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THE CANADIAN



HORTICULTURAL

MAGAZINE

PUBLISHED BY THE MONTREAL HORTICULTURAL SOCIETY

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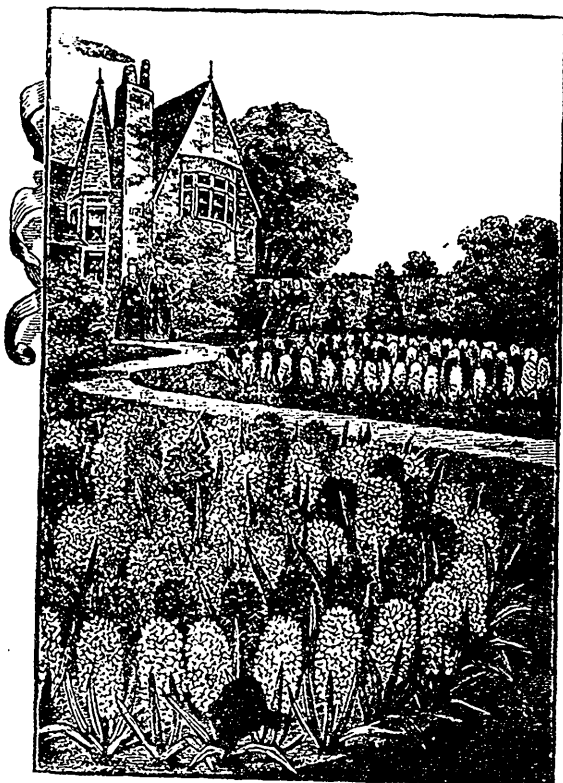
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THE CANADIAN
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Vol. II.

December, 1898.

No. 9

CANADIAN FERNS.

BY REV. ROBERT CAMPBELL, D.D., MONTREAL.

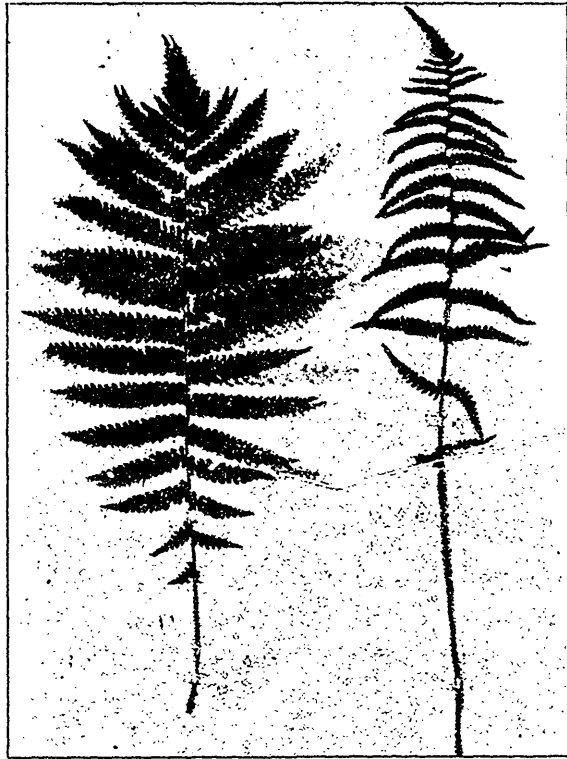
PART V.—DRYOPTERIS—*Continued.*

4. DRYOPTERIS BRAUNII (SPENNER) UNDERW.—*Braun's Holly Fern.* This fern bears a considerable resemblance to the European *Aspidium* or *Polystichum aculeatum*, and so it was classified as "*Aspidium aculeatum* var *Braunii*," by Swartz, and was thus designated in the sixth edition of Gray's Manual. Spenner counted it a distinct species in 1825, and it is so regarded by Britton and Brown, only they call it DRYOPTERIS, not *Aspidium*. This fern is not so stiff, however, as the English "Prickly Fern." Instead of prickles, the pinnules are beset by soft hairs; and they have not the lobe on the upper side that is noticeable in the corresponding European fern. Another feature of this fern is the large number of scales covering the stipe and rachis. The surface of the pinnules is also covered with minute hairs. It is somewhat rare in this part of Canada, although frequently met with in both the Eastern and Western Provinces. The specimen used in the illustration was found on a rocky hill in the valley of the Rouge, from which locality it was reported by D'Urban. The sori of this fern are small, nearer the midvein than the margin, and are furnished with a shield-like entire covering.

5. DRYOPTERIS NOVEBORACENSIS (L.) A. GRAY—*New York Fern.* This is a very pretty fern, both in form and colour. It tapers from the middle both ways, and has delicate pale-green leaves. The lower pairs of the pinnæ generally droop, while those at the top



(4) BRAUN'S HOLLY FERN. *Dryopteris Braunii* (Spencer) Underw.

