One of them (against the south-west front) has since grown up again to almost as great a height as before; indeed it reaches nearly to the top of the house, and its woody stems are of considerable thickness. Its intricate entanglement of branches affords excellent nesting places for a variety of small birds. This plant is of the white flowered variety, which is considered as the type of the species. It flowers plentifully, but at a season when we are usually absent from home. The bark of the old stems which is of a dull greyish brown color and tolerably smooth, splits open spontaneously, cracking lengthwise, and rolling back, exposing the inner bark; this latter is of a bright cinnamon color, and composed of a great number of very delicate, soft,

ROSACEÆ.

Rosaceæ

flexible layers, as thin as silver paper, which separate with the greatest ease, and have a very peculiar appearance.

POMEÆ.

Crataegus orientalis.

Mespilus odoratissima.

Botanical Mag. v. 49. t. 2314.

Loudon v. 2. 827.

Pomeæ

One tree in the pleasure ground, near the south west end of the house; the other in the arboretum near the tulip trees; both planted by my father in 1831.

He had them under the name of the *Azarole*, which they certainly are not. Both are in the form of trees, though not above ten or twelve feet high; and in general form, and the character of their trunk and bark, resemble such specimens of the common hawthorne as have grown into trees. The foliage is of a soft grey tint, very agreeable to the eye in contrast with the greens of other trees; and the fruits, which are very abundant, are of a particularly beautiful coral-red. This year (1868), they are in such profusion as to be exceedingly ornamental and to attract general attention.

ROSACEÆ.

POMACEA.

Amelanchier Canadensis.

Amelanchier Botryapium.

Mespilus Canadensis.—*Linnaeus*.

•*Gray*.—*Flora N. United States*.

Torrey & Gray.—*Flora N. America*,
v. I.

Loudon, v. 2., 874.

Several flourishing trees in various parts of the Pomacea pleasure ground and arboretum; planted by my father.

A beautiful little tree (for it always, here at least has the form of a tree, not of a shrub), very ornamental in April, with its profusion of delicate white flowers, and in Autumn with its crimson leaves. Its fruits are much in favour with small birds, which soon strip the tree of them.

Bullfinches also are very fond of the buds in early spring.

This according to *Torrey* and *Gray*, is a very variable plant in its own country; indeed those authors admit that it is sometimes difficult to distinguish from the European *Amelanchier vulgaris*.

ROSACEÆ.

POME.E.

Pyrus torminalis.—*Lindley*.

Loudon, v. 2, 913.

Cratægeus torminalis.—*Linnaeus*.

Pomeæ

When we were staying with Henry* at Abergwynant near Dolgelly (a small estate then belonging to him), in 1864, I was struck with the beauty of the autumnal colouring of this tree, on the wooded rocky hills upon the banks of the Mawddach. The foliage had then just changed colour, and showed a variety of fine tints, between pink and yellow, so as to be very ornamental. Henry afterwards sent me a plant of it, which is now growing in the American Garden, is above six feet high, and very healthy and thriving. This year (1874), the foliage changed colour about the middle of October, and continued for some time to show various fine tints of tawny red and reddish yellow.

* His brother, Colonel Bunbury.

CALYCANTHACEÆ.

CALYCANTHUS FLORIDUS.

Loudon, v. 2, 936.

The largest plant of this species at Barton (in ^{Calycanthus} the American garden, pl. 1826 ?), is at least eight ^{Floridus} feet high—I think more; but it does not form a “dense” bush, but a very loose and thin one. A marked character of the growth of this plant is that the smaller and younger branches go off at a very large angle, almost a right angle from the older ones; and very often when a branch has terminated in a flower, two younger branches spring from immediately beneath it, and thus, when the flower (which with us is always abortive), has fallen, the older branch has the appearance of forking into two branchlets, which diverge at a very wide angle. This gives an irregular, open and straggling character to the ramification of the shrub. The Carolina Allspice flowers plentifully every year with us, but ripens no fruit. The colour of the flowers is a rich dark brown-red, or chocolate colour. They are coloured of too light a red in plate 104 of *Smith & Abbot's Lepidopt of Georgia*, which is otherwise a very good representation of the plant.

Catesby's figure (*Carolina*, v. 1. pl. 46), is very indifferent. That in the *Botanical Magazine*, v. 14, t. 503, very good.

The scent of the flower is not unlike that of

CALYCANTHACEÆ.

Calycanthus Floridus over-ripe apples, and, to my taste, not particularly pleasant; but the wood and bark have a fine aromatic fragrance.

The structure of the flowers is accurately described by Lindley, in the generic character, copied by Loudon, p. 935. In many important and remarkable points it agrees with that of the genus *Rosa*: in the nature of the calyx-tube, the position of the ovaries within it, with their styles emerging from its mouth, and the insertion of the stamens; but it differs widely from *Rosaceæ* in the structure of the anthers, the number and arrangement of the parts of the perianth, and the absence of any distinction between the sepals and petals. There is no doubt however that the *Calycanthaceæ* are closely allied to the *Rosaceæ*. The affinity to *Rosaceæ* is disputed by Bentham and J. D. Hooker, who (*Genera Plantarum*, vol. I. p. 16). contend that the appearances which have led to this conclusion are deceptive. They hold that the tube which incloses the carpels is not a part of the calyx, but is a hollow *torus* or receptacle, analagous to that of *Nymphœa*. They place the order *Calycanthaceæ* next to *Magnoliaceæ*, observing that it is allied in particular to *Illicium*, though in some respects very anomalous.

CHIMONANTHUS FRAGRANS.

Loudon, v. 2, 938.

Chimonanthus fragrans

The only plant of this kind that we have here

CALYCANTHACEÆ

— against the wall of the arboretum—was killed nearly to the ground by the winter of 1860, but is reviving. There is a much finer one at Mildenhall against the South end of our house ; and this one has several times ripened fruit.

The flowers of the *Chimonanthus* are indeed deliciously fragrant, but the bruised leaves and bark have but very little scent.

SAXIFRAGEÆ.

HYDRANGEÆ.

Hydrangea quercifolia.

Loudon, v. 2, 995.

*Hydrangeæ
quercifolia*

Two or three plants of this, planted by my father, long ago, I suppose in 1832 or earlier, in the arboretum and American garden, are still growing very well, having survived all the intervening winters, and flower every year. They have not however grown to more than about four feet high. Their appearance is both handsome and singular, especially in autumn, when the leaves change to rich tints of red and purple.

It is remarkable that a shrub which is a native of Florida should be hardy with us. *Halesia tetraptera* and *Æsculus macrostachya*, are similar cases, showing that deciduous shrubs and trees can bear a great degree of cold in their dormant state, and therefore are much more hardy in proportion than evergreens.

Deutzia scabra.

Loudon, v. 2. 595. Hooker. Botanical Mag. t. 3838.

*Deutzia
Scabra*

Quite hardy. I have not seen it injured by the severest frosts that we have experienced here; and when in flower it is very ornamental.

Even in winter it is rendered rather conspicuous by the deep cinnamon colour of its young stems.

SAXIFRAGÆ.

It forms a very dense bush, a great number of stems rising up close together, at first erect and wandlike, toward their tops much branched and arching. The leaves are remarkably rough; flowers of a beautiful pure white, much like those of some Saxifrage on an enlarged scale; resembling also those of *Philadelphus*, but the stamens are only ten, and their filaments broad, flat, ending in three points, of which the middle one bears the anther. In general form and mode of growth ("habit") this is very like a *Philadelphus*, but it is remarkable for the degree in which the stems and older branches throw off their bark in winter—which I have not observed in the genus just mentioned. The bark exfoliates and comes off in large quantities, hanging loose on the stems in broad ragged strips, which show their interior of a bright cinnamon colour, and sometimes they take the form of quill-like rolls. The new bark, exposed by this exfoliation, is likewise cinnamon coloured; so that altogether the winter colouring of the bush is rather rich and warm.

ESCALLONIA MACRANTHA.

Hooker, Botanical Mag. t. 4473. (good).

One plant under shelter of a wall facing South, at the north extremity of the kitchen garden. Planted 187 ; looks healthy and thriving hitherto,

*Deutzia
scabra*

*Escallonia
macrantha.*

SAXIFRAGÆ.

and flowers well; but I am very apprehensive that it may suffer from the very severe weather now prevailing (December, 1878). In the grounds of Lynwood, Sunningdale (then belonging to Admiral Sir Frederick Grey), a few years ago I saw it thriving beautifully without any shelter, among azaleas, and other ericaceous shrubs in a bed of "heath soil," or what gardeners commonly call peat earth.

This is a beautiful shrub, much superior to any other species that I have seen of the genus, with foliage of a rich dark green, very glossy and beautiful bright red flowers.

(August, 1879.) This has not been killed as I expected by the severe winter; it has indeed been severely cut, but has again put forth fresh coloured and vigorous looking leafy shoots.

Ribesiaceæ

RIBESIACEÆ.—*Eudlich.*Ribes—*Sanguineum, Pursh.*

Loudon, v. 2. 988. Hooker, Botanical Mag. t. 3335.

LYTHRACEÆ.

Bentham and Hooker.

PUNICA GRANATUM.

Loudon, v. 3. p. 939.

A good plant of the double-flowered Pomegranate Punica granatum. trained against the south-east front of our house, and rising up it to the tops of the first floor windows. Planted by my father in 1825, I believe. Was severely hurt by the winter of 1860-61, but recovered completely. Flowers nearly every year, but in ordinary seasons rather sparingly. In September, 1865, its blossoms were remarkably abundant and fine. It is altogether a very beautiful plant, beautiful alike in its brilliantly glossy rich green foliage, the delicate red of its young leaves and shoots, and its glorious scarlet flowers.

The stem divides almost from the base into two, the larger of which is about eighteen inches round at the height of two feet, and both are excessively branched and subdivided all the way up.

Towards the base, the stems are very rugged, gnarled, twisted and wreathed like those of some woody climbers.

HAMAMELIDÆ.

Bentham and Hooker.

LIQUIDAMBAR STYRACIFLUA.

*Loudon v. 4, 2049.*Liquidambar
styraciflua.

Several flourishing trees of Liquidambar planted by my father in 1825 or 1826. The largest by far is near the south east corner of the pleasure ground, backed by taller trees; it must be near forty feet high, and is in every respect a very fine and vigorous tree.

One by the side of the main walk opposite to the south west corner of the house, a small, but flourishing tree, is conspicuous for the beauty of its crimson autumn colouring, and for being always the first to change colour. There are two or three others about the lawn, and two or three in the arboretum. But no one of these Liquidambar at Barton, though they are above forty years old, has ever shown any inclination to flower.

The Liquidambar, in all the specimens here, forms a tree with a distinctly pyramidal head. The bark of the main stem is remarkably rugged, that of the branches (when they are more than two or three years old) peculiarly corky, rising into odd looking, irregular fungous lumps and ridges of corky cellular tissue. The foliage, beautiful in summer, from its gloss and bright yellow-green color, but much more so in autumn, when the leaves assume the richest variety of purple, crimson, orange and yellow tints, excelling

HAMAMELIDEÆ.

I think, all other trees that we have in cultivation here, even the *Rhus typhina* and *Cotinus*. One Liquidambar at Lady Cullum's turns to an almost perfect rose colour in autumn. Liquidambar
styraciflua

(October, 1868.) The colouring of the Liquidambar trees here has been and is especially gorgeous this season. Even now they are absolutely masses of crimson.

(December, 1869.) By far the largest Liquidambar I have ever seen, is in Sir John Kennaway's grounds, at Escot, near Ottery St. Mary, Devonshire. It is really a timber tree.

The genus Liquidambar was formerly supposed to be closely related to *Platanus*. Blume made it the type of an order (of one genus) which he called Balsamifluæ; and Lindley who altered the name to Altingiaceæ (vegetable kingdom) thought that its affinities were with planes, willows and birches. But the botanists of the present day all seem to be agreed that the real relationship of Liquidambar is with the *Hamamelideæ*, with which order it is actually united by Bentham and Hooker (Gen. Plant. v. 1.), and in Hooker's *Icones Plantarum*.

The *Hamamelideæ* are a family by no means numerous in species, but widely scattered (none however are European) seemingly not very closely connected with any other family, but placed by Hooker and Bentham between the *Saxifrageæ* and

HAMAMELIDEÆ.

Liquidambar the *Halorageæ*. (The Haloragæ include *Hippuris*, *Myriophyllum*, and *Gunnera*.)

Liquidambar therefore must be placed in a widely distant part of the system from the *Planes* and the *Amental* families with which it is associated in Loudon's work.

CORNACEÆ.

CORNUS MASCULA.

Loudon; v. 2.

One, given by Lady Cullum, planted in January 1872 :—already a tree of some considerable height. Cornus
mascula

On the 14th March, last year (1871) Lady Cullum showed me in her garden at Hardwicke, a fine tree of this Cornel, perfectly covered with its yellow flowers, having a very bright and gay appearance. This was the first time I remember to have seen it in a garden, though it seems to have been frequently cultivated by our ancestors. See *Bacon's Essay of Gardens* where he mentions among the flowers of March—"the cornelian tree in blossom." See also Gerardi's *Herball*. p. 1466.

I saw it in flower, (March 27, 1848) in a wild state, on the Appenines, between Spoleto and Terui ; but there it grew as a shrub, whereas Lady Cullum's is a well-formed tree, perhaps twenty feet high. This Hardwicke tree, though it flowers so well, has (as I understand), never yet fruited.

Looked weak and sickly for some years after it was planted ; but being cut down to the height of about five feet (*pollarded*) it has become much more vigorous, and has put forth abundance of strong, healthy shoots, well clothed with leaves. (1879),

CORNACEÆ.

CORNUS FLORIDA,

*Loudon, v. 2. 1017,*C^{ornus}
Fl^{orida}

Charles Lyell gave my father several young plants of this species, from America, about 1852; but only one is now alive (1872.) This stands in the Vicarage Grove, near the *Abies Menziesii*; it appears tolerably healthy, but has grown very slowly, being now not more than about seven feet high, and the trunk only a few inches round. Though so small, the bark already shows the character noticed by Michaux, the cracks running in great measure rectangularly, so as to divide it into squares more or less regular. This tree flowered for the first time in June, 1868, and the single head of flowers which it produced was sent up to me, to London, on the 10th of that month. The involucre was much smaller than in the wild dried specimens which I have from America, but otherwise agreed well with them and with the descriptions.

A few more flowers were produced in 1869, and again in 1870; but with the involucres still smaller than in the first instance. It seems very strange that a tree which is described as being one of the most common and widely spread in North America, should succeed so ill here, where so many American trees and shrubs thrive perfectly.

CORNACEÆ.

BENTHAMIA FRAGIFERA.

Loudon, v. 2, 1019.

Decidedly not hardy here. Several plants were raised from the Himalaya in my father's time, and I found them flourishing young plants when I came here in 1860. I had them planted out in the American Garden, in a very well sheltered situation. They grew rapidly during a succession of hot summers and moderate winters (especially in 1866-7-8), and I began to hope that they might become established here; they did not however show any disposition to flower. The winter of 1870-71, killed them quite to the ground, and I do not think they will recover (March, 1872).

*Benthamia
fragifera*

(January 1877). The last prediction has not been exactly verified. The *Benthamias* have grown up again to about their former height and look as well as before, but they show no sign of flowering, so that they are not very satisfactory to cultivate here, since the leaves have no remarkable character of beauty or singularity.

(See Bentham and Hooker, *Gen. Plant.*
v. I., p. 950).

CORNACEÆ.

AUCUBA JAPONICA.

*Thunberg.**Loudon.*Aucuba
Japonica

The Aucuba was introduced into Britain as long ago as 1783; and it appears very singular that, till a very few years ago, while the *female* plant was very common in our shrubberies, the *male* did not exist in this country. Consequently no fruits could be produced. The male Aucuba was first sent home from China or Japan in the year 1861. by Mr. Fortune, and was successfully cultivated and propagated by Messrs. Veitch. Pollen from the male flowers being applied to those of the female plants (for the females flowered freely in this country), the handsome red fruits soon made their appearance. The male Aucuba however still continued for some time to be scarce among us; but within the last few years (the method of propagation, I suppose being better understood), it has been much more diffused, and plants are to be had at Veitch's and other nursery gardens for a very moderate price.

In May, 1872, having bought from Veitch two male plants of the Aucuba, we planted them in contact with two pretty large old bushes of the female; one on the east side of the lawn, the other near the garden gate. In 1873, both the male plants flowered, and in the spring of 1874, both the old

CORNACEÆ.

female bushes bore many fruits, fine, healthy and well grown fruits, which began to turn red before the end of March, and towards the end of April changed to a fine scarlet. Aucuba
Japonica

In each year since then, the berries have been produced more or less freely. This year (1876) we bought several more young plants of the male, and have planted them in various places near to the female bushes, so that we hope before long to have a plentiful crop of the scarlet berries. The male plants of *Aucuba* which are now in this country, belong to a different variety from that of which the female has been so long cultivated; or rather indeed they belong to the typical form of the species, having plain green, not variegated leaves. These leaves are of a fine rich deep green, very glossy. The male flowers appear rather more conspicuous than the female which is not saying much.

(1878). The *Aucuba* is fruiting very well with us this year, many of the bushes are bearing more or less plentifully their beautiful bright scarlet fruits. These berries are produced from the flowers which came out in the spring of last year. A new species of this genus was discovered by Dr. J. D. Hooker and Dr. Thomson, on the Himalaya, in the Sikkim territories, and is figured and described in Dr. Hooker's beautiful work on Hima-

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Aucuba
Japonica

layan plants, *plate* 12. He however expresses a good deal of doubt as to its specific distinctness from *Aucuba Japonica*; "the only differences which "I have been able to detect" (says Dr. Hooker), "and which I doubtfully regard as constant, are "that the Himalayan species has considerably "longer and narrower leaves, with longer, narrower "points and long acuminate points to the petals.

"It is very possible" (he goes on to say) "that "this *Aucuba* extends to the northward and "eastward in Central Asia, along the lofty chain "of snowy humid mountains, which bound China "on the West; and that specimens from the "countries which are intermediate between Japan "and the Himalaya would be found to unite the "characters of both species."— (*Illustrations of Himalayan Plants, text to plate* 12).

CAPRIFOLIACEÆ.

LONICERA CHINENSIS.

Hooker. Botanical Mag., tab. 3316.

Loudon, v. 2, 1051.

(Generally known in gardens as *Lonicera* Lonicera
Chinensis *flexuosa*; but according to Sir W. Hooker it is not the plant so named by Thunberg.

All that Loudon says of the beauty and fragrance of this plant is fully justified; but it is not perfectly hardy; the young shoots, and tips of the branches are apt to be killed by sharp frosts.

WEIGELIA ROSEA.

Lindley, in Horticultural Society's Journal, v. 1,
pp. 65 and 189, *plate 6.*

Discovered by Mr. Fortune in the Island of Weigelia
Rosea. Chusan, where however it was cultivated, not indigenous; introduced by him to the Horticultural Society's gardens, distributed from thence in 1845 and subsequent years, and now very common in our gardens. A deciduous bushy shrub, quite hardy, in moderately sheltered situations, and very beautiful when in flower. Very well described by Fortune and Lindley in the places above quoted in the *Horticultural Society's Journal*, and well figured.

CAPRIFOLIACEÆ.

Weigelia
Rosa

The genus *Weigela* of Thunberg (or *Weigelia*), to which this plant was referred, is re-united by Bentham and Hooker with *Diervilla*; and indeed the differences seem but slight; yet this shrub will no doubt retain in common language, the name by which it has already become well known. It flowers with us sometimes in the latter days of May, more usually in the first half of June. The flowers are scentless, but very beautiful: of various shades of rose colour in their different stages of expansion, from the deep bright carmine of the buds, to the almost white interior of the newly opened corolla, and then on to the full but less vivid rose of the mature blossoms. When not in flower the shrub is well described by Fortune as having the general appearance of a small Philadelphia.

STYRACACEÆ.

HALESIA TETRAPTERA.

Loudon, v. 2., 1190.

One planted in the American Garden by my father, in 1826, is a flourishing plant, high enough to be called a tree, yet not thoroughly tree like in form, for it divides from the base into three stems, which rise in oblique directions, with a rather irregular, wavy, crooked growth, to the height of (as I guess), fifteen feet or more. It flowers plentifully every year, in May; the white pendulous flowers are very pretty; the fruit which is also plentifully produced, is full grown about October, and remains on the shrub, in a dry state, and of a dark brown color, till the following spring.

*Halesia
tetraptera*

I have not observed the *Halesia* to suffer from any of our winters.

BIGNONIACEÆ.

CATALPA SYRINGIFOLIA.

Sims, Botanical Mag., v. 27. t. 1094.

Loudon, v. 3. 1261.

Catalpa
Syringifolia

Two planted by my father, in 1826; the one on the east side of the pleasure ground, the other in the western part of the arboretum. This latter is now a large and very fine tree, branching almost from the base, and spreading out its branches on all sides in a circle, sweeping the ground with their smaller ramifications, so that, when in leaf, it forms a complete and beautiful dome of brilliant verdure. The trunk divides at a small height from the ground into three principal stems, each about three feet round. The circumference of the space covered by its branches which sweep the ground almost all around it, is about forty-three yards. (measured roughly by stepping, January, 1870).

Michaux's remark as to the comparative smoothness of the bark is by no means applicable to either of our Catalpa trees; on the main trunk and principal limbs the bark is rough and much (though not deeply) cracked, with a tendency to scale off; and is much covered with lichens.

This fine tree has for many years past, flowered every summer, and in general very abundantly; only in 1861 in consequence of the injury it had suffered from the severity of the previous winter,

End of

BIGNONIACEÆ.

it flowered very scantily or hardly at all. This ^{Catalpa} ^{syringifolia} summer (1869) and several previous ones, it has flowered so profusely as to be a magnificent object. The flowers are beautiful as well in their general effect as when separately and closely examined, their honey-like scent is very sweet and powerful, and they are frequented by innumerable bees and other insects. The time of blossoming varies somewhat, according to the warmth or coldness of the season; I have known it to begin as early as July, and as late as the middle of September.

It was in 1857, I believe, that the *Catalpa* first bore its pods at Barton, and since then it has produced them pretty regularly (except in 1861), but in very various degrees of abundance. Even in the most productive seasons, the number of pods is always very small, compared with that of flowers; the great majority of the panicles of flowers form no pods, and there seldom are more than one or two to a panicle. The pods are very curious; in the unripe state they give one the idea of very slender green candles or tapers hanging from the stalks; in a favourable season they hang on through a great part of the winter, and have a very singular appearance amidst the leafless twigs.

Dr. Sims, in the *Botanical Magazine* (in 1808), says, "We have never known it to produce seeds."

BIGNONIACEÆ.

*Catalpa
syringifolia*

This year (1869). they were all or nearly all beaten off by a furious gale of wind in October.

The other *Catalpa* tree, the one planted on the east side of the pleasure ground,—being more enclosed and hemmed in by other trees, has grown more upright and to a greater height, but is by no means so fine a tree. From the same cause, it flowers sparingly, and has never yet borne fruit. In the summer of 1869, it has flowered more freely than I have ever known it to do before. The trunk grows at first quite upright, but divides at the height of only four or five feet from the ground, though the divided trunks are more upright in direction than those of the other tree; a little higher up it throws out its lowest side branches.

There is a very large *Catalpa* tree in the garden of "Rosebank" (belonging to Sir Montagu McMurdo), on the bank of the Thames at Fulham. According to a rough measurement made in August, 1873, the trunk is $10\frac{1}{2}$ feet round; and the space covered by the branches measures 63 feet in its largest diameter.

ERICACEÆ.

ARBUTUS UNEDO.

Loudon, v. 2, 1117.

The following is a copy of a MS. note by my father, inserted in his copy of *Loudon's Arboretum*:—

Arbutus
Unedo

“ The largest Arbutus tree I have ever seen in
 “ or out of England, is growing by the roadside on
 “ the way from Bristol to Clevedon, about two
 “ miles short of the latter place. It rises in three
 “ stems so large and timber-like that they might
 “ almost be called *trunks*. The height I should
 “ guess to be more than twenty feet. The foliage
 “ thick and luxuriant, with abundance of fruit.
 “ This noble tree stands in a little garden belong-
 “ ing to what is now a farm, but appears as if
 “ it had been an old Manor House. Within a
 “ mile of it stands the fine old Tudor mansion,
 “ Clevedon Court, the seat of Sir Charles
 “ Elton.”

H.E.B.

For my part I have nowhere seen the Arbutus so fine, of so large a size, or forming so conspicuous a feature in the scenery, as about the lakes of Killarney, and especially on the islands in those lakes. It has quite a tree-like character. In Italy where the Arbutus is abundant on the Genoese

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Arbutus
Uredo

coast, I have always seen it (except in gardens) in the form of a bush.

It is remarkable that De Candolle in his *Flore Francaise*, describes the Arbutus as "arbrisseau "d'un metre et demi," thus giving it a height of scarcely five feet.

Here, at Barton, the climate is a little too severe for the Arbutus. There was formerly a large and fine one in the kitchen garden, behind the greenhouse, perhaps ten feet high, and which sometimes bore fruit, but it was killed by the winter (I think) of 1838. The two which still remain on the lawn were killed to the ground in December, 1860; they have grown up again into pretty flourishing bushes, and flower abundantly, but have never fruited. One of them is of the red-flowered variety, which is very pretty.

(November, 1869). Both these bushes of Arbutus on our lawn have fruited this autumn, for the first time since 1860, and probably since long before. In spite of some uncommonly severe and stormy weather in the early part of this month, both these plants are now showing abundance of their beautiful crimson berries.

(November, 1871). The finest Arbuti I have seen anywhere in *England* are in the woods of King's Weston (the property of Philip Miles, near Bristol). These I saw in September, 1870. They are very

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numerous, and quite tree-like in height and size, though I do not think that any of them have completely the form of trees. They are quite comparable to those of Killarney. Arbutus
Unedo

The *Arbutus* grows in great beauty and luxuriance in the gardens at Bournemouth.

(December, 1877.) One of our *Arbutus* bushes here—the one with flowers of the ordinary colour, (not the red flowered one), has now a good many beautiful fruit on it.

RHODOREÆ.

Rhododendron ferrugineum.

Loudon, v. 2, 1137.

This and the *Rhododendron hirsutum*, which is extremely like it, were planted by my mother in the American garden in 1824 or 1825, and are still alive, though they have never appeared particularly vigorous or flourishing, at least they only hold their ground and do not spread. The *hirsutum* is the more thriving of the two. Both flower regularly every year, and tolerably well, though not so as to give any adequate idea of their beauty on the Alps. Both, I must observe, were planted in prepared soil, in heath soil brought from a distance. This species is much more generally spread over the Alps than the *hirsutum*, though the latter is very abundant in certain parts. Rhododen-
dron
ferrugineum

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Rhododen-
dron
ferrugineum

According to *Koch (Synopsis Florae Germanicae et Helveticae : Francofurti ad Moenum, 1837)*, a most accurate and valuable author—the *ferrugineum* belongs more especially to the *granitic* Alps, the *hirsutum* to the *calcareous* portions of the chain. I have not had opportunity of verifying this remark to any considerable extent; but certainly where I have seen the *hirsutum* growing in abundance it was on limestone, on the *calcareous* Alps of the Bernese Oberland; and where I have seen the *ferrugineum* in most conspicuous profusion, was on the *gneiss* and *mica schist* of the main range (for instance, on the *Simplon* and *Mont Cenis* passes, and on the *granitic* rocks of the *Mont Blanc* group). On the *Jura* however, which is principally *calcareous* the *hirsutum* is the more rare of the two; Haller knew of only one mountain on which it grew. Both are found on the Bernese Alps, according to Mr. J. P. Brown, an excellent authority.

On the Pyrenees, the *ferrugineum* is abundant, the *hirsutum* entirely wanting; but this is probably owing to some other cause than the nature of the rocks.

RHODODENRON HIRSUTUM.

Loudon, v. 2, 1137.

Rhododen-
dron
hirsutum

See the preceding species. I observed that the *hirsutum* as it grows now in our garden, has its leaves rather narrower and less copiously fringed

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than those of the native specimens. Unluckily I ^{Rhododen-}
never noticed this until lately, so that I cannot tell ^{dron}
whether this character has or has not been ^{hirsutum:}
influenced by cultivation.

SCROPHULARINÆ.

PAULOWNIA IMPERIALIS.

Hooker, Botanical Mag. t. 4666.

Paulownia
Imperialis

Two young trees planted in the farthest part of the kitchen garden (near the wall facing south, and near the *Cornus Mascula*) in 1874 (or '75?). They looked very healthy this autumn (1878), had made very vigorous shoots, and were covered with superb leaves; but they have not yet been tried by any severe winter. It is to be feared that even if the tree itself is not killed, its young shoots (which are very tender and succulent), may be cut off by the spring frosts, and thus it may not flower.

This (according to Sir W. Hooker, in *Botanical Magazine*), is what has happened to it in the neighbourhood of London.

Even at Paris this tree thrives and flowers well. When I was there in May, 1857, I saw several good sized trees of it in the open ground in the *Jardin des Plantes*, in full blossom and very handsome. In Italy, at Florence (where the winters are pretty severe), I saw it in 1866, thriving exceedingly, and already grown to a large size; bearing abundance of large brown capsules, which gave it a rather remarkable appearance.

In its general appearance, its ramification and foliage, the Paulownia is strikingly like the Catalpa, though the leaves are of a darker and duller green, and a less delicate appearance. In the inflorescence also there is a general resemblance, the

SCROPHULARINEÆ.

flowers being produced in large open pyramidal panicles; but the stalks are much thicker. The flowers are of a beautiful delicate very pale purple colour, and in shape a good deal like those of the Fox-glove.

(August, 1879). The two *Paulownia Imperialis* here look very healthy and vigorous, clothed with abundant and deep coloured foliage; they do not seem to have suffered from the winter but they have not flowered.

RANUNCULACEÆ.

CLEMATIS FLAMMULA.

Loudon, Arb. Brit. v. 1, p. 233.

Clematis
Flammula

In the arboretum, Barton. Quite hardy. This year (1861) it continued in blossom till the beginning of November.

CLEMATIS ORIENTALIS.

Loudon, v. 1, 234.

Clematis
Orientalis

A flourishing plant in the Arboretum here, against a wall; has stood for many years, seems to be perfectly hardy, flowers abundantly every year, in July and August, and produces its long tailed feathery fruit, but I doubt whether the seeds are really ripened. Its delicately glaucous foliage, and the peculiar colour of its flowers (a very peculiar tint of yellow), give it a well marked and agreeable appearance.*

This Clematis in a wild state is distributed, according to J. D. Hooker and Thompson through the whole of temperate† Asia as far East as Cashmere. They characterize it as a widely diffused and extremely variable species.† “The shape of the sepals, and the form and pubescence of the stamens are the same in all the forms; but the size of the flowers, and the shape of the leaves are very variable.” Clematis glauca (*Loudon p. 235*) is one of the varieties of Orientalis.

* This plant died some years ago (from what cause I know not), and has not been replaced. (1873).

† Flora Indica v. 1. p. 9.

RANUNCULACEÆ.

CLEMATIS VITALBA.

Loudon, v. I, 235,

Wild about Barton, in hedges and copses, not unfrequently; more plentiful in the more wooded country to the South of Bury. In the belt of plantation at the back (north side) of our arboretum it has grown so luxuriantly as to reach to the tops of some flourishing young fir trees, and half cover them, displaying its flowers and seeds in autumn among their topmost branches; in a very few years, I daresay, it will entirely conceal them. Clematis
vitalba

The most luxuriant growth of this plant that I have ever seen, is in the beautiful woods along the Undercliff of the Isle of Wight, near Steephill and Ventnor; the way in which it mantled the tall trees from top to bottom, and covered the thickets far and wide with its matted web of stems and branches, reminded me of tropical climbers.

In England, the Traveller's Joy is found usually on calcareous soils, either chalk or limestone; but not exclusively, for I have seen it in plenty in hedges on the red marl (triassic) of the Worcestershire plain, between Tewkesbury and the foot of the Malvern Hills.

The structure of the stem is curious: it is probably the same (essentially) in the whole genus *Clematis*, but is most striking in this species, which has the largest and most woody stems. The

RANUNCULACEÆ.

Clematis
vitalba

wood is composed almost entirely of large dotted vessels, appearing in the transverse section, as large open pores, with a very small proportion of ordinary woody fibre. It is found in a number of wedge-shaped portions, radiating from the pith; and in the old stems these wedges separate from one another (seemingly through the decay of the intervening medullary rays), and remain quite loose, held together only by the bark which covers them.

CLEMATIS MONTANA.

Loudon, v. I. 245.

Clematis
montana

Several flourishing plants at Barton. It is now (June, 1860) in full blossom; a very beautiful climber, seemingly quite as hardy as Clematis Flammula, and of a more vigorous and luxuriant habit, more like Vitalba; grows rapidly, and bears a rich profusion of large and brilliant white flowers, very ornamental. Appears to have suffered but slightly from the late long and severe winter. The flowers in cultivation have very often six sepals, almost as often as four, which is the normal number; sometimes five, but less often.

