

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

Coloured covers/  
Couverture de couleur

Covers damaged/  
Couverture endommagée

Covers restored and/or laminated/  
Couverture restaurée et/ou pelliculée

Cover title missing/  
Le titre de couverture manque

Coloured maps/  
Cartes géographiques en couleur

Coloured ink (i.e. other than blue or black)/  
Encre de couleur (i.e. autre que bleue ou noire)

Coloured plates and/or illustrations/  
Planches et/ou illustrations en couleur

Bound with other material/  
Relié avec d'autres documents

Tight binding may cause shadows or distortion along interior margin/  
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure

Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/  
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

Additional comments:/  
Commentaires supplémentaires:

Coloured pages/  
Pages de couleur

Pages damaged/  
Pages endommagées

Pages restored and/or laminated/  
Pages restaurées et/ou pelliculées

Pages discoloured, stained or foxed/  
Pages décolorées, tachetées ou piquées

Pages detached/  
Pages détachées

Showthrough/  
Transparence

Quality of print varies/  
Qualité inégale de l'impression

Continuous pagination/  
Pagination continue

Includes index(es)/  
Comprend un (des) index

Title on header taken from:/  
Le titre de l'en-tête provient:

Title page of issue/  
Page de titre de la livraison

Caption of issue/  
Titre de départ de la livraison

Masthead/  
Générique (périodiques) de la livraison

This item is filmed at the reduction ratio checked below/  
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	11X	12X	13X	14X	15X	16X	17X	18X	19X	20X	21X	22X	23X	24X	25X	26X	27X	28X	29X	30X	31X	32X
														✓								
		12X			16X			20X				24X			28X							32X

LeGill Price 20c.

\$2.00 per Annum.



# THE CANADIAN



## HORTICULTURAL

# MAGAZINE

PUBLISHED BY THE MONTREAL HORTICULTURAL SOCIETY

PRESENTED TO  
**M<sup>r</sup> WILLIAM BELL**  
FOR PRODUCING THE BEST  
**CARNATION**  
1812

Feb., 1899.

Entered at the Post Office Department of the Dominion of Canada as second-class mail matter.

Vol. II. No. 11

### OFFICE BEARERS - 1898-99.

Honorary President, W. W. OGILVIE.      Honorary Vice-Pres., ROBERT MACKAY.  
 Honorary Microscopist and Entomologist, VERY REV<sup>d</sup> DEAN CARMICHAEL.  
 Honorary Botanist, REV<sup>d</sup> DR. CAMPBELL.  
 President, W. M. RAMSAY, 303 Peel St.      Vice President, HON. L. J. FORGET.  
**DIRECTORS.**  
 His Worship Mayor R. PREFONTAINE, E. B. GREENSHIELDS, JAMES MORGAN,  
 JONATHAN BROWN, H. VINCENT MEREDITH, R. WILSON-SMITH,  
 CHARLES MEREDITH.  
 W. ORMISTON ROY, Secretary-Treasurer, P. O. Box 778, Montreal.

## .. Contents ..

	PAGE.
Canadian Ferns—Part VII.—Dryopteris.....	261
REV. ROBERT CAMPBELL, D.D., MONTREAL.	
Morphology—Part III—The Root.....	271
MRS. G. W. SIMPSON, MONTREAL.	
Conservatory Openings.....	276
Amateur Department.....	278
MRS. ANNIE L. JACK, CHATEAUGUAY BASIN.	

PROPERTY OF LIBRARY  
DEPARTMENT OF AGRICULTURE, OTTAWA

Lent to \_\_\_\_\_  
Date \_\_\_\_\_ PLEASE RETURN  
AL 32

THIS SPACE  
TO LET.

The...

**Major Mf'g Co.,**

(Limited.)

600 CRAIG STREET,  
MONTREAL.

Paper Boxes and Wire Goods.  
Everything in Paper Boxes, Wire  
Cloth and Netting, Foundry Riddles and Seives.

---

## R. A. DICKSON & CO.

Beg to announce to their numerous Customers  
that they will, in their New Premises



2261 St. Catherine Street,

Show one of the  
most Complete and  
Assorted Stock of

**Jewelry,**

that has ever been  
shown...  
in Montreal.

...ETC...

Fine Cut Glass, Clocks, Watches,  
Sterling Silver and Plated Table Ware,  
Brass and Onyx Goods, China Sets.



"NO TROUBLE TO SHOW OUR FINE STOCK."

---

**P. DONNELLY, -**

Manufacturer of

Doors, Sashes, Blinds, Architraves,  
House Finish in all kinds of Hard  
and Soft Woods. Lumber Dealer.  
Venetian Blinds a Specialty. Pack-  
ing Boxes and Cases.

OFFICE AND MILL:

276 CRAIG ST.

Bell Tel. 415.

THIS  
SPACE  
TO LET.

APPLY TO THE PUBLISHERS,

"Canadian Horticultural Magazine,"  
P.O. Box 778. MONTREAL.

**FOR THE CONSERVATORY ...**

**Palms** in many sizes and varieties.  
**Begonias**, foliage and flowering sorts, and the finest and most complete collection of greenhouse plants, of all kinds, that you would wish to see.  
**Chrysanthemums**, just right for potting or for autumn flowers, best kinds only, all named.  
**Roses** for winter flowering, from 4-inch pots, ready in June and July, \$3 \$3 per dozen.  
**Carnations**, large plants for winter flowering, will be ready in September.  
**FOR THE GARDEN.**—Growing plants of all the standard FRENCH CANNAS, \$1.10 per dozen; newer varieties and novelties at reasonable prices. GERANIUMS for bedding, 25 for \$1. COLENS, or foliage plants, well colored, 25 for \$1.