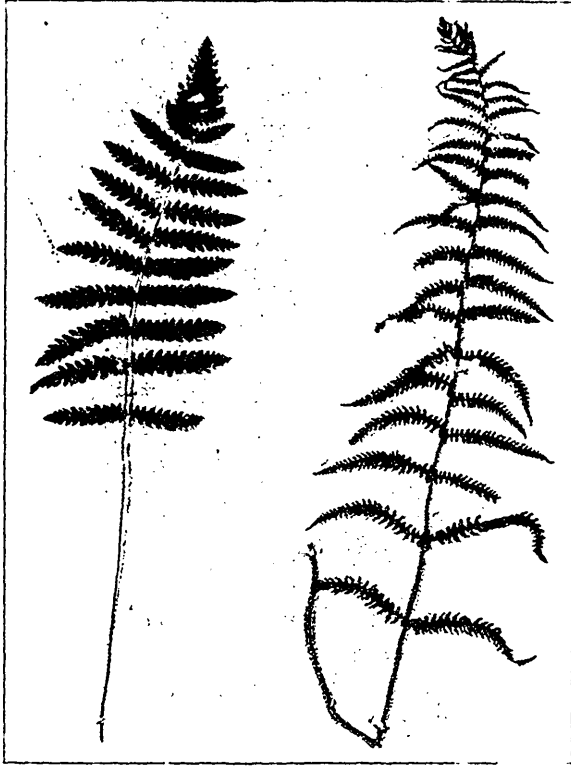


(5) NEW YORK FERN. *Dryopteris Noveboracensis* (L.) A. Gray.

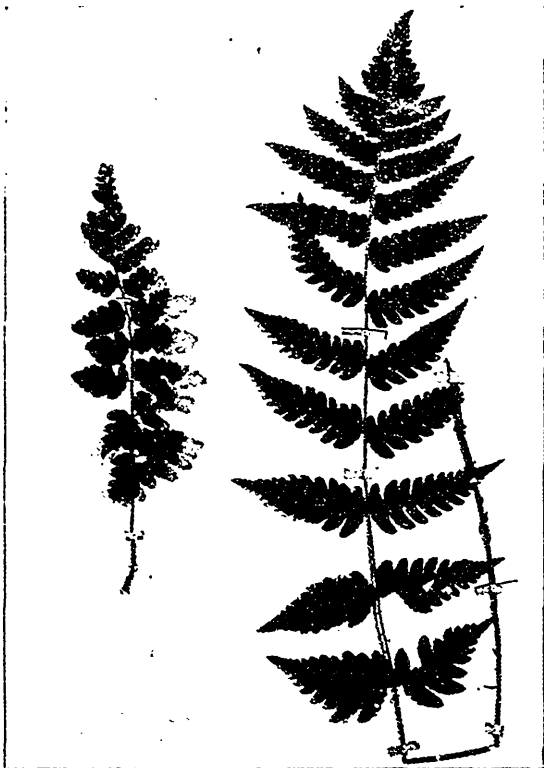
grow very sharp and pointed, giving a peculiarly graceful narrow outline to the upper part of the fern. The pinnules have a hairy border as well as a hairy midrib. The sori are separate, and near the margin of the pinnules, and have a kidney-shaped covering. The fertile and barren fronds are about of an equal height, although the fertile, owing to the contraction of their pinnules, sometimes appear narrower and more rigid than the barren ones. This fern has a pleasant odour when rubbed or dried, and altogether deserves a place in any collection of ferns. As its name implies, it prevails in the State of New York, but it is also plentiful in Canada, and Mount Royal yields it in abundance.

6. *DRYOPTERIS THELYPTERIS* (L.) A. GRAY—*Marsh-Shield Fern*. This fern has strong points of resemblance to that last described. But while the pinnules look much alike, a close examination discloses differences. The fronds have not such a conspicuously tapering top, nor do the lower pinnules become noticeably much shorter than those in the middle, nor have they a hairy outline. The sori are more crowded than on the *Dryopteris Norc-boracensis*, and while they are distinct early in the season, they run into each other later on, and the margins turn in over them, giving the pinnules of the fertile fronds a narrow, sharp pointed appearance, by which the fern is easily recognised. The fertile fronds are also much taller than the barren ones. As the folk-name indicates, this fern favours marshy ground. Wherever the black ash grows, there this fern may be looked for; but it varies not a little in appearance according as it is found in dense or more open woods. It is a widely distributed fern, being found in Europe, Russian Asia and New Zealand, as well as throughout North America.

7. *DRYOPTERIS CRISTATA* (L.) A. GRAY—*Crested Shield Fern*. This fern, like the *Dryopteris Thelypteris*, is well-known to European collectors. I met with it, however, only in Renfrewshire, Scotland. In Canada, it ranges from the Atlantic to the Rocky Mountains, although it is confined to certain localities throughout that range. I found it near Martintown and Summerstown, Ontario, and I saw it growing abundantly by the roadside in Avoca, along



(6) MARSH-SHIELD FERN, *Dryopteris Thelypteris* (L.) A. Gray.