(May, 1861). This Clematis is now coming out well into blossom, having apparently suffered little, if at all from the late terrible winter.

(November, 1861). It flowered well this summer and made a very handsome show.

RANUNCULACEÆ.

I have never seen it bear seeds here. It flowers much earlier than any other species of *Clematis montana* that we have in cultivation here.

PÆONIA MOUTAN.

Loudon, v. I. p. 250.

Several good plants at Barton, but none of any considerable height. It was severely cut by the winter of 1860-61, but has recovered and flowered pretty well this year (1862). It may therefore be fairly said to be hardy, but even in ordinary seasons the young leaves and flower buds are, as Loudon remarks, very apt to suffer from late frosts.

The flowers have a rather strong smell, very like that of the opium poppy.

MAGNOLIACEÆ.

MAGNOLIA GRANDIFLORA.

Loudon, v. 1. 261.

There is a magnificent coloured plate of this tree in *Catesby's Carolina*, vol. 2.

Here, at Barton, this will grow only against a wall, and requires further protection in winter. All our plants of this species (most of them of nearly thirty years' growth) were killed to the ground by the intense frost of Christmas, 1860; they were together with *Photinia serrulata* and the common *Laurustinus*, the first plants which showed its effect. They have since grown up again pretty vigorously from the stumps; and this autumn, 1869 one of them has flowered well, for the first time since that destructive winter.

In the Botanic Garden at Pisa, I saw, in 1848, a very large and beautiful tree of *Magnolia grandiflora*, which was planted in 1787; it ripens abundance of fruit every year, and young plants have been raised from its seeds. According to a note by Signor Penzi, in the *Gardeners' Chronicle* (November 27th, 1869), this tree measures six feet round the trunk at three feet from the ground, and the area covered by its branches is nearly sixty feet in diameter.

At Florence, where the winters are often very sharp, this tree thrives very well, as a standard

MAGNOLIACEÆ.

without protection, and is now much cultivated for ^{Magnolia} ornament in the gardens and public walks. ^{grandiflora}

In 1866, I saw it in full flower in the Boboli Gardens, on the 18th of June; and it not only flowers every year, but bears fruit.

This has passed unhurt (carefully protected however), through the late severe winter of 1870-71 and one of the plants (the same already mentioned) flowered well this autumn (1871), going on with a succession of flowers from August to the middle of October. There is a very fine Magnolia of this species, of great height and probably of considerable age, growing against the wall of the Bishop's Palace at Wells: it was beautifully in flower in August of this year.

MAGNOLIA GLAUCA.

Loudon, v. 1, 267.

Two, planted in autumn of 1861; one in the ^{Magnolia} American Garden, the other at west end of the ^{glauca} arboretum.

The first of these is since dead; the other seems thriving. June, 1864.

The second also is since dead. 1867.

MAGNOLIA ACUMINATA.

Loudon, v. 1, 273.

A very fine tree, in the American Garden, ^{Magnolia} ^{acuminata}

MAGNOLIACEÆ.

*Magnolia
acuminata*

planted, 1826 ; now certainly above fifty feet high, beautifully perfect and symmetrical in its growth. Stem four feet in circumference at three feet from the ground ; space covered by the branches about twenty-five feet in diameter. Flowers very abundantly every summer, but the fruit always drops off before half ripe. The colour of the flower very peculiar, a bluish green shaded in parts with a dull yellow, and having a glaucous bloom on other parts, altogether more singular than ornamental. The general form of this tree is very unlike that of the tree at Syon, figured by Loudon ; the lowest branches would sweep the ground if not propped, and the branches for a great way up the tree are very equal in length and spread ; so that the head is of very uniform width almost throughout, The branches, in general, go off from the trunk at first horizontally, then droop considerably, and curve upwards at the ends in a graceful manner.

(1862). The fine tree in the American Garden was so far affected by the winter of 1860-61, that it did not flower in the summer following, although it does not show other signs of injury.

There is another, a very flourishing young plant of this species, near the west end of the arboretum, planted 1841 : it grows fast, but has not yet flowered.

This young tree is now flowering for the first time (May, 1862).

MAGNOLIACEÆ.

Has flowered well this year. (June, 1864).

*Magnolia
acuminata*

The leaf buds of *Magnolia acuminata* are clothed with very close shining, silky, almost silvery hairs, giving them altogether a grey colour; those of *Magnolia tripetala*, *Magnolia auriculata*, and *Magnolia glauca*, are perfectly smooth. (1873).

The younger tree of this species planted 1841, bore, this year, a quantity of fruits which made a much further advance towards ripeness than any I have yet seen. When I first observed them (September 15), they were flushed all over with a beautiful rose or carmine colour; and these red fruits had a fine effect in the midst of the pale green leaves. By the end of the first week in October, their colour had changed to a dusky reddish purple, and they were beginning to open; each several carpel of the fruit splitting open vertically up its outer face, and showing the bright orange-coloured seeds,—sometimes solitary in each carpel, sometimes two, one above the other. Not long afterwards, in stormy weather, all the remaining fruits were beaten off the tree, so that none of them came to their full growth. None are much more than one inch long, whereas Michaux says their length is about three inches. They do not indeed well agree, either in shape or colour with what he figures as the fruit of this species of *Magnolia*.

MAGNOLIACEÆ.

MAGNOLIA TRIPETALA.

Loudon, v. 1, 269.

Magnolia
tripetala

The figure of this plant in *Catesby's Carolina*, v. 2, plate 80, is very fine.

One in the American Garden, flowers, plentifully. Loudon's remark as to the new stems shooting up frequently from the root, alongside of the old ones, is very correct, so that the general form, now, is rather that of an upright shrub than of a tree. The stems are slender and sparingly branched.

MAGNOLIA AURICULATA.

Loudon, v. 1.

Magnolia
auriculata

One, in the American Garden, planted 1826, at same time with the *Magnolia acuminata*, which stands opposite.

Flowers every summer. Stem slender for its height, sparingly and laxly branched, forming a very loose head.

MAGNOLIA CONSPICUA.

Loudon, v. 1. 278.

Magnolia
conspicua

In the arboretum, trained against a wall facing west; has flowered very well this year, 1860. Last year its flowers were all destroyed, just before expansion, by a late frost. It has survived the frost of last Christmas, and is now May 5th, 1861, coming into leaf, but shows no sign of flowering.

MAGNOLIACEÆ.

There are two trees (of slightly different varieties), against the arboretum wall; both flourishing; flowered well this spring (1871). They seem not to suffer from the most severe *winter* frosts, but the flower buds are very liable to be killed by the late frosts in spring.

Magnolia
conspicua

MAGNOLIA PURPUREA.

Loudon, v. 1, 282.

Several good plants of this in the arboretum and American Garden. It seems quite hardy here, and flowers well, but, though some of the plants (I believe), are as much as 35 years old, none of them have grown to more than about eight feet in height.

Magnolia
Purpurea

Loudon's description of this *Magnolia* is very good.

I observe in the two Chinese species—*Magnolia purpurea* and *Magnolia conspicua*—that the flower buds are readily distinguishable from the leaf buds, both by size and shape, quite early in the season, long before any of them have begun to expand. This is not so apparent in the American *Magnolias*.

The proper season for its flowering is May, but sometimes it flowers again, partially, in July or August.

MAGNOLIACEÆ.

LIRIODENDRON TULIPIFERA.

Loudon, v. 1. 284.

Liriodendron
tulipifera

Two good trees in the arboretum, planted 1832.* They *were* very fine but were sadly shattered and mutilated by a violent gale of wind in the autumn (of 1842?) They flower abundantly most summers and form abundance of fruit, in which however the seeds are I believe always abortive. In the summer following the terrible winter of 1860, they did not flower, though the foliage was as good as usual.

The plate of the tulip tree in *Catesby's Carolina*, vol 1. plate 48, is very characteristic. That in *Smith and Abbot's Insects of Georgia* vol. 1. plate 102 is the best representation of the flower that I know; it belongs to the variety with the lobes of the leaves obtuse.

In native (dried) specimens of the tulip tree, I observe that not unfrequently, the two lower or outer lobes of the leaves have each of them an additional tooth, or accessory lobe; so that the leaf altogether has six points instead of four. I have not seen this in the cultivated tree. (December, 1877).

A large tulip tree in the garden of the Bishop's Palace, at Wells, which I examined last year, bears leaves having six points or teeth in the same manner as those of the native specimens I have mentioned above.

* They have flowered for the first time in 1843.

BERBERIDEÆ.

BERBERIS DULCIS.

Loudon, v. I. 305.

A large plant in the arboretum 8-10 feet high, and some smaller ones in the Vicarage Grove and elsewhere. It is a pretty shrub, and appears to be quite hardy, not having suffered in any considerable degree from the severe winter of 1860-61. The general habit is like that of *Berberis vulgaris*; branches conspicuously arched, slender, wiry, somewhat zigzag; spines three-parted, rather small; leaves clustered, small and neat, of an agreeable green; flowers produced in abundance, of a fine rich saffron yellow colour. With us it is deciduous, and the young leaves come out in April with the flowers. According to Dr. J. Hooker, in the *Flora Antarctica*, and Lindley in the *Journal of the Horticultural Society* v. 5. p. 2., this is a variety of *Berberis buxifolia*, which in one form or another is said to be a common plant all over the south-western parts of South America. (The original typical form, *buxifolia*, was discovered near the Straits of Magellan). The form or variety *dulcis* was introduced from Valdivia, in Southern Chili.

BERBERIS DARWINII.

Hooker, Icones Plantarum, v. 7. tab. 672.

Botanical Mag. tab. 4590.

One plant in the American Garden, brought by *Berberis Darwinii*

BERBERIDEÆ.

Berberis
Darwinii

Henry* from Meikle's at Folkstone, planted out, 1862; another in the Vicarage Grove, bought from Veitch, planted, 1862. In Henry's* garden at the Cottage, there is a finer one than either.

This Barberry is a beautiful little shrub, named by Sir W. Hooker (its first describer), after Charles Darwin, who discovered it in the island of Chiloe, on the coast of Southern Chili, and was the first to bring home dried specimens. It was afterwards found by Mr. Bridges, near Valdivia and Osorno, in Chili, in about 40 degrees south latitude, a little further North than Chiloe. It appears to be hardy and easily cultivated.

The stem of *Berberis Darwinii* has somewhat of the same arching mode of growth as those of *Berberis dulcis* and *vulgaris*, but does not grow to more than between two and three feet high, the younger parts of the stems clothed with brownish down; rather densely leafy, with small beautifully neat, very glossy, holly-like leaves, of a deep bright green, pale at the back, turning red with age, each leaf having 4 or 6 prominent spinous-pointed teeth. The flowers, which are produced in April, in short thick drooping racemes, are of a beautiful orange-yellow, richly stained with red on the outside.

(February 1868.) What I have said above

* His brother, Colonel Bunbury

BERBERIDEÆ.

as to the height to which this shrub grows, is quite mistaken. The plant in the Vicarage Grove is now between 5 and 6 feet high, and the shoots it has made in the last two years are surprisingly vigorous, some of the shoots thrown up from the base of the old stems grow to between 4 and 5 feet in the year. This seems to succeed best in what is called a *heath* soil,—that is, a mixture of peat or decayed leaves with sand,—a sandy peat, as it is sometimes called. At least, all the best plants I have seen of it have been in such a soil, and of our two plants, the one which flowers best is in the American garden, where the ground, when first laid out, was partly prepared for Rhododendrons.

*Berberis
Darwinii*

BERBERIS ARISTATA.

*J. D. Hooker and Thomson,
Flora Indica v. I. 222.*

Two plants, one in arboretum, the other at south-west corner of pleasure-ground; both raised from seeds brought by Henry* from the Himalaya in 1851. They are quite hardy here, grow vigorously, and form strong dense bushes above 6 feet high similar in habit to *Berberis vulgaris* but altogether larger and more robust. There seems to have been much confusion and uncertainty among botanists as to *Berberis aristata*

*Berberis
aristata*

* His Brother, Colonel Bunbury.

BERBERIDEÆ.

Berberis
aristata

and the allied species, and I was for some time uncertain whether our plant belonged to *aristata* or to *Asiatica*. I relied too much on Lindley, who (in *Journal Horticultural Society*, v. 5.) characterized the *Asiatica* as having "dark purple roundish berries, covered with a rich bloom like a plum," and the *aristata*—"red, bloomless, oblong berries." In relation to the fruit, our plant certainly agrees with the characters thus assigned to *Berberis Asiatica*, while the inflorescence and leaves are those of *aristata*. By comparison of our plant with the careful descriptions in Hooker and Thomson's *Flora Indica*, I am satisfied that it belongs to *Berberis aristata*, and probably to the variety which has been called *Berberis Chitria*. The berries, according to J. D. Hooker and T. Thomson, are very variable in their characters. Still, in one point this agrees with the description of *Berberis Asiatica* in the *Flora Indica*; the bark of the stem and branches being very pale-coloured. The leaves of this plant, as cultivated here, are regularly deciduous, but remain very late on the bush,—in mild winters almost to the end of the year. The leaves, before they fall, change colour partially (not at all uniformly) to a fine red. They come out (the young ones) about the middle of April. When full grown, they are decidedly but not extremely coriaceous, bright green and glossy on both sides paler, but not at all glaucous

BERBERIDEÆ.

underneath; the network of veins distinctly Berberis aristata apparent, but not prominent. Their margin is very variable, seldom quite entire, the teeth always very sharp and prominent, very various in regularity and proportional number. Flowers palish yellow, numerous in lax, somewhat drooping branches and paniced racemes, which are longer than the leaves. Berries, roundish-oval, deep purple, covered with a dense bluish white bloom.

BERBERIS FASCICULARIS.

Mahonia fascicularis.—*Loudon*, v. I. 309.

A large plant in the arboretum, near the south Berberis fascicularis east corner; planted, 1826; never flowered; killed by the winter of 1860-61.

BERBERIS AQUIFOLIUM.

Pursh—*Lindley*.

Mahonia Aquifolium.—*Loudon*, v. I. (309).

This is now very common in gardens and shrub- Berberis aquifolium berries and plantations, and well deserves all that is said by Loudon and Lindley in its praise. There is a very good account of this plant by Lindley, in the *Journal of the Horticultural Society*, v. 5. p. 16. The leaves, the flowers and the fruit, are all beautiful. It is perfectly hardy with us, having been scarcely at all hurt by the severe winter of 1860-61. The old leaves partially change to a fine deep red or sometimes even a rich crimson in winter.

MALVACEÆ.

HIBISCUS SYRIACUS, L.

*Loudon, v. I, 362.*Hibiscus
Syriacus

Several in the arboretum. It is certainly hardy here, not requiring special protection even in the hardest winter; but it is only in fine and warm summers that it flowers well and abundantly, and makes a handsome show. This autumn, 1868, it bears a considerable abundance of capsules, which I have not observed before, but at the beginning of October these capsules are not yet ripe. They show very well the distinctive character of the *Hibiscous* group of Malvaceæ; whereas, in the mallows proper, the fruit consists of numerous distinct though contiguous carpels, falling on separately; here, it is composed of five carpels completely united into a five celled capsule, each cell containing many seeds arranged in two rows along the inner angle. The capsules are above twice as long as the calyx; of a shape between oviform and pyramidal, clothed with a short dense starry down.

(November, 1871). The capsules, gathered and kept in a dry cabinet, opened spontaneously along the middle of the back of each carpel: in botanical language the *dehiscence* is *loculicidal*.

The shrub has never fruited again since 1868, which was a peculiarly warm and dry season.

(November 1874.) This past season also has been a remarkably warm and dry one; yet the *Hibiscus Syriacus* has not fruited.

TILIACEÆ.

TILIA ALBA

Loudon, v. 1. 372.

One at Barton, planted on the lawn by my ^{Tilia alba} father, has grown into a very beautiful tree, high, with drooping branches, of which the lowest rest on the ground all around; it forms a luxuriant dome of foliage, of a parabolic outline, like that of a vigorous Horse-chestnut; especially beautiful when the wind tosses its large silvery backed leaves, showing by turns their green upper and white under sides, and giving to the whole mass of foliage a peculiar sparkling appearance. It flowers in great profusion about the middle of July, later, usually; in this very hot and dry summer of 1868, it flowered in the middle of July; in 1867, it was in the same state in the middle of August. A little later than the common Lime tree. Its blossoms have a peculiarly strong and sweet honey like scent, more powerful than that of the common Lime, though perhaps less delicate, and they are especially in favour with the bees. When one stands near the tree in its full flowering season, the "murmur of innumerable bees" is as if one were in the midst of many hives.

This White Lime, Henry* tells me, is abundant on the Balkan mountains (the ancient Haemus). It seems not to extend westward into Germany; at least, it is not included in *Koch's Synopsis*. It

* His brother, Henry Bunbury.

LILIACEÆ.

Tilia alba is certainly a distinct species from *Tilia Europæa*, as species are generally understood by Botanists. There is a clear and botanically important character in the *scales* (as they are called)* of the corolla; these scales are in appearance, super-numerary petals: they stand exactly opposite to the real petals, but appear to be separate from them from the very base, are of the same colour and texture, nearly equal in length, but much narrower, and are enveloped in the normal petals when these curl inwards in withering.

* "Nectaries," according to the Linnean school.

HYPERICACEÆ.

HYPERICUM CALYGINUM.

Loudon, v. I. 400.

It is very doubtful whether this can properly be said to be a *native* of the west of Ireland and Scotland. It certainly grows in several places in those countries, but there is great reason to suppose it is only naturalized, as it is a very hardy plant, spreading rapidly and extensively, and easily establishing itself in favorable situations. Indeed I think the remarkable thing is that it should not have become more common as a naturalized plant. It appears to be in reality a native of Turkey (See Sir James Smith in *Linnean Transactions* v. 10. and in *English Botany*, v. 29, t. 2017. Hypericum
calycinum

SAPINDACEÆ.

KOELREUTERIA PANICULATA.

*Loudon, v. I. 475.*Koelreuteria
paniculata

One tree in the arboretum, flowered for several years in succession, and ripened fruit in autumn, 1857, but was blown down soon afterwards. There is now a young tree at south east corner of pleasure ground, and another in the Vicarage grove.* The capsules are very curious and pretty; of a three cornered pyramidal shape, much inflated, of a thin papery texture, pale green, more or less tinged with red, prettily reticulated with veins; the seeds (of which only one or two ripen in each of the three cells of the capsule), large, nearly spherical, smooth and glossy, of a very dark rich brown, approaching to black.

* This last is dead, and the other has been removed to the corner of the arboretum, where it has flowered, but sparingly, this year, 1868.

SAPINDACEÆ.

HIPPOCASTANEÆ.

Lindley.—*Vegetable Kingdom.*

Æsculaceæ.—*Loudon.*

The genera *Æsculus* and *Pavia* are re-united by ^{Hippocast-}
Eudlicher, and are indeed very insufficiently ^{anezæ}
distinguished.

ÆSCULUS RUBICUNDA.

Loudon, v. I. 467.

A fine tree in the arboretum, and another near ^{Æsculus}
the north west angle of the house. Both planted ^{rubicunda}
in the spring of 1826. Several younger ones in
various parts of the grounds, especially on each
side of the road to the east lodge.

It appears to be as hardy as the common Horse-chesnut, and is exceedingly handsome in its general effect when in blossom, though the flowers looked at individually and closely, are scarcely as beautiful as those of the common kind. Is now much cultivated at Paris; when I was last there in 1857, I observed very fine and numerous trees of this kind at that time in profuse blossom in the *Jardin des plantes*. In the gardens of Herrenhausen near Hanover, also there are great numbers of the red Horse-chesnut, of very fine growth, and which, being covered with flowers at the season when I was there, had a beautiful appearance. The tree never, so far as I have seen, grows to nearly so great a height as the common Horse-

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*Æsculus
rubicunda*

chesnut, but forms a broad bushy head with a short trunk. It flowers later than the common kind but the leaves expand almost as early here at Barton, it ripens seeds pretty plentifully, and several thriving young plants have been raised from seed of the tree in the arboretum.

(1868.) The red Horse-chesnut is fruiting particularly well this autumn. The capsules are very large, and the seeds even larger and more beautiful than those of the common Horse-chesnut. The capsules are much less prickly than those of the common Horse-chesnut, so that the character is somewhat between those of the subgenera *Æsculus* and *Pavia*.

ÆSCULUS (PAVIA) FLAVA.

Pavia flava.—*Loudon*, v. I, 471.

*Æsculus
flava*

One thriving tree in the arboretum, planted, 1825; flowers abundantly every year. Another in the shrubbery at the north-west angle of the pleasure ground, near the fine scarlet Oak and red Horse-chesnut. The flowers are of a pale dirty yellow or greenish buff colour, not by any means handsome, but the leaf buds and young leaves when first expanding in the spring, are very beautiful; the bud scales are of a delicate flesh colour or pale pink, the young leaflets of a peculiar reddish tawny green, exquisitely plaited along the very numerous lateral veins. Though a native of the more southern parts of North America

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(Carolina and Virginia) it is perfectly hardy, not having suffered at all from the winter of 1860-61. Æsculus
flava

It ripens in favourable seasons; very abundantly this year 1868. The capsules are much smaller, and of a much thinner substance than those of the common and red Horse-chesnuts, and quite smooth; the seed of a very bright bay colour, and very glossy.

ÆSCULUS INDICA. ÆSCULUS (PAVIA) INDICA.

PAVIA INDICA JACQUEMONT.

First introduced by my brother Henry;* he brought seeds from India in 1851, from which plants were raised here, and planted out the same year. One of the trees is now in the arboretum; one at the south-west corner of pleasure ground, near the pond; one in the Vicarage Grove; and one between the stables and the east lodge. Others were sent to Wales, and some given away. The growth is exceedingly rapid; the leaves larger and more beautiful than those of any other Æsculus. The tree in the arboretum flowered (for the first time) in June, 1858, and produced that year twelve thyrses of flowers; it was then (in seven years from the seed), sixteen feet high. The general appearance of the flowers, and especially their style of colouring, is much like Æsculus
Indica

* His brother, Colonel Bunbury.

SAPINDACEÆ.

Æsculus
Indica

that of the common Horse-chesnut, though they are altogether more delicate, especially in form. All parts of the inflorescence very smooth. Petals four, widely spreading, especially the two lateral, which gives the flower a very different appearance from that of *Pavia flava*; they are white, delicately stained with yellow and rose colour. Stamens longer than the petals, but not so remarkably long as in *Pavia macrostachya*. Last year, 1859, the plant did not flower; nor has any one of the other three plants yet flowered. The tree comes into leaf later than *Æsculus hippocastanum* or *rubicunda*, or *Pavia flava*; at this time (May 2nd, 1860), those three species have quite unfolded their leaves, while the buds of *Indica* have not yet begun to open. The young leaves and shoots are of a beautiful red colour; the full grown leaves of a very fine bright green.

In the young trees that we have here, the ramification is very symmetrical; the branches ascending at a more acute angle than in the *Æsculi* generally. In the Western Himalayæ where Henry* saw it, he describes it as a tree of the very largest size, and of remarkable beauty and grandeur; much more bold and picturesque in its growth than the common Horse-chesnut; growing especially in the ravines of the mountains and spreading its broad arms over the beds of

* His brother, Colonel Bunbury.

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torrents. Mr. Edgeworth tells me (September, 1868) that he measured, in the Himalaya, a tree of this species which was upwards of forty feet round the stem. It ascends, he says, nearly to the perpetual snow. Æsculus
Indica

My gardener, Robert Pettit, has tried to propagate this species by grafting on *Æsculus Hippocastanum* and *rubicunda*; and it seems likely to succeed. The fine one in the arboretum is now (May 5th, 1861), putting out its young leaves in full beauty, seemingly quite unhurt by the terrible winter that is past. This same tree flowered again in June, 1861, and I exhibited a thyrses of its flowers at the meeting of the Linnean Society, on the 20th of that month.

(June, 1864). The tree in the arboretum, which I have so repeatedly mentioned, flowered very well last year; and this summer it has a greater abundance of thyrses of flowers than it has ever yet shown. The blossoms are now beginning to open (June 16th). The three other trees, though they appear very thriving, have not yet shown any disposition to flower (July, 1868).

Another tree of this kind, the one planted between the stables and the east lodge, bore flowers last year for the first time, and has flowered again more abundantly in the early part of this month. The large one in the arboretum ripened fruit last year, and four thriving young plants have

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Æsculus
Indica

been raised from the seeds. October, 1868; the fruit rather plentiful this year. Capsule quite smooth, not much smaller than that of the common Horse-chesnut, but of a more irregular and eccentric shape, as if unequally developed.

ÆSCULUS MACROSTACHYA.

Pavia macrostachia.—*Loudon*, v. I, 473.

Æsculus parviflora.—*Walther (and of Gardeners generally)*.

Æsculus
macrostachya

Two or three good plants in the arboretum, and others in the pleasure ground. A very pretty shrub, thriving extremely well here, and seemingly quite hardy, flowering well every year; not however ripening seed, and seldom even forming its fruit. The long upright spires of delicate white flowers, feathery, with the long slender prominent stamens, are very beautiful; and the young leaves in the spring are not less so. The leaf-stalks at that season, are of a ruby red color; the leaflets of a soft light red, neatly folded lengthwise, and most regularly and elegantly feather veined. The structure of the leaf buds, which is essentially the same in all the Horse-chesnuts, is shown with beautiful distinctness in this species, when they begin to expand. The outermost layers or scales, of the bud are merely dilated petioles, without any blade; the next within them consist of petioles still more dilated, crowned with very small and

SAPINDACEÆ.

imperfect leaflets; and proceeding to the interior of the bud, we find the stalks successively less and less dilated, and the leaflets more and more developed. It is rather remarkable that this plant which is a native of one of the most southern States of North America (Georgia) should not suffer apparently from our hardest winters.

Æsculus
Indica
macrostachya

(October, 1868.) The *Æsculus macrostachya*, this year, has produced a good many fruits which appear to be fully formed, though I doubt whether the seeds are really *ripe*.

This last remark was mistaken; the fruit and seeds appear to be perfect.

ACERACEÆ.

ACER PSEUDO-PLATANUS.

Loudon, v. 1, 414.

Acer pseudo-platanus

The bark of the trunk in young trees is, as Loudon says, very smooth; but in old trees it *exfoliates*, or comes off in squarish flakes, somewhat after the manner of the plane tree, but less copiously and regularly.

Of the trees which are native or commonly cultivated in England, there are but few which have the leaves (and consequently the leaf-buds and branches), regularly opposite. The Sycamore is one of these few, and may easily be recognised when leafless, by its large, oval, smooth, light green leaf-buds, which are not in the least glutinous. The ash is known by its blackish leaf-buds, clothed with a peculiar minute mealy kind of pubescence. The buds of the Horse-chesnut are in shape a good deal like those of the Sycamore, but still larger, dark brown, very glutinous, and as if varnished; those of the common Maple very small, dark brown, bearded with tufts of minute white hairs.

ACER PLATANOIDES.

Loudon, v. 1, 408.

Acer platanoïdes

Many good trees of this in various parts of the grounds. A very handsome tree. Its ap-

ACERACEÆ.

pearance both singular and beautiful when in flower (in April and beginning of May); the flowers of a bright greenish yellow, are produced in such profusion before a leaf appears, that the whole tree appears one mass of yellow. They are much frequented by bees and other honey-feeding insects.

ACER SACCHARINUM.

Loudon, v. 1, 411.

One fine tree in the arboretum, planted 1831. This is rather the American representative of *Acer platanoides* than of *Pseudo platanus*, but very different from both in its inflorescence; the flower pendulous and tassel-like, on long slender pedicels, while the main stalk of the corymb is very short. The leaves turn bright yellow, not reddish, in Autumn; and this I find to be the case also in dried native specimens from North America.

I suspect from what I have observed in *Acer platanoides* and *Acer campestre*, that the autumnal colouring of the leaves is a very variable and uncertain character.

The tree in our arboretum bore fruit in the summer of 1864.

ACER ERIOCARPUM.

Loudon, v. 1, 423.

One fine tree in the arboretum, and several

ACERACEÆ.

Acer
eriocarpum

others in various parts of the grounds, in particular, a very tall one between the stables and east lodge. Seems to thrive as well here as *Acer platanoides*; is of rapid growth and forms a tree of great beauty, with foliage of a lighter and more feathery character than that of the other maples. I have not been able to find fruit on any of the trees here, but the tree in the arboretum bears female flowers in March or April. The leaves with us remain later on the tree than in *Acer rubrum* and *saccharinum*; but they do not turn red, only a pale yellow, the principal ribs becoming red.

In almost all the trees of this kind which we have here, the trunk divides at a very small height from the ground, into two or three trunks, which are of about equal size, and rise equally erect. The leaves when they first expand (in May), are of a soft and delicate tawny red colour, giving at that season a peculiar and beautiful appearance to the whole tree.

ACER RUBRUM.

Loudon, v. I, 424.

Acer
rubrum

One tree in the arboretum, another of good size in the shrubbery beyond the arboretum ("Sorcerer's"* paddock); two or three on the

* This name given because a famous race-horse of Sir Thomas Charles Bunbury was buried here. He was black, and I have been told that many of the horses belonging to the "Blues" regiment were his descendants.

[F. J. B.]

ACERACEÆ.

edge of the dairy grove, facing the Oakery. These last (perhaps because in the most exposed and sunny situation) show the best colouring in autumn, many of their leaves, even after this wet and cold summer of 1860, having turned to a beautiful crimson. The leaves of the tree in Sorcerer's paddock are also (at the time of their fall) beautifully coloured with red and orange; those of the arboretum tree in general turn to a warm yellow or rich amber colour, the white under side often delicately flushed with pink, and the ribs and veins bright red. This species, with us shows no tendency to rival *Acer eriocarpon* in height or bulk. I have seen only the male flowers which come out in March, are deep red, and very small, by no means showy.

(June, 1864). The trees on the edge of the Dairy Grove bear female flowers, and this year they have borne a considerable quantity of fruit. The bunches of *keys* (samaræ) had a pretty appearance in the early part of May, when they were finely tinged with purplish-red, though not of a uniform red colour as represented by Michaux. A month later they were dry and brown, and were shed spontaneously, being apparently ripe. They are much smaller than those of the common maple; the wings of a very delicate texture, and beautifully veined.

(October, 1868). The two small trees on the

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*Acer
rubrum*

edge of the Dairy Grove (those which bore fruit in 1864), are now almost entirely leafless; the larger one in "Sorcerer's" paddock, standing in a more sheltered situation, has hardly begun to change colour. They are now, in the middle of October, changing fast, and those on some of the twigs have entirely turned to a splendid crimson.

(October 31.) The tree in "Sorcerer's" paddock has now a most beautiful appearance; the whole mass of its foliage gloriously coloured with the most varied tints of red, orange, and yellow, through every shade, from deep scarlet to amber.

(November, 1871). This same tree, much the largest which we have here of this species, shows a great deal of fine colouring every autumn, even in seasons which are not generally favourable to the development of such tints.

(October, 1879). The tree in "Sorcerer's" paddock, above mentioned, is now in great beauty, which I should not have expected after a summer so peculiarly cold and wet; the foliage has even now (October 31), only partially changed colour, and shows broad patches of brilliant scarlet in the midst of the prevailing deep green.

ACER CAMPESTRE.

Loudon, v. 1, 428.

*Acer
campestre*

Very common in hedges and copses about

ACERACEÆ.

Barton, where it appears quite at home, and often grows into a considerable tree. I have no doubt it is one of the really native trees of the district, though the whole country has long since been reduced into such an artificial state, that it may be impossible to say of any one particular tree, whether it was self sown or not. Acer
campestre

A tree of this common Maple near the "Nector Hall" cottages, in this parish is seven feet in the circumference of the trunk, at three feet from the ground. Mr. Kingsley remarked to me (October, 1873) that he had nowhere seen the common maple growing to so large a size, or so handsome as here, about Barton.

AMPELIDEÆ.

VITIS VINIFERA.

Loudon, v. I, 477.

Vitis
vinifera

It is a much disputed question, whether the common Vine is an aboriginal native of Italy. Targioni Tozzetti was of opinion that it was so, and Bentham seems to agree with him.* At any rate, whether strictly indigenous or not, it is completely established as a wild plant in the Roman territory; it grows in great abundance in the abrupt ravines and on the broken rocky banks in the Campagna, between Rome and the Ciminian hills, where it forms beautiful festoons, entwining the Spanish Broom, and mingling with the *Clematis vitalba* and *Lathyrus sylvestris*. It seems to be equally established in Portugal, where Southey in his Letters speaks with enthusiasm of its beauty.

VITIS QUINQUEFOLIA.

Lamarck.

Smith and Abbot, Insects of Georgia.

Tab. 30.

AMPELOPSIS HEDERACEÆ.

Loudon, v. I. 482.

Ampelopsis
hederaceæ.