If you have not seen our illustrated Catalogue, write for it; will interest you if you are interested in flowers.

Leading Canadian Florists.

**WEBSTER BROS.,** HAMILTON, ONT.

**GUARDIAN FIRE AND LIFE ASSURANCE Co.**

HEAD OFFICE FOR CANADA

LIMITED

Guardian Assurance Building, 181 St. James St.,  
**MONTREAL.**

Capital Subscribed, - - - - - \$10,000,000.  
 Funds in hand exceed, - - - - - 22,500,000.

Trustees in Canada { W. M. RAMSAY, Esq. J. O. GRAVEL, Esq. Hon. ALPH DESJARDINS  
 R. WILSON-SMITH, Esq. W. H. BEATTY, Q. C.

E. P. HEATON, Manager. G. A. ROBERTS, Sub-Manager.

**LONDON and LANCASHIRE LIFE ..**

1897

Assets - - \$6280,000,  
 Interest overdue 2,005,

A RECORD WITHOUT A PARALLEL.

Head Office for Canada,

Chairman, RIGHT HONORABLE

Cor. St. James & Place d'Armes,

LORD STRATHCONA AND MOUNT ROYAL

**MONTREAL**

B. HAL. BROWN,

J. L. KERR,

Gen. Manager.

Asst. Manager.

\* ESTABLISHED 1825. \*

**The Standard Assurance Co.'y**

OF EDINBURGH.

Head Office for Canada, - MONTREAL.

Invested Funds, - - - - - \$41,200,000  
 Investments in Canada, - - - - - 12,500,000

(WORLD WIDE POLICIES.)

Thirteen months for revival of lapsed policies without medical certificate of five year's existence. Loans advanced on Mortgages and Debentures purchased.

J. HUTTON BALFOUR, Superintendent.

Agents Wanted.

W. M. RAMSAY, Manager.

# EWING'S SEEDS.



Illustrated Catalogues Mailed free, on application, in which will be found enumerated the best varieties of

## Garden Seeds, Flower Seeds, Farm Seeds.

Our stock includes all that is best in **Garden Seeds, Farm Seeds, and Flower Seeds.**

We also call attention to our list of new and special Flower Seeds, which includes the best introductions of the year; as also choice strains of **Pansy, Primula, Cineraria, Cyclamen**, and other Florists' Plants; new varieties of **Sweet Peas**, including **Burpee's Earliest of All**; **Summer Flowering Bulbs** in great variety; **Decorative and Bedding Plants, Climbers, Flowering Shrubs**, and a grand collection of **HARDY PERENNIALS**; **Spraying Appliances, Nikoline** and other **Insecticides**; **Garden and Green-House Supplies**, including the best Lawn Tools, Cultivators, Flower Pots, Spraying Pumps, etc.



### Albert's

#### Concentrated Horticultural Manure, Brand A. G.

It is the only Fertilizer Guaranteed **Free from Sulphuric Acid, Chlorine, Gypsum**, or any deleterious Acids, and is **Soluble in Water.**

Is without doubt the best artificial manure on the market for **Florists and Gardeners.**

#### Albert's Thomas Phosphate Powder

17 to 20 per cent. Phosphoric Acid, equal to 37 per cent. Phosphates. Analysis and purity guaranteed. The cheapest and most profitable sources of available phosphates ever offered. The best Fertilizer for all kinds of Farm and Garden Crops, and is especially recommended by the "Nova Scotia School of Horticulture" for Fruit Trees and all Small Fruits.

Fully descriptive pamphlets regarding these Fertilizers sent on application. Send for one.



# William Ewing & Co.,

SEED MERCHANTS.

142 McGill Street,

 MONTREAL.

THE CANADIAN  
HORTICULTURAL MAGAZINE.

Vol. II.

February, 1899.

No. 11

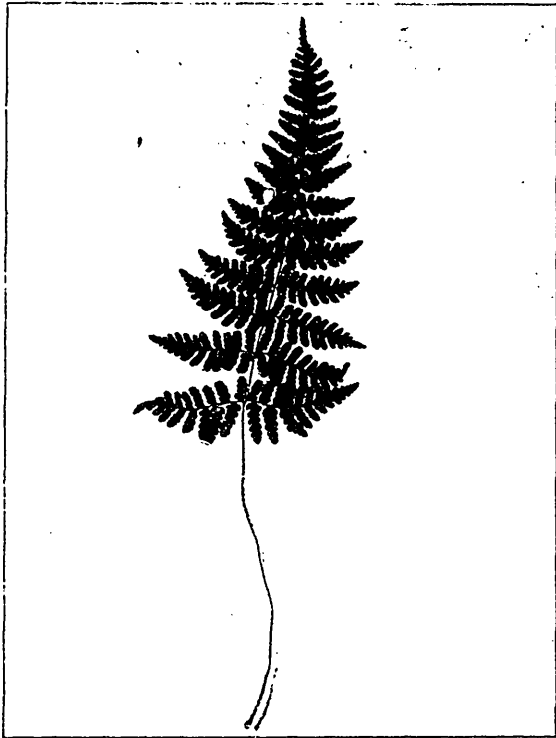
CANADIAN FERNS.