(7) CRESTED SHIELD FERN. *Dryopteris Cristata* (L.) A. Gray.

the valley of the Rouge, wherever the soil was wet. Though a coarse fern, it has a stately form. It grows tall and narrow, its pinnæ being almost triangular in shape. The lobes of the pinnæ are toothed and tipped with sharp points,—whence the name *cristata* or “crowned.” is derived. The sori are of a dark-brown colour and are very numerous, about half way between the margin and the mid-rib of the pinnules, but they do not run into each other, although when ripe they seem almost to cover the pinnules. The number and size of the sori always attract attention to this fern. It grows in the marshy ground, near the bridge between the two Cemeteries, on Mount Royal.

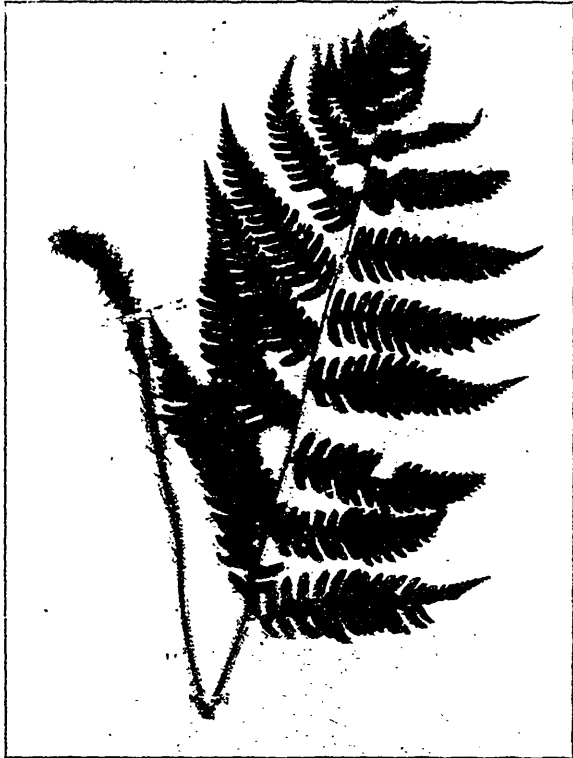
8. *DRYOPTERIS CRISTATA CLINTONIANA* (D. C. EATON) UNDERW.—*Clinton's Crested Shield Fern*. This variety of the “Crested Shield Fern” is strikingly different from the European form of *Aspidium Cristatum*, being distinguished from it, as well as from the typical American *Dryopteris cristata*, by its greater size and more numerous pinnæ and segments. The fertile fronds sometimes rise to a height of four feet, with oblong-lanceolate pinnæ, which are broadest at the base and from four to six inches long. The sori are also nearer the midvein than in “*Dryopteris Cristata*.” I have only further to remark that the barren fronds, both in the typical *Cristata* and in Clinton's variety, are very much smaller than the fruiting ones, as shown in the illustration. This is true of a good many of our ferns, the design in nature being, no doubt, to secure that those individuals of the species on which propagation depends, should be specially favoured with light and air, to bring their fructification to maturity.

9. *DRYOPTERIS GOLDBEANA* (HOOK) A. GRAY—*Goldie's Fern*. This is perhaps the grandest of all the ferns peculiar to North America. Its size, pose and colour, the foliage being in general dark, with lighter shades along the rachis, make this species very showy. It somewhat resembles the “Crested” fern; but the frond is broader, and its pinnæ are not triangular like those of “*Dryopteris Cristata*,” but are broadly lance-like, widest at the middle. They are parted into about twenty pairs of sword-shaped segments, which



(8) CLINTON'S CRESTED SHIELD FERN.

Dryopteris Cristata Clintoniana (P. C. Eaton) Underw.



(9) GOLDIE'S FERN. *Dryopteris Goldiana* (Hook) A. Gray.

are slightly serrate. The sori are very near the midrib, and are close together, but not confluent, with a smooth covering. This fern was thought by Pursh to be *Aspidium Filix-mas*, but Sir J. D. Hooker, to whom it was referred, declared it a new species, and named it Goldieana, after Mr. John Goldie, an Ayrshire man, who settled in Ayr, Ontario, and who was the first to draw attention to its specific characteristics. What makes this fern interesting specially to Montreal people is the fact that Mr. Goldie found it first on Mount Royal, in 1819. Personally, I am interested in the name, as I had the pleasure of the old gentleman's acquaintance when I was a young man, and can count several of his children among my friends. "Goldie's Fern" is not found now on Mount Royal, but it is abundant in Baggs's woods, near the Back River. It is also met with in several other places near Montreal, and in the Laurentian Mountains.

ROBERT CAMPBELL.



MORPHOLOGY.

PART I.

ORIGIN AND DEVELOPMENT OF THE SHOOT.

BY MRS. G. W. SIMPSON, MONTREAL.