The Virginian Creeper is, to my thinking, one of the most beautiful and valuable of the hardy climbing plants that we have in cultivation. In

* See, in the Journal of the Horticultural Society, vol. 9, an interesting review by G. Bentham of Targioni Tozzetti's "*Cenni Storici sulla introduzioni di varie piante.*"

AMPELIDEÆ.

summer it spreads a beautiful mantle of a rich and delicate green over walls and trees; and more closely looked at, the form both of the leaves and of the young shoots is remarkably graceful. In autumn the colouring of the foliage is surprisingly beautiful, By the middle of September in most years, and sometimes earlier, it begins to be variegated with red; as the season goes on, this colour (sometimes mixed with yellow) encroaches more and more on the green; and in the early part of October, usually, the whole is of a rich crimson. This year, 1868, as might be expected after so hot and bright a summer, the colouring is remarkably fine. There is a plant against the north east face of the house and climbing now quite to the top; this is always the first plant of the kind here which turns red, and now (October 10) it has for the last ten days or more been of the most glowing and beautiful crimson, from its lowest to its topmost leaves.

Ampelopsis
hederaceæ

The one which grows against the lodge on the high road is equally rich and beautiful in colour.

This plant has never formed any fruit here, though it flowers abundantly every year. The berries are figured in Smith and Abbot's "*Insects of Georgia.*" Vol. 1, plate 30.

The genus *Ampelopsis* of Michaux is very properly reduced by Bentham and Hooker, to a section of *Vitis*.

AMPELIDEÆ.

VITIS (AMPELOPSIS) VEITCHII.

Vitis
Veitchii

A native of Japan, introduced by Messrs. Veitch. Very similar in general appearance, and in its manner of climbing, to the Virginia creeper; but easily distinguished by its leaves. These instead of being regularly and uniformly digitate, with five perfectly distinct leaflets, are variable: sometimes simple, though more or less lobed; sometimes digitate, but in this case, of not more than three leaflets.

The leaves though not evergreen, are of a thicker substance, and a firmer and more coriaceous texture, than in the Virginian Creeper; their upper surface very smooth and glossy, of a rich deep green colour in summer; the under side much paler but likewise smooth. The simple (not digitate) leaves are broad, deeply heart shaped, three-lobed, with three strong ribs parting from the base and running straight to the points of the lobes; these lobes broad and shallow, pointed, coarsely and rather irregularly toothed. On the whole these lobes are not unlike in form to those of *Acer rubrum*.

(October, 1879). I find that the leaves which appear simple are not strictly so, in fact, being articulated with the top of the leaf stalk, and separating from it when they fall.

The autumnal colouring of this plant, when it is trained against a wall in a good sunny exposure,

AMPELIDEÆ.

is even more beautiful than that of the Virginia Creeper. The leaves begin to change colour early in October, they turn first to a deep rich vinous purple (showing, when the light is seen through them, a tint like that of the finest garnet) and ultimately to a most splendid red, varying between scarlet and crimson. The beauty of their colouring can hardly be surpassed by that of the finest flowers.

Vitis
Veitchii

ZANTHOXYLACEÆ.

AILANTUS GLANDULOSA.

Loudon, v. 1, 490.

*Ailantus
glandulosa*

Thrives extremely well here. The largest and oldest tree we have of the kind stands on the east side of the pleasure ground. It was planted 1826, and measures three-and-half feet in circumference at three feet from the ground. Most of the trees of *Ailantus* growing here, flowered very abundantly in August last year (1861), and, what is unusual, the greatest part of the flowers they bore were hermaphrodite, with well formed and fully-developed pistils as well as stamens. A considerable number of fruits were formed, but all dropped off before coming to their full size. The oldest tree here—the one I have already particularly mentioned—flowered more sparingly than most of the others; probably because growing in a more shady situation. The flowers are of a very pale yellowish-green, or greenish-yellowish-white colour; the petals fall very quickly.

The *Ailantus glandulosa* is much cultivated for ornament (in company with the *Catalpa*, *Robinia*, *Melia azedarach*, and *Acer negundo*), in the gardens and public walks of Rome and Florence, where it grows to a very large tree, and flowers and fruits most abundantly. In the latter end

*This has been much damaged by a gale of wind in 1869

ZANTHOXYLACEÆ.

of June, 1848, I saw it at Florence, loaded with ^{Ailantus} half-ripe seed-vessels, which are not unlike in ^{glandulosa} general form to those of the Ash, and of a rich, red colour. The late Professor Targioni Tozzetti told me that the first specimen of this plant that was ever seen in Italy was in the Botanic Garden ("Orto Botanico-agrario"), at Florence, and that all the innumerable trees of the species now growing in the environs of that city, were raised from cuttings or seeds of that original tree.

As this *Ailantus* is perfectly hardy with us in Suffolk (not having suffered at all from the terrible frost of 1860-61), there is probably a mistake in the statement made by De Candolle and Don, that it is a native of the Moluccas as well as of China. The Molucca plant may be a different but nearly allied species.

(September, 1868). The large tree on the east side of the pleasure ground bears abundance of fruit this season. The large panicles of *keys* (*samaræ*), partly pale yellow and partly bright red, are very conspicuous among the deep green leaves. These fruits or *samaræ* have a superficial resemblance to those of the Ash, but are very different in the position of the seed. In the Ashes, the seed is at the base of the fruit; in the *Ailantus* it is near the middle, or rather beyond the middle, *i.e.*, nearer to the apex than the base;

ZANTHOXYLACEÆ.

*Ailantus
glandulosa*

it is nearer to the one edge than the other, and attached to a slender placenta which runs as a rib along this nearer margin. The samaras are of a narrow-elliptical or oblong form, very flat and thin, like leaves, delicately veined, with thickened margins and very often tinged on one side with a fine red.

Often only one samara follows each flower; not unfrequently two or three. I have not seen more than three.

Hooker and Bentham, in their *Genera Plantarum* refer this genus to *Simarubææ*, instead of *zanthoxyleæ* *

The two orders are indeed very nearly related, both belonging to the Rutal alliance. The principal differences appear to be, that *Zanthoxyleæ* have glandular-dotted leaves, calyxes, &c., and have the carpels more or less united, not completely distinct.

In both these points *Ailantus* certainly agrees with *Simarubææ* rather than with *Zanthoxyleæ*.

* They consider *Zanthoxyleæ* as no more than a tribe of *Rutaceæ*.

CELASTRACEÆ.

EUONYMUS LATIFOLIUS.

Loudon, v. 2. 498.

Of this there are many good plants here; it thrives exceedingly, is very hardy (not having suffered from the winter of 1860-61), and fully deserves all that Loudon says in its praise. The ripe fruit in September, the rich rose colour of the capsules, with the brilliant orange coloured seeds hanging out, are most beautiful; and nearly at the same time the leaves change colour, first to a rich vinous purple-red, and then to a bright crimson, before they fall. In summer, too, the foliage is much handsomer than that of the common *Euonymus*. It flowers with us in May; and both ripens its fruit and sheds its leaves much earlier than the *Europæus*.

Though we have several plants of this species standing by themselves on the lawns, not mixed with other shrubs, I do not perceive that it has any tendency, as Loudon says, to form a *tree*; it always (with us) is truly a shrub, though a large and tall one; *i. e.*, it always has numerous nearly equal stems, springing up side by side from the same root.

*Euonymus
latifolius*

RHAMNACEÆ.

PALIURUS ACULEATUS.

Loudon, v. 2, 527.

*Paliurus
aculeatus*

A large plant in the arboretum, and a smaller but very flourishing one near the pond in the pleasure ground. Both were injured—the older one severely—by the winter of 1860-61, but have recovered. They flower most years, abundantly in fine summers; and in the Autumn of 1857, both bore fruit, which however did not ripen completely. The prickles are smaller and less powerful on these cultivated plants than in the wild state. About Rome, this shrub is very generally used for fences, both live and dead, and in either way makes a very formidable fence.

In October 1st, 1857, my father sent me from Barton to Mildenhall, specimens in fruit of *Paliurus aculeatus*. This fruit in its half-ripe state, bright yellow-green with a very smooth surface; surrounded at its base by the saucer-shaped permanent calyx; at first nearly turbinate but becoming broader and flatter as the wings enlarge: for in these specimens there are three distinct wings, not a continuous wing-like border as in the ripe fruits that I have from Italy. The outer coat of the fruit is thick, of a texture (in the present state), between fleshy and mealy; the internal part (the endocarp or putamen), much

RHAMNACEÆ.

harder (quite bony in the ripe fruit), three-celled; ^{Paliurus} each cell nearly filled by a solitary erect seed. ^{aculeatus} *

In the Maremma of Tuscany, as I was told by my uncle, Mr. Fox, † it is one of the most common shrubs. Henry ‡ observed it forming a great proportion of the thickets in that part of Bulgaria where our army was quartered in 1854.

* See my Botanical Notes, No. 20. October, 1857.

† His Uncle, Henry Stephen Fox.

‡ His brother, Colonel Bunbury.

TEREBINTHACEÆ.

(Anacardiaceæ),—*Loudon*.

RHUS COTINUS.

Loudon, v. 2, 549.Rhus
cotinus

A very ornamental shrub, as Loudon justly says; but he has omitted to mention one of its beauties, namely, the autumnal colouring of its leaves; in September and October they assume very rich and finely varied tints of yellow, bright red, and dark red.

A plant raised from seed, which Henry* brought from Bulgaria, and now growing in the arboretum here, is a slight variety of *Rhus cotinus*, with leaves more glaucous and less rounded at the tip, indeed almost pointed. The plant however is still young, and it remains to be seen how far this character may be permanent. Henry says the shrub is very common in Bulgaria, along the skirts of the Balkan mountains.

The Italian name of *scotino*, for this plant (*see Loudon*), is more likely to be a corruption of *cotinus*, than to be derived from the Greek *skotios*.

RHUS TYPHINA.

Loudon, v. 2, 550.Rhus
typhina

This well deserves all that Loudon says of its beauty, especially in Autumn, when the scarlet glow of its leaves, especially if backed by evergreens, or by other shrubs that remain green after

* His brother, Colonel Bunbury.

TEREBINTHACEÆ.

it has changed, has a very fine effect. I think that Loudon has mistaken the meaning of the specific name of this Sumach. I imagine that Linnæus did not mean any allusion to *typhus* fever, but intended to compare the thick, club-like, woolly masses of fruit to the spikes of the *Typha*. I have since found Linnæus' own explanation of the name, in the *Amœnitates Academicæ*, vol. 4, dissert. 63, p.311; where he says that this species differs from *Rhus glabrum*,—"Ramis hirtis uti *typhi* cervini," &c. I do not indeed find *typhus* in the dictionaries, but it is quite evident that Linnæus here means the young horns of deer while covered with their downy skin.

There is much uncertainty as to the gender of the name *Rhus*, whether it should be feminine or neuter. In the above-quoted dissertation in the *Amœnitates Academicæ* (63), Linnæus makes the name of this species *typhinum*; yet in the very same article, he mentions *Rhus coriaria* and *Rhus glabra*. The generality of modern authors, I think, make the name feminine. It seems to be clear that *Rhus coriaria* is the original *Pos* of Theophrastus and Dioscorides; and this name *Pos*, according to Liddell and Scott, and to Donnegan, is both masculine and feminine. So there is no authority, at any rate, for the neuter use of the name.

LAURACEÆ.

LAURUS NOBILIS.

*Loudon, v. 3,*Laurus
nobilis

Of the sweet Bay, or true Laurel, we have at present two good trees; one standing close to the south-west corner of the house, and sheltered by it; the other, a larger and finer one, in the middle of a clump on the lawn, a little way from the south-west front of the house. Both were planted by my father, but I do not know the date; both were killed to the very ground in the winter of 1860-61, and both have grown up to be as large or larger than they were before, and very fine healthy vigorous trees. They have not indeed quite the appearance of trees; like almost all the Bays that I have seen in England, they throw out branches from the very base and all up the trunk, so as to be a dense mass of verdure from the ground to the top.

The branches, as usual in this species (at least in cultivation), are very upright. The larger of our two may be 18 or 20 feet high; both flower plentifully every year, but I have never seen any fruit formed. In the south of England, the Bay tree fruits plentifully. In Italy, this tree grows to a much larger size, and has a more truly tree-like form and character than in this country, though still it is always a small tree in comparison with its gigantic kindred in Madeira and the Canaries. (*Laurus Canaricensis*,—*Webb*).

LAURACEÆ.

We saw and measured in June, 1866, the famous bay tree on the Isola Bella, in the Lago Maggiore. ^{Laurus nobilis}

Its two trunks—for it has two—separating just above the ground, and rising very straight, measured—the one, eight feet, nine inches, the other, nine feet, one inch in circumference, at one foot above the ground. There are several other Bay trees on the island, of considerable size and beauty, and generally the species grows there with great luxuriance. At Rome also, in the groves of the Borghese and other villas, there are many Bays of very fine growth.

JUGLANDEÆ.

JUGLANS REGIA.

Loudon, v. 3, 1423.

Juglans
Regia

A Walnut tree, planted in the early part of 1814, near the north east front of this house, to commemorate the birth of my brother Hanmer* now measures only four feet, one inch round, at the height of three feet. Some others however, planted a few years later by my father, in the back yard of his house at Mildenhall, have grown to a much greater size.† The chalky soil at Mildenhall appears to suit the Walnut, and there were many fine ones in the parish; but the winter of 1860-61 either killed or severely injured nearly all of them, young and old. The bark of the trunk in trees of fifty years old and upward, is comparatively almost smooth, whereas that of *Juglans nigra* at a much less age, becomes remarkably rugged.

JUGLANS NIGRA.

Loudon, v. 3. 1436.

Juglans
nigra

Several planted by my father in the arboretum and about the grounds, have grown very well. It is a very handsome tree, and my father notes that he found it to grow faster, and to attain a given height in a shorter time than the common Walnut.

* Captain Hanmer Bunbury, R.N.

† These were cut down in 1887.

JUGLANDEÆ.

The finest in the arboretum, planted 1825 (?) *Juglans nigra* measures five feet round; but this is not a fair measurement, as the trunk divides, very near the ground into two parts, and though one of these was cut off several years ago, yet the other stem has hardly yet attained to the bulk it would have had if single. This tree bears abundance of fruit, and in favourable seasons (as after the hot summers of 1858 and 1859) these grow to a considerable size and become *apparently* ripe, but not eatable.

The bark of the trunk is very rugged with strong prominent ridges, intersecting one another so as to leave somewhat lozenge shape hollows or depressions between them.

This tree stands very near the great Cephalonian Fir. Another black Walnut, near the *Æsculus Indica*, in the more western part of the arboretum, measures five feet, two inches in girth, but has not so fine a head as the first. A third tree (standing not far from the fern-leaved Beech) is taller and more erect in growth, and will perhaps ultimately be a finer tree, but its trunk does not at present exceed four feet, three inches in circumference. (October, 1868.)

The large black Walnut in the arboretum is perfectly loaded with fruit; after the first gale of wind of the season (October 24), the ground beneath was thickly strewn with the fruit looking

JUGLANDEÆ.

Juglans nigra like large green apples. In this green state they measure from six to seven inches round each way, being almost exactly spherical.

The finest black Walnut tree that I have ever seen, and probably the largest in Britain, is the one in Fulham Palace Gardens. Its present height, as given by D. Cunningham in *Gardeners' Chronicle*, (January 15, 1870) is seventy feet; girth, at three feet from the ground, fifteen feet, nine inches.

There is also a very large and beautiful tree of this kind in Mr. Lee Warner's grounds at Walsingham Priory, Norfolk. And another very fine in the Palace Garden at Wells.

CARYA AMARA.—*Loudon*, v. 3. 1443.

JUGLANS AMARA.—*Michaux*.

Carya amara Two flourishing trees in the arboretum here (one under the erroneous name of *Carya tomentosa*) and one very handsome one, in the pleasure ground.

Juglans amara

It is a tree of much slower growth than the black Walnut, but very handsome both in foliage and general form. The leaves of the two in the arboretum turn to a beautiful bright amber-yellow in October; in the one on the lawn this is not so conspicuous. The leaves remain green considerably later, and of

JUGLANDEÆ.

course fall later than those of the black Walnut. Carya : mara
 The leaf buds which are alike in all, and are characteristic—are of a peculiar brownish yellow colour, with a minutely downy or mealy surface, and “naked,” *i.e.* not enveloped by scales. Juglans amara

The two trees in the arboretum have in this last year (1864) borne a considerable quantity of young fruits, but these have all dropped off when scarcely half ripe, and hardly larger than filberts. In this stage of growth the four prominent sutures, or “wing-like ridges,” running down the outside of the husk (the tube of the calyx) are very apparent. They often extend much more than half way down.

The bark of the trunk is nearly smooth; or but slightly cracked, not rugged as that of the black Walnut is at the same age.

(February 9th).

JUGLANS (*carya*) AMARA.

I have now no doubt that the two “Hickories” Juglans (carya) amara in the arboretum belong to this species. The fallen fruits which I have lately found are considerably larger than those mentioned, November 26th of last year, but yet not nearly ripe. The four strong prominent ridges which run down along the outside of the fruit or of the calyx tube, are certainly what Michaux means in the ex-

JUGLANDEÆ.

Juglans
(carya)
amara

pression, "Suturis superne prominulis;" in some they continue nearly to the base; the older fruits show a tendency to split along these ridges, and one or two which have lain long on the ground, I find actually split along them into four valves. The hard endocarp or shell is smooth on the outer surface, not furrowed as in the typical Walnuts, and is comparatively thin: its shape roundish, with a narrow neck (urceolate).*

* See Note Book, Feb. 9th, 1868.

SALICACEÆ.

POPULUS MONILIFERA.

Loudon, v. 3, 1657.

“Measurement of the black Italian Poplar, ^{Populus} _{monilifera}
“near the north-west corner, standing at the front
“of the Vicarage Grove :—height, eighty-three
“feet ; circumference of body at five feet from
“the ground, five feet, two inches. November 5th,
“1856.” (This measurement is by my father).
Circumference of the same at *three* feet from
ground, February 12th, 1872 : seven feet, ten
inches. (C.B.).

BETULACEÆ.

ALNUS GLUTINOSA.

Loudon, p. 1678.

*Alnus
glutinosa*

Two plants here, one in the pleasure ground, near the "Lizard" pond, the other in the arbo-retum. A singular variety of the Alder, with leaves so very like those of the Hawthorn, that every one at first takes it for a kind of *Cratægus*. But its twigs and leaf-buds, though on a smaller scale, are like those of the common Alder; and when it shows its seed-bearing cones and the young male catkins which are to flower next spring, there can be no mistake about it. Both the trees are now (in this winter of 1864-5), bearing catkins of both kinds. This variety is of much less vigorous growth and smaller in all its parts than the normal state of the common Alder; it has altogether something of a contracted and pinched appearance; its leaves are not only much smaller than those of the normal form, but smaller than those of the Hawthorn, which they so much resemble in shape. Loudon's wood-cut, 1539, gives a good idea of the foliage.

CUPULIFERÆ.

QUERCUS CERRIS.

Loudon, v. 3, 1846.

A great number of trees of this species, planted ^{Quercus} _{cerris} by my father, at different times since 1823, have grown very well, and are now of considerable height and size. They bear abundance of acorns which however do not ripen except in warm and dry seasons. The largest trees that I have measured are, one at the south-east corner of the Dairy Grove, and one between the pleasure ground and the Vicarage Grove; each of these now (1869) measures about five feet, nine inches round, at the height of three feet.

Loudon's description of this Oak is very good and so are his woodcuts, on a small scale. It is a very handsome tree, much more upright and symmetrical in form than the common oak, and with less of the character of rugged and massy strength; the principal branches not becoming nearly so large in proportion. The foliage very rich, dense and handsome; what Loudon says of the extraordinary variability in form of the leaves is perfectly accurate. They turn, on the approach of winter, to a warmer brown colour than those of the common oak, and a portion of them often remain on the tree, in this brown state, through a great part of the winter. The acorns are large and fine, of a more lengthened form than in the

CUPULIFERÆ.

Quercus
cerris

Quercus robur. Some of the largest and finest trees of the *Cerris* that I have ever seen, are in Mr. Berners's beautiful park at Woolverston on the Orwell. This oak is pretty common in Italy, but much less so than the *Quercus pubescence* (Willd.) or *Quercus robur* variety *lanuginosa* (*Alphonse De Candolle*) which may indeed be called *the Oak of Italy*. I have seen the *Cerris* in woods near Sienna, in abundance on hills about the Lake of Bolsena, and several large trees of it on rough hilly ground between the river Magra and the Gulf of La Spezzia.—*Hooker* (in *Linnean Transactions*, v. 23. 386) says that *Quercus Cerris* is "a native of Spain, Italy, France, Austria, Greece, and Asia Minor"; but on the contrary, *Lindley* (in the *Penny Cyclopædia*, article *Quercus*) assents seemingly on the authority of *Webb*, that it is unknown in Spain.

According to *Alphonse De Candolle* (D.C. Prod. v. 66. section post, p. 42), who has very carefully attended to the geographical distribution of Oaks, this is extensively spread through "the East," from Lebanon through the whole of Asia Minor to European Turkey, through the whole south east of Europe, and from Sicily along the whole length of the Appenines; it is found in a few dis severed localities in France, and in one place in Spain, namely, the Park of the Pardo near Madrid, where it is perhaps not indigenous.

CUPULIFERÆ.

QUERCUS COCCINEA.

Loudon, p. 1879.

Alphonso De Candolle, Prod. v. 16., pt. 2., p. 61.

Several good trees, I believe of this species, are in various parts of the grounds at Barton, planted by my father; but I find it very difficult (without the acorns, which have never ripened here) to distinguish *Quercus coccinea* from *rubra*. The differences in the outline of the leaves, as given by authors, appear vague, and difficult to determine, and those in the autumnal colouring, on which *Michaux* lays much stress, seem, under cultivation in this climate to become altogether uncertain.

*Quercus
coccinea*

One of the handsomest trees of this kind at Barton, and most marked in its characters, stands in the north-west part of the pleasure ground, not far from the library windows. It is not a large tree, but thriving and healthy. The leaves are large and deeply sinuated or lobed, corresponding exactly with *Michaux's* figure of *Quercus coccinea*.

When they first expand in the spring, they are downy, and delicately tinted with a soft pale red; throughout the summer they are of a very bright and glossy green. Before the end of September, usually, a few bright red leaves appear here and there in the midst of the green ones; for the change of colour begins suddenly, with a complete

CUPULIFERÆ.

*Quercus
coccinea*

change in a few individual leaves. As the change goes on, the leaves become finely variegated, the bright red colour showing itself first in stripes along the principal veins. But the whole foliage of the tree does not become thoroughly red at any one time, for while some of the leaves still remain green, others have turned from red to brown, and this last colour predominates before the leaves have mostly fallen. The colouring of this tree varies considerably in different years, but is always finer than that of any other Oak we have.

The male catkins of this tree, in the spring are of a beautiful delicate red colour; on the other trees which I suppose to be of this species, they are yellowish.

There are two or three trees in the new part of the arboretum ("Sorcerer's" paddock) and others on the edge of the Vicarage grove, which agree in the main with this, both in the form and colouring of the leaves; for in favourable seasons they assume a very good red. Abundance of acorns are formed, but always fall off in a very immature state, before they are half grown.

Still, even in this early stage, the form of the acorn cup (*cupule*) agrees with what is figured and described in *Quercus coccinea*, and may probably be accepted as characteristic of the species.

According to *Alphonso De Candolle* (in *Prod.* v. 16.) the form of the *cupule* is very constant,

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whereas that of the leaves does not afford a certain and permanent distinction between *Quercus rubra* and *coccinea*. Quercus
coccinea

We have some others and larger Oak trees here which may belong either to a variety of *coccinea* or to *rubra* for the leaves are larger than on those hitherto mentioned, much less deeply lobed, and turn yellow-brown, not red, in autumn.

QUERCUS RUBRA.

Loudon.

Alphonso De Candolle. Prod. v. 16.

One tree, on the lawn, standing in company with a *Taxodium distichum* and a *Robinia viscosa*, may be said pretty confidently to belong to this species; for it produces plenty of acorns, and although these always fall before they are half ripe, the cups (or *cupules*) show quite distinctly their characteristic forms; they are very shallow and almost flat underneath, nearly saucer-shape, quite distinguishable from those of *coccinea*, at the same age. This tree is still a small one. It was planted by my father. Quercus
rubra

QUERCUS ILEX.

Loudon, v. 3. 1899.

There are no old *Ilexes* at Barton, but many Quercus
ilex

CUPULIFEREÆ.

Quercus
ilex

planted by my father since 1825; which have thriven very well. Their growth however is always very slow. Most of them lost their leaves in the winter of 1860-61, but appear to have quite recovered. Two or three however were killed down to the stump, and these, as usual in such cases seem likely to remain in the form of bushes. I have observed both here and on the hills about Genoa, that when the *Illex* grows in this scrubby bushy form, its leaves are apt to have less of the usual grey down on the back, and sometimes are quite green on both sides, so that in *herbarium specimens*, they might be thought to belong to a different species.

One tree in the arboretum, raised from an acorn brought by my father from Nice is now flourishing.

There was an old *Illex* in the paddock, at Mildenhall, of considerable size which was believed to have been planted there by Sir Thomas Hanmer, in the first half of the eighteenth century; yet it was killed to the very ground by the frost of January, 1861.

The finest *Ilexes*, by far, that I remember to have seen in England, are in Mr. Mill's beautiful grounds at Stutton on the Stour. There are five of them of a size and beauty that would be striking even in Italy. They grow in a group so as to intermix their branches, forming a complete and continuous dome of foliage, the circumference

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of which everywhere touches the ground. The ^{Quercus} _{ilex} circuit of this dome, measured by pacing round the outside edge where the ends of the branches rest on the ground, is upwards of a hundred yards. (November, 1868.)

The trunk of one of these *Ilexes*, has a girth of nine feet, eight inches; of another, seven feet, three inches. This is according to Mr. Mills' note of their dimensions.

The tradition is that they were planted in Queen Elizabeth's time, and I think it probable that they are some of the oldest of their kind in England. They were not materially hurt by the winter of 1860.

There is an *Ilex* in the Bishop's Palace Gardens at Fulham, which, according to the *Gardeners' Chronicle* (January 15th, 1870) measures eleven feet in the girth of the trunk. It was planted by Bishop Compton, in 1686.

In travelling southward through France,—the eastern part of it,—by the road from Paris to Marseilles, one first observes the *Ilex* growing wild, somewhere about Montelimart, or between 40° 30' and 40° 50' north; not far from the same parallel where the cultivation of the Olive begins. In the arid, hilly, limestone country about Avignon, Nismes, Aix, etc., it is rather common, but always in the form of a bush, and much less abundant than the little holly-like Kermes Oak, *Quercus cocifera*.

CUPILIFEREÆ.

Quercus
ilex

On the hills about Genoa, it is very common in a scrubby form, but I remember no large *Ilexes* there, except single trees, doubtless planted near some of the convents. In the "Cascine," near Pisa, mixed with the Stone Pine and the Pinaster, it forms extensive woods on a light sandy soil. The limestone mountains behind Spoleto are entirely clothed with the *Ilex*; so are those near Terni, around the famous Falls of the Velino, and those bounding the valley of the Nar from Terni to Narni. There are many large trees of it on the banks of the Nar near the Bridge of Augustus. The superb *Ilexes* in the grounds of the Villa Borghese and Villa Pamfili at Rome are celebrated; but the finest trees of the kind that I remember ever to have seen are on the road between Castel Gandolfo and the Capuchin convent above the town of Albano. They are of vast size.

Virgil applies the epithet *corusca*—"sparkling,"—to the *Ilex*:—

"Quantus Eryx, aut quantus Athos, aut ipse, *coruscis*.
Cum fremit *ilicibus*, quantus, gaudetque nivali.
Vertice se attollens pater Appenines ad auras."

This may at first appear an unsuitable epithet for a rather dusky-coloured tree; but I have often been struck with its propriety when I have observed the evergreen Oaks here on a blowing day. The leaves tossed by the wind, and rapidly

CUPILIFEREÆ.

showing by turns their dark upper and whitish ^{Quercus} _{ilex} under-side, give to the tree altogether an appearance which may well be described as *twinkling*.

(October, 1868). In this remarkable season, several of the Ilex trees at Barton are bearing well-grown and full-sized acorns in a certain degree of abundance. The acorns in this fresh state are very handsome; of a rich, bright brown colour, very glossy, and striped lengthwise with a darker shade; the cup covered with very small neat scales, and whitish with down.

Mr Mills's Ilex trees at Stutton are loaded with acorns this year. (November, 1868).

The "Live Oak" of North America, *Quercus virens*, will not bear our winters here. My father planted one in the early days of the arboretum; but it was speedily killed. Yet it is so very much like the Ilex, that botanists seem puzzled to point out a good distinctive character.

Alphonse De Candolle, who has studied the Oaks with great care, can find (see *Prodromus*), no other *constant* difference than that the starry hairs which clothe the back of the leaf are much more minute in the *virens* than in the Ilex. The variations in the form of the leaves correspond in the two species. The character derived from the form of the acorns, in the *Hortus Kewensis*, seems to be ambiguous. Some acorns of the *virens*, given me by Dr. Hooker, are indeed much

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Quercus
ilex

smaller than those of the *Quercus ilex*, rather rounder and of a greyish colour; but these are characters not to be relied on.

QUERCUS SUBER.

Loudon, v. 3, 1911.

Quercus
suber

Our climate here does not suit the Cork tree. My father planted one when he first formed the arboretum, and the *stump* of it still remains; but the tree has repeatedly been killed down nearly to the ground in hard winters; in fact, every winter of more than average severity has cut it down; so that it is now reduced to a mere scrubby bush. At times, however, when there has been a succession of favourable seasons, it has grown up into something of a tree-like stem. But it is evident that the tree will not thrive here.

The old Cork tree in the grounds of Fulham Palace, mentioned by Loudon, is still in existence. I saw it this summer, June, 1868; it is a wreck, severely shattered by a snow storm, two or three years ago, as well as by previous tempests, but its size and appearance are still striking. According to D. Cunningham, in *Gardeners' Chronicle*, January 15th, 1870, the girth of its stem at the height of three feet, is nine feet ten inches, and its height fifty feet. But this last measurement,

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I should think, must belong to a time before the snow-storm. I remember to have seen, many years ago, one or two very fine Cork trees in Goodwood Park, near the house. I suppose they were planted by Peter Collinson. Quercus
suber

Loudon is quite correct in saying that the leaves of the Cork tree vary in the same manner as those of the Ilex. All the leaves borne by the young Cork tree here have been sharply toothed, wavy, and short in proportion to their breadth; whereas those which I gathered from old trees on the Estrelles mountains in the South of France, are entire-edged and comparatively long and narrow.

In herbarium specimens there seems to be no character by which we can distinguish the Cork tree from the Ilex; but the habit of the tree, when well grown, is markedly different. Not only is there a striking character in the bark, but the wood also is different, that of the Cork tree being much more lax and porous, and characterized especially by the very broad and conspicuous medullary rays.

QUERCUS CERRIS. *Var.* Luccombeana.

Loudon, v. 3. 1851.

I am by no means clear as to the difference between the Luccombe and the Fulham Oaks, Quercus
cerris

CUPULIFEREÆ.

Quercus
cerris
var.
Luccombeana
and Fulham
Oak

but we have two good trees in the arboretum, under the former name, planted by my father in 1831. They measure each a little above five feet round the trunk, but are not quite so large or so tall as Turkey Oaks of the same age, nor of so symmetrical a shape. The leaves are very similar in outline, cutting, and texture, to those of *Cerris*,—at least, to the less divided forms of leaf of that species; but they are almost completely evergreen, at least in mild winters like the present; at this time, January, 1869, they are as green as the *Quercus ilex*. The acorns, which have been produced in abundance this winter, have much more resemblance both in shape and colour to those of *Ilex* than of *Cerris*; but the cups are like those of the latter, except that the projecting tips of the scales are rather shorter, stiffer, and less curled. The bark of the trunk is much less rugged than that of *Cerris* of the same age. Mr. Webb (as quoted in the *Penny Cyclo-pædia*, Art. *Quercus*), was of opinion that the Luccombe Oak was identical with his *Quercus Hispanica*, and with the *Quercus pseudo-suber* of Desfontaines, a native of Spain. But if this be so, the notion of its hybrid origin must be erroneous.

Alphonse De Candolle considers it (including the Fulham Oak), as a variety of *Quercus cerris*; and appears to know it only as a garden plant; but he acknowledges that it comes very near to *Quercus Pseudo-suber*.—*D. C. Prod.* v. 16, p. 42,43.

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FAGUS SYLVATICA. *Var. Purpurea.**Loudon, v. 3, 1950.*

A number of purple Beeches, planted by my father in various places about the grounds here, at different times since 1822, have thriven very well, and are now very ornamental, though none have grown to any remarkable size. The delicate light red colour of the foliage in spring and its deep purple in the full summer, produce a beautiful effect, mixed and contrasted with the varied greens of other trees. My father was very attentive to these effects in choosing sites for planting the purple Beech; and his care has been very successful. At the end of summer and in the early autumn—for some little time before they begin to turn yellow,—the leaves of this variety almost entirely lose their purple colour, and change to a dark dusky-green. This is striking in a tree growing at the north-west corner of the Vicarage Grove, which is full in view from the house, and which throughout the spring and greater part of the summer, is very conspicuous by the contrast of its colouring with the various greens of the neighbouring trees; but for a short time at the end of summer and beginning of autumn it is hardly to be distinguished from the rest of the grove. In the regular autumnal change, the yellow or golden-tawny colour acquired by the leaves of the purple Beech, is even

*Fagus
sylvatica
var. purpurea*

CUPULIFEREÆ.