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

PART VII.—DRYOPTERIS—*Continued.*

16. DRYOPTERIS BOOTHII (TUCKERM.) UNDERW.—*Booth's Shield Fern.* Long regarded as only a variety of *Dryopteris Spinulosa*, this fern is at length accorded on all hands the dignity of a "species." It has this position given it in Gray's sixth edition of his "Manual,"—of course not as *Dryopteris*, but as *Aspidium*. Dr. George Lawson called it *LASTREA BOOTHII*, assigning it specific rank, while by some botanists it has been counted as a variety of *Dryopteris* or *Aspidium Cristatum*, named *uliginosum*. It indeed resembles *DRYOPTERIS CRISTATA* in outline. It is, however, when examined with a lens, found to differ in several minute and constant particulars both from *Spinulosa* and *Cristata*. The pinnules are broadly oblong and very obtuse, the upper ones pinnate, while the lower ones are pinnatifid, in this respect differing from the two species just mentioned. The outlines of the pinnules also differ from those of both the *Spinulosa* and *Cristata* Fern. The covering of the sori is glandular, while that of *Spinulosa* and *Cristata* is smooth. The leaves are narrower in proportion to their length than those of *Spinulosa*.

This fern is somewhat rare, although widely distributed in Canada, being found in Nova Scotia and in various parts of Ontario, as far west as London. It is to be looked for in swamps or on the



(16) BOOTT'S SHIELD FERN. *Dryopteris Boottii* (Tuckerm.) Underw.



(1) LONG BEECH FERN. \* *Phegopteris Phegopteris* (L.) Underw.



wet margins of ponds, in woods and thickets. The specimen used in the illustration was collected in a marsh at St. Lambert.

With this fern, we complete the list of Canadian Dryopteris or Aspidium,—the *Oak* or *Shield Ferns*.

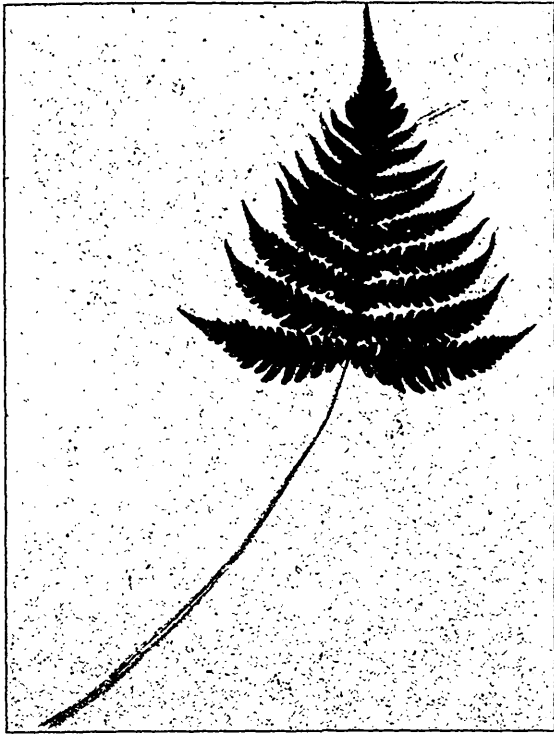
### PHEGOPTERIS.

We now come to deal with the *Beech Ferns*, *Phegopteris* being Greek for Beech Fern, as *Dryopteris* signifies Oak Fern, in the same language. They are rather small ferns.

1. PHEGOPTERIS PHEGOPTERIS (L.) UNDERW.—*Long Beech Fern*. This species is more generally known as *Polypodioides* than as *Phegopteris*; but Britton and Brown, in carrying out the general principle adopted by the Torrey Club, of restoring the specific name first given to a plant, when it can be done with propriety, have gone back to the designation of Linnæus. That great authority, however, counted it among the “Polypodies,” with which it has truly some features in common. But for half a century at least the PHEGOPTERIS has been ranked as a Genus, while its resemblance to POLYPODIUM was still noted in the specific name *Polypodioides*.

The differences between this “Phegopteris” and the one next described are,—that this one is longer than it is broad,—that the lower pair of its pinnæ are bent downwards,—that the midribs of its pinnules are hairy, as well as the edges,—and that its stipes are shorter. Other features of this species are that the points of its pinnæ are blunter than those of the *Hexagonoptera*,—and that the small sori are borne in a single row, near the margin of the pinnules. This fern is known in Great Britain as the “Mountain Polypody,” but it does not abound in the homeland as it does especially with us in the Province of Quebec. It can be collected by the hundred on the wooded hillsides at Cap-a-l’Aigle.

2. PHEGOPTERIS HEXAGONOPTERA (MICHX.) FEE.—*Broad Beech Fern*. This species of “Beech Fern” is distinguished from the last described by being about as broad as it is long—by the sharper-ending of its pinnæ,—by the small hairs growing all over its pinnules, including the margins, but not conspicuously on the



(2) BROAD BEECH FERN. *Phegopteris Hexagonoptera* (Michx.) Fee.



(3) OAK FERN. *Phegopteris Dryopteris* (L.) Fee.

midribs, as in *Phegopteris*,—by its longer stipes,—by the absence of any great deflexion of the two lowest pinnæ,—and by the sori being arranged in two rows at the bottoms of the pinnules. It is also fragrant.

While the *Polypodioides* or *Phegopteris* favours moist hillsides, this fern is to be found only in woods on dry hillsides. It is not so plentiful in this Province as the longer and narrower species last described; but it is more abundant in Ontario than the species *Phegopteris*. The specimen used for illustration was collected on a hillside in Avoca, County of Argenteuil.