The beginning of every plant, whether non-flowering or flowering, is a cell. A cell is a microscopic body full of a material called protoplasm. Every part of a flowering plant, whether embryo, root, stem, leaf, or flower, is a mass of microscopic cells. But only those parts of a plant *actually growing*, such as an ovule, or a growing point, are full of protoplasm. As the cells increase in size they contain less protoplasm, and the cavities caused by the shrinkage are filled with *cell sap*. As the plant grows the protoplasm somewhat alters in structure, if not in nature, and is found lining the membrane which separates cell from cell. This lining the cell retains so long as it lives. Although a cell often contains aromatic flavours and other ingredients, it is customary in describing the contents of a living cell to speak of them collectively as protoplasm.

Morphology is a discourse about shape or form. Plants vary greatly in form; but in the midst of the variety there are certain traceable similarities. It is the province of botanical morphology to discover and name these.

Evolution, a word in everybody's mouth, supposes racial descent with racial likeness more or less discernible; it likewise supposes individual peculiarities, also more or less discernible.

An apple belongs to the pome or apple tribe. A Fameuse apple has the form and features of its race; and it possesses, also, as well in appearance and flavour, an individuality all its own. There has never been more than one Fameuse apple tree. All the trees of that name are parts or cuttings from that one original tree. A seedling Fameuse apple tree will differ from the parent tree just as a child differs from its mother. It is like and yet unlike. It is perhaps like father *and* mother. And more, there is a certain something which proclaims distinct individuality, without destroying

the likeness to the parents. Every seedling apple tree has had two parents. The mother may easily be found; we may gather the apple, select the seed and plant it, with our own hands. But it is not so easy to determine the male element. The pollen which is the male element may have been brought by insects from afar; it may have been produced by flowers on the same tree; it is not likely that it is the pollen of a stamen growing in the same blossom because the pistils do not mature at the same time as the stamens in any *one* particular blossom; and even if a pistil were to be touched with pollen from its own blossom, it would not be affected by it. Such is the unwritten law of Apple-blossoms.

Since, then, seedling plants differ from their parents, of necessity, and, as the generations advance, differ more and more, they afford ample material for observation and comparison. It becomes a very interesting study to seek likenesses and differences,—a study improving to the mind because ever opening up a wider and wider view of the Great Creator's world. "O, all ye green things upon the Earth, bless ye the Lord; praise him and magnify him for ever!"

Race similarities are grouped in our text-books under certain names which generally explain themselves, such as *tribe*, *family*, *genus*. Individualities are noted under *species* and *varieties*. These are broad distinctions whereon to found classification. Minor differences referring to the genus and species are not easily classed, but are extremely important, and must be taken up in detail in the course of a thorough study of Morphology.

No effort will be made in these papers to do the work of the excellent text-books now to be met with everywhere. But we shall try to prepare the way for such study by calling attention to the interesting nature of the work.

We have just mentioned the Cell. The Cell and its protoplasm are the beginnings of a l Nature. Protoplasm, that is, cell contents, is capable of independent locomotion. There are plants generally microscopic, which are nothing more than free atoms of unwallled protoplasm, floating about in water. These tiny plants throw out

thread-like processes and propel themselves hither and thither, swimming with great celerity, and constantly changing shape as they go. Next we find higher forms fastening themselves by one end of their rod-like bodies to some rock or stone while floating on the water by means of the free end of the rod. Here, again, branching processes dive and dance, hither and thither, seeking nourishment in their native element.

Seed producing plants which rank as the highest form of plant life, are generally thought of as stationary. While this is true from a superficial point of view, it is at least as true that they are constantly in motion. They are as restless on the bosom of Mother Earth as a lively infant in its mother's arms. They turn to meet the morning sun, and demurely close their flowers and fold their leaves at night. They lie down along the ground where it suits their circumstances, and climb to greatest heights when they feel the need of air and light, and sometimes they may be truly said to move from place to place—they shift their quarters, so to speak—and the strawberry plant on the hill-side in one season, re-appears by virtue of its runners a foot or more away from the old locality, the next year. The meadow-grass travels on its creeping stem; the Solomon's Seal marks its progress step after step; and our old friend the potato would, if left to himself, move all over the field in which he was originally planted and fill the whole space with his tuberous store-houses.

We need not then be surprised to find that the plantlet in the seed possesses a power of movement so soon as it is awakened from its sleep within the seed-coat. It begins at once to show a distinction between shoot and root. The seedling at its first appearance is a rod like form with a growing point at each end. These growing points are called apices. The one is the apex of the shoot, the other is the apex of the root. The line, or rod of plant matter between the apices is the axis or stem. The seedling itself, as it lies in the seed-coat, is a mass, or aggregation of protoplasmic cells. Between the apex of the shoot and the apex of the root there is a dividing line, not easily discerned until the seedling has attained

considerable growth. This is the point of separation whence the root starts on its journey into the bowels of the earth, and the shoot mounts into the upper air. The point of departure is called the *hypocotyl*, or *under the seed-leaf*, as the word signifies. The seed of a bean, allowed to germinate in water, or very damp earth, will show the parts of a seedling to great advantage. The tiny shoot will be visible, and the stumpy root, and between them the two great seed-leaves. Between the seed-leaves and the apex of the root lies the important, but as yet invisible, hypocotyl.