Fagus
sylvatica
var. *purpurea*

richer and more glowing than that of the common kind.

The finest purple Beech that I have seen is at Lady Cullum's, at Hardwick, on the lawn behind the house: a truly magnificent tree.

This variety does not fruit so regularly or so plentifully as the normal kind; indeed I believe it is rather unusual for it to bear perfect fruit. The great purple Beech at Hardwick, already mentioned, bears (as I was told by Lady Cullum), abundance of fruit, and young trees have been raised from its seeds. It was in 1875 that I first observed the purple Beech to bear fruit at Barton; in that year, a tree at the east corner of our pleasure ground, nearly opposite to Mrs. Somerville's Cedar, bore a good crop of *mast*, and another near the Library front of the house, fruited also; but less plentifully. These fruits were fully as large as those of the common Beech, and entirely like them, except in the colour, which was a rich, deep purple-brown, turning browner as the autumn advanced, but always retaining a decided purple tinge.

FAGUS SYLVATICA. *Var. Heterophylla (asplenifolia).*

Loudon, v. 3. 1951.

Fagus
sylvatica,
var
heterophylla
(*asplenifolia*)

One planted by my father in the arboretum, in 1831. It appears healthy, but has grown

CUPULIFERÆ.

slowly, being still a small tree, not above fifteen feet high with a trunk only three feet round, and a dense umbrella-like head; the principal branches spreading very horizontally. I have never observed flowers or fruit on it. The leaf-buds are much smaller than those of the common Beech, but agree in form and structure. The leaves are exactly as figured and described by Loudon; but this year, 1868, the tree has borne some twigs covered with leaves of the ordinary type of the common Beech. These twigs proceeded from the same branches with others bearing leaves of the variety; and in one instance I observed leaves of the common Beech type, and others of the fern like variety growing on the same twig. (October, 1869).

This year for the first time (as far as I am aware) the fern-leaved Beech has flowered and fruited; flowered freely and borne several fruits which have apparently ripened, though I have some doubt whether they are perfect. These are considerably smaller than those of the common Beech, and the cupule is shorter in proportion to the nuts.

*Fagus
sylvatica*

PLATANACEÆ.

PLATANUS ORIENTALIS.

Loudon, v. 4. 2033.Platanus
orientalis.

Several good ones at Barton, planted by my father, in 1825, or thereabouts; well grown and handsome, though none of them are so symmetrical or so beautiful as they might have been owing to their having been crowded, and cramped in their youth by other trees left growing too near them. In consequence of this their trunks have grown crooked and twisted and their heads unsymmetrical, but their foliage is beautiful.

The oriental Plane keeps its leaves till very late; this year (1876) it remained well clothed with rich and verdant foliage till the second week in November, when a sharp frost accompanied by rough wind, brought the leaves down in heaps.

The leaves, in general, change colour very little before they fall, only becoming a little paler.

PLATANUS ACERIFOLIA. (?)

Willdenow. (?)

Pl. Orientalis. (?)

Var. Acerifolia. (?)

Loudon. (?)Platanus
acerifolia.

I feel much uncertainty about this species or variety. We have, certainly, at Barton, many trees (planted by my father) of that sort of Plane, which is commonly supposed to be the Western or American Plane tree, *Platanus occidentalis*. It is the same which is so generally planted in the

PLATANACEÆ.

squares and parks of London. In Berkeley square ^{Platanus acerifolia} in particular, there are very fine trees of it; and it is of more rapid growth than the Oriental and quite as hardy. The leaves certainly agree very closely with those of *Platanus occidentalis* judging not only from figures but from dried specimens of the American species. But when George Bentham was here and inspected our trees in 18 , he told me that the Plane of the London squares is *not* the American species, *Platanus occidentalis*, for which it is commonly taken, but is an Asiatic species the *Platanus acerifolia* of Willdenow, more related to the Oriental, of which it is perhaps a variety. The clearest distinction he remarked is to be found in the balls or heads of fruit. These in *Platanus orientalis*, are very rough (*echinate*) all over, and almost prickly, from the permanent hard projecting beaks of the seed vessels. In the *occidentalis* the surface of these balls is much smoother, without projecting points. This character is very distinctly seen in Michaux's figure, (*Sylva* v. 1, pl. 63.) Our Plane trees of the sort in question, bear fruit much more sparingly than the Oriental; but the fruit balls which I have observed on the largest tree, certainly resemble those of the Oriental and ~~most~~ ^{not} of the American kind.

MYRICACEÆ.

COMPTONIA ASPLENIFOLIA.

*Comptonia
asplenifolia.*

One bought by me in 1860 (?) from Ewing of Norwich, and planted on a shady slope on the southern margin of the arboretum. Is now (1879) tolerably thriving, but small, not above two feet high, has never done more than tolerably well here, never been thoroughly vigorous; probably the soil does not suit it, and it would do better in a heath soil. I have seen it of much finer growth in the Woking cemetery.

This is an interesting plant, both for its name which commemorates one (Compton, Bishop of London), who had a principal share in the introduction of exotic plants into Britain, and who is well deserving of botanical commemoration; and for the singularity of its leaves. These have been compared to the fronds of a fern, indeed the likeness is sufficiently striking to have gained for this shrub, in America, the popular name of Sweet Fern, by which it is well known, yet its leaves have but a vague resemblance to any Fern that I know; but they are remarkably similar (especially in outline) to those of several Australian *Proteacæ* of the genera *Banksia* and *Dryandra*; insomuch that, in mere drawings or impressions, they could with difficulty be distinguished. The *Comptonia* is a native of North America; from Canada to Virginia, according

MYRICACEÆ.

to Pursh. Lyell found it plentiful on the Alleghanies, in the anthracite region of Pennsylvania; he told me he had observed that on the White mountains in New Hampshire, this and the common Brake Fern, *Pteris aquilina* occupied different zones, whereas in Nova Scotia, they grew plentifully intermixed.

*Comptonia
asplenifolia.*

CONIFERÆ.

PINUS AUSTRIACA.

Loudon, v. 4. 2205.

Pinus
Austriacus

Besides the tree near the pond (Lizard Lake) there are several planted on "the heath" close to the parish gravel pits; all are very thriving and bear cones abundantly. The tree appears to be perfectly hardy, and to flourish very well here. It does not grow as rapidly *in height* as the *Pinaster* but forms a thicker and more bushy and compact head, of a peculiarly dark green, so that the name of *Pinus nigricans* is very appropriate. Even without cones, it is easily known from the *Pinaster* both by its darker leaves, and by the form of the buds, which is exactly that described and figured by Loudon in *Pinus laricio*. I do not see in *Austriaca* that interrupted arrangement of the leaves, in tufts, alternating with naked spaces, which is so conspicuous in *Pinaster*, and which Loudon notices in *Laricio* (p. 2202.)

Pinus Austriaca is considered by Endlicher as a variety of *Pinus laricio*, but Lindley in his enumeration of Coniferæ in *Horticultural Society's Journal*, vol. 5., keeps it separate. The difference appears to be very slight, judging by the descriptions and figures of *Laricio*. Whatever the true *Pinus resinosa* or *Pinus rubra* of North America may be, the tree that we have at Barton, under the name of *Pinus resinosa* differs in nothing (that I can see) from *Austriaca*.

CONIFERÆ.

PINUS PINASTER.

Loudon, p. 2213.

There were several trees of this in the Barton ^{Pinus} arboretum, raised from seeds sent from St. Helena ^{pinaster} under the absurd name of *Pinus Novae Zelandiæ*. proved to be not even a marked variety of *Pinaster*, and have been nearly all cut down. One which was thrown down by a storm, I think, in 1843, has continued vegetating ever since, though lying prostrate on the ground, with only a small part of its roots fixed in the soil: it still puts out leaves every year.*

The *Pinaster* grows very rapidly, and attains to a great size, but is very shortlived in this part of the country.

PINUS PINEA.

Loudon, p. 2224.

The Stone Pine grows very poorly here, and does not form a tree of any size or beauty. ^{Pinus} My father planted several here, both in the pleasure ^{pineæ} ground and arboretum; they have lived and borne cones, but they grow very slowly, and make a very poor appearance. Though none of them were killed outright by the severe winter of 1860, they have appeared to dwindle still more since then. In fact it may be said that they keep alive, and no more. The late Sir Thomas Cullum planted a considerable

* 1879. It is now dead

CONIFERÆ.

Pinus
pinea

number of these Pines in the park at Hardwick, where they seemed to thrive better than with us; but they were, I think, all killed by the winter of 1860-61. Those planted by Lord Bristol at Ickworth seem to have stood it better.

(December, 1869). The Stone Pines (two in the pleasure ground and one in the arboretum) have thriven much better these last two or three years, and now make a much better appearance than they ever did before.

Some young trees of the kind raised from seed not many years ago,* and which we have planted out (two in the pleasure ground and one on the edge of the Vicarage grove), look very healthy.

There is a fine wood of very tall and stately Stone Pines, mixed with *Pinasters* in the sandy plain between the city of Pisa and the sea; it was included in the Grand Duke's park called the *cascine*. The Stone Pine grows admirably well at the Cape of Good Hope, to which it was introduced (I believe) by the Dutch. It now forms extensive groves both on the lower slopes of Table Mountain and on the sandy flats to the East of Cape Town, and appears to flourish as in its native country. In warm dry weather, the fragrance of these pine groves (both in Italy and at the Cape is truly delightful.

(November, 1879). The three young Stone Pines,

* In 1860.

CONIFERÆ.

which we planted out in December, 1869 (*see* ^{Pinus} ^{picea} above) have grown very well, and now look very healthy and handsome, but the two in the pleasure ground have not yet grown high enough to be beyond the shelter of the shrubbery.

PINUS LONGIFOLIA.

Lambert, Pin. v. I. 24. table 26 and 27.

Loudon, v. 4, 2252.

This tree will not bear the winters at Barton. ^{Pinus} ^{longifolia} We have some plants raised from seed, which are treated like *Rhododendron arboreum*; plunged during summer, and kept in a cool house during winter. Thus treated, the foliage looks healthy but the stem grows very slowly, assuming the character of a *dwarfed old tree*, like *Pinus halepensis* and others when growing on very barren rocks. The very long and delicate drooping bright green leaves are pretty. Dr. Thomson* says that this is the Pine which descends to the lowest level in the Himalaya and "is a common tree throughout the whole region" (the temperate region of those mountains) "from the mountains of the Punjaub to the East of Bootan. It is confined in a great measure to the outer ranges of the mountains, and commences as low as one thousand feet above the level of the sea, rarely, if ever

* Journal of Horticultural Society. v. 6. 257.

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*Pinus
longifolia*

“attaining a greater elevation than seven thousand feet. This tree appears to have a very great power of enduring varieties of climate, for it seems equally at home in the hot damp valleys of Sikkim, surrounded by an entirely tropical vegetation; and on the dry stony hills of the Punjaub, where rain hardly ever falls, and it is at all seasons exposed to a powerful and scorching sun.”

My brother Henry, who saw the *Pinus longifolia* in the Western Himalaya, describes it, in a letter to me, January 18th, 1850, as “a beautiful tree where it has room, with a very large and straight reddish coloured stem (like the real Scotch Fir) and then a great flat spreading head.”

The wood (of which I have a specimen from India) is pale coloured, soft, light, and of loose texture, and is not much valued in the country*.

PINUS CEMBRA.

Loudon, p. 2274.

*Pinus
cembra*

Two planted by my father in 1825:—one of them in the arboretum, did not grow well, and was taken down several years ago; the other in the shrubbery on the east side of the lawn, is now (1874), healthy and thriving, and a handsome tree, though too much cramped in its growth by neighbouring trees. It has borne cones for

* (1880.) All our plants of *Pinus longifolia* are now dead.

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some years past, but these are so quickly and greedily devoured by squirrels (almost before they are ripe), that I have not been able to obtain one good specimen. Their general shape and the form of the scales, agree with the figure in Lambert's *Pinus*.

*Pinus
cembra*

Within the last few years, we have planted several young trees of this species in various places about the grounds here, and they are doing very well; the most flourishing is one on the northern edge of the Vicarage Grove.

(1879). The young tree, just mentioned, and another (of about the same age), which we planted as a memorial of dear Sarah Hervey, † are flourishing, the rest have disappeared.

On the Alps, this kind of Pine is local and rather rare, though scattered in various places along the range from the mountains of Dauphiné and Provence* to those of Austria. Some old trees well known to tourists, grow on the Wengern Alps, between Lauterbrunnen and Grindelwald, just below the summit of the pass as one begins to descend towards Grindelwald. I saw them in 1829, and again in 1848. They do not form a wood, but grow irregularly scattered over the side of the mountain, unmixed with any other tree, the forests of Spruce Fir ceasing at some distance

* De Candolle, *Flore Franc.* v. 3. Koch's Synopsis, *Flore German*

† Mrs. Sanford, died 1877.

CONIFERÆ.

Pinus
cembra.

below them. They are fine, large, picturesque trees, very bold in their form; having nothing of the compact and rather formal character which the *Cembra* exhibits in cultivation; but on the contrary, a freedom and wildness, quite in harmony with the Alpine scenes in which they grow. They appear to be very old; their branches loaded with lichens; many of them are shattered and half dead, and some show life only in a few of their boughs.

I did not see the *Cembra* on the Scheideck, and our guide affirmed that it is found nowhere in the Bernese Alps except on the Wengern Alp and the Grimsel. It is called *Arve* by the people of the country.

Schimper* says that the *Cembra* which is sporadic, dispersed or collected into forests of small extent, along the chain of the Alps as far as the Carpathians, covers immense districts on the Ural, in the northern parts of Siberia, about the Altei, and in Kamschatka.

Schimper moreover says, that this Pine is rapidly diminishing in numbers (“*diminue presque à vue d’œil*”) on the mountains of Central Europe, where it formerly occupied extensive spaces (“*des espaces*” *très étendus*);† and he adds that, as this tree does not exist elsewhere in Europe, the species

* *Traité de Paléontologie Végétale*, v. 2. 231.

† *Traité Paléontologie Végétale*, v. 1. 59.

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will be completely extinct there (in Europe) as ^{Pinus} soon as the last plant of it shall have perished in ^{cembra} Switzerland.

PINUS EXCELSA.—*Wallich*.

Loudon, v. 4, 2285.

Two very fine plants in the arboretum, raised ^{Pinus} from seed (which) I believe was given to Lady ^{excelsa} Napier by Dr. Wallich, when at the Cape, and by her to my father); planted out, 1843. A smaller plant in the American Garden. The two large ones in the arboretum have a peculiar habit, unusual in Conifers, and correctly represented in Loudon's figures 2201 and 2202; the lower branches are very long, drooping at their first departure from the trunk, and resting on the ground for a considerable length, only turning up at the ends; so that though the trunk is single, the general form is rather that of a gigantic pyramidal bush than of a tree. The larger of them measures about 25 yards in circumference round the extremities of these branches. Each of these two trees bore two cones last year (1859) after the three successive hot summers:—the cones smaller than those I have received from India, but otherwise agreeing. The very long and slender delicate, pendulous leaves of *Pinus excelsa*, and their soft pale green colour, give it a very well marked and peculiar character, very pretty. The leaves

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*Pinus
excelsa*

of this species are as remarkably pendulous as those of *Pinus longifolia* and *Canariensis*, but very different in colour.

(May, 1861). *Pinus excelsa* has borne this last terrible winter without suffering the slightest injury.

(June, 1864). The larger of the two trees in the arboretum bears an abundance of cones this year; they are sometimes single, sometimes two, three, and in some instances as many as four together, at the ends of last year's shoots; at present about half grown, or less, of a purplish glaucous green colour, much more distinctly and conspicuously stalked than those of *Pinus strobus* or *monticola*.

There are cones on the other trees also, but less numerous. Last year too, they both bore cones which grew to be as large as the specimens I have seen from India.

(March, 1865). The beauty of the cones of *Pinus excelsa*, last autumn, was very striking, and was remarked by all our visitors. Their abundance, their great size and the rich glaucous purple colour (with a glaucous bloom on them like that on a plum or a purple grape) which they assumed in August and September, made them exceedingly ornamental. When quite ripe, they are pale brown, with some remains of the glaucous bloom on parts of each scale, and with a yellowish tint

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here and there (as in Lambert's plate) from the overflowing resin. They abound with resin, which has a most agreeable fragrance. Pinus
excelsa.

(December, 1871.) Both the trees of *Pinus excelsa*, above mentioned, have continued to bear cones abundantly every year; and many thriving young plants have been raised from the seeds.

PINUS MONTICOLA.

Loudon, v. 4, 2291.

The tree in the arboretum at Barton, planted in 1848, is very flourishing, and grows with very great rapidity; it is now (1864) absolutely loaded with cones. It is probably (as Sir W. Hooker, *Flora Boreali Americana*, considers it), merely a variety of *strobis*; differing in the larger size of the cones, in their colour (which is a purplish brown at the same stage of growth when those of the other are light green), and in the more rigid, more erect, and more crowded leaves, which are, to a certain degree, intermediate in character between those of *strobis* and of *cembra*. The cones when full grown, are nearly as long as those of *excelsa* but not as thick; they abound with resin. Pinus
monticola

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ABIETINÆ.

ABIES SMITHIANA.

Loudon, v. 4. 2317.

Lindley in *Penny Cyclopaedia* (with a good figure of the cone.) Art. Abies.

Pinus Smithiana,—*Wallich*.

Pinus Khutrow.—*Royle*. *Endl. Conif.* 122.

Pinus Morinda (of gardeners.)

Two good trees in the arboretum, raised (like the *Pinus excelsa* and the *deodaras*) from seeds sent to my father from the Cape by Lady Napier, to whom they had been given by Dr. Wallich:—planted out, in their present situations, in 1843. The habit or character of the tree is marked and peculiar, and as Henry* tells me, is quite the same which it has on its native mountains:—the general outline very regularly and strictly pyramidal, narrower than in the common Spruce, the main branches shortening very gradually upwards; the secondary branches very decidedly and remarkably pendulous.

Colour of the foliage, in the general view, a grey-green, lighter and much more greyish than that of the common Spruce.

Leaves considerably longer than those of the common Spruce, $1\frac{3}{4}$ inches to 2 inches long when full grown, not straight, but constantly and very distinctly *incurved*, that is, forming an arch with the concavity towards the branch.

* His brother, Colonel Bunbury.

CONIFERÆ.

ABIETINÆ.

Cones have been produced more or less freely, ^{Abies} ^{Smithiana.} for several years past, and this autumn (1869) they are in abundance on the finer of the two trees (the one near the great Douglas Fir). They have the same situation and direction as those of the common Spruce, and are like them in general form, but rather thicker in proportion, blunter at the end and a little more tending to an oval figure. At the present time (October, 1869), they are of a bright green colour (contrasting rather strongly with the colouring of the foliage), of a very smooth, glossy and neat appearance; the scales not quite one inch broad, convex, very smooth, very entire at the edge, closely and neatly imbricated.

This tree seems to belong chiefly but not exclusively to the more western parts of the Himalaya, especially to the parts about the valleys of the Ganges and the Sutlej. Dr. Hooker mentions it only once in his explorations of Sikkim. Major Madden* says it is rare in that province, and confined to valleys of the inner range at 8000 to 9000 feet, mixed with *Abies brunoniana*, and seldom exceeding 50 feet in height. In Kumaon, he says, it is not found. Dr. Hofmeister who travelled up the valley of the Ganges, and thence North westward, assigns to this Fir a

* Journal of Horticultural Society, Vol. 5. 238.

CONIFERÆ ABIETINÆ.

Abies
Smithiana

range in elevation from 6,500 to 10,000 feet and in latitude from 30°45 to 32.° My brother Henry in a tour among the mountains to the north-west from Simlah, found this and the *pindrow* growing mixed together in the forests, an exception, he observed, to the general rule, that the several species of Pines and Firs on those mountains grow separately. According to Madden, it is common on the mountains of Cashmere, above the Cedar forests, in company with *Pinus excelsa* and *Abies pindrow*.

The *Abies Smithiana* appears to be quite hardy with us; it was not at all hurt by the winter of 1860-61.

There is a remarkably fine tree of this species in Lady Cullum's Grounds, at Hardwick:—much taller and larger than either of ours, though planted later. Perhaps the soil is more favourable.

The name of *Morinda*, by which gardeners generally call this Fir, has no authority and seems to be founded on a mistake as to the native name. Among the many native names for it mentioned by Major Madden, I do not observe that of *Morinda*, but this name is mentioned by him as given, in one part of the range, to *Abies (picca) pindrow*. The usual native name for our *Abies*

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ABIETINÆ.

Smithiana (at least, in the valleys of the Sutlej and the Ganges,) appears to be *Rai* or *Roi*, and sometimes *Rai-sulla*. Abies
Smithiana

ABIES MENZIESII.

Loudon, v. 4. 2321.

Gordon, Pinetum, p. 6.

Two brought from Knight's nursery, and planted by my father, in 1847; one in the western part of the arboretum, not far from the *Æsculus Indica*; the other in the Vicarage grove. Both are flourishing exceedingly, and are very symmetrical and handsome trees, of amazingly rapid growth; the general habit, like that of the common Spruce, or even more rigid, and distinguishable at a distance by the silvery or glaucous hue of the leaves. I do not think that any of our Firs have surpassed (hardly equalled) these in the length of the annual shoots. Neither of them have yet borne cones, and therefore I feel some doubt as to the accuracy of the name, for the leaves do not agree with Lambert's or rather David Don's description, though the short specific character in Endlicher's Synopsis suits them well enough. It is well known that David Don was the real author of all the scientific part of Lambert's "*Genus Pinus*." Abies
Menziesii

CONIFERÆ.

ABIETINÆ.

Abies
Menziesii

The description in Gordon's *Pinctum* answers exactly to our plant.

Our tree cannot be said to have "the habit and leaves of the Silver Firs" as Don says of his *Pinus menziesii*.

The leaves are essentially those of a Spruce, though making a slight approach to the characters of the Silver group: they are not "flat," but distinctly four-cornered, yet decidedly flattened; the angles very unequal, the two lateral ones much more acute than the other two, and the diameter from one of these lateral angles to the other much greater than that from the front to the back. Thus two of the four sides form, in fact, the *upper face* of the leaf, and the other two the *under face*; and Endlicher's term of "*compresso tetragona*" is perfectly correct. The two upper sides (the front of the leaf) are of a full deep green colour, without any mixture of white, very smooth; the two lower or back ones white, like the back of the Silver Fir leaf. The leaves are about one inch long, very straight and rigid (not "incurved") tipped with a remarkably sharp and hard, almost thorn-like point, and articulated at the base with a tubercle projecting from the branch.

The young branches are very thickly covered with leaves, which spread in all directions, yet not quite equally, but showing sometimes of a two ranked tendency.

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ABIETINÆ.

The young branches are very rough all over with these tubercles, which are the projecting apices of ridges (called *pulvini* by Endlicher that are in reality, the adherent bases or petioles of the leaves.

The young branches of the Common Spruce are rough in precisely the same manner, but in a less degree, the ridges and tubercles being smaller and less prominent than in *Menziesii*.

(April, 1877). A number of the cones have been blown off from the tree in the arboretum, and are now in my collection; they agree exactly with Gordon's description (*Pinctum* p. 7.) I saw in 18 that there were cones on the tree, but confined to the topmost branches, and I could not get at them; so these are old cones, and have shed their seeds. They are very small in comparison with those of the Common Spruce and the *khutrow*; being only three inches long; the scales numerous and small, crowded, but (at least in this old state), widely spreading and almost re-curved, thin, and in particular very thin at the edge, their ends remarkably and irregularly toothed and jagged. Gordon expressively describes them as "bitten." The colour of the old cones is a dull brown.

(February, 1878). I see cones at present on the *other* tree of this species—the one in the Vicarage grove; but as before, they are only on the topmost branches.

Abies
Menziesii

CONIFERÆ.

ABIETINÆ.

ABIES CANADENSIS (*Hemlock Spruce*).

Loudon, p. 2322.

Abies
Canadensis

Two in the arboretum, both (?) planted in 1830 ; not of large size, though apparently very healthy and thriving ; their growth very slow. They have the general round form and gracefully drooping branches, noticed by Loudon. The larger of the two (near the fine Cephalonian Fir) has not yet borne cones ; the smaller one (near west boundary of arboretum), has this last year (1864), borne them in tolerable plenty. The cones are fairly well represented in *Lambert's* work (ed. 2) ; they are curiously small for the size of the tree, not bigger than hazel-nuts ; pale delicate glaucous green while unripe, pale brown when quite ripe. (October, 1869).

Both the trees of *Abies Canadensis* bear cones this year in great abundance.

These little pale green cones, so neatly formed, hanging like drops from the ends of the slender twigs, have a very pretty appearance.

(Dec. 1871). The larger of our two Hemlock Spruces has for the last two years appeared sickly and declining, and this last summer it was evidently in a dying state ; therefore we had it cut down. I conceive that it had suffered, not from cold, but from the great drought of some recent

CONIFERÆ.

ABIETINÆ.

summers. The other tree, which grows where the soil is more damp, appears quite healthy,

Abies
Canadensis

There is a large and very beautiful Hemlock Spruce at Mr. Mills's, at Sutton; it forms a perfect dome of verdure; its lowest branches resting on the ground; the main trunk almost entirely concealed; the younger branches drooping in the same graceful way as in the young trees. The cones borne by this tree are as small as those of my tree.

The largest Hemlock Spruces I remember to have ever seen are at Bowood, Lord Lansdowne's; but I saw them too long ago to have a very precise recollection.

ABIES DOUGLASII.

Loudon, v. 4, 2319.

Lindley in Penny Cyclop; Art Abies.

Gordon Pin.

One in the arboretum at Barton, planted by my father in 1831, grew for many years with astonishing rapidity and vigour, and up to the age of perhaps fifteen years promised to be one of the tallest trees here; but between twenty and twenty-five years ago it began to show signs of dwindling, its leading shoot failed year after year, its general appearance became more scraggy;

Abies
Douglasii

CONIFERÆ.

Abies
Douglasii

and though of late it seems to have somewhat recovered, its top looks thin and unsatisfactory; even its lower branches are less well clothed than formerly, and it can no longer be called a very fine tree. I suspect that its roots have reached down to some soil which does not agree with them, probably one in which there is too much chalk. When measured (roughly), by Sir Frederick Grey in 186—, this tree was nearly seventy feet high.

The circumference of the trunk at three feet from the ground is seven feet four inches. (December, 1869).

The next best Douglas Fir that we have, is near the laundry, beside the footpath going to the Livermore lane. I do not find any note of the date of planting.

Another in the arboretum* (near the Æsculus Indica), has a curious peculiarity in its growth. All the side branches and their subdivisions, down to the youngest shoots, but especially the branches of a few years old, have a most curiously wavy and *serpentine* character; each year's growth forming a graceful arch; the sinuosity being always in a vertical plane; so that the direction of a branch of some years old has been compared to the received idea of the Sea Serpent.

Something of this peculiar sinuosity may be

* Planted by Frederick William Freeman, stepson of Sir George Napier.

CONIFERÆ.

observed in the large tree first mentioned; but in a much less degree. The bark of the young branches is very smooth, of a silvery grey colour; that of the old trunk much and deeply cracked, with something of a cork-like look, but not corky to the touch.

The leaf-buds are of a bright reddish-brown colour, very smooth and neatly formed, ovoid and pointed, composed of numerous thin and closely imbricated scales. There are several other trees of the kind in various parts of the grounds and park, but none very fine, though all grow well for some years after planting. The large tree first planted bears cones in abundance, and has done so regularly for many years past. Some of the younger trees in small plantations in the park also bear fruit freely. The cones with their long trident-shaped sharp-pointed bracts, projecting beyond the scales, have a very distinct and peculiar character, well represented in a woodcut in the Penny Cyclopedia (art. *Abies*).

Dr. Lindley believed that the Douglas Fir would prove a valuable tree in cultivation for timber; but experience has not confirmed this supposition. A fine trunk of this Fir, 150 feet high, sent some years ago from British Columbia now stands as a flag-staff in Kew Gardens

CONIFERÆ.

ABIETINÆ.

ABIES CEPHALONICA*

Loudon, v. 4. 2325.

Lindley in Journal of Horticultural Society, v. 5.

Picea Cephalonica, *Gordon, Pinetum*, p. 146.

*Abies
Cephalonica* *

The history of this tree, and of its introduction into England by Sir Charles Napier, is very accurately given by Loudon, p. 2328. The young tree raised at Luscombe in Devonshire are there mentioned; it was one of these young plants that Mr. Hoare sent as a present to [Emily] Lady Bunbury, and it was planted in the arboretum here in May, 1838; being then about ten years old from the seed. This has grown into a superb tree and is now (1864), flourishing in the highest vigour and beauty, not having suffered in the slightest degree from the severe frosts of 1860-61, or of any other winter. Its height was thirty-five feet in January, 1857, and must now certainly be above forty feet.

This tree has borne cones almost every year since 1858, and this last year (1864), it has had a considerable number; but they are all confined to the very topmost of the lateral

* The name, as has been remarked to me, should more correctly be

Cephalonica.

CONIFERÆ.

branches, so that it is not easy even to see them distinctly, and there is no chance of examining them. They appear however to be very like those of the Silver Fir, and they certainly agree with the character of that tree, and of the sub-genus *Picea* in shedding their scales. Abies
cephalonica

In other words the cone falls away piece-meal, scale by scale, from its axis, instead of itself falling off entire, as is the case with all the Spruce Firs as well as the Pines.

Of younger trees of this kind, purchased and planted since 1850, we have many here, and they all grow vigorously, and appear perfectly hardy. Their growth is rapid. One in the Vicarage Grove, planted, 1857, grew $2\frac{1}{2}$ feet in the two years, 1861 and 1862. Another ("Sarah Napier's* tree"), planted, 1860, has for the last three years made leading shoots of about one foot in the year.

(February, 1868). The large *Abies cephalonica* in the arboretum was measured last year, September 16th, and found to be 58 feet high; the circumference of the trunk, at three feet from the ground, seven feet.

Several young plants have been raised here from the seeds of this tree. The leaves of the young seedlings are exactly like those of the adults.

* Now Lady Albert Seymour

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Abies
cephalonica

It is probable that the *Abies apollinis* of Link, which Endlicher considers as a variety of the Silver Fir, with sharp pointed leaves, is nearly but not quite the same with *Abies cephalonica*; for according to Link's description, quoted by Endlicher,* the leaves are "turned to two sides" as in the common Silver Fir; whereas in the *Cephalonica* they spread in various directions. This *Abies apollinis*, according to Link, forms woods on the mountains of Greece between the elevations of 3000 and 4000 feet, especially on Parnassus, Taygetus, Cæta, and Olympus.

ABIES PINSAPO.

Lindley, in *Journal Horticultural Society*, v. 5. 211.

PINUS PINSAPO.

Boissier.

PICEA PINSAPO.

Gordon, *Pinetum*, p. 159.

Abies
pinsapo

Two young trees at Barton; one at the corner of the Pleasure Ground towards the stables, lost its leading shoots in January, 1861, but is gradually repairing the loss, and otherwise looks very healthy; the other a younger plant in a more sheltered situation in the Vicarage Grove, is exceedingly thriving; it grew $11\frac{3}{4}$ inches in the course of the year 1862.

This tree was first discovered by Boissier on

* Syn. Conif. 97.

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the high mountains near Ronda in the South of Spain. (See his notice of it in Hooker's *London Journal Bot.*, v. 5. 441). He first observed it on the top of the Sierra Bermeja (or Vermeja ?) near Estepona, due south of Ronda. Abies
pinsap¹

Lord Lilford tells me (June 9, 1870), that it grows also on the Serra da Estrella, in Portugal.

The name *pinsapo* (Lord Lilford tells me) is accented on the second syllable—pinsapo.

The *pinsapo* is excessively like the *cephalonica*, differing only (so far as I can see) in the shorter, still more rigid, and more thickly-set leaves, which stands out so densely and stiffly as to give a peculiar hedgehog-like look to the young branches. I think it very probable that, when they come to be more thoroughly known, these two kinds of Silver Fir, the one from Greece and the other from the South of Spain, will be found not to be permanently distinct.

ABIES CEDRUS.

Lindley, in *Penny Cyclopaedia*.

(CEDRUS LIBANI.)

Loudon, *Arb.* v. 4. 2402.