3. PHEGOPTERIS DRYOPTERIS (L.) FEE.—*Oak Fern*. This fern, known also by the name *Polypodium Dryopteris*, is almost as widely distributed over the globe as the common Polypody. And yet it is somewhat rare in England and Ireland, although I saw it growing plentifully in Scotland. It is a very delicate and lovely fern, and is easily distinguished from the other two species of *Phegopteris* by its three primary stalked divisions, on account of which it has been often called “Ternate Polypody.” Its stipes are slender, varying in length from four to twelve inches, and are chaffy at least near the base. The primary divisions are pinnate, some of the lower segments being bi-pinnate. In the typical *Dryopteris*, the terminal primary division is considerably the largest, and this makes the fern look longer than it is broad. It is found all over Canada in rocky woodlands.

4. PHEGOPTERIS DRYOPTERIS ROBERTIANA (HOFFM.) DAVENP.—*Robert's Oak Fern*. This variety of the species *Dryopteris* is differentiated from the type just described by the two lower divisions being larger than the terminal one, making it look broader than long, and by its glandular stalks and fronds. It is rarer than the typical *Oak Fern*. The specimen here photographed was collected in the River Rouge district.

#### WOODWARDIA.

This Genus, called after an English botanist, Thomas J. Woodward, who died in 1820, is represented by three species in North



(4) ROBERT'S OAK FERN. *Phegopteris Dryopteris Robertiana* (Hoffm.) Davenp.



VIRGINIA CHAIN FERN. *Woodwardia Virginia* (L.) J. E. Smith.

America, but only one of them is credited to Canada, which we describe below.

WOODWARDIA VIRGINICA (L.) J. E. SMITH.—*Virginia Chain Fern*. This large and coarse fern grows in swamps and wet woods. It derives its folk-name "Chain Fern" from the arrangement of the sori in the fertile specimens. The sori, which are linear, run in chain-like rows, parallel to the margins of the pinnules, and sunk in cavities of the leaf. The leaves are lance-shaped, acute at the apex and narrowed at the base, and vary in length from one to two feet, and in width from six to nine inches. The pinnæ are also lance-like and usually, though not always, alternate in their occurrence on the rachis. The stipes are stout, a foot to eighteen inches in length, and are dark-coloured below. We are indebted to Prof. Fowler, of Queen's University, for the specimen used in the illustration, and it was obtained from him through the good offices of Rev. J. K. MacMoline, of Kingston. The WOODWARDIA VIRGINICA is widely distributed over the continent, as the peatbogs are which are its favourite haunt; yet it is so rare in localities that but few collectors have specimens in their cabinets.

ROBERT CAMPBELL.



## MORPHOLOGY.

## PART III.—THE ROOT.

BY MRS. G. W. SIMPSON, MONTREAL.

The little stem which forms the descending axis of the embryo, and which can be easily seen in any large seed, such as *pea*, or *bean*, by soaking it in water till it swells and begins to germinate, used to be called the radicle, and still bears the name in some text-books. But *radicle* signifies *root*, and it is now understood that the descending axis of the embryo is a stem bearing the *living cell*, or *growing point* of the *root* at its apex. We cannot actually see the *living cell* till it begins to grow, and then it is no longer *one* living cell, but a *mass* of living cells, all so small that but for the increasing size of the mass we could not, without a microscope, see them at all. The stem which lay, ready made, in the seed-coat is always a stem, but its great value to the plant consists in this, that it can, from time to time, according to need, produce new growing points from its base, and thus supply just as many new roots as the plant requires. It happened last month that a seed of Indian Corn (*Zea Mays*), which had germinated in culture-water, met with an accident when it was about an inch and a half high—it lost the tip, that is the growing point of its root. The experimenter felt quite inclined to throw it away, but suddenly remembering that monocotyledones have a habit of preferring lateral roots to primary, it was determined to replace the tiny plant in the culture-water, and see what it would do, if anything. Within a few hours a tiny bead-like protrusion, white as a pearl, appeared at the base of the infant stem, followed, a few hours later, by a second. The new roots immediately took upon themselves the office of food providers, and the primary root, without withering, became a mere stump. This root-producing stem, the radicle of old, is now called *hypocotyl*, a word we have already introduced, signifying under, or below, the seed leaves. The stem in the Embryo, immediately above the seed



leaves, is called the *epicotyl*, which means above the seed leaves ; and the epicotyl is to the shoot what the hypocotyl is to the root, namely, the provider of growing points.

The original or first root of the Embryo, or plant shut up in the seed-coat, is called the *primary* root. The primary root is generally a tap-root. The word tap-root explains itself, it is a tapering root. For types of a tap-root we will take a turnip (*napiform type*), a carrot (*conical type*), a radish (*fusiform type*) ; other forms are varieties of these.

The primary root, important as it is to the embryo, or seedling, in order that the new vegetable may gain for itself a firm place in the earth and secure food, even though it should have to be fetched from the remote depths of the ground, is not found so useful once the plant is established. Its nature is to make straight for the centre of the earth, and if it be hindered in this laudable ambition before it has attained its full length, it turns round at an angle and sends out lateral or side roots, that they may succeed in getting over the impediment, rock or stock, or whatever it may be. The primary root, in these circumstances, not being able to sink itself into the soft earth, is apt to be bulky and unshapely, and its effort to get room to grow will even lift a large tree out of the earth, to its manifest disadvantage. The tap-root is therefore often removed artificially, and the tree made to depend altogether on the side or lateral roots. Roots, as well as shoots, have a branching habit, and it often happens that the roots underground, spreading in a circle, in order to form a firm base, are equal in size and shape to the crown or leaves and flowers overhead.