We will leave the root for the present and follow the *shoot*.

The tiny shoot, too young at first to prepare its own food, comes with its nourishment stored up in the seed-leaves. This shoot has as much life in it as a young animal, and has, enclosed within its microscopic being, all the possibilities of a great tree.

Pushing its way into the air, apex first, it forms, close under the apex, a bud; and below that, but not quite behind it, another bud; and so on until the growing point has lengthened like a telescope drawn out. Each bud is a new growing point, and will in turn repeat the work of the first, or primary shoot. As the buds grow, the stem lengthens. Each bud has a protecting bract, and as the leaves expand it is well to note the difference in appearance between the leaf proper and its leaf-like appendage. The leaves grow faster than the stem and often seem to crowd each other on the young branch.

The production of the shoot in the manner described is called normal; there are also shoots irregularly produced called adventitious. An injury to a plant often induces the growth of adventitious shoots. Such are shoots produced from cuttings; also from tubers, rhizomes, stems and leaves. As the growing point is always formed of cellular tissue, and as the body of most seed-bearing plants is formed of tissue which has outgrown and passed beyond the stage of cellular tissue, such as we find in the seedling, two things are apparent; 1st, that tissue adds to its qualities as it grows; and 2nd, that the older and mature parts of a tree can return to their primitive

condition and furnish the pure protoplasm necessary to the production of the growing point.

There are buds and buds. There are buds growing regularly from seed, such as we have attempted to describe; and there are buds, very like them, growing irregularly from cuttings, tubers, etc. But there are also buds so well provided with protoplasm, and so independent in habit, that they leave the protecting bract, and the supporting stem, and falling to the ground start in life, at once, on their own account.

If we have not already said so, we hope it may be inferred that the leaf is the important member of Shoot Life. The leaf is generally attended by stipules, or a leaf sheath; it has a blade or lamina, and generally a stalk or petiole.

Leaves vary exceedingly both in form and use. They are primarily divided into scales, foliage leaves, bracts and floral leaves.

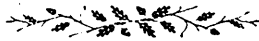
When we speak of leaves, we commonly mean foliage leaves. Indeed it is often thought wrong to speak of petals and sepals as leaves: but all the parts of the flower must be thought of as leaves altered indeed in form in order that they may do the special work of reproduction, but still leaves at bottom, as may be proved by the facility with which horticultural skill, or natural press of circumstances can require a plant to produce leaves or flowers almost at will. The green leaf feeds the plant. The flower leaf produces seed. The flower leaf is so capable of changing its form and use that it can be a petal, a sepal, a stamen, a pistil, just as circumstances dictate. It is not uncommon to find single and double flowers on the same plant. A double flower is only a flower which has grown petals instead of stamens and pistils, in other words, which has turned its stamens and pistils into petals. Will petals then do the work of foliage leaves? It seems not. The work of leaves is to nourish the plant; and the caterer on behalf of the plant-body must be green. This providing power seems to reside in a green pigment called chlorophyll.

A leaf with no stock is said to be sessile.

For the different forms of leaves it will be best to consult an

elementary text-book. They vary too much to be understood without illustration. There are often three or four forms on the same plant; the aster, the water-buttermilk and many other common examples may be cited. The seed-leaf almost always differs from the foliage leaf, and the stipules also. Sometimes the stipules are larger than the leaf proper, and sometimes the leaf proper makes common cause with the stem, as in the case of the Cactus tribe.

LUCY SIMPSON.



HORTICULTURAL SOCIETY'S ANNUAL MEETING.

The annual general meeting of the Montreal Horticultural Society and Fruit Growers' Association of the Province of Quebec was held on December 7th, at the office of the Standard Assurance Company, when the annual reports of the Secretary and Treasurer were submitted and adopted.

The following Board of Directors was unanimously elected:—Honorary President, W. W. Ogilvie, re-elected; Honorary Vice-President, Robert Mackay, re-elected; His Worship Mayor R. Prefontaine; Hon. L. J. Forget; W. M. Ramsay, Standard Assurance Co.; E. B. Greenshields; James Morgan; Jonathan Brown; H. Vincent Meredith; R. Wilson-Smith; Charles Meredith.

At a subsequent meeting of the board, held on December 19th the election of officers for the ensuing year took place, with the following result:—President, W. M. Ramsay, re-elected; Vice-President, Hon. L. J. Forget; Secretary-Treasurer, W. Ormiston Roy, P.O. Box 778, Montreal. Executive Committee—Messrs. David Williamson, Robert Reid, Archibald MacArthur, E. K. Watson, T. W. Burdon, Joseph Bennett, I. Rubenstein, George Copland and W. Ormiston Roy.