There are no old Cedars at Barton; the oldest is one that my father found growing in the Kitchen garden, and transplanted in 1823 to the Pleasure Ground between the two great Oaks, where it now stands.* This has not grown very Abies
cedrus

* We cut this down in 1867

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Abies
cedrus

well ; its trunk is now (September, 1860) only six feet round at a height of three feet. The numerous Cedars planted here by my father since 1823, show many variations in form and mode of growth, and in height relatively to age ; confirming what Loudon says of the variability of the tree. The finest is one in the pleasure ground, between the house and “ Lizard Lake ” ;* this was planted in 1832 ; it is one of the most characteristic, massy, *flat roofed* form of the Lebanon Cedar ; with a thick trunk, large and numerous horizontal branches, spreading widely and lying densely one over another, forming “ dark green layers of shade ” as Tennyson says. This tree has for the last two or three years produced a considerable quantity of male catkins, but as yet no cones. Another opposite the north-east front of the house planted about the same time † is of quite a different habit ;—tall, slender, and spiry, with more of the general form of a Larch, except that the branches are more horizontal. In some the branches droop at the ends, though not so remarkably as in the *Deodar*. At Cavenham there is a fine large old Cedar, close by the hall, with foliage strikingly glaucous. This may possibly belong to the variety *Atlantica*, the Cedar of the Atlas mountains.

(1869). The finest of the young Cedars here,—

* Planted by Sir Henry and Lady Bunbury.

† By Mrs. Somerville.

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PINUS (ABIES CEDRUS).

the one planted in 1832 produced two well-grown ^{Abies} cones in 1867, and has borne cones each year ^{cedrus} since, but as yet only a very few.

I first observed them in August of that year.

(1876). The Cedar above-mentioned bears, this year, a remarkable abundance of cones, very well formed and handsome. It is odd that none of our other Cedars have yet borne any, though some of them are equally old with this tree.

(1879). Another of our Cedars has this year borne a good many cones. It is the one opposite to the north-east front of the house, which I noticed as remarkable for its tall, slender, and spiry form. From the colour of the cones, I suppose they must really be of last year.

Some of the most beautiful Cedars I know are in Mr. Mills's grounds at Stutton Rectory, on the Stour. The largest of them measured, in 1851, sixteen feet one inch in circumference, and was a magnificent tree, but it has since been sadly shattered, mutilated and disfigured by violent storms of wind and snow. Two others, which are comparatively uninjured, measure, the one fifteen feet three inches round, the other, thirteen feet three inches. There are many very noble Cedars at Embley, Mr. S. Shore Smith's (formerly Mr. Nightingale's), near Romsey.

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ABIES DEODARA.

Lindley, in Penny Cyclopædia.

(CEDRUS DEODARA).

Loudon, v. 4, 2428.

The finest *Deodar* at Barton is near the north-west corner of the arboretum; planted there, 1843. This is a beautiful tree, very perfect in its form, rich and full in ramification and foliage. Another of the same age, and also fine, but inferior to the first, stands near the remnant of the old dividing wall of the arboretum. A third fine one near the east corner of the pleasure ground, transplanted thither in 1849, having been originally planted in 1843. All these, I believe, were raised from seeds sent by Lady (George) Napier, who received them from Dr. Wallich. There are also several much younger plants. The three principal *Deodars* here do not differ much in habit; all are distinctly marked, as compared with Lebanon Cedars of the same age, by their longer and less rigid leaves, their very glaucous colour, and branches drooping at the tips. And such are the general characteristics of the *Deodar* as cultivated in this country. But like many other Conifers, it seems to vary much in habit at different stages of growth. It is said by those who have seen the *Deodar* on its native mountains, that the old trees are very unlike the young ones with which we are now familiar, and are very

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much more like the Cedar of Lebanon. Sir William Hooker and his son, Dr. Joseph Hooker are both strongly inclined to believe that these two Cedars are varieties of one species, and that the *Deodar* should be considered as the more typical form; the Lebanon Cedar (though first known in Europe), being much more local and perhaps an abnormal form of the species. It is certainly a very remarkable fact that is mentioned by Hooker and Thomson in their Introduction to the *Flora Indica* as showing the tendency to variation in these trees when raised from seed; namely, that — “no Himalayan traveller within our experience has ever recognised the *Deodar* at Kew Gardens by habit to be the plant of those mountains, and that on the contrary, we have frequently had the Cedar of Lebanon pointed out as that tree.” The same authors say, in page 30 of the same Introduction, that there has been supposed to be a distinctive character in the cones, the scales of the cedar-cones being persistent, and those of the *Deodar* deciduous; but that in point of fact, the Cedars at Kew and elsewhere scatter their cone-scales whenever a hot summer has ripened their wood. The large *Deodar* at Kew, which I suppose is one of the oldest in this country, is of a much darker colour than any other I have seen. Joseph Hooker told me he had seen another,

Sir
Abies
deodara

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Abies
deodara

raised from a seed out of the *very same cone* with that from which this tree at Kew was raised, yet strikingly different in habit. There is an excellent paper by Joseph Hooker on the three Cedars—of Lebanon, of the Himalaya, and of the Atlas in the *Natural History Review*, vol. 2. (1862). He is of opinion that they must be considered either as three distinct species, or all as varieties of one type.

The *Deodar* is now planted in most parks and pleasure grounds in England; seems to be quite as hardy as the Lebanon Cedar, and of much more rapid growth. My brother Henry observed that the *Deodar*, in the Himalaya, is to a certain extent dioecious, some trees producing scarcely anything but male catkins, and others an abundance of female cones, with few, if any, male flowers. The same appears to be the case with the Lebanon Cedars, (*see* Loudon's remark near the bottom of p. 2404).

(May, 1861). All our *Deodars* have stood the ordeal of this extraordinary winter, without injury, except the large one at the east end of the Pleasure Ground; this was much cut, and lost most of its leaves, but is now putting out fresh ones.

(1876.) All the three *Deodars* I have mentioned are healthy, and growing vigorously; and still retain their distinctive peculiarities of habit; one of them—the one in the Pleasure Ground—bears

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male catkins, though not very plentifully; but I have not yet seen any sign of cones on any of the three. Abies
deodara

CUPRESSINÆ.

THUIA PENDULA.

*THUIA FILIFORMIS (*Kew gardens*).

Lambert's Pinus, ed. 2. v. 2. t. 67 (?).

Loudon, v. 4. 2461.

A thriving plant in the arboretum, planted by my father. Forms a dense bush, quite different in habit from either the American or Chinese *Thuia*. Appears quite hardy, not having suffered materially from the winter of 1860-61. This year, 1869, it bears some cones which I have never seen before. Thuia
pendula

This is a very peculiar and anomalous plant, quite different in habit from any other of the *cupresseæ* that I know, and peculiarly remarkable for its confused and irregular ramification, strikingly contrasted with that of the other *Thuias*, the ramification instead of being distichous or pinnated, is *fasciculate* and very irregularly so; the shoots of each year springing out, many together of various lengths and thickness, in a sort of confused cluster, from near the end of the preceding year's growth. The branches are long, slender, and lax, but in general not distinctly pendulous. The leaves also are unlike those of the other *Thuias*; they are

* I saw it labelled with this name at Kew.

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*Thuia
pendula*

indeed decussately opposite, and very distinctly four-rowed, but those of all the four rows are exactly alike, and spread equally. The free portions of the leaves, too, are much longer, and more pointed than in the other *Thuia*, and this is the case even on the youngest shoots. The colour is a full and rather deep, uniform bright green. The cones are solitary, sessile at the end of the shoots of a year or two old, amidst the confused cluster of new shoots; they agree essentially in structure with those of *Thuia (biota) orientalis*, and are of the same colour in the corresponding stages of growth; but have a very peculiar appearance owing to the very long, large and strongly-hooked points (like horns) into which their scales are prolonged.

This plant belongs to the genus *biota* of Don and Endlicher (which I do not consider distinct from *Thuia*); but it differs as much in foliage and ramification, from the type of that section (the *Thuia* or *biota orientalis*) as it does from the true American *Thuias*. Lambert's figure agrees so imperfectly with this, especially in the fruit (which wants the strong horn-like hooks) that I have quoted it with a mark of doubt. Endlicher's description agrees imperfectly as to the leaves, but well in other respects; Gordon's, fairly well.

According to Gordon's *Pinetum*, this was found

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by Dr. Siebold, growing wild on the Hakone ^{Cupressæ} mountains in Japan, and is universally cultivated for ornament throughout Japan and Northern China. "It is also said to be found in Tartary and Nepaul, but on very doubtful authority." (*Gordon*).

CUPRESSUS LUSITANICA.

Loudon, v. 4. 2477.

Syn. C. glauca.

Endlicher Synops. Con.

I was much struck with the beauty of this tree ^{Cupressus} in the Gardens of Madeira, where it is much ^{Lusit211} cultivated for ornament. It there forms a tree of considerable size, of a remarkably graceful and beautiful habit, and of a very delicate and pleasing glaucous colour; very much branched and with branches most gracefully weeping. It had been introduced from Portugal. I brought home some ripe cones, and from the seeds a great number of young plants were raised here at Barton. Several were planted out, in the arboretum and American garden, grew vigorously and rapidly, and bore some winters without injury. By last summer (1860) some of these were, at least, eight feet high, and already of great beauty. The intense frost of December, 1860, and January, 1861, killed them

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CUPRESSINEÆ.

Cupressus

lusitanica

all. Some plants, which were kept in the cool greenhouse with *Pinus longifolia*, are still thriving, and have borne many cones, agreeing exactly with those which I brought from Madeira, and with those figured in Lambert's work. The figure in that work is indeed in all respects very good.

(October, 1869). These last mentioned trees are still doing well, being protected every winter, and set out during the summer.

(March, 1877). All our plants of *Cupressus glauca* or *lusitanica* are now dead; those mentioned in my last note (which were sheltered during the winter) dwindled more gradually than the others, but died one after another. It may be safely said that this beautiful tree will not bear our climate—at least in this part of England. If it be, as it is said, a native of Western India, near Goa, it is surprising that it should have borne even one of our winters without protection.

CUPRESSUS GOVENIANA.

Journal Horticultural Society, v. 4. (1849) p. 295
(with a very characteristic wood-cut).

Gordon, Pinetum, 60.

Cupressus
goveniana

One in the arboretum, near the great *Catalpa*, pl. 1862; has grown very fast, thrives exceedingly, and bears a profusion of cones. It is a beautiful little tree, with slender and delicate shoots;

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CUPRESSINÆ.

the foliage and young twigs of a remarkably light, cheerful grass green colour; the general form not unlike that of the variety *horizontalis* of the common Cypress, the outline being on the whole *pyramidal*, though the direction of many of the branches is spreading. The cones are nearly sessile, and are so numerous and crowded on many of the branches as to have a remarkable appearance; they are scarcely larger than a cherry, almost exactly spherical, with a remarkably smooth and glossy surface, of a greyish brown colour when ripe; altogether they are peculiarly neat looking; the scales, from six to eight to each cone, with small and rather blunt point or tubercle on the disc of each.

*Cupressus
goveniana*

First discovered by Mr. Hartweg, on the western declivity of the mountains of Monterey, in Upper California, within two miles of the seashore, in company with *Pinus muricata*; forming a dense bush, from six to ten feet in height (Gordon and *Journal Horticultural Society*). As it grows on the coast, we might apprehend that it might not be thoroughly hardy here. Our plant has not yet suffered from any of the winters; but it has not passed through any of exceptional severity.

(October, 1871). Last winter was a very severe one, and this Cypress had its younger shoots much *cut* by the frost, but it now looks healthy.

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CUPRESSINEÆ.

CUPRESSUS FUNEBRIS.

Endlicher Syn. Conif. p. 58.

C. pendula, *Lambert*, *Pin.* ed. 2 t. 66.

Loudon, v. 4, 2479.

*Cupressus
funebriis*

Introduced, I believe, by Fortune, very pretty, but certainly not hardy in this part of England. Several which had been planted out at Barton, though carefully protected by huts of branches and fern, were entirely killed by the cold of this last winter. We have still some in a cool greenhouse. They do not grow nearly as fast as *Cupressus lusitanica*, nor have they yet borne cones. This species is remarkable for the length of time that the early leaves (those of the seedling state) remain on the plant, and for the singular way in which they are mixed, even on the same branch, with the very different foliage of the mature plant, giving it a curiously *polymorphous* appearance.

Lambert's *Cupressus pendula* is certainly the same as this. His figure agrees perfectly with specimens from Sikkim, given me under the name of *funebriis*, by Dr. J. Hooker. Endlicher appears to have changed the name, because the original *Cupressus pendula* of Thunberg was identical with *Thuia pendula*. His name of *funebriis* has since been generally adopted, and is very appropriate, as the tree is said to be generally planted by

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the Chinese in their cemeteries. Joseph Hooker ^{Cupressus funebris} found it cultivated about the Buddhist temples in Sikkim, but introduced thither from China, not being a native either of Sikkim or Bootan. He describes it as a magnificent tree, growing as much as eighty feet high, forming "irregular cones of pale bright green, with naked gnarled tops; the branches weep gracefully, but not like the picture in Macartney's 'Embassy to China,' whence originated the famous willow pattern of our crockery. The ultimate branchlets are very slender and pendulous. The trunk quite erect, smooth, cylindrical and pine-like." (*Himalayan Journals*, v. I. 336).

CUPRESSUS NUTKAENSIS.

Hooker (W. J.) Flora Boreali Americana.
Gordon, Pinetum, p. 66.

CHAMAECYPARIS NUTKAENSIS.

Parlatore in D. C. Prod. vol. 16. p. 465.

THUIOPSIS BOREALIS of *Gardeners and Nurscrymen.*

Our oldest specimen is one which we planted ^{Cupressus Nutkaensis} in 1862, in the newest part of the arboretum ("Sorcerer's" paddock), now (1877) very healthy and vigorous and has borne cones since 1873, but not plentifully. Another in Vicarage Grove planted (for Mr. and Mrs. Mills), 1868.

CONIFERÆ.

CUPRESSINEÆ.

*Cupressus
nutkaensis*

A native of the north-west coast of North America, first observed near Nootka Sound, in 49° North lat.; found as far north as Sitka, in north lat. 58°. Is said to grow into a tree 100 feet high. Here, it has not yet assumed the appearance of a tree, the trunk being concealed quite from the ground, by the densely growing branches and leafy shoots; its general form pyramidal, but not so upright and stiff as that of the common Cypress, or the Chinese *Thuia*. It is very handsome from its deep, rich glossy green colour, and the beautifully feathery or fern-like ramification of its young branches. It belongs to that section or subgenus of the Cupresses (made into the genus *chamaecyparis* by Spach and Parlatores) which by the flattened and pinnated form and arrangement of the leafy branches resembles the *Thuias*. In fact the Cupresses of this group have the branches and leaves of *Thuia* and the cones of *Cupressus*. To this group belong the *Cupressus thuoides* of Linnæus and the *Cupressus lawsoniana* of Murray, as well as the present one. This is generally known among cultivators by the name of *Thuyopsis borealis*; but in Parlatores's monograph of the Conifera* the genus *Thuyopsis* is restricted to one species *Thuia dolabatra* (*Thuia dolabatra* of

* Included in De Candolle's Prod. Vol. 16., part 2.

CONIFERÆ.

CUPRESSINÆ.

Lambert's *Pinus*), a Japanese tree, which has cones more like those of *Thuya* than of *Cupressus*.
 Our *Cupressus Nutkaensis* (I saw it under this name in Kew Gardens in 187), appears to be quite hardy as far as we can yet judge, but it has not yet experienced here any winter of uncommon severity. The primary branches are thickly set and rather upright; the secondary ones curved outwards and drooping a little towards their tips, and closely pinnated with the green branchlets, which are set on alternately and spread out in two opposite directions; so that the whole ramification has a flatness like that of *Lycopodium complanatum* or of many *Selaginellas*. The branchlets are so closely covered with the scale-like leaves, that no spaces are seen between them; their colour on the upper side is a deep, glossy green, on the under, paler and without gloss, and often a little glaucous.

TAXODIUM "RICHARD."

DISTICHUM.—*Loudon*, v. 4, 2481.

Endl. Conif. 68.

Lambert, Pin. ed. 2., v. 2. 116, t. 63.

Syn. *Cupressus distichum*.—*Linn.*

Michaux, v. 2, t. 151.

One in the middle of the lawn, Barton, planted 1826; two in the arboretum, planted, 1831 (?)

Taxodium distichum

CONIFERÆ.

CUPRESSINÆ.

*Taxodium
distichum*

There were, originally three in the arboretum, but one of them fell into a sickly and declining state; and I had it cut down a few years ago.

Another in the western part of the arboretum (too near to the great *Deodara*) much younger than those before mentioned, but its date is not recorded. This one has been cut down because it was so near to the *Deodara*, as to interfere injuriously with its beauty. (March, 1872).

There is also a young one in the Vicarage Grove.

The deciduous Cypress has never yet fruited nor even flowered at Barton, though some of our trees of it are above 40 years old.

The largest specimen we have, measures scarcely three feet round the trunk. It grows very slowly with us, yet it looks healthy, and its foliage is beautiful. Perhaps our soil or climate is too dry for it. I remember to have formerly seen a fine tree of this kind at Harling, in Norfolk (the seat, at that time of Lord Colborne), bearing cones abundantly, but unluckily I neglected to make any note of them. Henry has sent me cones from Abergwynant* (produced on a tree much younger than some of ours), but they differ remarkably in shape from those described and figured in books. Catesby, Lambert, and Michaux all represent the cones as spherical, or

* Col. Bunbury's place in Wales.

CONIFERÆ.

CUPRESSINÆ.

very nearly so; but these from Wales are oval, Taxodium distichum their length almost half as much again as their breadth.

They are, however, quite green and unripe, and it is quite possible that they may alter in shape as they ripen. The disks of the scales are remarkably rugged and knobby.

Loudon's description of this Cypress, is very good, except that he has omitted to mention the beauty of the autumnal colouring. The leaves keep their light and delicate green colour till pretty late in the autumn, and then assume a peculiarly soft and pleasing, light red brown; in this latter state they remain on the tree often till the end of November.

The finest deciduous Cypress I have seen is at Embley, near Romsey, in Hampshire, (Mr. S. Smith's, formerly Mr. Nightingale's).

This tree stands very near the house; it has really the character of a *tree*, rising with a robust, straight bare trunk to (I should guess) 20ft. before a branch; its girth $8\frac{1}{2}$ feet; with a fine dense pyramidal head of beautiful foliage. As this tree stands close to the house, on the slope of a hill, its remarkably vigorous growth can hardly be owing to any great moisture of the soil.

Taxodium differs from *cupressus* not only in the

CONIFERÆ.

CUPRESSINÆ.

*Taxodium
distichum*

general appearance of its foliage, but in a more important point. M. Adolphe Brongniart many years ago (April, 1857), remarked to me that the *Coniferæ* of the sub-order *cupressæ* form two natural groups, clearly distinguished by the arrangement of the leaves.* In *cupressus*, *thuia*, *libocedrus* (of Endlicher) *juniperus*, *frenela*, *callitris*, the leaves are either *decussately* opposite (that is, in pairs, crossing each other so that the direction of each pair is at right angles to that of the next pair above and below), or in verticles of three, *i. e.* in every case either two or three leaves are placed on the same level on the branch. In *juniperus*, at least, in many of the species, the leaves are in pairs, and in threes on different branches of the same tree, and even on different twigs of the same branch. In *taxodium sequoia*, *cryptomeria*, and the remaining genera, the leaves are placed in a regularly spiral order, no two contiguous ones being on the same level. M. Brongniart attached much importance to this character, and he observed that the scales of the cone followed the same law as the leaves, though it is not equally apparent. The spiral insertion of the leaves in *taxodium*, is not readily apparent in those leaves which are in perfection, on the

* I believe that he has published this observation, but I do not exactly remember *where*.

CONIFERÆ.

CUPRESSINÆ.

young shoots of the year. By a peculiar twist in every leaf, just where it separates from the branch, they are thrown into two opposite ranks or directions in the same plane, so that it is difficult not to believe that they are really inserted in two opposite lines. But by looking at the twigs of the past year, on which there remain only the adherent *bases* of the leaves, we easily perceive that their insertion is really spiral. The same may be said of *sequoia sempervirens*, and nearly the same of those kinds of Fir (the Silver Firs), which have two-ranked leaves.

*Taxodium
distichum*

It is a very extraordinary fact, clearly ascertained by the researches of Heer and others, within the last years, that the deciduous Cypress, was in a former age of the earth, one of the most common and wide-spread trees of the extreme northern regions. Abundant and unmistakeable fossil remains of it have been brought by recent explorers from the Miocene Tertiary deposits which have been discovered on the coasts of Greenland, of Spitzbergen, and lastly, of Grinnell Land; in this last locality, it was found by the last Arctic expedition as far north as $81^{\circ} 45'$ of latitude. *As Heer observes, there can be little doubt that in those times it ranged as far towards the pole as land extended. It had indeed a wide

* Heer, in *Quarterly Journal Geol. Soc.* vol. 34. pt. 1.

CONIFERÆ.

CUPRESSINÆ.

Taxodium
distichum

range in those Miocene times, for its remains have been found in Italy, Southern France, Switzerland, Silesia, and Bohemia, as well as in the far northern regions I have mentioned.*

SEQUOIA SEMPERVIRENS.

Endlicher, Synopsis, Coniferæ, 198.

Gordon, Pinctum.

Heer.

TAXODIUM SEMPERVIRENS.

Lambert's Pinctum (ed. 1832) v. 2., tab. 64 (and of gardeners generally), but seemingly *not* of *Hooker's Icones Plantarum*.

Sequoia
sempervirens

Succeeds very well at Barton. The one in the arboretum, planted, 1847, is a remarkably fine, handsome, and well grown plant, and the only one I have seen that has borne cones; in the three years from September 1848 to September, 1851, it gained five feet two inches in height; its leading shoot was killed in the winter of 1860, and its increase in height has thereby been much checked; yet it must be now at least 25 feet high. Its lower branches are so numerous and crowded, so long and strong that I have not been able to get near enough to the trunk to measure it

CONIFERÆ.

CUPRESSINÆ.

satisfactorily. This tree bore abundance of cones, Sequoia sempervirens which came to perfection in 1862.

Another planted in 1848, at the south-west corner of the Pleasure Ground, near the pond, is nearly as tall as the first, but growing in a much exposed situation, it has suffered at times a good deal from violent westerly gales, and is not so luxuriant or so handsome in growth. Its trunk, in December, 1862, measured 34 inches round, at 3 feet from the ground; that of the first must certainly be larger. No. 3 is at east extremity of Pleasure Ground.

No. 4, younger, but of remarkably fine growth is in the north grove, near the boundary of "Sorcerer's" paddock. This is now (1867), I think, the tallest of all.

This may fairly be said to be quite hardy, although as I have mentioned, the fine one in the arboretum appears to have lost its leading shoot in the extraordinary winter of 1860-61. It evidently is the better for the shelter of other trees, and suffers from stormy winds; of the plants here, number 4, which is the most completely surrounded and sheltered by larger trees, is the finest and most flourishing for its age; Number 2, which is most exposed to the westerly gales, has suffered most, and has more than once appeared to be half dead, though it has

CONIFERÆ.

CUPRESSINEÆ.

*Sequoia
sempervirens*

always recovered. The description in Gordon's *Pinetum* is good. The bark (of the main trunk of trees between 10 and 20 years old), is remarkable:—very thick, and of a peculiarly soft, spongy, and elastic texture, as if *padded*, being composed of very loose cellular tissue, bound together by loosely interlacing longitudinal fibres; its colour, dark reddish-brown.

In the older parts it is pretty deeply fissured, but does not show a tendency to flake off in long ragged strips, as does that of *cryptomeria*.

The male catkins make their appearance generally in December, and in 1862 came to perfection towards the end of January. The female (seed-bearing) cones, which first appeared in January, 1862, ripened towards the end of January, 1863, and have remained on the tree in a dry and empty state a full year longer. I presented some of the cones to the Linnean Society in 1863, when Kippist told me that they were the first (of English growth) he had seen.

The fine tree in the arboretum has now (January, 1864), abundance of both male and female flowers; but whether they will come to perfection will of course depend much on what the weather may prove to be in the latter part of the winter.

The ripe cones are of a dull brown colour,

CONIFERÆ.

CUPRESSINÆ.

about one inch long, in shape nearly ellipsoidal, or approaching to a short, thick cylinder, abrupt at both ends: their scales of a rather corky texture; the disk rhomboidal with the transverse diameter the greatest, tumid and uneven, with a depression in the centre and a slight crest or ridge running transversely each disk.

The *Taxodium sempervirens* of Sir W. Hooker's *Icones Plantarum* (vol. 4, tab. 379), seems to be something quite different from this, as the leaves are represented as not at all 2-ranked, but erect, and densely clothing the branches on all sides. The fruit is not shown. Lambert's figure under the name of *Taxodium sempervirens* represents an imperfect specimen, with an old and empty cone, but agrees accurately enough with our plant.

The peculiar generic name, *Sequoia* was given (by Endlicher?) in commemoration of a *Cherokee* chief, celebrated as having "invented an original alphabet, and spent his life in endeavouring to enlighten and elevate his race." (Emerson: *Trees and Shrubs of Massachusetts*, ed. 3.v. I., p. 66.

Sequoia
sempervirens

CONIFERÆ.

CUPRESSINEÆ.

SEQUOIA GIGANTEA.—*Endlicher* (?)

(Synon). *Wellingtonia gigantea*.—*Lindley*.
Gordon, Pinet. 330.

Hooker, Bot. Mag. vol. 80, th. 4777—8.

(with a full history of the tree).

*Sequoia
gigantea*

The *Sequoia gigantea* of *Endlicher's* Conif. is a nonentity, according to Sir W. Hooker in *Bot. Mag.*; being founded solely on a mistaken figure in the *Icones Plantarum* which really belonged to the *Abies bracteata*. Of the so-called *Wellingtonia*, we have none but young plants at Barton; but they thrive very well, and seem, as far as we can yet judge, to be quite hardy. Their growth is very rapid. Of the two principal specimens here, the one in the Vicarage Grove, planted February 4th, 1859,* is above six feet high, and gained nineteen inches in height in the course of the one year 1862; the other in the arboretum, pl. 1858, is a little taller, and grew twenty-eight inches in the same year. It is remarkable that the growth of the young plants should be so very rapid; while, as is evident from the remarkable narrowness of the rings of growth in the specimens of the wood which have been brought, the growth of the mature tree must be extremely slow. The young shoots appear very tender and succulent,

* On Sir Charles Bunbury's 50th birthday.

CONIFERÆ.

CUPRESSINEÆ.

and yet do not, as far as I have yet seen, suffer from the hardest frosts. Sequoia
gigantea

This species of *Sequoia* differs remarkably from the original and typical one (*S. sempervirens*), by the form and arrangement of its leaves, which instead of being flat and linear, like those of the Yew, and directed two opposite ways, so as to give an appearance of flatness to the young branches, are between subulate and acicular in shape, sharp-pointed, but slightly spreading and arranged spirally all round the branches without any tendency to a flat 2-ranked disposition. In fact, they are more like the leaves of the *Cryptomeria* than of *Sequoia sempervirens*. I speak of the leaves on the young plants, which are all that I have seen.

The cones, however, described from Californian specimens in the Kew museum, closely resemble those of the first species, except in being larger, and of a more decidedly ovoid shape. I am not aware that they have yet been produced in Europe.

(March, 1866). It is very curious that one of our young *Wellingtonias* at Barton, planted only two years and a half ago, and now hardly more than three feet high, should already have produced several *cones* fully formed and *almost* as large as those I have seen in the Kew museum.

CONIFERÆ.

CUPRESSINEÆ.

*Sequoia
gigantea*

I have seen no male flowers, either on the same plant, or on any of the others here.

(October, 1869). This year, *many* of our young Wellingtonias are bearing cones, some of which are of a good size. I have seen no male flowers. Dr. Hooker tells me that he has known other instances of the same occurrence; but he does not believe that the seeds contain a perfect embryo.

CRYPTOMERIA JAPONICA.

Don, in Linn. Trans., v. 18, 167.

Hook, Ic. Plant., v. 7, tab. 668.

Endlich. Syn. Con. 72.

Gordon, in Journ. Hort. Soc., v. 1, 57.

Syn. Cupressus Japonica.—*Thunberg.*

*Cryptomeria
japonica*

The *Cryptomeria* succeeds very well at Barton, grows very fast, and is quite hardy, not having suffered at all from the terrible winter of 1860-61. The finest of the kind here is one in the arboretum, planted in 1848; it is of very regular and symmetrical growth, of a regular conical form, with its lowest branches quite lying on the ground and altogether very handsome; yet certainly less so than it was a few years ago. For it seems a constant habit of the tree to throw off its secondary branches (the side branches proceeding from its main branches), very early; whence,

CONIFERÆ.

CUPRESSINÆ

even before it is twenty years old, the lower main branches become very long and bare, with tufts of green leafy shoots at their extremities only; and the look of the tree generally becomes *scraggy*, compared with what it was at an earlier age. This is the case even with the fine specimen in the arboretum, and much more with the two others of about equal age, one of which now stands near the east corner of the Pleasure Ground; and the other in the Vicarage Grove.

Cryptomeria japonica

The large *Cryptomeria* in the arboretum has for several years past borne abundance of cones, and ripened perfect seeds, from which numerous young plants have been raised. I have observed also a few cones on the tree in the Vicarage Grove, but none as yet on the others. The male (or stameniferous) flowers are in small oblong pale yellow catkins, which appear in great numbers in the axils of the leaves near the ends of the year's shoots; they last in a green or immature state through the winter, shed their pollen in the early spring, and remain a long time in an empty and withered state on the branches. The cones are solitary and terminal, on separate shoots from those which bear the male flower, but generally near to them. In their earliest stage they appear merely like a small thickening of the end of the shoot, with a slight enlargement of the leaves.

CONIFERÆ.

CUPRESSINÆ.

Cryptomeria
japonica

When half grown they are nearly globular, of a glaucous green colour, bristled with the prominent points of the bracts. The ripe cones are hardly larger than filberts, of a shape between spherical and conical, dull brown in colour, having something of a prickly or ragged appearance* from the projecting points of the scales and bracts: the scales are peltate and woody, like those of a cypress-cone, but the dilated disk of each of them runs out at its upper edge into a variable number (usually three), of sharp-pointed rigid, almost prickle-like teeth; and each scale is also crested in the centre with the prominent recurved point of its bract; the bracts becoming in the ripe cone, firmly incorporated for the greatest part of their length with the scales which are auxiliary to them.

I observe that in the *Cryptomeria*, the shoot is very frequently continued, in its ordinary leafy state, beyond the apex of the cone, as if it had grown *through* the cone; this extension of the shoot grows often to the length of some inches, and even in some cases bears male catkins. A similar prolongation of the axis of the cone is not very unfrequently seen in the common Larch; but in no other conifer have I observed it to be so

* But not like what is represented in the plate accompanying Don's Paper in the Linnean Transactions, which does not give at all a correct idea of the cones, at least as they are seen in cultivation.

CONIFERÆ.

CUPRESSINEÆ.

frequent or so conspicuous as in the *Cryptomeria*. *Cryptomeria japonica*
 The modern botanical visitors to Japan—Veitch and Fortune—speak of the Japan Cedar, or *Cryptomeria* as a stately and beautiful tree*. Veitch's account of it is, that it is—"perhaps the commonest conifer in the empire. It grows exceedingly straight, attaining a height of eighty to one hundred feet. It is found in all parts, from Nagasaki to Hakodadi. There are numerous varieties of it cultivated in gardens. The wood is light and soft, but being very cheap it is one of the most generally used timbers." The Japanese name, it appears, is *Sugi*. The tree, however is not confined to Japan; for Sir W. Hooker, in his *Icones Plantarum*, mentions specimens which he had received from the Chinese island of Chusan, in N. lat. 30° 30'. It was first introduced into England by Mr. Fortune, in 1844, from Shanghai in China; and has been certainly a valuable acquisition.

JUNIPERUS EXCELSA, *Bieb.*

Loudon, v. 4, 2503.

Endl. Conif. 25.

The Tree which we have under this name was planted by my father, and is now very thriving. *Juniperus excelsa*

* See Sir R. ~~Aldorf's~~ "Capital of the Tycoon." Vol. 2, pp. 480, 484.

Alcock's

CONIFERÆ.

CUPRESSINÆÆ.

*Juniperus
excelsa*

It stands in the western part of the arboretum, near the great *Catalpa* and the largest *Pinus excelsa*. It is certainly a very well-marked and peculiar kind, but I confess I have not yet carefully compared it with the description, so as to verify the name. It answers well to the epithet *excelsa*, for it grows in almost as aspiring a form, as straight and upright as the Italian Cypress.

The general colour is a remarkably pale, greyish green,—almost ashy; by which it is remarkably distinguished amidst the others in the arboretum.

Its twigs and young shoots are slender; the leaves minute, scale-like, closely imbricated. I have not seen any of the long acicular leaves which probably belonged to the young state of the plant. I find that on the youngest shoots the leaves are obtuse, closely imbricated in four rows (decussately opposite), as in the Cypresses, but on some of the older ones, they are in *threes* and pointed; but not acicular and spreading, as in some of the Junipers. If it were not for the fruits (*galbuli*), which it bears in abundance, one would certainly take it for a kind of Cypress. These (*galbuli*) are larger than those of the more common sorts of Juniper, being about as large as myrtle berries; they are of a roundish-oval shape, of a pale green colour, which gradually changes as they ripen to a purplish-brown, covered

CONIFERÆ.