We will now suppose that we have a full-grown plant, or tree, ready and able to feed itself without the help of the seed leaves. What is the work before it ? Its roots must begin to suck up the moisture out of the earth. Only the tips or growing points of the roots absorb. The business of the hard, woody part of the roots is to keep the plant steady and firm in its place. The tips of the roots are aided in the work of absorption by tiny, silky hairs which creep into the smallest crevices, and find water where apparently no water is.

Water lying in, or passing through the earth, is never pure, in the sense in which distilled water, or rain water, is pure. It is heavily charged with mineral and organized matter.

By means of this water the plant must make protoplasm, without which it has no existence at all; it must lay up stores, without which it cannot endure through summer and winter, through drought and flood.

The elements out of which all these vegetable necessities of life are to be made are, at least, ten in number: (1) Carbon, in the form of carbonic acid gas (as we have seen); (2, 3) oxygen and hydrogen, in the form of water; (4, 10) nitrogen, sulphur, phosphorus, calcium, magnesium, potassium and iron—all of them in solution, for the reason already given, that the food of plants must be in the form of liquid or gas. Iron is necessary to the formation of chlorophyll, and chlorophyll (the green colouring matter of leaves) to the formation of carbon. Thus does nature render her properties interdependent. Nine out of the ten elements here enumerated are administered in liquid form, which calls the *root* into action, for roots absorb liquids, while leaves deal with gas. The root drinks at the tip; and thence to the most distant leaf and bud, the mineralized water is sucked up through what I will call water-ways, or canals, until the whole plant is fed and satisfied. Up the roots into the stems, up the stems into the branches, until every leaf and flower is glad with flower satisfaction. But no part of the living plant must be left without its due quantity of simple water. If at any time it becomes surfeited, it throws off the overplus by means of *stomata* or mouths (holes) which exist generally on the lower surface of the leaf. We may sometimes see this extra water exuding from the leaves of water plants. When drought prevails and water is scarce the young, soft branches and leaves wilt; the waterways have not water enough to send to the extremities; when the main stem is quite dry, the plant is in a bad way, and if water is not soon furnished to the living root, will die beyond recovery.

But the root does its best to preserve its own life under the most unfavourable circumstances, knowing that it should be able to

store the stems lying nearest to it with insoluble food, it will have solid matter to go and come upon, whenever moisture allows the rebuilding of the plant structure in the upper air. Such waiting roots are hardly distinguished from underground stems.

We are generally taught that stems bear leaves and roots none, but to draw a line exactly between roots and stems is not easy, the one passing into the other imperceptibly.

But we should not leave a right impression if we were to allow the reader to suppose that, having spread her table with the ten elements above named, Dame Nature allowed her plant world to drink them in, and feed upon them, without causing them to undergo some process akin to that which we call *cookery*. The cook is often an unconscious chemist. The plant also is an unconscious chemist. The preparation by which the plant prepares the mineral food for its own use and benefit is called *metabolism*. The word signifies change of substance. So far we have been content to refer to it under the general term chemical action.

We ought also to know that *all* the elements which go to make up this earth on which we live, move, and have our being, have, at one time or other, in one place or other, a part in plant formation ; *but the ten above named are never absent.*

It is not the habit of elemental life to continue in one state. Oxygen is in water, in air, and in earth,—in water as a liquid, in air as a gas, and in earth combined with other minerals as an *oxide*, which is earthy mineral matter. Carbon is in the air, and in the earth. Hydrogen is in the water, and in the air. Nitrogen is in the air, and in the earth. And when this is said, the half is not told, for all the elements can make new combinations and throw them off again ; can attract and repulse ; combine and disunite ; fly towards each other, and fly from each other ; change their forms, and seem to change their nature ; and then change back again to the first form. One does not know where to have an element.

A power of selection resides in the plant. Once food is provided, each kind of plant takes what it needs for its own sustenance. Only the right food will be accepted. When the leaves in the air,

and the roots in the earth, have found the raw material proper to the kind of plant for which it is their office to provide, the protoplasm (for every authority at present considers that the power resides in the protoplasm) by virtue of *metabolism*, or transformation, makes of the same elements starch, sugar, acids, bitters, etc., etc., and change starch into sugar, sugar into acid, etc., etc., and changes them back again, if not at *will*, at *NEED*. For nature is never capricious. Starch, for instance, being insoluble in cold water, can be stored close by the water-ways without hurt or damage, until the plant requires it for food. Then metabolism transforms it into sugar, and away it goes with the first flush of the waterways to the top-most leaves and flowers, neglecting none by the way. We remember that sugar is very soluble, and we know that starch is not. When the plant has taken all the sugar that it needs for its present use, then metabolism comes to the front again, and, transforming sugar back into starch, stores it generally in the neighbourhood of the root in low or under-ground stems which we call tubers. The tuber which we all know best is the potato, but there are many others in the world—many more than we could name in a paper like this. In the Bahr el Gazal, a country in Africa, about which we have read lately in the newspapers in connection with the Egyptian war and Lord Kitchener, tubers grow to an immense size without special cultivation. The country is wild, inhabited for the most part by savages. It is equatorial, which is the same as saying that for half the year it is in flood and for half the year it is rainless. Concerning this country the scientific traveller *Schweinfurth* writes: "It is a remarkable peculiarity of the flora of this region that all the species which are not essentially shrubby or arborescent strive for a perennial existence, and, as evidence of this, it may be observed that the roots and portions of the stem beneath the soil either develop into bulbs and tubers, or exhibit a determination to become woody. All vegetation seems to be provided with a means of withstanding the annual steppe-burning, and of preserving the germs of life until the next period of vitality recurs. When their corn provision is exhausted,

or when there is a failure in the harvest, then do the natives find a welcome resource in these tubers; they subsist upon them for days in succession, and find in them the staple of their nourishment whenever they go on their wilderness marches." These tubers are yams, sweet potatoes, manioc, and many others for which we have no names. Under cultivation, Schweinfurth tells us that the yam attains great size,—from fifty, the average, to eighty pounds. It is not unlike the potato, but more tender and of preferable flavour.