The following sub-committees were also elected:—Horticultural Magazine, Messrs. Reid, Burdon and Roy; Juvenile Section, Messrs. MacArthur and Roy; Cottage Gardens, Messrs. Watson, Williamson and Roy; Exhibitions, Messrs. Williamson, Watson, Rubenstein and Roy; Conservatory Openings, Messrs. Burdon and Roy; Window Gardens, Messrs. Bennett, Copland and Roy; Subscriptions, Messrs. Rubenstein, Watson and Roy.

The advisability of holding a spring exhibition of flowers was discussed and very favorably considered, and at the next meeting of the board it may be decided to hold one in April next. It was the opinion of the meeting that an exhibition held in the spring would prove more instructive and undoubtedly be better appreciated by the public than one held in the autumn. Such an exhibition, however, was not intended to take the place of the regular fall show, which, to include fruit, must obviously be held at that season of the year.

It was decided to continue and strongly encourage the Juvenile Branch of the Society which has for its object the creation of a taste and love for flowers, and the dissemination of horticultural knowledge among the school-children of our city and province. All the children attending the public schools are entitled to become Juvenile members on payment of twenty-five cents; poor children are given free membership. Two plants with flower pots and cultural directions are given to each Juvenile member early in the season. The plants are grown by the children and entered for competition at the fall show, when upwards of two hundred prizes are awarded to the successful competitors. Juvenile members receive free admission to all the Society's exhibitions.

The work of the Society for this year will also be to encourage the Cottage Garden Competition, and it is intended that a number of handsome trophies will be offered for competition among the owners of gardens in the city and suburbs.

A DISTINGUISHED VISITOR.

Montreal Horticulturists were favored with a visit during the month from Mr. Peter Barr, V.M.H. (Victorian Medalist in Horticulture) of London, England, who is now on a tour round the world.

Mr. Barr is one of the most eminently known of British Horticulturists. Probably the branch of Horticulture to which he owes his greatest reputation has been in collecting and distributing the daffodils, to which work he has devoted a great deal of his time. Many of our most beautiful daffodils owe their introduction and popularity to Mr. Barr's labours. One of his striking characteristics is self-reliance. He follows his own thoughts to their logical conclusions rather than placing his trust in the decisions of so-called authorities. Though at an age when most men would begin to seek rest and repose from the cares and troubles attendant upon an active commercial life, this sturdy Scot hands over the business to his sons, and starts on a globe-trotting expedition—the outcome of the quality that has made him a successful business man, to wit., an insatiable thirst for knowledge on every conceivable subject.

The London *Garden* dedicated one of its volumes to Mr. Barr in recognition of his services to Horticulture. The following biographical notes are gathered from the *Garden's* dedication notice:

Peter Barr was born at Govan, Scotland, in April, 1826. The looms of Govan, once a prosperous weaving village on the Clyde, were no great attraction for the youth, who had acquired a taste for flowers in his father's garden. At an early age he was employed in the seed shop of Mr. Jas. Thyne, of Glasgow, eventually taking full charge of the seed department. His next appointment was with Messrs. Daly, Drysdale & Co., seed merchants of Newry, County Down, Ireland, when but twenty years of age, where he went through the terrible famine years of 1846-'47, caused by the general failure of the potato crop. From Newry he went to Mr. Richard Smith's nursery at Worcester, then only sixteen acres in extent, and a year or two afterward he was appointed manager to Messrs. Butler &

McCulloch, of Covent Garden. After some years of experience in the London seed trade, Mr. Barr started as a seedsman in the autumn of 1861 under the style and title of Barr & Sugden. Two years later he commenced his labors on bulbs. He has devoted much attention to hardy garden plants as well as seeds, beginning with the daffodils and lilies, and stuying also other groups—such as the scillas, hellebores, funkias, while more recently he has paid much attention to the beautiful genus *pæonia* in all forms and variations, having travelled a good deal in Spain to collect the European species, some of which were known in herbariums, but unknown in cultivation. Mr. Barr will donate a collection of these European species to the Botanical Gardens of New York, Harvard University, University of Pennsylvania, Schenley Park, Pittsburgh, and other American institutions.



WINTER CARE OF APPLE TREES.

The apple orchards of our farms are all-important because we have them, but many of them are not as profitable as other crops because they do not receive proper attention. They are not cultivated in the sense that corn and potatoes are cultivated. Why is it so? Much money and time are expended to grow the trees, valuable land is devoted to them, and through carelessness the whole is at least two-thirds lost.

We know that land occupied by any one crop season after season for many years, will become, for that crop, "land-sick" and unproductive. This may not be true of carrots, onions and grasses, but it is true, generally speaking. Grassland, even, will not remain healthy and productive unless cultivated by mowing, pasturing, fertilizing and harrow-working, with re-seeding. Agitation by the hoofs of animals is cultivation, and renews vigor; mowing does the same and imparts new life, if such work is done before the seed matures.