CUPRESSINÆ.

with a thin glaucous bloom. When quite ripe, ^{Juniperus} their colour becomes a deep brown, and the thin ^{excelsa} powder which gives the glaucous colouring nearly disappears. They retain more distinctly than the "berries" of the common Junipers, the traces of the structure of the *cone* from which they are derived; the lines marking the margins of the scales which compose the cone, are distinguishable even in the nearly ripe fruit; and the little prominent points, corresponding to those on the scales of all the Cypresses, remain distinct even to the last.

TAXINÆ.

Taxacea—Lindley.

Taxus baccata—Loudon, v. 4.

None of the Yews at Barton are at all remarkable in any way. The largest I can find (one of those in the Vicarage Grove) measures no more than five feet ten inches round, at three feet from the ground. ^{Taxus} ^{baccata}

The Yew is unquestionably indigenous to Britain, and abounds especially in the limestone districts. It is remarkably plentiful on the banks of the Wye, about Chepstow and Tintern, and is strikingly conspicuous in that beautiful scenery, particularly in autumn, when its black green is strongly contrasted with the rich colouring of the other trees. It grows in the most inaccessible

CONIFERÆ.

TAXINEÆ.

Taxus
baccata

positions on the limestone cliffs there; as it does also on the rocks (of the same carboniferous limestone) at Matlock and elsewhere in Derbyshire.

(November, 1869). A Yew tree in T. Scott's garden, at the Home Farm, here, is remarkable for the great abundance of its berries, and still more for their large size and unusual form, being considerably longer or *deeper* than is usual. Their appearance is strikingly beautiful. There is nothing uncommon in the habit or foliage of the tree.

TAXUS BACCATA.

Var. 2. fastigiata (the Irish Yew).

Loudon, v. 4. 2066.

Taxus
baccata.
var.
fastigiata

Thrives exceedingly well here; there are many very handsome specimens, planted by my father in 1825; in various parts of the grounds. They bear fruit plentifully. I have never seen a trace of male flowers on this variety, either here or elsewhere; yet the seeds appear to be perfect. I remarked this to Joseph Hooker (January, 1868), he said that he had never seen male flowers either and he believed that the female flowers of the Irish Yew are always fertilized by the floating pollen of the common Yew. It would be curious to ascertain whether plants raised from seeds of the Irish Yew would be invariably female.

CONIFERÆ.

TAXINEÆ.

SALISBURIA ADIANTIFOLIA.

Loudon v. 4. 2094.

Endlich. Syn. Conif. 237.

One in the arboretum, planted by my father, in 1825, is now (1872) high, and the circumference of the stem, 2 feet 3 inches at 3 feet from the ground. Another, planted, 1844. It is, here at least, a tree of extremely slow growth and it has never flowered with us. The finest tree of the kind that I remember to have seen in England, is in the garden of the Bishop's palace at Wells: its trunk is about 4 feet round; the branches long and the lower ones somewhat drooping. M. Adolphe Brongniart told me, in 1857, that the *Salisburia* ripens fruit freely in the South of France, and he thought that it might even at Paris, but the very large and old tree in the *Jardin des Plantes* is a male, and of the female they have only young trees, which at that time had not flowered. Loudon does not accurately describe the leaves, as to their venation, which is the especial peculiarity of the plant. They resemble those of some Ferns (especially of the genus *adiantum*) not only in form, but most remarkably in veining; they have no midrib, and the veins are all equal and similar, radiating from the base of the leaf in a fan-like form, dividing

*Salisburia
adiantifolia*

CONIFERÆ.

*Salisburia
adiantifolia*

repeatedly in a dichotomous* manner and extending to the margin, without sending out any lateral veinlets, or being connected by any transverse branches. This peculiarity of the leaves is very interesting; I do not know any other dicotyledonous plant of which the leaves have this remarkable venation; and I think it may be said that, if detached leaves of *Salisburia* had been found in a fossil state, and the tree had been otherwise unknown, they would almost certainly have been considered as belonging to a Fern. But the leaves of *Salisburia*, though so like those of Ferns in form and veining, have not the peculiarity of arrangement before expansion—the *carinate venation*, which is so characteristic of that family. In the young state their lobes are folded together, and somewhat rolled inward, but they are erect from the first without the least curving downwards of the Apex or of the stalk. Another character to be noted in the leaves of *Salisburia* is, that the *stomata* (or pores of the epidermis) are scattered without order, not arranged in lines as they are in almost all other Conifers.

* That is, dividing each time into two equal and similar branches.

LIST
OF
FERNS
CULTIVATED
IN MY
GARDEN
AT
BARTON.



MILDENHALL:
PRINTED BY S. R. SIMPSON.

1889.

LIST OF FERNS.

ACROSTICHUM.

1. From Kew (?) under the name of *Ophioglossum* *Acrostichum*
frigidum. *Ophioglossum* being of course
a slip for *Elaphoglossum*; but I find no
such name as *frigidum* among the *Acros-*
ticha in *Sp. Fil.* or *Syn. Fil.*

ADIANTUM.

1. *A. reniforme*. Madeira and Canaries. *Adiantum*
2. *A. affine*. New Zealand. *A. setulosum*.
J. Sm.
3. *A. trapeziforme*. Tropical America.
4. *A. trapeziforme*, (var. *pentadactylon*, *Ic. Fil.*).
Brazil.
5. *A. formosum*. Australia.
6. *A. fulvum*. New South Wales and New
Zealand. (From Kew).
7. *A. macrophyllum*. Tropical America.
8. *A. Capillus—Veneris*. South Europe, Africa,
India, &c.

ADIANTUM.

- Adiantum 9. *A. concinnum*. Tropical America.
10. *A. tenerum*. West Indies.
11. *A. tenerum*. (var.—Farlyense). Barbadoes.
12. *A. cuneatum*. Brazil.
13. *A. pedatum*. North America.
14. *A. cultratum* (*A. trapeziforme*, var.—*cultratum*. Syn. Fil). Tropical America.
15. *A. polyphyllum* (Syn. *A. cardiochlaena*). Tropical America.
16. *A. gracillimum*. Hort. (Qu :—var. of *cuneatum*). Tropical America.
17. *A. rubellum*.

ALSOPHILA.

- Alsophila 1. *A. Australis* (?) (Given by Mr. Montgomerie Given away by us to Mrs. Saumarez, the plant having grown too large for our house).

ANEMIA.

- Anemia 1. *A. Phyllitidis*. Tropical America.

ASPIDIUM.

1. *A. caryotideum*. India. Aspidium
2. *A. falcatum*. China.

ASPLENIUM.

1. *A. nidus*. Malay and Pacific Islands. Asplenium
2. *A. serratum*. (*A. crenulatum*). South America.
3. *A. hemionitis*, L. *A. palmatum*, Lam. Madeira, Canaries and Algeria.
4. *A. flabellifolium*. Australia and New Zealand.
5. *A. Trichomanes*. Europe, &c. Brought from Wales, 1864.
6. *A. Vulcanicum*. Java.
7. *A. marinum*. Britain. West Indies. South Brazil. (Brought from Wales, 1864.)
8. *A. lucidum*. (*A. obtusatum*. Var. *lucidum*). Australia.
9. *A. Adiantum nigrum*. Europe. (From Wales).
10. *A. furcatum*. (*A. Canariensis*. W.) Madeira, Canaries, Cape, &c.

ASPLENIUM.

- Asplenium 11. *A. fragrans*. Tropical America.
12. *A. bulbiferum*. Australia, New Zealand, &c.
13. *A. bulbiferum*. (Var. *fabianum*). Australia (?)
14. *A. cicutarium*. Tropical America.
15. *A. flaccidum*. Australia.
16. *A. viviparum*. Mauritius. (From Mr. Berners?) Another from Mrs. Lambart.
17. *A. filix-fœmina*. (*Athyrium*) Roth. Europe, Asia, Africa, America. Brought from Wales.

BLECHNUM.

- Blechnum 1. *B. occidentale*. Tropical America.
2. *B. gracile* (?) *B. longifolium*. Tropical America.

CIBOTIUM.

(*Part of Dicksonia*).

- Cibotium 1. *C. Princeps* (?)

CYATHEA. Smith.

1. *C. dealbata*. New Zealand. Brought by *Cyathea* Clement,* 1878.

CYSTOPTERIS.

1. *C. fragilis*. Europe, Asia, Africa, America. *Cystopteris* (Brought from Wales and from Derbyshire, 1877).
2. *C. bulbifera*. North America.

DAVALLIA.

1. *D. canariensis*. Madeira, Canaries, Spain ² *Davallia* and Portugal. (One plant growing here before 1860).
2. *D. bullata*. India.
3. *D. chærophylla*. India.
4. *D. tenuifolia*. India and Malay Archipelago.
5. *D. pyxidata* (?) *solida* (?) Australia ; brought *Gymno-* by Lord Charles Hervey. *gramme*

* His Nephew, R. Clement Bunbury.

GYMNOGRAMME.

Gymno-
gramme

1. *G. chrysophylla*, under name of *G. ochracea*.
G. calomelanos. Var. Baker. Tropical
America.
2. *G. "Marteusii."* *G. tartarea*. Var. (?)
Tropical America.
3. *G. Javanica*. India.
4. *G. Japonica*. Japan.

LEPTOPTERIS. Presl.

Leptopteris

1. *L. Superba*. New Zealand. Brought by
Clement.*

LAMARIA.

Lamaria

1. *L. alpina*. Tasmania, New Zealand, and
Fuegia.
2. *L. lanceolata*. New Zealand. Brought by
Clement, 1878.
3. *L. gibba*? Pacific Islands.

LYGODIUM.

1. *L. scandens* (?) India and Malay Islands.

MARATTIA.

1. *M. fraxinea*. Tropical America.

Marrattia

* His Nephew, R. Clement Bunbury

NEPHRODIUM.

1. *N. molle*. Tropical America India. Madeira. *Nephrodium*
2. *N. patens*. Tropical America.
3. *N. Filix-mas*. Europe, India, South America,
&c (Brought from Wales.)
4. *N. spinulosum*. (Var dilatatum). Europe.
(Brought from Wales).
5. *N. Sieboldii*. Japan.

NEPHROLEPIS.

1. *N. exaltata*. Tropical Asia and America *Nephrolepis*
2. *N. pectinata*. (*N. cordifolia*.) Tropical
America.

ONOCLEA.

1. *O. sensibilis*. North America. *Onoclea*

For O. Germanica, Syn. Fil,—see Struthiopteris.

ONYCHIUM.

1. *O. lucidum* (*O. Japonicum*. Syn. Fil. India, *Onychium*
China, Japan.

OSMUNDA.

1. *O. regalis*. Europe, India, North and South *Osmunda*
America. (Brought from Wales).

OSMUNDA.

- Osmunda. 2. *O. gracilis*, Link (*O. regalis*, var. *gracilis*, Syn. Fil.). Brazil and Uruguay.

PELLŒA.

PLATYLOMA, J. SM.

- Pellœa. 1. *P. cordata*. Mexico.
2. *P. rotundifolia*. New Zealand.

PLATYCERIUM.

- Platynerium 1. *P. alcicorne*. Australia.

POLYPODIUM.

- Polypodium 1. *P. vulgare*. Europe, North America, &c. (Brought from Wales).
2. *P. vulgare* (var. *Cambrican*). Wales and Ireland.
3. *P. appendiculatum*, Kl. (*P. plesiosorum*, Syn. Fil.) *Goniophlebium*, J. Sm. Mexico.
4. *P. subauriculatum* (?) (*goniophlebium*) India, Malay and Pacific Islands.
5. *P. aureum* (*phlebodium*). R. Br. Tropical America.

POLYPODIUM.

6. *P. pustulatum*. Phymatodes. Australia and Polypodium
New Zealand. Pi.
7. *P. pennigerum*. Forster. Goniopteris. J. Sm.
New Zealand. (Brought by Clement).
8. *P.* (Phymatodes) *Billardierii* (?) New Zea-
land. (Brought by Clement, 1878).
9. *P. rugulosum* (?) New Zealand. (Young
plants raised from spores brought by
Clement).

POLYSTICHUM.

Aspidium, sec 1. Syn. Fil.

1. *P. triangulum*. West Indies. Polystichum
2. *P. aculeatum*. (Var. *lobatum*). Europe.
3. *P. aculeatum*. (Var. *angulare*). Subvar. (?)
4. *P. aristatum*. India and Pacific Islands.

PTERIS.

1. *Pt. longifolia*. Tropical countries. Also Pteris
Spain, Sicily, Teneriffe, &c.
2. *Pt. cretica*, Italy, Greece, and many warm
countries.
3. *Pt. umbrosa*. Australia.
4. *Pt. serrulata*. China.

PTERIS.

- Pteris
5. *Pt. cremata*. India.
 6. *Pt. quadriaurita*. (Var. *argyrea*). Tropical countries.
 7. *Pt. ^zarguta* (?) Portugal, Madeira, Canaries.
 8. *Pt. tremula*. Australia.
 9. *Pt. elata*. Tropical America.
 10. *Pt. aquilina*.

SCOLOPENDRIUM.

- Scolopendrium
1. *Sc. vulgare*. Europe.

STRUTHIOPTERIS.

- Struthiopteris
1. *S. Germanica*. *S. Pennsylvanica*. *Onoclea Germanica*. Syn. Fil. North America and North Europe.

TRICHOMANES.

- Trichomanes
1. *T. speciosum*, W. *T. radicans* (?) Sw. (?) Ireland, Madeira, Canaries, Azores, West Indies.

WOODWARDIA.

- Woodwardia
1. *W. radicans*. Spain, South Italy, Sicily, Madeira, Canaries, Azores, North India.
 2. *W. orientalis*. China and Japan.

FERNS DEAD.

1. *Adiantum hispidulum*
2. *Anemia collina*
3. *Asplenium viride*
4. *Asplenium ceterach*
5. *Blechnum brasiliense*
6. *Cheilanthes myriophylla*
7. *Dicksonia antarctica*
8. *Hemionitis palmata*
9. *Meniscium simplex*
10. *Nothochlaena nivea*
11. *Polypodium dryopteris*.

NOTES ON WILD PLANTS.

NOTES
ON
WILD PLANTS

FOUND IN THE
PARISH
OF
GREAT BARTON.



CHARLES J. F. BUNBURY.

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NOTES ON WILD PLANTS.

THE parish of Great Barton which contains about (?)* acres, cannot be said to be at all rich in a botanical view. This does not mean that it has not a tolerable abundance of wild plants; but there is no great variety, and most of those that it produces are what are called *common* plants, that is they may be found pretty plentifully in most of the counties of England. The parish has little variety of surface, and is generally deficient in those local peculiarities which are favourable to variety of vegetable production. It has no marshes, no water, except a few small ponds and ditches, no heaths, only one tolerably old wood; and above all, nearly the whole of it is arable land, and has long since been brought under careful cultivation. Draining and high farming are deadly enemies to botany. I have had plentiful opportunities of observing within my own experience, the effect of these operations. The number of wild plants † which I have observed in this parish in the course of my acquaintance with it (since 1825, that is to say) amounts to about 385; and of these, at least 25 have disappeared

* 4030 acres. [F.B.]

† *Flowering* plants; that is to say, including mosses, lichens, funguses, and other plants which do not produce real flowers or seeds.

—are no longer to be found in this parish; they were mostly plants which grew in damp ground and were extirpated by drainage; partly also, corn field “weeds,” destroyed by improved farming.

There is a field, on what is now the home farm, which was formerly (in my younger days) a rough and rather swampy pasture, (it was called the *ox pasture*), and which used to be in the spring, perfectly purple with the beautiful flowers of the early purple orchis (*orchis mascula*); and with this there grew also the true oxlip (*primula elatior*), and some marsh grasses, (*carex panicea*, *carex binervis*, *blysmus compressus*, *triodia decumbens*). All these have disappeared of course since the field was drained and ploughed up. The orchis, indeed still exists in the park and in the shrub wood. The bee orchis (*ophrys apifera*) used to grow in the pasture adjacent to what is called Nepton Hall; but my father ploughed up the ground and destroyed the orchis. It may possibly still exist on some of the grassy, sunny banks on the side towards Fornham (I gathered it in that direction in 1832); but I do not know of a certain locality for it in the parish.

Another beautiful orchis (*morio*) is still abundant in the lower part of the park; and there it may be seen every spring, with blossoms varying through every shade of colour from the deepest purple to flesh and cream colour, but always showing the green lines on the *helmet* of the flower quite un-

varied. The *green man orchis* (*aceras anthicophora*) grows in the Park, but is very rare. I have seen, on the whole, perhaps a dozen plants of it in all the time that I have known the place. I must observe, however, that I have very often been absent from Barton in the orchis season. The butterfly orchis (*habenaria bifolio* or *chlorantha*) grows in a beech wood on the Livermere side of the parish; the pyramidal orchis (*orchis pyramidalis*) very sparingly in the park.

The most remarkable of the wild (or apparently wild) plants of Barton are two species of *crocus* which grow abundantly in the park, and have grown here for a time beyond the memory of man. One of them has deep yellow flowers; of a rather deeper shade of colour than the common garden crocus; the other flowers are of a delicate pale lilac, or sometimes nearly white, always striped with deep purple. The yellow kind called by botanists *crocus aureus*, is a native of Greece and Asia minor, not known to grow *really* wild any where on our side of the Adriatic sea; it is probably what is celebrated by the ancient poet Sophocles as the *crocus with the lustre of gold*. The other, which is called by some botanists *crocus minimus*, and by others *crocus biflorus*, is a common plant in Italy and the South of France; and what is absurdly called in gardens, the *Scotch crocus* is an enlarged variety of it. Both, I have no doubt, were formerly cultivated in a garden at Barton, and have held their ground ever since.

Another garden plant which grows apparently wild in this same park, is the yellow tulip, *tuilipa sylvestris*, of which the leaves appear plentifully every spring, but the plant is, as gardeners would say, a very shy flowerer. Other half-wild plants in the same place are two kinds of Star of Bethlehem, *ornithogalum umbellatum* and *O. nutans*.

The common columbine, *aquilegia vulgaris*, is another naturalized plant at Barton; it is indeed undoubtedly a native of the northern and western counties of England, growing amidst rocks and woods; but *here*, we can only look on it as a relic of gardens. It is still to be found here and there in the hedges about the so called Necton Hall, which was in old times a manor house, now divided into cottage tenements. I hardly know whether the bear's foot hellebore, *helleborus foetidus* can be considered as a true native of this parish or not. It grows in some small copses on the home farm, and in those countries also where it is undoubtedly native it is a woodland plant; but the facts that it was very commonly cultivated in old gardens, and that it holds its ground very tenaciously where it has once been introduced, tend to throw some doubt on its claims.

The colchicum or meadow saffron, *colchicum autumnale*, is a pretty flower, not common in England, though found in a good many counties; it used to grow here in great abundance, especially in the park, till my father took pains to have it rooted out, because of its poisonous quality. It

still makes its appearance every Autumn, but in a scattered manner, in the park and in some old pastures in the northern part of the parish.

A very pretty wild plant, which is very plentiful in the park and other old pastures is the dropwort, *spiraea filipendula*: with its delicate cream coloured flowers tipped with red in the bud, graceful form, and feathered leaves, it is one of the most elegant wild flowers that we have hereabouts. There are two British species of *spiraea*: the other the meadowsweet, or *spiraea ulmaria*, is a much more generally common plant than the dropwort, growing, in wet and marshy places, about wet ditches and river banks. Both are to be found here in the park.

The dropwort is most frequent on a chalky soil or subsoil, and indeed is generally considered as one of the characteristic chalk country plants. I remember it is very abundant on the chalk downs which end in Beachey Head. At Barton, therefore, it may be said to be in a congenial soil; and along with it grow some other plants which are considered characteristic of the chalk, such as the pyramidal orchis, the clustered campanula (*campanula glomerata*), the downy oat grass (*avena pubescens*).

But again there is a profusion of cowslips in these same pastures, and they are considered to belong especially to a *clay* soil; and so is the silver weed (*potentilla anserina*) which grows here and there in low damp spots in the park. In fact, there

is an extraordinary mixture of soils in this parish.

The cowslip, as I have said, grows in profusion in the park and other pastures; in the shrub wood, the ground in spring is enamelled with primroses and wood anemones, which a little later are succeeded by an almost equal profusion of the wild hyacinth or blue-bell; but in the rest of the parish, I think, the primrose is not abundant. The oxlip (*primula elatior*), grew formerly in the low and damp parts of the park before it was drained, and, as I before mentioned, in the ox pasture. I doubt whether it is now to be found anywhere in this parish; but at Cockfield, about seven miles south-east of Bury, there is a wood in which the ground is as thickly clothed with oxlips as in our Shrub it is with primroses. Professor Churchill Babington tells me that scarcely a primrose is to be seen in the parish of Cockfield. This difference in the distribution of the two may be partly owing to soil; for *that* of our Shrub is light, whereas Bull's Wood at Cockfield is on a stiff and heavy clay. Barton has hardly any ferns: I do not know with certainty of any which are *now* to be found wild within the limits of the parish, except the two commonest of all, the male shield-fern (*aspidium felix-mas*), and the common brake (*pteris aquilina*). I have formerly found also the prickly shield-fern (*aspidium aculeatum*), the common polypody, and the hart's tongue; but I believe they have been

eradicated by the destruction or alteration of the hedges in which they grew.

It is, however, remarkable that a fern was brought to me a few years ago, which I should little have expected to meet with in Suffolk: it was the brittle fern, *cystopteris fragilis*; a plant not uncommon in Wales and Scotland, and the mountainous districts of England, but very seldom to be seen in the plains. It was growing on the inside of an old well; and I think it most probable that the minute seeds of the plant, floating in the air, had been wafted thither from some garden, and had germinated where they found the moisture and the deep shade suitable to them.

The 385 species of plants which I know to grow or to have grown wild in the parish of Barton, belong to 60 families or natural orders.

(“This estimate includes several naturalized plants as already mentioned). The grasses amount to 40 species or distinct kinds.”)

By *species*, I mean sorts or forms of which the differences are distinctly perceptible, and appear to be constant under ordinary circumstances and within ordinary experience. The sedges (or *cyperaceae*, amount to only 12, including some which have been destroyed by drainage; the rushes (*junceae*), to 6, or perhaps 7; the lilies (taken in the widest sense), to 5, 3 of which are naturalised; the orchids to 10; the ranunculus

family to 15; (including 2 or 3, which I believe are now lost); the cruciform family to 12; the pink family (*caryophylleae*) to 17; the *leguminous* or *papilionaceous* family to 21; the rose family *rosaceae* to 17. This number is very uncertain, owing to the very various opinions of botanists as to the number of species of *bramble* [*rubus*].

The *umbelliferous* (or parsley) family to 19; the madder family (*stellatae*) to 8; the compound flowered plants (*compositae*) to 42; the borage family to 7, or perhaps 8; the snap-dragon family (*scrophularineae*) to 18; the mint family (*labiatae*) to 21; the dock (*or buckwheat*) family (*polygoneae*) to 11; the goosefoot family (*chenopodeae*) to 5; and most of the remainder to one or two each.

The neighbourhood of Bury St. Edmund's was formerly (in the latter part of last century and the early years of the present) rather celebrated for its botanical riches; and many interesting plants found in the neighbouring parishes by Sir Thomas Cullum and others are recorded in the books of that time. It is probable that several of these are no longer to be found in the places where they were formerly noted; but still it is true that the botanical wealth of the whole district is not to be judged by that of Barton. In Pakenham, Rougham, Thurston, Hengrave, Culford, West Stow, Lackford, Hawstead, Ickworth, and various other parishes within ten miles of Bury, very many plants are to be found which are wanting here. As I said at first, this comparative poverty

(botanically) is owing to the uniformity of the surface of our parish, and the small proportion of uncultivated land. But as I should be glad to have an accurate list of the wild plants which grew on this ground a hundred years ago, so I think it may be worth while to keep a record of those which have grown here within my knowledge

CHARLES J. F. BUNBURY.

GREAT BARTON.

April, 1884

PLANTS
FOUND IN
BARTON PARISH.

RANUNCULACEÆ.

1. *Clematis vitalba*.
2. *Anemone nemorosa*.
3. *Ranunculus aquatilis*.
4. *Ranunculus hederaceus*. (Not seen for many years).
5. *Ranunculus ficaria*.
6. *Ranunculus sceleratus*.
7. *Ranunculus auricomus*.
8. *Ranunculus acris*.
9. *Ranunculus repens*.
10. *Ranunculus bulbosus*.
11. *Ranunculus arvensis*. (Not seen here since 1827).
12. *Caltha palustris*.
13. *Helleborus foetidus*. (In some copses on the home farm).
14. *Aquilegia vulgaris*. (In some hedges near "Necton Hall" an ancient Manor House—probably a relic of cultivation).
15. *Delphinium ajacis* (J. D. Hooker, Students' Flora. Formerly a weed in cornfields, but not seen here since 1826).

PAPAVERACEÆ.

16. *Papaver argemone*. (Sparingly in cornfields and on dry banks on light soil in the parts of the parish towards Rougham and Thurston).
17. *Papaver dubium*. (Sparingly in same situations as the last).
18. *Papaver Rhœas*.

FUMARIACEÆ.

19. *Fumaria officinalis*.

CRUCIFERÆ.

20. *Nasturtium officinalis*.
21. *Barbarea vulgaris*
22. *Cardamine hirsuta*.
23. *Cardamine pratensis*.
24. *Sisymbrium thalianum*. (*Arabis* L.)
25. *Sisymbrium officinale*.
26. *Sisymbrium alliaria*.
27. *Erysimum cheiranthoides*. (Not uncommon as a weed in turnip fields, and sometimes in kitchen gardens). 28. *Draba verna*. L. (*Erophila*, Students' Flora).
29. *Camelina sativa*. (In a cornfield near the "Holy House," in 1842; never seen since).
30. *Capsella bursa pastoris*.
31. *Senebiera coronopus*.

RESEDACEÆ.

32. *Reseda lutea*.

VIOLACEÆ.

33. *Viola odorata*.
34. *Viola hirta*. (Pretty plentiful in groves and shady places near Barton Hall; more frequent than *odorata*).
35. *Viola canina*; sub-species, *sylvatica*. (Plentiful in all the groves).
36. *Viola tricolor*; sub-species, *arvensis*.

POLYGALACEÆ.

37. *Polygala vulgaris*.

CARYOPHYLLEÆ.

38. *Silene inflata*.
39. *Silene Anglica*. (Now and then in cornfields, but very uncertainly; in abundance in 1842 in a field near the borders of Livermere, not seen there since).
40. *Silene noctiflora*. (Not uncommon in cultivated fields, especially among turnips, now and then a weed in gardens).
41. *Lychnis*. *Flos-cuculi*.
42. *Lychnis vespertina*. (Common in cultivated fields; the red sort, *L. diurna*, is frequent in the woods and shady lanes to the south of Bury, but I have never seen it in this parish).

CARYOPHYLLÆ.

43. *Agrostemma Githago*. (Formerly frequent in cultivated fields ; now very uncommon).
44. *Moenchia erecta*. (Found sparingly, long ago, near the gravel pits).
45. *Cerastium semidecandrum*.
46. *Cerastium glomeratum*.
47. *Cerastium triviale*.
48. *Stellaria media*.
49. *Stellaria holostea*.
50. *Stellaria graminea*.
51. *Arenaria trinervis*.
52. *Arenaria serpyllifolia*.
53. *Sagina procumbens*.
54. *Sagina apetala*.

HYPERICINÆ.

55. *Hypericum perforatum*.
56. *Hypericum quadrangulum*.
57. *Hypericum hirsutum*. (Sparingly, in coppices in the park, and in hedges near "Necton Hall").
58. *Hypericum humifusum*. (Formerly near the gravel pits, sparingly).

MALVACÆ.

59. *Malva sylvestris*.
60. *Malva rotundifolia*.

LINEÆ.

61. *Linum catharticum*.

GERANIACEÆ.

62. *Geranium molle*.
 63. *Geranium pusillum*.
 64. *Geranium dissectum*.
 65. *Geranium Robertianum*.
 66. *Erodium cicutarium*.

CELASTRACEÆ.

67. *Euonymus Europæus*. (In the Shrub woods.)

RHAMNEÆ.

68. *Rhamnus catharticus*. (In hedges near the
 "Cage Grove," towards the border of
 Livermere parish).

SAPINDACEÆ.

69. *Acer campestre*.

LEGUMINOSÆ.

70. *Genista tinctoria*. (Formerly in a moist
 pasture on what is now the *Home Farm*.
 Long since destroyed).
 71. *Ulex Europæus*.
 72. *Ononis spinosa*. (Plentiful in damp pastures
 and by road-sides on a stiff soil. *Ononis*
arvensis is frequent on the sandy lands,
 a little way to the north, but not in
 Barton).

73. *Medicago lupulina*.
74. *Trifolium arvense*. (About the gravel pits; not plentiful).
75. *Trifolium ochroleucum*. (In the park and in some other pastures, before they were broken up).
76. *Trifolium pratense*.
77. *Trifolium striatum*. (Formerly about the gravel pits—not seen for many years.)
78. *Trifolium repens*.
79. *Trifolium fragiferum*. (On the grassy margins of the "Toll-gate" road; sometimes by the side of the footpath to the Church).
80. *Trifolium procumbens*.
81. *Trifolium minus*.
82. *Trifolium filiforme*. (About the gravel pits).
83. *Lotus corniculatus*.
84. *Lotus major*. (By the sides of drains in the lower parts of the park;—on the margin of the Church ditch.)
85. *Astragalus glycyphyllus*. (In a hedge, one or two fields west of the Church; first found by Lady Blake. I have not been able to see anything of it for several years).
86. *Vicia cracca*.
87. *Vicia sepium*. (In the shrub wood).
88. *Vicia sativa*. Var. *angustifolia*. (Among grass and bushes in and about the gravel pits, rather plentiful; very variable in size, both of the plant and of the flowers).

LEGUMINOSÆ.

89. *Lathyrus aphaca*. (In 18—, among long grass in a nearly dried up pond, to the west of the Church ;—never seen since).
90. *Lathyrus pratensis*.

ROSACÆ.

91. *Spiræa ulmaria*.
92. *Spiræa filipendula* (very abundant in the park).
93. *Rubus cæsius*.
94. *Rubus corylifolius*.
95. *Rubus fruticosus*.
96. *Geum urbanum*.
97. *Fragaria vesca*.
98. *Potentilla anserina*.
99. *Potentilla reptans*.
100. *Potentilla tormentilla*.
101. *Potentilla fragariastrum*.
102. *Alchemilla arvensis*.
103. *Agrimonia eupatoria*.
104. *Poterium sanguisorba*.
105. *Rosa canina*.
106. *Rosa rubiginosa* Subsp. *micrantha*. (The normal form of the sweet briar I have never seen *wild* here).
107. *Rosa arvensia*.
108. *Rosa tomentosa*. (I found it formerly, though sparingly, in several places in the parish ; but I think it is lost).
109. *Pyrus malus*.
110. *Crataegus oxyacantha*. (I am not sure whether this is really *wild* in the parish).

SAXIFRAGÆÆ.

- 111. *Saxifraga granulata*.
- 112. *Saxifraga tridactylites*.

HALORAGÆÆ.

- 113. *Callitriche verna*.

ONAGRARIA.

- 114. *Epilobium hirsutum*.
- 115. *Epilobium parviflorum*.
- 116. *Epilobium montanum*. (Sparingly in the Shrub and in other shady places).
- 117. *Epilobium tetragonum*. (Now and then in the home grounds).

CIRCAEACEÆ.

- 118. *Circaea lutetiana*.

CUCURBITACEÆ.

- 119. *Bryonia dioica*.

UMBELLIFERÆ.

- 120. *Sanicula Europæa*.
- 121. *Conium maculatum*. (Now and then in hedges, but very uncertainly).
- 122. *Apium nodiflorum*. (*Sium* L.)
- 123. *Sison Amomum*.
- 124. *Ægopodium podograria*.

UMBELLIFERÆ.

125. *Pimpinella saxifraga*.
 126. *Bunium flexuosum*.
 127. *Scandix pecten—veneris*.
 128. *Chærophyllum temulum*.
 129. *Chærophyllum sylvestre*, L. *Anthriscus*. H.
 130. *Æthusa cynapium*.
 131. *Silaus pratensis*.
 132. *Pastinaca sativa*, L. (*Peucedanum* Bentham)
 133. *Heracleum sphondilium*.
 134. *Daucus carota*.
 135. *Caucalis anthriscus*. (Torilis).
 136. *Caucalia infesta*. (Torilis).
 137. *Caucalis nodosa*. (Torilis).

ARALIACEÆ.

138. *Hedera helix*.

CORNACEÆ.

139. *Cornus sanguinea*.

CAPRIFOLIACEÆ.

140. *Viburnum lantana*. (Very sparingly in hedges, mostly in the part of the parish towards Livermere).
 141. *Sambucus nigra*.
 142. *Lonicera periclymenum*.