### CONSERVATORY OPENINGS, 1899.

Through the courtesy of the proprietors, the following conservatories will be open to the members of the Society and their friends on the afternoon of the dates mentioned:

#### FEBRUARY 18TH.

Mrs. Burnett, 27 Ontario Avenue.  
 Sir Wm. C. Van Horne, 917 Sherbrooke Street.  
 R. B. Angus, Esq., 240 Drummond Street.  
 James Ross, Esq., 310 Peel Street.  
 Robert Meighen, Esq., 140 Drummond Street.  
 R. G. Reid, Esq., 275 Drummond Street.  
 \*T. H. Dawes, Esq., 507 St. Joseph Street, Lachine.  
 McGill Botanical Gardens, Côte des Neiges Road.  
 City Gardens, Logan's Park.  
 Mount Royal Cemetery Co., Mount Royal.

#### FEBRUARY 25TH.

Mrs. Burnett, 27 Ontario Ave.  
 Sir William C. Van Horne, 917 Sherbrooke Street.  
 H. Montague Allan, Esq., "Ravenscrag," 505 Pine Avenue.  
 Andrew Allan, Esq., "Iononteh," 361 Peel Street.  
 Robert Mackay, Esq., "Kildonan Hall," 1059 Sherbrooke St.  
 Robert Meighen, Esq., 140 Drummond Street.  
 James Ross, Esq., 360 Peel Street.  
 W. W. Ogilvie, Esq., "Rosemount," 197 Simpson Street.  
 McGill Botanical Gardens, Côte des Neiges Road.  
 Mount Royal Cemetery Co., Mount Royal.  
 City Gardens, Logan's Park.

\*Open afternoons and evenings.

## MARCH 4TH.

Mrs. Burnett, 27 Ontario Avenue.  
 Sir Wm. C. Van Horne, 917 Sherbrooke Street.  
 Robert Meighen, Esq., 140 Drummond Street.  
 R. B. Angus, Esq., 240 Drummond Street.  
 Robert Mackay, Esq., "Kildonan Hall," 1059 Sherbrooke St.  
 Andrew Allan, Esq., "Iononteh," 361 Peel Street.  
 H. Montague Allan, Esq., "Ravenscrag," 504 Peel Street.  
 James Ross, Esq., 360 Peel Street.  
 R. G. Reid, Esq., 275 Drummond Street.  
 \*T. H. Dawes, Esq., 507 St. Joseph Street, Lachine.  
 Mount Royal Cemetery Co., Montreal.  
 McGill Botanical Gardens, Côte des Neiges Road.  
 City Gardens, Logan's Park.

## MARCH 11TH.

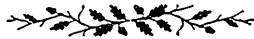
W. W. Ogilvie, Esq., Rosemount, 107 Simpson Street.  
 Robert Meighen, Esq., 140 Drummond Street.  
 City Gardens, Logan's Park.  
 Mount Royal Cemetery Co., Mount Royal.  
 McGill Botanical Gardens, Côte des Neiges Road.

## MARCH 18TH.

Robert Meighen, Esq., 140 Drummond Street.  
 McGill Botanical Gardens, Côte des Neiges Road.  
 City Gardens, Logan's Park.  
 Mount Royal Cemetery Company, Mount Royal.

## MARCH 25TH.

R. B. Angus, Esq., 240 Drummond Street.  
 Robert Meighen, Esq., 140 Drummond Street.  
 City Gardens, Logan's Park.  
 Mount Royal Cemetery Company, Mount Royal.



## AMATEUR DEPARTMENT.

CONDUCTED BY MRS. ANNIE L. JACK, CHATEAUGUAY BASIN,  
CHATEAUGUAY, QUE.

## LETTERS FROM READERS.

DEAR HORTICULTURIST—I want to plant a flower garden this year on a plot of ground that has been kept in grass. Would you advise me to get the turf cut up into beds, and if so, round or oval or any particular shape. There is a long, narrow strip, and it will not leave very much room if large beds are made. Kindly advise, and I hope I shall get the answer before it is time to dig.

For answer we would say that it is better to study first the lay of the land. From the letter we may judge that the "long narrow strip" would be spoiled by being cut up. Better leave the centre in grass. Set out hardy shrubs along each side of the fence, close to it, and then a row of lower-growing perennial or herbaceous plants, and the front fill with annuals or a clump of rose bushes at the farthest end of each side. The hardy Hydrangeas, the Spireas, Deutzias, and the Siberian Pea flower (*Caragana*) with an *Althea* and *Forsythia* make a fine background, and behind them may be the *Syringas*, *Lilacs* and *Weigelias*. The *Spireas* differ very much in height, the best for tall shrubs of this variety are, "*Van Houtteii*," "*Prunifolia*," sometimes called *Bridal Wreath*, and *Callusa Superba*. The dwarf sorts are many, of which, however, *Thunbergii* is best. Besides being inartistic, and often not symmetrical, the beds cut in grass are a very great deal of trouble. They must be continually bolstered up, so to speak, have to be consulted as to quantity and dimensions, and one must be in pleasant contrast with the other or the whole effect is lost. Nor do you wish your little back yard to ape the extensive outlay and display of a park, or public garden, or square. It is better to have it more of your own individual taste. If you like roses best, then do away with some things you do not like so well, and just grow to perfection the flower you claim as your

choice, making it a point, to have them blossom all through the growing season. Later I shall have something more to say on this subject; but I must look over the rest of my letters, and just say that this is only an opinion, and that on this, as every other subject, tastes differ.