The orchard does not provide self-cultivation. In neglected orchards the bark becomes dull and lifeless, a limb cut or broken off, leaves a dead stump, and decay ultimately recedes with blighting effect into the heart of the tree. Many hundreds of little suckers fill its body, and thereafter such trees will not produce clean or full-sized fruit. Such results are the direct effect of neglect, either from want of knowledge or attention. Orchards of this class may be resuscitated and made profitable by the application of the pruning-knife and scraper at this season, and other care later on.

Winter pruning should be done carefully, removing as few of the large limbs and as little healthy wood as possible; but do not fear to open the tree so that no limbs cross, and so that daylight will flow freely through in every direction. Three barrels of first-class fruit can be quickly gathered, easily marketed and will bring more money than twice that number of inferior stock. Do not fear to *cut*. Then scrape away all dead or weak, small limbs, rough bark; and, as far as possible, leave only healthy wood and an occasional strong "sucker" to fill the head. Crisp, bright, sound fruit will grow only on absolutely healthy wood, no matter what amount of ground cultivation, tree pruning or spraying you may do.

One growing season's management of an old orchard is worth separate and special attention, particularly when such management will produce results beneficial to the orchard and profitable to the owner. But put the above work in hand at once.—*Country Gentleman*.



TREE PLANTING.

BY JOHN CRAIG.

Referring to the practice of planting what are known as "pole trees," Mr. John Craig writes in *Park and Cemetery*: "These trees are usually contracted for with the nomadic tree planter and tree agent. They are usually dug by this person from groves of slender young saplings in the outskirts of the forest. In setting them on the street their character of stem, top and roots are such as to call for radical transformation. This change is brought about by lopping off the entire top, which reduces the tree to the form of a pole—hence "pole tree." While the removal of the top very often saves the life of the tree it is a practice that should be discouraged, especially with bushy top trees like hard maples. Why is a pole tree inferior to one headed back to a reasonable extent? (1) For the reason that the young branches making the new head are forced out near together at the extremity: (2) these crowd each other in a few years causing decay and the final breaking down of the head in part or whole. In addition, heart rot is often induced by the wound made in removing the top. To substantiate these statements one but needs to look at the street trees in many of our cities. It is true that the natural spreading habit of the elm tends to overcome the defects encouraged by this system, but the same misfortune also often overtakes this noble tree. The mistake that lies at the root of the matter is in the selection of forest-grown saplings. These are entirely unsuited in every way. The nursery grown and transplanted tree is a better tree, will transplant with greater success and without the necessity of severe heading back. Let us discourage the pole tree; let us plant trees symmetrical and well grown.

ORCHIDS AND FERNS IN THE WINDOW.

For the welfare of some of the most attractive orchids in cultivation the costly greenhouse is by no means necessary; indeed I am of the opinion that many orchids may be even more successfully grown in the conservatory, and even in the window garden, than in the average greenhouse. I have named a few of the best ones for this purpose, plants which are not expensive, and which will not

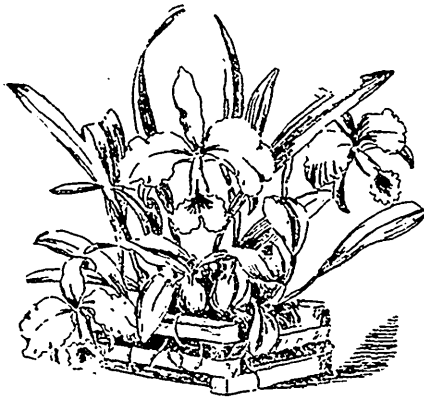


Cypripedium Sedeni.

require any more care than is necessary for a mixed collection of plants in the window garden or conservatory. From a long acquaintance with the public in their estimate of the orchid I feel warranted in suggesting that when beginning the culture of this plant in the window or conservatory, they first of all rid themselves of the idea that the orchid is frail in structure or lacking in vitality: for, as a matter of fact, few plants are more tenacious of life or better able to bear the neglect to which they are sometimes subjected. Assuming that the reader has no knowledge of the culture of orchids indoors, I would suggest that when plants are purchased, the plantsman be requested also to furnish the proper receptacles for the plants, for

some of them do best in pots, while others require cribs or cabins, so called, small wooden boxes made expressly for this purpose. This is an essential point. The soil is also a matter requiring attention, and the florist should also supply this in the proper mixture to suit the various plants. All of the varieties named require a mixture of fibrous peat and sphagnum (moss), while for many of them charcoal and potsherds are necessary.