CAPRIFOLIACEÆ.

143. *Adoxa moschatellina*. (In the groves of the Hall, and in a hedge beside the Church lane).

STELLATÆ.

144. *Galium verum*.
145. *Galium cruciatum*. (In the Shrub).
146. *Galium palustre*.
147. *Galium saxatile*. (Near the gravel pits).
148. *Galium aparine*.
149. *Galium tricornè*. (Now and then in stubble fields on the Home Farm, but by no means constant).
150. *Galium Parisiense*. *G. Anglicana*, Huds. (On a low wall by the side of the lane dividing the Home Farm from the Home Plantations).
151. *Sherardia arvensis*.

VALERIANEÆ.

152. *Valeriana officinalis*. (In the Shrub wood, sparingly).

DIPSACEÆ.

153. *Dipsacus sylvestris*.
154. *Dipsacus pilosus*. (Formerly in a hedge not far from the Church; has long since disappeared).

DIPSACÆ.

155. *Scabiosa succisa*.
 156. *Scabiosa columbaria*. (In the part of the parish, near the gravel pits and bordering on Pakenham).
 157. *Scabiosa arvensis*.

COMPOSITÆ.

158. *Arctium lappa*.
 159. *Carlina vulgaris*. (About the gravel pits).
 160. *Centaurea nigra*.
 161. *Centaurea scabiosa*.
 162. *Centaurea cyanus*. (formerly abundant in cornfields, now hardly to be met with).
 163. *Serratula tinctoria*. (In little copses and plantations in the park; formerly in the Shrub).
 164. *Carduus nutans*.
 165. *Carduus lanceolatus*.
 166. *Carduus acaulis* (very abundant in the park and in some other pastures).
 167. *Carduus arvensis*.
 168. *Carduus palustris*.
 169. *Eupatorium cannabinum*. (On the damp grassy margins of the road near Livermere Thicks—perhaps not strictly in this parish).
 170. *Tussilago farfara*.
 171. *Erigeron acris*. (On dry gravelly banks and in old chalk and gravel pits near Shinham bridge and Barton mere).

COMPOSITÆ.

172. *Bellis perennis*.
173. *Inula dysenterica*.
174. *Bidens tripartita*. (Formerly on the margins of some small ponds in this parish, but I have not seen it for many years).
175. *Achillea millifolium*.
176. *Matricaria inodora*.
177. *Chrysanthemum leucanthemum*.
178. *Chrysanthemum segetum*. (Formerly not uncommon in cornfields, but extirpated by careful farming).
179. *Artemisia vulgaris*.
180. *Gnaphalium uliginosum*.
181. *Gnaphalium sylvaticum*. (Abundant in the Shrub, in *one* year, after the underwood had been cut; never seen since).
182. *Filago Germanica*.
183. *Filago minima*. (About the gravel pits).
184. *Senecio vulgaris*.
185. *Senecia Jacobœsus*.
186. *Senecio erucaefolius*. (Not uncommon in hedges).
187. *Lapsana communis*.
188. *Hypochoeris radicata*.
189. *Helminthia echioides*. (Once found, long ago, on a ditch bank near "Cape Grove.")
190. *Tragopogon pratensis*.
191. *Leontodon hirtus*.
192. *Leontodon hispidus*.

COMPOSITÆ.

193. *Leontodon autumnalis*.
 194. *Taraxacum officinale*. (*Leontodon tarax.* L).
 195. *Crepis virens*.
 196. *Sonchus oleraceus*.
 197. *Sonchus arvensis*.
 198. *Hieracium pilosella*.
 199. *Hieracium boreale*. (Formerly in the Shrub).

CAMPANULACEÆ.

200. *Campanula rotundifolia*.
 201. *Campanula trachelium*. (Rather plentiful in the Shrub).
 202. *Campanula glomerata*. (In the park, here and there among bushes, but less plentiful than formerly, also in a rough pasture not far from the windmill).
 203. *Campanula (specularia) hybrida*. (In corn fields, especially between the church and the Shrub).

ERICACEÆ.

204. *Calluna vulgaris*. (Formerly near the gravel pits, but hardly to be found now).

GENTIANEÆ.

205. *Erythræa Centaurium*.

CONVOLVULACEÆ.

206. *Convolvulus arvensis*
207. *Convolvulus sepium*.

BORAGINEÆ.

208. *Lycopsis arvensis*.
209. *Lithospermum officinale*. (In a hedge near the Cage Grove, towards the border of Livermere,—sparingly).
210. *Lithospermum arvense*. (Sparingly in corn fields).
211. *Myosotis palustris*.
212. *Myosotis sylvatica*. (In the Shrub, and here and there in the Home Plantations; I am doubtful whether it is true *sylvatica*, or the variety *umbrosa* of *arvensis*).
213. *Myosotis arvensis*.
214. *Myosotis versicolor*. (Near the gravel pits).
215. *Myosotis collina*.

SOLANEÆ.

216. *Solanum dulcamara*.
217. *Solanum nigrum*.

PLANTAGINEÆ.

218. *Plantago major*.
219. *Plantago media*.
220. *Plantago lanceolata*.
221. *Plantago coronopus*. (On the light soil near Shinham and Barton Mere).

SCROPHULARINEÆ.

222. *Verbascum thapsus*.
223. *Linaria elatine*. (Frequent in the stubble fields after harvest).
224. *Linaria vulgaris*.
225. *Linaria minor*. (Sparingly in gravel pits and in cornfields on light soil; sometimes a weed in gardens).
226. *Scrophularia nodosa*.
227. *Scrophularia aquatica*.
228. *Veronica agrestis*.
229. *Veronica hederæfolia*.
230. *Veronica arvensis*.
231. *Veronica serpyllifolia*.
232. *Veronica officinalis*.
233. *Veronica chamædrys*.
234. *Veronica montana*. (Formerly in a hedge between the Hall and the Church, but I have not been able to find it for many years).
235. *Veronica beccabunga*.
236. *Veronica anagallis*. (In small ponds in the park).
237. *Bartsia odontites*.
238. *Euphrasia officinalis*.
239. *Rhinanthus Crista-galli*.

OROBANCHEÆ.

240. *Orobanche minor*. (Sometimes very plentiful in cloverfields, but very uncertain in its occurrence).

LABIATÆ.

241. *Mentha aquatica*. (*M. hirsuta*, Sm.)
242. *Mentha rubra*? (In the wet clay pits by the Livermere road).
243. *Mentha arvensis*.
244. *Lycopus Europæus*.
245. *Thymus serpyllum*.
246. *Calamintha officinalis*. (By the side of the Bury road—I am not quite sure whether properly within the bounds of Barton).
247. *Calamintha clinopodium* (*Clinopodium vulgare*, L.)
248. *Calamintha acinos*. (Sparingly, in fields of very light soil, near the gravel pits).
249. *Salvia verbenica*.
250. *Nepeta cataria*. (Sparingly by the side of the Bury road).
251. *Glechoma hederacea*, L. (*Nepeta glechoma*).
252. *Prunella vulgaris*.
253. *Stachys sylvatica*.
254. *Galeopsis ladanum*.
255. *Galeopsis tetrahit*.
256. *Lamium purpureum*.
257. *Lamium amplexicaule*.
258. *Lamium album*.
259. *Ballota nigra*.
260. *Teucrium Scorodonia*. (In the Shrub, sparingly).
261. *Ajuga reptans*.

VERBENACEÆ.

262. *Verbena officinalis*.

PRIMULACEÆ.

263. *Primula acaulis*. (In great profusion in the Shrub—sparingly elsewhere in the parish).
264. *Primula elatior*, Jacq. (Formerly in various damp pastures, especially in the “Ox pasture,” where the *Orchis mascula* grew in profusion).
265. *Primula officinalis*, Jacq. (Very abundant in the park and other old pastures).
266. *Anagallis arvensis*.

POLYGONEÆ.

267. *Polygonum amphibium*.
268. *Polygonum lapathifolium*.
269. *Polygonum persicaria*.
270. *Polygonum aviculare*.
271. *Polygonum convolvulus*.
272. *Rumex crispus*.
273. *Rumex obtusifolius*.
274. *Rumex pulcher*.
275. *Rumex sanguineus*, var. *viridis*.
276. *Rumex conglomeratus*, J. D. Hooker (*R. acutus*, Sm.)
277. *Rumex acetosa*.
278. *Rumex acetosella*.

CHENOPODIACEÆ.

279. *Chenopodium Bonus-Henricus*. (At the foot of a wall, just outside the grounds of the Hall, in the Livermere lane. A single patch of it has grown there, to my knowledge, ever since 1825, without visibly spreading or yet diminishing in extent. I have seen it nowhere else in the parish).
280. *Chenopodium album*.
281. *Chenopodium ficifolium*. (Occasionally in kitchen gardens, but by no means frequently).
282. *Chenopodium rubrum*. (Now and then in waste ground by roadsides, or where manure has been heaped, or on dried-up mud by the sides of ponds).
283. *Chenopodium polyspermum*. (Came up in plenty, in the autumn of 187 (?) on the muddy bed of a half-dried pond in the park. I have not seen it since, nor elsewhere).
284. *Atriplex patula*.

THYMELACEÆ.

285. *Daphne laureola*. (Formerly in old hedges between the fields near "Necton Hall"; I am not sure whether any plants of it remain).

EUPHORBACEÆ.

286. *Euphorbia helioscopia*.

EUPHORBIACEÆ.

287. *Euphorbia peplus*.
288. *Euphorbia exigua*. (Not uncommon in corn fields).
289. *Euphorbia amygdaloides*.
290. *Mercurialis perennis*.

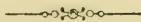
CERATOPHYLLÆ.

291. *Ceratophyllum demersum*.

URTICACEÆ.

292. *Urtica urens*.
293. *Urtica dioica*.
294. *Humulus lupulus*. (Plentifully in hedges in many places, but it is difficult to say where it is indigenous).

MONOCOTYLEDONS.



ORCHIDEÆ.

295. *Orchis mascula*. (In the park and in the Shrub wood).
296. *Orchis morio*. (In the lower part of the park).
297. *Orchis maculata*.
298. *Orchis pyramidalis*. (Sparingly in the park, between its western fence and the Church path).
299. *Gymnadenia conopsea*. (Formerly in the park but very sparingly).
300. *Habenaria bifolia*. (*H. chlorantha*, Bab.) (In the wood called Cage Grove, near the border of Livermere).
301. *Habenaria viridis*. (A very few plants now and then found in "Broad Pasture" between the Hall and the Church).
302. *Aceras anthropophora*. (A very few plants found in the park, at long intervals of time).

ORCHIDEÆ.

303. *Ophrys apifera*. (On grassy banks and slopes here and there; by no means common, but I have now and then, in some former years, seen it in tolerable plenty;—in the year 1827 and 1832, particularly. It used to grow on the bank just outside of the moat at “Necton Hall,” but was destroyed when the ground was ploughed up in my father’s time).
304. *Listera ovata*. (In the lower part of the park and now and then in the groves near the Hall).

IRIDEÆ.

305. *Crocus minimus*. (Botanical Magazine. biflorus, Parl.)
306. *Crocus aureus*. Botanical Magazine. These two croci have grown in the park here, in considerable plenty, as long as either I or my father have known the place; but they are certainly relics of old cultivation—probably from Sir Thomas Hanmer’s garden).

DIOSCORACEÆ.

307. *Tamus communis*.

ALISMACEÆ.

- 308 *Alisma plantago*.

NAIADÆ.

309. *Potamogeton natans*.
 310. *Zannichellia palustris*. . (Formerly in a small pond near Necton Hall).

LILIACEÆ.

311. *Scilla nutans*. (In great profusion in the Shrub).
 312. *Ornithogalum umbellatum*. (Sparingly in the park, naturalized).
 313. *Ornithogalum nutans*. (In the park naturalized).
 314. *Tulipa sylvestris*. (In the park, probably naturalized;—rarely flowering, though its leaves come up in great plenty).

LILIACEÆ.

315. *Colchicum autumnale*. (In the park, and in several pastures near; formerly very abundant, since purposely eradicated to a great degree).

JUNCEÆ.

316. *Juncus communis*.
 317. *Juncus glaucus*.
 318. *Juncus lamprocarpus*.
 319. *Juncus bufonius*.
 320. *Luzula pilosa*. (In the Shrub wood).
 321. *Luzula campestris*.

ARACEÆ.

222. *Arum maculatum*.

LEMNACEÆ.

323. *Lemna minor*.
 324. *Lemna polyrrhiza*.

TYPHACEÆ.

325. *Sparganium ramosum*.

CYPERACEÆ.

326. *Isolepis setacea*. (Formerly in a drain near the Church ;—lost long since).
 327. *Eleocharis palustris*
 328. *Blysmus compressus*. (Formerly, but very sparingly, in a small drain in a meadow on the Vicarage farm).
 329. *Eriophorum polystachyon*, var. *angustifolium*. (Formerly in the drain near the Church—now lost).
 330. *Carex vulpina*.
 331. *Carex remota*. (Sparingly in the groves of the Hall).
 332. *Carex sylvatica*. (In the Shrub, and in the groves of the Hall, but not plentiful).
 333. *Carex glauca*. (In damp parts of the park, and many other places, especially on clay).
 334. *Carex panicea*. (Formerly in low and damp parts of the park, and in the “Ox Pasture” —destroyed by drainage).

CYPERACEÆ.

335. *Carex præcox*. (Common in dry pastures).
 336. *Carex pseudo-cyperus*. (Along the margin of the ditch by the side of the Church path;—not plentiful, but has grown there constantly ever since 1825).
 337. *Carex binervis* (?). (*C. distans* var. (?). Formerly in the damp and rather boggy pasture called the “Ox Pasture” on the Home Farm;—since destroyed by drainage).

GRAMINA.

338. *Phleum pratense*.
 339. *Alopecurus pratensis*.
 340. *Alopecurus agrestis*. (Frequent in cultivated fields, in a stiff soil).
 341. *Alopecurus geniculatus*.
 342. *Phalaris* (*Digraphis*) *arundinacea*. (In a pond in the park, and one in a plantation beside the Church path).
 343. *Anthoxanthum odoratum*.
 344. *Agrostis vulgaris*.
 345. *Agrostis alba*.
 346. *Aira cæspitosa*. (Very abundant).
 347. *Aira caryophyllea*. (About the gravel pits).
 348. *Aira præcox*. (With the preceding).
 349. *Avena pratensis*. (Plentiful on dry grassy banks and open ground, on chalk and sand;—in the park, but in less plenty than *pubescens*).

GRAMINA.

350. *Avena pubescens*. (Abundant in the park; elsewhere less plentiful than *pratensis*).
351. *Trisetum flavescens*. (Very abundant).
352. *Arrhenatherum avenaceum*. (*Avena elatior*. Common).
353. *Holcus lanatus*, L.
354. *Triodia decumbens*. (Formerly in the "Ox Pastures";—destroyed by drainage).
355. *Dactylis glomerata*.
356. *Koeleria cristata*. (On sunny banks and in dry pastures, in several places, especially by the road to Fornham St. Martin. On the margin of the pleasure-ground on the South side).
357. *Poa annua*.
358. *Poa pratensis*.
359. *Poa trivialis*.
360. *Poa compressa*.
361. *Glyceria fluitans*.
362. *Glyceria rigida*. (Sparingly in old disused chalk and gravel-pits).
363. *Festuca pratensis*.
364. *Festuca elatior*.
365. *Festuca gigantea*. (In the groves of the hall, and in other wooded places, but less common than *bromus asper*).
366. *Festuca ovina*.
367. *Festuca duriuscula*.
368. *Bromus asper*.

GRAMINA

369. *Bromus sterilis*.
370. *Bromus mollis*.
371. *Bromus secalinus*. (Sometimes a weed in corn-fields ; not common, and not constant to any place).
372. *Cynosures cristatus*.
373. *Brachypodium sylvaticum*. (Very abundant in dry woods, groves and hedges).
374. *Triticum repens*.
375. *Lolium perenne*.
376. *Lolium temulentum*. (Found only once or twice in corn-fields).
377. *Hordeum murinum*.
378. *Hordeum pratense*. (Plentiful in the park, and in some other pastures).
379. *Briza media*.

LIST
OF
FLOWERING
PLANTS
AND
FERNS,

FOUND IN THE PARISH OF
MILDENHALL,
SUFFOLK.

C. J. F. B.

MILDENHALL :
PRINTED BY S. R. SIMPSON.

1889.

FLOWERING PLANTS AND FERNs.

RANUNCULACEÆ.

1. *Thalictrum minus*. (On the north-east slope of the Warren Hill, Mildenhall, towards the boundary of Eriswell parish; among furze on dry open ground; the soil chalk, with a slight covering of sand).
A very luxuriant and less glaucous variety (approaching to the *T. majus*, Sm.) was found many years ago in a hedge on the left hand side of the road from Mildenhall to Holywell Row; but it has disappeared from that place].
2. *Thalictrum flavum*. L. (On the sides of water cuts, and in low boggy ground, among willows, near the river, in the Wammell meadows, Mildenhall. In plenty in boggy parts of the low meadows beside the river, between Mildenhall and Barton Mills).
3. *Ranunculus aquatilis*, L. (The sub-species *pantothrix*, very common and abundant; the sub-species *heterophyllus*, the typical form—much less so; sub-species *circinatus* in fen ditches and pools; *fluitans*, in the river).

RANUNCULACEÆ.

4. *Ranunculus ficaria*, L.
5. *Ranunculus flamula*. L. (The variety *pseudoreptans*, rather common on black peaty soil on the edges of fen pools and turf pits).
6. *Ranunculus lingua*, L. (In fenny pools and ditches, growing almost or quite in the water, among reeds and other tall water plants; nowhere very abundant. In the Little Fen, in Mildenhall parish, towards Eriswell, near the cottage called "Bombay," and in various boggy places by the side of the great drain, called the Eriswell Lode. In bogs in some of the plantations at Mildenhall).
7. *Ranunculus acris*, L.
8. *Ranunculus repens*, L.
9. *Ranunculus bulbosus*, L.
10. *Ranunculus sceleratus*, L.
11. *Caltha palustris*, L.
12. *Delphinium Ajacis*. (J. D. Hooker's Students' Flora). (Formerly frequent and abundant in cornfields on the chalky lands about Mildenhall, especially to the west of the town; now almost entirely extirpated by improved farming. In 184 — I found it rather plentifully in a corn field near the great chalk pit, on Barton hill; but have not seen it since).

NYMPHACEÆ.

13. *Nuphar luteum*. (In the great drain, called the Eriswell Lode. In the river Lark, between Mildenhall and Tuddenham, rather plentiful, but not flowering freely).
14. *Nymphaea alba*, L. (In fen pools, especially in the Little Fen ("the Bombay Fen") between Mildenhall and Eriswell).

PAPAVERACEÆ.

15. *Papaver hybridum*, L. (In one or two corn-fields, and in the hedges bordering them by the side of the footpath by the river from Mildenhall to West Row (the Wammell footpath)).
16. *Papaver argemone*. (Not uncommon in corn-fields on chalky soil, as on Barton hill, and between Mildenhall and West Row).
17. *Papaver dubium*, L. (In cornfields on Barton hill).
18. *Papaver Rhœas*, L.
19. *Chelidonium majus*, L. (Wild (?) here and there as a weed in shady parts of gardens).

FUMARIEÆ.

20. *Fumaria officinalis*.
21. *Fumaria vaillantii*. (Now and then among the corn beside the footpath, from Mildenhall to West Row).

CRUCIFEREÆ.

22. *Coronopus ruellii*. (On waste ground here and there, as about the Boys' School-house, Mildenhall).

CRUCIFEREÆ.

23. *Capsella bursa pastoris*.
24. *Nasturtium officinale*.
25. *Nasturtium amphibium*. (Plentiful in bogs and pools in several of the plantations, coming up in great quantities, when they are dried by a hot summer).
26. *Barbarea vulgaris*. (In wet meadows and osier grounds near the river, not plentiful).
27. *Arabis hirsuta*. (Rather frequent on old walls; and in many places on the dry, uncultivated sandy lands).
28. *Cardamine Amara*, L. (Among reeds and sedges on the margin of the river Lark, and of the large wet ditches communicating with it, both above and below the town; plentiful by the river side between Mildenhall and Barton Mills).
29. *Cardamine pratensis*.
30. *Cardamine hirsuta*.
31. *Sisymbrium thaliana*. (*Arabis* L).
32. *Sisymbrium Sophia*. (Now and then by roadsides, but not frequently).
33. *Sisymbrium officinale*.
34. *Sisymbrium alliaria*. (*Erysimum* L).
35. *Erysimum cheiranthoides*, L. (Not uncommon on the banks of fen ditches, and in cultivated fields where the soil inclines to peat; often very abundant on land lately reclaimed from the fen).

CRUCIFEREÆ.

93. *Sinapis arvensis*.
 37. *Draba verna*. (*Erophila* D.C.)
 38. *Teesdalia nudicaulis*. (Very frequent on the dry, open sandy lands on the north and east of Mildenhall).

RESEDACEÆ.

39. *Reseda luteola*, L. (In old chalk pits and gravel pits, on chalky banks by road sides, not uncommon).
 40. *Reseda lutea*, L. (On the open, sandy warren lands; on dry, sunny chalky or sandy banks; also among corn and in fallow fields on a light soil; common).

CISTACEÆ.

41. *Helianthemum vulgare*. (In the pasture called the "Harst" (or Hurst) near Holywell Row).

VIOLACEÆ.

42. *Viola hirta*, L. (In "Munn's wood, near the road to West Row).
 43. *Viola canina*, subspecies *flavicornis*. (Common on the dry, open sandy warren lands in company with the *Teesdalia*, *Myosotis collina*, and other sand plants).
 43b. *Viola canina*, var. *sylvatica*. (In "Munn's" wood, and here and there in other shady places, but not common).

VIOLACEÆ.

44. *Viola tricolor*, L. (In a cultivated field, on light soil on the Warren Hill).
 44b *Viola tricolor*. (Sub-species—*arvensis*, common).

POLYGALACEÆ.

45. *Polygala vulgaris*, L. (Abundant in moist pastures near the edge of the fens, where the soil is damp and blackish, a mixture of peat and sand, but not actually boggy).
This is not in Mildenhall parish.

Remarkably fine in the low, moist meadows, between Wammell and West Row.

Also on dry, sunny, grassy banks in the great chalk pit near Barton Mills in company with *Hippocrepis* and *Anthyllis*.

CARYOPHYLLÆ.

46. *Dianthus deltoides*. (Very sparingly in the dry pasture called the Hurst, where the *Helianthemum* grows).
 47. *Silene inflata*.
 48. *Silene conica*, L. (In cultivated fields, more often among saintfoin and clover than corn; in various places in Mildenhall parish, sometimes in great abundance, but not constant to any one locality. Seems very likely to have been introduced here with foreign seeds).
 49. *Silene otites*, L. (Frequent on the dry, sandy, open warren lands, also on grassy banks by roadsides, and in old chalk-pits).

CARYOPHYLLÆ.

50. *Silene noctiflora*, L. (Very sparingly in cultivated fields).
51. *Lychnis flos-cuculi*, L.
52. *Lychnis vespertina*, Sibth.
53. *Githago segetum*, Desf. (*Agrostemma githago*, L. In cultivated fields, not uncommon).
54. *Cerastium semidecandrum*, L.
55. *Cerastium glomeratum*.
56. *Cerastium triviale*.
57. *Cerastium arvense*, L. (Very common in all the dry, open sandy lands, and on sunny banks by roadsides).
58. *Stellaria media*.
59. *Stellaria holostea*, L.
60. *Stellaria graminea*, L.
61. *Stellaria glauca*, With. Not uncommon in bogs, and on the margins of fen ditches and drains).
62. *Stellaria uliginosa*, L. (Plentiful in black peaty soil about fen ditches and pools).
63. *Arenaria tenuifolia*, L. (Not uncommon). Growing always in a much scattered manner on the dry, open sandy lands).
64. *Arenaria serpyllifolia*, L.
65. *Sagina procumbens*, L.
66. *Sagina nodosa*. (*Spergula*, L). Very plentiful and ornamental in moist pastures near the borders of the fens, where the soil is black and peaty, more or less mixed with sand).

CARYOPHYLLÆ.

67. *Spergula arvensis*, L.

PORTULACÆ.

68. *Montia fontana*, L. (In wet places about the former "Decoy").

PARONYCHIÆ.

69. *Scleranthus perennis*, L. (Plentiful in many places on the very dry, sandy, uncultivated lands).
70. *Scleranthus annuus*, L. (In sandy fields).

HYPERICACÆ.

71. *Hypericum perforatum*
72. *Hypericum quadrangulum*.

MALVACÆ.

73. *Malva sylvestris*.
74. *Malva rotundifolia*.

LINEÆ.

75. *Linum catharticum*.
76. *Radiola millegrana*, Sm. (*R. linoides*, D.C.)
(In low, damp sandy ground, overflowed in winter, near the crossing of the roads opposite to Barton Mills, between the road from Mildenhall to Bury, and that from Newmarket to Thetford; 1845.—I have not been able to find it of late years).

GERANIACÆ.

77. *Geranium molle*.

GERANIACEÆ.

78. *Geranium dissectum*.
 79. *Geranium Robertianum*.
 80. *Erodium cicutarium*. (Very common on the dry sandy lands.

PAPILLIONACEÆ,

81. *Spartium scoparium*, L. (So commonly sown for covert for game, that I can hardly tell *where*, in this district, it is really native).
 82. *Ulex Europæus*.
 83. *Ononis arvensis*. (Very common on the open sandy lands. The prevailing form, here, seems to be the *O. repens* of Withering).
 84. *Anthyllis vulneraria*. (Especially abundant on the chalk hill near Barton Mills, over which the road to Newmarket passes).
 85. *Medicago falcata*. (In old chalk-pits and sand-pits, on dry, sunny uncultivated ground, among short grass, on sandy or chalky soil, abundant in many places in the neighbourhood; certainly a native:—

The variety with flowers of various shades of purple, and mixed purple and yellow, (apparently an intermediate variety between the typical *falcata* and the cultivated *M. sativa*), occurs now and then; in 1851, I found it in the little chalk-pit near Munn's wood; *M. falcata* growing in the same pit, and *M. sativa* cultivated in the adjoining field).

PAPILIONACEÆ.

86. *Medicago lupulina*.
87. *Medicago minima*. (Frequent on the dry, open uncultivated sandy lands; sometimes very luxuriant on ground of this kind which has been newly enclosed and planted).
88. *Melilotus officinalis*. (On sandy ground, chiefly on the outskirts of the plantations, or on land newly broken up, not very common hereabouts).
89. *Trifolium repens*, L. (Very diminutive among short grass or heath on the open, sandy lands).
90. *Trifolium fragiferum*, L. (In moist meadows, plentiful in those near Wammell; also on grassy ground near the edges of the bogs, and in moist spots on the grassy margins of roads).
91. *Trifolium pratense*, L. (Most clearly weed on dry, chalky banks, in company with *Anthyllis* and *Avena pratensis*).
92. *Trifolium arvense*, L. On the dry, sandy lands, common, in company with *Medicago minima*, *Scleranthus perennis*, *Festuca ovina*, and *Erodium cicutarium*. Usually quite procumbent, indeed, close pressed to (the ground).
93. *Trifolium scabrum*, L. In the same situations with *T. arvense*, but rather less frequent).
94. *Trifolium procumbens*, L.
95. *Trifolium minus*, Sm.

PAPILIONACEÆ.

96. *Lotus corniculatus*, L.
97. *Lotus major*, Scop.
98. *Astragalus hypoglottis*, L. (Rather plentiful on the slope of the chalky hill next beyond the Warren Hill, on right of the road from Mildenhall towards Brandon. (I am not quite sure whether this is strictly within the bounds of Mildenhall parish). Also sparingly in one or two spots on the Warren Hill, where the chalk is nearly or quite exposed).
99. *Ornithopus perpusillus*, L. Very common on the dry, sandy lands).
100. *Hippocrepis comosa*, L. (On grassy slopes in the great chalk-pit on the hill behind Barton Mills—not in Mildenhall parish, I believe).
101. *Onobrychis sativa*. (Now and then in chalk-pits, but escaped from cultivation).
102. *Vicia cracca*, L.
103. *Vicia sativa*, L., var. *angustifolia*.
104. *Vicia lathyroides*. (On the dry, open sandy lands, not uncommon):
105. *Vicia sepium*, L.
106. *Lathyrus pratensis*, L.

ROSACEÆ.

107. *Spiræa Ulmaria*, L.

ROSACEÆ.

108. *Geum urbanum*, L.
109. *Potentilla anserima*, L.
110. *Potentilla argentea*, L. (On dry, sandy open ground among short grass, near "Bombay," Mildenhall).
111. *Potentilla reptans*, L.
112. *Potentilla tormentilla*. (On heaths and in pastures where the soil is more or less black and peaty; also in bogs and especially about their margins; very abundant).
- 113a. *Comarum palustre*, L. (In black peaty bogs and about the edges of fen ditches; abundant).
- 113b. *Rubus fruticosus* (?)

SAXIFRAGÆ.

- 113c. *Saxifraga granulata*. (On damp but not boggy sandy ground, especially in the old pasture called the Harst (Hurst).
- 113d. *Saxifraga tridactylites*. Very abundant, often giving a red tint to portions of the sandy lands).
- 113e. *Parnassia palustris*. (Very abundant in the fenny parts of the parish towards Eriswell and Lakenheath).

CRASSULACEÆ.

114. *Tillæa muscosa*, L. (Sparingly in a few spots in Mildenhall parish, where the soil of loose pure sand has scarcely any other vegetation).
115. *Sedum acre*, L. (Very abundant on the sandy lands).

DROSERACEÆ.

116. *Drosera rotundifolia*, L. (In wet spongy bogs, near the great drain called the Eriswell Lode, on the borders of Mildenhall and Eriswell parishes; less abundant than *Drosera Anglica*).
117. *Drosera Anglica*. (In considerable plenty in the aforesaid bogs).

HALORAGEÆ.

118. *Hippuris vulgaris*, L. (Abundant in wet ditches and pools in the fenny districts towards Eriswell; also in drains and water cuts communicating with the river below Mildenhall).
119. *Myriophyllum verticillatum*, L. (In the Little Fen, near the "Bombay" cottage).
(*M. spicatum*—I never could find near Mildenhall, though it appears most likely to grow there).
120. *Callitriche verna*.

ŒNOTHEREÆ.

121. *Epilobium hirsutum*, L.
 122. *Epilobium parviflorum*.
 123. *Epilobium palustre*, L. (Frequent in bogs, especially in those enclosed in plantations).

LYTHRACEÆ.

124. *Lythrum salicaria*, L. (Very abundant on the river banks and the water cuts connected with it).

UMBELLIFEREÆ.

125. *Hydrocotyle vulgaris*, L.
 126. *Conium maculatum*, L. (Now and then in hedges, but uncertain in its localities).
 127. *Apium graveolens*, L. (On the bank of the river).
 128. *Apium nodiflorum* (*Sium* L.)
 129. *Apium inundatum* (*Sison* L.) (In bogs and fen pools in the "Bombay Fen.")
 130. *Sium latifolium*, L. (In the "Bombay Fen.")
 131. *Sium angustifolium*.
 132. *Pimpinella saxifraga*, L. (On chalky ground).
 133. *Conopodium denudatum*. (*Bunium flexuosum*).
 134. *Scandix pecten-veneris*, L.
 135. *Chærophyllum tenulum*.
 136. *Anthriscus vulgaris*.
 137. *Anthriscus sylvestris*
 138. *Œnanthe fistulosa*, L.
 139. *Œnanthe phellandrium*.

UMBELLIFEREÆ.

140. *Æthusa cynapium*.
 141. *Angelica sylvestris*, L. (Abundant in wet places, among willows, alders and reeds).
 142. *Peucedanum palustre*. (Selinum.—Sparingly in fenny places among reeds and alders, especially in bogs in some of the plantations).
 143. *Pastinaca sativa*, L. (Peucedanum. Bth. Borders of fields in chalk soil).
 144. *Heracleum Sphondylium*, L.
 145. *Daucus Carota*, L.
 146. *Caucalis Anthriscus*. L.
 147. *Caucalis infesta*.
 148. *Caucalis nodosa*.

ARALIACEÆ.

149. *Hedera helix*, L. (Wild at Mildenhall) (?)

CORNACEÆ.

150. *Cornus sanguinea*, L. (I am not sure whether I have seen this wild at Mildenhall though it is so common at Barton).

CAPRIFOLIACEÆ.

151. *Viburnum Opulus*, L. (Among bushes on the banks of the Lark, towards Barton Mills).
 152. *Lonicera Periclymenum*, L.

STELLATÆ.

153. *Galium verum*, L.
 154. *Galium palustre*, L.
 155. *Galium uliginosum*, L. (On the margins of fen ditches and pools among reeds, &c.)
 156. *Galium saxatile*.
 157. *Galium aparine*, L.
 158. *Galium Parisiense*. (*G. Anglicum*, Huds. (On old walls near the church and Manor House at Mildenhall).
 159. *Asperula cynanchica*, L. (On dry, sunny ground, on chalk soil: on some parts of the Warren hill, but much more plentifully in the chalk-pit on Barton hill, which is not in Mildenhall parish).
 160. *Sherardia arvensis*, L.