Mrs. D. T. writes that she has been troubled a great deal with the red spider, that it weaves great webs over the back of the leaves of her roses and so she has cut them all down and burned the tops. In reply it must be said that this insect is so small as to be a mere speck, hardly visible to the naked eye, and their presence is detected by the upper side of the leaf becoming browned, and the under side showing the ravages they make.

Parlor plants, or those where people are afraid of giving the moisture necessary, are more subject to this pest than where they are regularly watered, and the only remedy is sponging the leaves thoroughly, and spraying to keep them moist. A dry, hot atmosphere is sure to bring them to perfection, and the only remedy is a frequent wetting of the leaves. I have heard of those who, like Mrs. D. T., did not know the minute nature of the insect, looking for a spider of some proportions, and thinking that any webs they saw were made by them. But it would almost need a microscope to detect the real culprit, which has been sapping the life out of the plants for a long time, very often before it is discovered. This is one of the very important uses of a magnifying glass among plants, when depredators are too small to be visible without it.

"Nellie" writes to ask what Canadian firm we could recommend, as she wishes to purchase plants and seeds, and we can only say that it would be unkind to one or more to leave them out in making comparisons, but we think any firm advertising in this Magazine can be trusted to be reliable, honest dealers. Seeds will fail, they are often so badly cared for after sowing that it is impossible for them to grow, and plants are often used the same way. But it is not always a justice to blame the dealer who, for his own



credit, will endeavor to supply the best, knowing that if found otherwise, he will be certain to lose his patrons.

#### WATERING PLANTS.

“Good luck” is often a term used by people in speaking of successful plant-growers—and we have all heard the remark, “She is so lucky with flowers.” But if the truth were known it is more in careful attention than good luck, and in nothing is it more shown than in judicious watering. One thing does not seem to be well understood—that if too much water is given it is worse than too little. Amateurs that are inexperienced seem to think that to be told to give a plant plenty of moisture means to keep it wet and cold all the time. There is need of an intelligent knowledge as to the habits of the plants, too, and to suit them as near as is possible to their native haunts. It is a good thing for a plant to let it become dry sometimes. This is nature’s method, for even in the wettest climate there are some dry periods, but no plant must be allowed to drop its leaves for want of water, and only close attention can give the happy medium. If you rap on the side of the pot with the knuckles a hollow sound denotes want of water, while a dull, heavy tone signifies enough or too much of it.

If the soil remains wet in a pot it is certain to be waterlogged, and should be turned on its side and the water run off, the drainage must then be attended to. The smaller the pot, the more watering the plant needs, all things being equal. Succulent or thick-leaved plants may be put away to rest after the season’s growth. They can be left in a dry place, and will not require water for a while. Showers, like fine dew, are beneficial to the leaves of most plants, and can be done by means of some of the atomizers that are used very successfully in windows, without soiling the floor or window, if the water is clean. Better tepid than cold water, and when the green fly are on the branches of some of the hardier plants, a good soaking in hot water will often destroy them without injury to the plant. But ice cold water is sure to retard growth and flowering.

## THE NEEDS OF THE MONTH.

In our land of snow no work can be done in the garden except to see that field mice do not commit too many depredations. They are often very destructive in the orchard and nursery of young trees, but do not at any time confine themselves to this part of the horticultural department. They will sometimes take the bark off shrubs and choice roses, and last spring we found little mounds of crocus bulbs lying on the grass, that had been pulled up and the heart eaten out of them, a choice morsel, no doubt, for the mice family during the long winter months, but leaving us without flowers of this favorite spring bulb.

A little terrier will do much good in searching for them, and it is greatly practised in orchards to tramp the earth hard around the roots of the trees, so that mice cannot work underneath in the soft snow. They are specially fond of the Flowering Almond, and have destroyed a number of these shrubs for me past any chance of recovery.

If one wishes to experiment in seed sowing in the house, these are often interesting results, and shallow boxes are best, about two or three inches deep. They can be covered with a pane of glass, and are all the better if not water tight. The best soil is a mixture of equal parts of sand, leaf mould, and light loam, all of which much be mixed together and passed through a coarse sieve. The boxes can then be filled to within half an inch of the rim, and preseed firmly and evenly. It is best to water thoroughly a day before sowing, to allow the water to drain off. After they are sown cover lightly with firm soil, place in a southern or western window, and keep the temperature about 60.

The indiscriminate use of water often causes these tiny seedlings to "damp off," and yet it is not safe to have them become dry. Careful spraying with a fine rose sprayer is the best and lightest way of applying moisture. As soon as the plants are large enough to handle they must be pricked out into other pots or boxes, placing them about an inch apart each way. They must be shaded from the sun for a few days. The third transplanting will make

them stocky little plants ready to wait for the planting out season. By the last of this month a trial may be made of seeds of cabbage, cauliflower and celery, with a few of the hardy annuals that will not be injured by planting out of doors, before danger of frost is over. These "needs" are for the amateurs who do not make a hot-bed, those who do can tell by experience as to weather when it seems safe to sow seeds.