Cattleya labiata, flowering in the autumn, is a gem among the class, and, like all of the varieties, the flowers are highly colored. It requires plenty of water during the growing season, and plenty of



Cattleya labiata.

drainage, in a mixture of peat and sphagnum. It may be grown either in pots or cribs. *C. perivaliana* is one of the most richly-colored orchids known to cultivators, and, although there is considerable variation in the size and coloring of the flowers, all of them are attractive, and the variety is one of the most desirable for the window or conservatory. If I were confined to the culture of but two specimens, this variety, together with *Cattleya trianae*, would be my choice: both require good drainage, fibrous peat and sphagnum, and succeed equally well in pots or cribs. *Oncidium tigrinum* has long branching sprays of yellow blossoms, very fragrant, and may be readily grown suspended in the conservatory or window. It

requires locating in cribs or cabins, with fibrous peat and moss, plenty of water, and the warm spot in the window. Any one successful with a general collection of plants in the window can succeed with this orchid.

Laelia autumnalis and *L. albida* are easily grown in the window, blooming in the autumn and early winter; the blossoms are richly colored and showy. Their culture should be confined to cribs with plenty of charcoal and potsherds mixed with peat and sphagnum.



Pteris argyrea.

Stanhopea tigrina and *S. grandiflora* are the best of the genus for the window or the conservatory; both are profuse bloomers, the flowers deliciously perfumed, and the foliage attractive; the flowers frequently come out through the interstices of the cribs in delicate pendulous racemes.

The few varieties named will give the grower an abundance of bloom, and enable him to become familiar with orchids, so that an intelligent addition to the collection may be made a second season. Cribs and cabins, peat and sphagnum are to orchids what pots and soil are to other plants, and though the terms are not so familiar to

the flower lover. the uses are the same, and there is no occasion for the general feeling that they can be successfully handled only by the professional plantsman.

A collection of plants in a greenhouse, conservatory or window is scarcely complete without ferns. While it is true that many of them require the peculiar atmosphere of a fern-house of glass for the best results, there are so many that can be successfully grown in the window that we shall have no trouble in securing a desirable collection.

The requirements of ferns grown in the window and conservatory are shade, moisture, good drainage, and a light soil mixed with



Davallia.

sand and peat or leaf-mould. Given these, any one can grow the ferns mentioned here in the window and among a collection of miscellaneous plants.

Frequently one has an east window where flowering plants, requiring sun, will not succeed well, and such a location may be easily arranged for ferns. The winter-grown variety of the maiden-hair fern, *Adiantum cuneatum*, is easily grown in the window, using pots and soil as directed, and giving the plants the shady place in the window. *A. dolabriforme* is especially desirable for growing in

hanging baskets in the window ; it is creeping in habit, with long, drooping fronds at the ends of which young plants form. *Davallia Stricta* is one of the finest varieties for house culture ; the fronds are strong, of a beautiful shade of green, and the plant is a strong grower, standing neglect better than any other variety. There are several other varieties of both *Adiantums* and *Davallias* suitable for culture in the window, which space forbids mentioning.

Polypodium aureum is one of the best ferns for house culture ; it grows to a good size and thrives well in shade when given plenty of water at the roots. *Pteris argyrea* is one of the most useful of ferns ; the foliage is broad and large, and each frond has a broad band of white running through the centre. *Nephrolepis davallioides furcans* is a beautiful crested variety, with numerous arching fronds, which frequently grow three or four feet long, so the variety is mainly suited to the conservatory, where it may have plenty of room.

The dwarf ferns are especially useful for planting in fern dishes for table decoration. The fronds of all are dainty and graceful, and each is distinct from the other ; yet all do well in the same soil. The following are the best for the purpose : *Adiantum gracillimum*, *Lomaria ciliata*, *Pteris cretica mayii*, *P. serrulata cristata* and *P. tremula*.

In using jardinières, it must be remembered that they are intended simply as coverings for the common clay pots, and, as a rule, are not made so as to afford any drainage. Ferns should therefore never be potted directly in them. Use a clay pot of the proper size, provide plenty of drainage by the use of small stones or broken bits of pots, set the plants in the soil recommended above, and the pot is ready for the jardinière. In the bottom of the jardinière place a handful of dry moss to absorb any moisture which may accumulate when watering. Keep the plants well watered, especially at the roots, and provide moisture in the air by spraying the plants occasionally or by dishes of water set among the plants, and you will find ferns as easy to grow successfully as any plants suited to the window or conservatory.—GEO. R. KNAPP, in *The Country Gentleman*.



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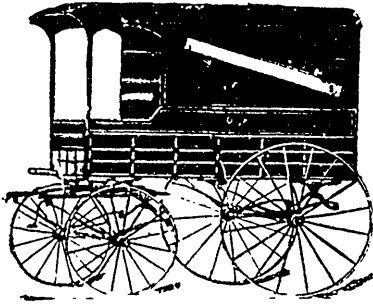
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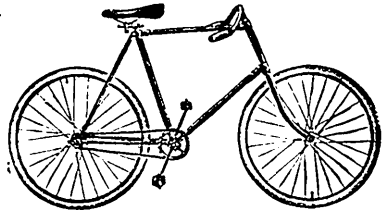
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