VALERIANEÆ.

161. *Valeriana dioica*, L. (Plentiful in the fenny grounds).
 162. *Valeriana officinalis*, L. (On the marshy banks of the Lark).

DIPSACEÆ.

- 162a *Dipsacus sylvestris*, L.
 162b *Scabiosa succisa*, L.
 163. *Scabiosa columbaria*, L. (Frequent on the dry open lands, both sandy and chalky, especially the latter).
 164. *Scabiosa arvensis*, L.

COMPOSITÆ.

165. *Arctium lappa*, L.
 166. *Carlina vulgaris*, L.
 167. *Centaurea nigra*, L.
 168. *Centaurea scabiosa*, L.
 169. *Centaurea cyanus*, L. (Formerly frequent in cultivated fields about Mildenhall, has become scarce, owing to improved farming).
 170. *Centaurea calcitrapa*, L. (Sparingly by the side of the road called "the Neat-way.")
 171. *Carduus nutans*, L.
 172. *Carduus lanceolatus*, L.
 173. *Carduus acaulis*, L. (Less abundant than at Barton;—mostly on chalk, seldom, if ever, on sand):
 174. *Carduus arvensis*. Curtis
 175. *Carduus palustris*, L.
 176. *Carduus pratensis*. (Hudson. In boggy meadows near the great drain called the Eriswell Lode).
 177. *Onopordon acanthium*, L. (Here and there by roadsides, and about the outskirts of plantations; not common).
 178. *Eupatorium cannabinum*, L. (Plentiful in the fen, and by the river side, especially among bushes).
 179. *Petasites vulgaris*. (*Tussilago Petasites*, L. Plentiful by the river side).
 180. *Tussilago farfara*, L.
 181. *Erigeron acris*, L.

COMPOSITÆ.

182. *Bellis perennis*, L.
 183. *Inula dysenterica*, L.
 184. *Bidens cernua*, L. (By the river side, and beside fen drains).
 185. *Bidens tripartita*, L.
 186. *Achillea millefolium*, L.
 187. *Achillea ptarmica*, L. (In boggy meadows—but not plentiful).
 188. *Matricaria inodora*.
 189. *Chrysanthemum leucanthemum*, L.
 190. *Chrysanthemum segetum*, L. (Formerly a common weed in cultivated lands, but almost extirpated by improved farming).
 191. *Artemisia campestris*, L. (Not plentiful.—Here and there on very dry, sandy ground between the town and Holywell and Beck Rows; also sparingly by the side of the road to Brandon).
 192. *Artemisia vulgaris*, L.
 193. *Gnaphalium uliginosum*, L.
 194. *Filago Germanica*, L.
 195. *Filago minima*. (On the “Warren Hill.” and elsewhere on very dry, sandy and stony ground).
 196. *Senecio vulgaris*, L.
 197. *Senecio sylvaticus*, L. (Plentiful on sandy ground, among the young plantations, and on their banks).
 198. *Senecio Jacobæns.*
 199. *Senecio aquaticus*.

COMPOSITÆ.

200. *Lapsana communis*, L.
 201. *Cichorium intybus*, L. (Here and there on
 chalky margins of roads and fields).
 202. *Hypochoeris radicata*.
 203. *Leontodon hispidus*, d.
 204. *Leontodon autumnalis*, L.
 205. *Taraxacum officinalis*.
 206. *Crepis virens*.
 207. *Sonchus oleraceus*, L.
 208. *Sonchus arvensis*, L.
 209. *Hieracium Pilosella*, L.

CAMPANULACEÆ.

210. *Campanula rotundifolia*, L.
 211. *Campanula (Specularia) hybrida*, L. (Spa-
 ringly in stubble fields on the chalk).
 212. *Jasione montana*, L.

ERICACEÆ.

- 212b. *Erica Tetralix*. (On rather boggy, heathy
 ground, in the part of Mildenhall nearest
 to Eriswell. In great plenty on Tud-
 denham and Cavenham heaths).
 213. *Calluna vulgaris*. (In various parts of the
 open country about Mildenhall, but not
 where the chalk comes to the surface.
 On the Warren Hill it is excessively
 dwarfish).

GENTIANEÆ.

214. *Gentiana Amarella*. (In the great chalk pit on the hill near Barton Mills).
215. *Erythraea centaurium*. (On dry, open, ground, chalky or sandy, about Mildenhall).
216. *Menyanthes trifoliata*. (Abundant in wet, spongy bogs. Mildenhall, in the part of the parish bordering on Eriswell and Tuddenham Fen).

CONVOLVULACEÆ.

217. *Convolvulus arvensis*. (Very common).
218. *Convolvulus sepium*. (Common in damp hedges and thickets, and among reeds and bushes on the margins of pools and fen ditches).

SOLANACEÆ.

219. *Hyoscyamus niger*. (By the roadside at the entrance of Eriswell village from Mildenhall; also now and then by the side of the "the Neatway," Mildenhall; sometimes a weed in gardens, but not at all common. I have not observed it to be permanent anywhere in this neighbourhood).
220. *Solanum nigrum*. (Very common. In a very diminutive state (with the berries much larger in proportion to the plant than usual), in gravel pits and about rabbit burrows on the Warren; while as a weed in our kitchen garden it is sometimes two feet high).

SOLANACEÆ.

221. *Solanum Dulcamara*. (Common. In much the same situations as *Convolvulus sepium*).
222. *Atropa Belladonna*. (On a chalky bank, under a hedge, in the way from West Row (Mildenhall) to Isleham Ferry, 1845).

SCROPHULARINÆ.

223. *Verbascum Thápsus*. (Common).
224. *Verbascum nigrum*. (In lanes about Eriswell and elsewhere, but by no means common).
225. *Veronica arvensis*. (Common).
226. *Veronica verna*. (Mildenhall; here and there on the barren, sandy lands, to the north and north-west of the town; I found it several times, but never in plenty, and seldom two successive years in the same place).
227. *Veronica triphyllos*. (In sandy fields near Holywell Row, Mildenhall, 1845. In a sandy corn field at Eriswell, on one side of the village).
228. *Veronica serpyllifolia*. (Common).
229. *Veronica scutellata*. (In the bogs near Mildenhall and Eriswell. Growing remarkably large in bogs; in some of the plantations at Mildenhall).
230. *Veronica anagallis*. (In watery ditches, frequent).
231. *Veronica beccabunga*. (In wet places by roadsides).

SCROPHULARINEÆ.

232. *Veronica officinalis*. (Among heath moss, and fern, in glades and margins of the plantations, Mildenhall).
233. *Veronica Chamædrys*. (Not so common in this district as at Barton).
234. *Veronica hederifolia*. (A very common weed).
235. *Veronica agrestis*. (A very common weed).
236. *Euphrasia officinalis*. (Common on the open sandy lands, particularly near the skirts of the bogs).
237. *Euphrasia odontites*. (Here and there in damp fields and on the edges of roads, especially towards the fens, not very common).
238. *Rhinanthus crista-galli*. (In low meadows by the side of the river Lark).
239. *Pedicularis palustris*. (In boggy meadows, especially along the sides of the great drain called the Eriswell Lode).
240. *Pedicularis sylvatica*. (In turfy, spongy, black soil, in such places as *Erica Tetralix* grows in).
241. *Scrophularia aquatica*. (On the sides of rivers, pools, and watery ditches).
242. *Linaria vulgaris*. (Common in cultivated land).
243. *Linaria minor*. (In gravel pits on the Warren Hill, Mildenhall; in stubble fields, and in a gravel pit on Barton Hill near Barton Mills).

SCROPHULARINEÆ.

244. *Limosella aquatica*. (On a patch of low, moist ground, (formerly I suspect a sand-pit), sometimes overflowed, where the road from Newmarket to Thetford crosses that from Mildenhall to Bury, near Barton Mills, 1845).

LABIATÆ.

245. *Verbena officinalis*. (Dusty roadsides, near Mildenhall; not very common).
246. *Salvia verbenaca*. (On some dry, chalky hedge-banks between Wammell and West Row, Mildenhall).
247. *Lycopus Europæus*. (River-side, Mildenhall).
248. *Mentha aquatica*. (Common in wet places, and very variable).
249. *Mentha arvensis*. (In damp cornfields).
250. *Thymus serpyllum*. (Common on the open sandy and chalky lands).
251. *Calamintha Acinos*. (Common in fields on the sandy lands).
252. *Calamintha Nepeta*. (On a hedge-bank, near Worlington, on the way to Kennet).
253. *Ajuga reptans*. (In low, wet meadows near the river, Mildenhall and Barton Mills).
254. *Ballota nigra*. (Very common in hedges).
255. *Lamium album*. (Very common).
256. *Lamium amplexicaule*. (Here and there in cultivated ground).

LABIATEÆ.

257. *Lamium purpureum*. (Very common).
258. *Galeopsis Ladanum*. (Not uncommon in cornfields, mostly on chalk).
259. *Galeopsis Tetrahit*. (Common in damp cornfields).
260. *Stachys palustris*. (Frequent in cultivated fields where the soil is damp and inclining to boggy).
260a. *Stachys sylvatica*. (In Munns' Wood, Mildenhall).
261. *Stachys arvensis*. (In cornfields).
262. *Glechoma hederacea*. (Common).
263. *Nepeta Cataria*. (In hedges on the road by Worlington to Kennet).
264. *Prunella vulgaris*. (In grassy places).
265. *Scutellaria gallericulata*. (Among carices, reeds, and mints in boggy places in some of the Mildenhall plantations, and on the edges of fen ditches).

BORAGINEÆ.

266. *Myosotis palustris*. (Common along the margins of the Lark, and in wet ditches communicating with it).
267. *Myosotis cæspitosa*. (In boggy ground in some of the Mildenhall plantations).
268. *Myosotis arvensis*. (Common in cultivated ground or sandy soil).

BORAGEINEÆ.

269. *Myosotis collina*. (Common on the dry, open sandy lands, Mildenhall).
270. *Myosotis versicolor*. (On dry, open sandy lands, Mildenhall; less common than *M. collina*).
271. *Lithospermum arvense*. (In cornfields, Mildenhall; Not very common).
272. *Symphytum officinale*. (On the margins of the Lark, between Mildenhall and Barton Mills).
273. *Lycopsis arvensis*. (In cornfields; very common).
274. *Cynoglossum officinale*. (By the roadside, not far from the Warren Lodge, Mildenhall, on chalk).
275. *Echium vulgare*. (Abundant on the dry, barren sandy or chalky lands, whether cultivated or not; often giving a blue colour to considerable tracts of ground).

LENTIBULARIÆ.

276. *Pinguicula vulgaris*. (On boggy ground in that part of Mildenhall parish which borders on Eriswell).
277. *Utricularia vulgaris*. (In fen pools and peat holes in the bogs in Mildenhall parish towards Eriswell).

PRIMULACEÆ.

278. *Primula veris*. (In the meadows between Wammell farm-house and West Row, Mildenhall).
279. *Hottonia palustris*. (Plentiful in fen pools and ditches in the part of Mildenhall towards Eriswell).
280. *Lysimachia vulgaris*. (On fenny ground in the aforesaid part of Mildenhall, mostly among bushes or reeds).
281. *Lysimachia Nummularia*. (In low, wet meadows, between Mildenhall and Barton Mills).
282. *Anagallis arvensis*. (Very common in cultivated ground).
283. *Anagallis tenella*. (On boggy, turfy ground, and in wet places in several of the plantations on the north side of Mildenhall, also between Mildenhall and Icklingham).
284. *Samolus valerandi*. (In fenny ground about Mildenhall; frequent).

PLANTAGINEÆ.

285. *Plantago major*. (Very common).
286. *Plantago media*. (Common on lawns).
287. *Plantago lanceolata*. (Very common).
288. *Plantago coronopus*. (In dry, open exposed places, on light soil; frequent).
289. *Littorella lacustris*. (In the bogs near the cottage called "Bombay," between Mildenhall and Eriswell; sparingly).

CHENOPODIACEÆ.

290. *Chenopodium rubrum*. (In some low grounds overflowed in winter, between the Warren Hill and the river Lark).
291. *Chenopodium hybridum*. (A weed in the gardens of the Manor House, Mildenhall and now and then in lanes in the outskirts of Mildenhall, towards the river).
292. *Chenopodium album*. (Very common).
293. *Atriplex patula*. (A common weed in cultivated ground).

POLYGONACEÆ.

294. *Polygonum amphibium*. (In ponds and still waters).
295. *Polygonum Persicaria*. (In cultivated grounds on a damp soil).
296. *Polygonum lapathifolium*. (In rather wetter situations than the last).
297. *Polygonum Hydropiper*. (Plentiful in wet ditches and in places where water has stagnated by waysides).
298. *Polygonum aviculare*. (Very common).
299. *Polygonum convolvulus*. (A weed in cultivated ground).
300. *Rumex Hydrolapathum*. (Plentiful in the fen ditches and on their margins).
301. *Rumex crispus*. (Very common).
302. *Rumex obtusifolius*. (Very common).
303. *Rumex acutus*. (In wet places).

POLYGONACEÆ.

304. *Rumex pulcher*. (By roadsides and under walls in the outskirts of villages).
305. *Rumex maritimus*. (In the "Bombay" fen, on the borders of Mildenhall and Eriswell).
306. *Rumex Acetosa*. (Among grass in low meadows near the river).
307. *Rumex Acetosella*. (Very plentiful, both on the open, sandy grounds, and in black peaty soil, near the bogs).

EUPHORBIACEÆ.

308. *Euphorbia helioscopia*. (Very common).
309. *Euphorbia exigua*. (In cornfields on the chalk hill, near Barton Mills).
310. *Euphorbia Peplus*. (Very common.)

URTICACEÆ.

311. *Urtica urens*. (Very common).
312. *Urtica dioica*. (Very common).
313. *Parietaria officinalis*. (Here and there on the walls of old churches and church yards, and on the court-yard wall of Wammel).
314. *Humulus Lupulus*. (Here and there in hedges, as by the side of the road between Eriswell and Lakenheath, but probably not indigenous.)

CUPULIFERÆ.

- 315 *Quercus Robur*. (There are some dwarfish, stunted, rugged, gnarled oak trees, evidently very old, in a rough, damp pasture called the *Harst* (the *Hurst*), between Mildenhall and Eriswell; these *may* be relics of an aboriginal wood. Trunks of oak trees are not uncommonly found buried in the peat of the Fens, and prove that the tree was indigenous in this district).
- 316 *Corylus Avellana*. (Hazel-nuts are occasionally found buried in the peat of the Fens, but I do not remember to have ever seen the hazel growing apparently wild any where in this district).

SALICACEÆ.

317. *Salix fusca* (vars. *a. fusca* and *b. repens*).
(In the boggy grounds and on the sandy heathy ground bordering on the bogs, between Mildenhall and Eriswell).

Salix. (I omit the rest of this genus, partly because I have not studied it, and partly because I am very doubtful *which* of the species and varieties, or whether any of them are real natives of the Mildenhall district).

ORCHIDEÆ.

318. *Spiranthes autumnalis*. (On damp, grassy ground by the side of the road from Mildenhall to Eriswell, a little way beyond Holywell Row).

ORCHIDEÆ.

319. *Listera ovata*. (Here and there in the open parts and margins of the plantations at Mildenhall; but not frequent).
320. *Epipactis palustris*. (In the boggy pastures called "The Dolvers," by the side of the Eriswell Lode;—in bogs on Undley common, between Mildenhall and Lakenheath—bogs near Tuddenham).
321. *Orchis latifolia*. (Plentiful in bogs and wet meadows about Mildenhall, Eriswell, and Lakenheath; also by the side of the Lark, near Mildenhall).
322. *Orchis maculata*. (I think I have seen this at Mildenhall, but cannot remember precisely where).
323. *Gymnadenia conopsea*. (Pretty frequent in boggy ground, by the side of the great drain called the Eriswell Lode).

IRIDEÆ.

324. *Iris Pseud-acorus*. (Plentiful in marshy grounds, among reeds and sedges, on the margins of the Lark, and of fen ditches, drains and pools).

AMARYLLIDEÆ.

325. *Narcissus biflorus*. (One or two plants found by my Father (in 1824) (?) in a rough, damp pasture beyond Holywell Row, near the

AMARYLLIDÆ.

skirt of the Fen. Probably a straggler from cultivation. It is quite established as a relic of cultivation, *apparently* wild, in the paddock of the Manor House at Mil-denhall).

Narcissus incomparabilis, *Muscari racemosum*, *Ornithogalum umbellatum* and *O. nutans*, grow there in company with it, and in the same condition; all of them probably survivals from the old garden).

HYDROCHARIDÆ.

326. *Hydrocharis morsus—ranae*. (Plentiful in the Eriswell Lode, and in other large drains and fen ditches).

327. *Anacharis Canadensis*. *Elodea Canad.*—Bethm. *Anacharis Alsinastrum*.—Bab. (In the river Lark, and in water cuts and ditches communicating with it; plentiful since 1855. In that year I first saw it, in small quantity, in a part where I had often botanized before, and I do not think I could have overlooked, if it had existed there earlier. It increased very rapidly and soon filled and choked many of the water cuts).

ALISMACEÆ.

328. *Alisma Plantago*. (Common in wet places).

ALISMACEÆ.

329. *Alisma ranunculoides*. (In the little Fen by "Bombay," between Mildenhall and Eriswell; and in boggy pastures beside the Eriswell Lode).
330. *Sagittaria sagittifolia*. (Abundant in the river Lark and on its margins, both above and below Mildenhall, as well as in the wet ditches and water cuts connected with it, and in the large fen drains. In the river, the petioles of its leaves are often drawn out to a surprising length by the stream, while their laminæ are not developed at all, so that it might easily be taken for something different).
331. *Butomus umbellatus*. (Formerly frequent in Mildenhall Fen, but become rare since the drainage. I found it only once during the 16 years that we lived at Mildenhall).*
332. *Triglochin palustre*. (In wet meadows near the river, and in the fens).

FLUVIALES.

333. *Potamogeton densus*. (In the river Lark at Mildenhall in plenty).
334. *Potamogeton crispus*. (In wet ditches and drains, between Mildenhall and Eriswell).

* Found in the Lark, near Barton Mills (July, 1889), by Mr. Sullivan.—

FLUVIALES.

335. *Potamogeton perfoliatus*. (Plentiful in the Lark, both above and below Mildenhall).
336. *Potamogeton lucens*. (In the Lark with the preceding).
337. *Potamogeton heterophyllus*. (In pools in the "Bombay" fen, between Mildenhall and Eriswell).
338. *Potamogeton natans*. (In ponds).

AROIDEÆ.

339. *Lemna minor*. (Very common).
340. *Lemna polyrrhiza*.
341. *Lemna trisulca*. (Both frequent in pools and fen ditches).
342. *Arum maculatum*. (Not common in this unwooded district; grows in a hedge near the boat house, between Mildenhall and West Row).
343. *Sparganium natans*. (*S. minimum*,—Bab. In fen pools and drains, between Mildenhall and Eriswell).
344. *Sparganium simplex*. (In the fen ditches and drains abundantly).
345. *Sparganium ramosum*. (Common).
346. *Typha latifolia*. (Frequent in pools and wet ditches, and here and there by the side of the Lark).
347. *Typha angustifolia*. (In fen ditches between Mildenhall and Eriswell).

JUNCEÆ.

348. *Juncus conglomeratus*, L. (Common in wet pastures and wet spots in the grassy margins of roads).
349. *Juncus effusus*. (In the same places with the last, and equally common).
350. *Juncus glaucus*. (I am not quite sure whether I have seen this near Mildenhall; it is certainly much less common than at Barton).
351. *Juncus acutiflorus*. (Common in wet places).
352. *Juncus lamprocarpus*. (In wet ditches and boggy pastures, but less plentiful than near Bury).
353. *Juncus obtusiflorus*. (Very plentiful in the fen ditches and bogs between Mildenhall and Eriswell).
354. *Juncus supinus*. (In the bogs and peat holes of the "Bombay" Fen. Very variable).
355. *Juncus bufonius*. (Very common).
356. *Juncus squarrosus*. (Not so common as I should have expected. I observed it only on some rough, dampish ground [where there seems to be water underlying the sand], by the side of the Thetford road, a mile or two from Mildenhall).
357. *Luzula campestris*. (Common). Var. *congesta*. (Frequent about the bogs in the "Bombay" Fen, and elsewhere in the fenny lands between Mildenhall and Eriswell; very variable in size and density of inflorescence).

CYPERACEÆ.

358. *Cladium Narcissus*. (Formerly very abundant in the fenny lands; now only on the margins of the Eriswell Lode and other principal drains and large ditches).
359. *Schoenus nigricans*. (Plentiful in the "Bombay" Fen and other boggy grounds between Mildenhall and Eriswell).
360. *Scirpus lacustris*. (In the river Lark, below Mildenhall. Very common in the Fens, before they were drained, and still occurring here and there in the larger drains).
361. *Scirpus setaceus*. (On the margin of the Eriswell Lode, near the "Bombay" Fen).
362. *Scirpus palustris*. (Common in wet places).
363. *Scirpus pauciflorus*. (In the "Bombay" Fen, very sparingly).
364. *Scirpus fluitans*. (In the "Bombay" Fen, between Mildenhall and Eriswell. Varies considerably in length of stems and in consistence of the leaves, according as the season is wet or dry).
365. *Eriophorum polystachyon*. (Plentiful in wet meadows and boggy ground).
366. *Carex dioica*. (In the bogs, "Bombay" Fen, between Mildenhall and Eriswell).
367. *Carex pulicaris*. (Frequent in boggy ground).
368. *Carex intermedia*. (In the boggy grounds).
369. *Carex arenaria*. (Very abundant on all the open, dry, sandy lands, thriving in the most barren, drifting sand. Where the sands

CYPERACEÆ.

have been enclosed and planted, it continues to grow, the leaves becoming excessively long and lax, and then it seldom flowers).

371. *Carex paniculata*. (Abundant in bogs, especially where these are surrounded by plantations or intermixed with bushes).
372. *Carex cæspitosa*, L. (according to Bentham).
In the bogs.
373. *Carex stricta*, good. (Abundant in the "Bombay" Fen and other bogs, especially such as are in the midst of plantations. It grows in dense, solid clumps like *C. paniculata*.)
374. *Carex flava*. (Common in bogs and wet, spongy meadows. The variety *Æderi* not uncommon, but it is difficult to draw accurately the line between it and the species).
375. *Carex fulva*. (In the "Bombay" Fen, and other wet and boggy grounds on the borders of Mildenhall and Eriswell).
376. *Carex panicea*. (Common in wet meadows and boggy ground).
377. *Carex psuedo cyperus*, L. (In wet spots in a disused clay-pit near the brick-kilns. I do not remember to have seen it anywhere else about Mildenhall).
378. *Carex glauca*. (In damp pastures, but by no means so common as at Barton. (The light soils about Mildenhall seem not to suit it).

CYPERACEÆ.

379. *Carex praecox*. (In dry pastures and grassy places).
380. *Carex filiformis*. (In bogs by the side of the Eriswell Lode, nearly in a line between Mildenhall and Eriswell village).
381. *Carex hirta*. (In damp, not boggy, places, on sand or clay; in disused pits, wet spots by roadsides and sometimes in low places in plantations).
382. *Carex ampullacea*. (In great abundance in the fen ditches and pools in the "Bombay" Fen and the "Dolwers," and about the great drain called the Eriswell Lode).
383. *Carex riparia*. (Plentiful along the banks of the river and of the water cuts communicating with it; also about the principal drains in the Fen).
384. *Carex paludosa*. (With the *riparia*, and still more common).

GRAMINA.

385. *Phalaris arundinacea*. (Plentiful on the margins of the river and of water cuts).
386. *Anthoxanthum odoratum*. (In dry meadows).
387. *Phleum pratense*. (In meadows and pastures. The variety *nodosum* in dry, barren places, by roadsides and about old pits, but not usually in loose sand).

GRAMINA.

388. *Phleum arenarium*. (Frequent in dry, loose sand, in the open country on the north and east of Mildenhall).
389. *Phleum Boehmeri*. (On dry, open, barren ground, on chalk or sand, on the northern part of the Warren Hill, and by the side of the road from Mildenhall by Eriswell towards Brandon; also on the high ground beyond Barton Mills towards Herringswell).
390. *Alopecurus pratensis*. (In meadows on good soil—much less common than about Bury).
391. *Alopecurus agrestis* (?) (I am not sure that I have seen this at Mildenhall, though it is common at Barton. It is partial to a stiff clay soil).
392. *Alopecurus geniculatus*. (In shallow pools and stagnant waters).
393. *Agrostis vulgaris*. (Very common).
394. *Agrostis alba*.
395. *Agrostis canina trichodium*. (On rough, heathy ground, very plentiful in the fir plantations, chiefly on sandy soil).
396. *Agrostis spica-venti*, L. *Apera*. (In fields which have been cultivated, on light sandy soil, often abundant, but not constant to one locality. In great abundance on the rising ground (where there is a conspicuous plantation of firs) near the village of

GRAMINA.

Eriswell, in the year 185 —. Formerly abundant on the open, sandy ground, between the Warren Hill and the Bury road).

397. *Calamagrostis epigeios*. (In damp places in the nursery plantation, and several other plantations near Mildenhall).
398. *Calamagrostis lanceolata*, roth. (In great abundance (forming large and thick clumps) in bogs and fenny places in several of the plantations on the side towards Eriswell).
399. *Aira caespitosa*. (On rough and somewhat spongy pasture ground mostly near the skirt of the fens; much less common than at Barton).
400. *Aira caryophyllea*. (On open sandy lands).
401. *Aira praecox*. (In the like situations as the last).
402. *Avena pratensis*. (Plentiful on very dry open ground, where the chalk is either exposed or thinly covered with sand).
403. *Avena flavescens*. (Very common on dry, sunny open ground).
404. *Holcus lanatus*. (Very common).
405. *Holcus mollis*. (Plentiful in many of the older fir plantations (where the trees stand thinly and on their borders).
406. ^N*Mardus stricta*. (On the dry sandy warren lands, but rather sparingly).

GRAMINA.

407. *Hordeum murinum*. (Common in the outskirts of the town and its immediate vicinity).
408. *Triticum repens*. (Common).
409. *Lolium perenne*. (Common in the meadows and about hedges).
410. *Brachypodium sylvaticum* (*Festuca*, Sm. E. Fl.) Under hedges between the town and Wammell, and in a few other spots where there are hedges on chalky, not sandy, soil.
411. *Bromus mollis*. (Common).
412. *Bromus asper*. (Sparingly under trees near the river, and the back of the town).
413. *Bromus sterilis*. (Common).
414. *Bromus secalinus*. (Now and then in corn-fields, but uncommon).
415. *Festuca ovina*. (Very common on the dry sunny open lands).
The variety *cæsia* frequent, but not general, and I cannot see what are the local circumstances on which it depends.
416. *Festuca duriuscula*. (In hedges and meadows, between the town and West Row).
417. *Festuca pratensis*. (In meadows beside the Lark).
418. *Festuca elatior*. (Here and there on the margins of the river and of fen ditches).
419. *Festuca myurus*.
- 419a. *Dactylis glomerata*. (Common).

GRAMINA.

420. *Cynosurus cristatus*. (In the meadows near the river).
421. *Briza media*. (With the preceding).
422. *Glyceria aquatica*. (In great plenty along the banks of the river, and of water-cuts, communicating with it).
423. *Glyceria fluitans*. (Common).
424. *Glyceria rigida*. (Sparingly here and there in old chalk-pits and gravel-pits).
425. *Poa annua*. (Everywhere).
- 425a. *Poa pratensis*. (Common).
426. (?) *Poa trivialis*. (I suppose, common about Mildenhall, but I confess that I did not take care to distinguish it from *pratensis*).
427. *Poa compressa*. (On old walls and dry banks).
- 427a. *Arundo phragmites*. (Very abundant in the fens).
428. *Molinia caerulea*. (Very abundant in the fens, especially in plantations on boggy soil).
429. *Catabrosa aquatica*. (On the margin of the "Eriswell Lode)."

FILICES.

430. *Polypodium vulgare*. (Sparingly at the roots of trees in one or two of the plantations).

FILICES.

431. *Nephrodium thelypteris*. (In the "Bombay" Fen, between Mildenhall and Eriswell). (I have never seen fertile fronds).
432. *Nephrodium Filix-mas*. (On old stumps of trees in some of the plantations, but by no means plentifully).
433. *Nephrodium dilatatum*. (With the preceding).
434. *Pteris aquilina*. (Most abundant).
435. *Botrychium lunaria*. (In old chalk-pits on the slope of the Warren Hill, not plentiful, and the specimens small).
436. *Ophioglossum vulgatum*. (Sparingly in the fenny meadow called the Dolver, which is crossed by a foot-path from Holywell Row to Eriswell).

EQUISETACEÆ.

437. *Equisetum arvense*, L.
438. *Equisetum palustre*, L. (Very common in moist and boggy ground).
- 438b. *Equisetum palustre*, var. *polystachyon*. (See Schkuhr, tab. 170). (On damp ground in an old sand-pit (which we used to call the *Marchantia-pit*) inclosed within the first plantation on the Brandon road. It occurs very uncertainly, and the terminal spike is often imperfect).

EQUISETACEÆ.

- 438c. *Equisetum palustre* var. (?) (*See*—Schkuhr tab. 169. fig. d.) In dryer parts of the aforesaid pit. (Both this and the preceding are perhaps more properly to be called *accidents* than varieties).
439. *Equisetum limosum*. (Common in fen pools and ditches).

SUMMARY
OF
MILDENHALL PLANTS.

DICOTYLEDONS.

Species.

Ranunculaceæ	....	12	
Nymphæaceæ	....	2	
Papaveraceæ	....	5	(including <i>Chelidonium majus</i> , which is very doubtfully wild).
Papaveraceæ			} 2
Sub-order—Fumarieæ			
Cruciferae	....	17	
Resedaceæ	....	2	
Cistaceæ	....	1	
Violaceæ	....	3	
Polygalaceæ	....	1	
Caryophylleæ	....	22	(<i>Sileneæ</i> 8, <i>Alsineæ</i> 14).
Portulaceæ	....	1	
Hypericaceæ	....	2	
Malvaceæ	....	2	
Lineæ	....	2	
Geraniaceæ	....	4	
Leguminosæ	....	24	
Rosaceæ	....	8	

	<i>Species.</i>	
Saxifrageæ	3
Crassulaceæ	2
Droseraceæ	2
Halorageæ	4
Ænothereæ	3
Lythraceæ	1
Umbelliferæ	24
Araliaceæ	1 (?) (<i>Hedera</i> , doubtfully wild).
Caprifoliaceæ	2
Stellateæ	8
Valerianeæ	2
Dipsaceæ	4
Compositeæ	
Cynarocephalæ	13
Corymbiferæ	22
Cichoraceæ	9
Ericaceæ	2
Gentianeæ	3
Convolvulaceæ	2
Solaneæ	4
Scrophularinæ	21
Labiataæ	20
Boragineæ	10
Lentibulariæ	2
Primulaceæ	7
Plantagineæ	5
Chenopodiaceæ	4
Polygonaceæ	14
Euphorbiaceæ	3

		<i>Species.</i>	
Urticaceæ	....	4	(Including <i>Humulus</i> , which is probably not indigenous, and <i>Parietaria</i> , which is doubtfully so).
Cupilferæ	....	2	(?) (<i>Corylus</i> , doubtful).
Salicaceæ	....	
Total....			303.

MONOCOTYLEDONS.

Orchideæ	....	6	
Irideæ	....	1	
Amaryllideæ	....	1	(Very doubtfully wild)
Hydrocharideæ	....	2	
Alismaceæ	....	5	
Fluviales	....	7	
Aroideæ	....	9	(<i>Araceæ</i> 1, <i>Typhaceæ</i> 5, <i>Lemnaceæ</i> 3).
—			
31			
Juncaceæ	....	10	
Cyperaceæ	....	26	
Gramina	....	47	
—			
83			
31			
—			
114			

The proportional numbers of the two great classes, mono and dicotyledonous, appear to be different from those usual in the vegetation of Europe; the proportional number of monocotyledonous being higher than usual. According to my list, the monocotyledons are between one-fourth and one-third of the total number of phanerogams.

This peculiarity appears to be owing to the large number of cyperaceae and grasses in my list, the number of these two families together amounting to 73.

The plants which I have found growing wild at Mildenhall amount to about 430 species, some few of them I have not found strictly in the parish of Mildenhall, but a little way outside of its limits, in those of Eriswell, Barton Mills, or Tuddenham. Only 10 of these 430 are vascular cryptogams, the rest phanerogamous. Of the 410, 114 are monocotyledonous, 303 dicotyledonous. In fact, however, both the the total number of phanerogams, and the number of dicotyledons are greater than here set down; several species probably ought to be added to the genus salix.



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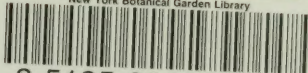
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