In looking over the catalogues of reliable seedsmen and nurserymen, before the garden work begins, it is important to study for earliness and hardiness in this northern climate and so save disappointment. Not the gayest coloured flower, or vegetable, or fruit, but such as has been tested and endorsed, by those whose word can be depended upon. Quick-growing and early-maturing are more important in this Province than enormous production that is not mature when frost comes. In these very important matters good catalogues guide and direct us.

Much disappointment could be averted by testing seeds. Many seedsmen test all they send out, but if one is not certain, or has seeds left over from last season, it is best to prove them before planting them. The easiest method is to count out a few seeds so that you can know the exact percentage that germinate. Place the seeds in a shallow dish, a flower pot saucer will answer, spreading them out and keeping moist. In the temperature of an ordinary living room they will germinate in a few days, but if they start slowly and are weak it is a sign that the seed has lost some of its vitality, and for this reason the experiment is useful.

#### SEASONABLE RECIPE FOR VEGETABLES.

Stuffed Turnips.—Peel and boil some medium-sized turnips, in salted water, drain, and scoop out half the middle with a tea spoon. Mash the part taken out with butter, pepper and salt, and the yolk of an egg. Fill the turnips with the mixture, baste with the white of the egg, and set in the oven to brown.

Saratoga Potatoes.—Cut raw potatoes in slices as thin as wafers, lay in cold water for several hours, with a small bit of alum to make

them crisp. Rinse and dry with a towel before dropping into hot lard, as for crullers. Skim out and sprinkle with salt, and serve hot.

Stewed Carrots.—Boil the carrots until they are half done—then cut into thick slices; put them into a stew pan with as much milk as will only just cover them, a very little salt and pepper, and a small quantity of chopped parsley, simmer until tender but not broken, add a piece of butter rolled in flour and put into the oven a few minutes in a covered dish.

Imitation Duck.—Boil two large onions until nearly soft, chop them fine and mix with stale bread that has been soaked in milk, add a little powdered sage, some pepper and salt. Pour the yolk of one or two eggs among it, and put it into a greased baking pan, strew bits of bread grated fine, and small lumps of butter over the top and bake for half an hour. It makes a savory breakfast dish and is economical.

To Cook Celery.—Pick over and wash two heads of celery, cut them into pieces an inch long and stew in a pint of water until tender. Rub a large tablespoonful of butter and a spoonful of flour well together, stir in this a little cream, put in the celery and let it boil up. It is a healthful vegetable, and is served with boiled poultry, but is a pleasant addition to our winter vegetables for those who like its flavour.

And the student of diet and hygiene nowadays has proved beyond doubt that we eat too much meat and not sufficient of the vegetable product of the ground. And while canned vegetables have become almost indispensable, and are certainly very useful, there is nothing so appetizing as the products of the earth, in any form, and more especially if of our own growing.

#### PLANTS IN POOR PEOPLE'S HOMES AND SICK ROOMS.

A writer in one of our best floral magazines, speaking of the efforts of some of the very poor of New York city to raise flowers, said "that in one window was a Ricinus, or Castor Oil Bean, growing in a common flower pot." The owner was probably not able to purchase a seed, but having an inborn love for the beautiful, had done the best she could.

One package of seed, or slips of some easily rooted plant, given

to some poor child or woman, would make many a dark day bright for them here, and give them a hope of something better in the life to come. We often throw away slips that we do not want ourselves, which would be treasured by some poor soul, starving for some bit of brightness in this life that has been denied them.

A few cut flowers sent into the sick room will give the invalid something to think of, and make the always long and dreary days there seem much shorter and brighter. I remember during a recent illness of my own, when the hours seemed to drag along like days, how a blooming Rose or Carnation of my own, brought into the room, would cheer me up and give me something to think of. Although I was ill at the time when the

"Hills beneath the October skies  
Had caught the lights of Paradise,"

and my couch was placed near a window where I could look off to the distant hills and watch the autumn passing in glory away, there were times when I longed inexpressibly for the sight of one tiny flower.

Having a large, beautiful white Hyacinth—the first of the season—I hesitated about sending it to an invalid, but finally clipped it and sent while fresh; a few days afterward, when she was lying under the sod, and I heard how much pleasure it had given her, I was very glad that I had made a little sacrifice.

During the summer months most flowers bloom better for being cut often, especially the annuals, which if once allowed to form seeds will stop blooming. Tea Roses, too, should be cut often, and if cut with long stems new branches will soon start. I have never yet seen anyone who does not like the Sweet Pea, and they should be cut fresh each morning.

I believe in flowers for the living as well as for the dead. A few of these silent messengers sent to one in trouble will give more comfort and hope than whole volumes of words, and they will often be thankfully received when visitors would not be admitted.

In giving plants to either semi-invalids or beginners, one should give a few instructions as to their cultivation, remembering that it is

not everyone who reads a floral magazine. In sending cut flowers send something that will last a few days unless you know there will be something fresh every few days. Cut flowers will last longer if the stems are trimmed and placed in fresh water daily and they should never be tied, but thrown loosely into a vase. Clear glass should be used, allowing the leaves and stems to show. A bit of charcoal in the water will keep them fresh much longer.

To shut-ins who are confined to a room for months at a time, how much pleasure a budding potted plant would give. Watching the new growth, and the buds expanding from day to day, would give them new interest in life.

“And with childlike credulous affection  
We behold their tender buds expand:  
Emblems of our own great resurrection,  
Emblems of a bright and better land.”

### WIRE FENCING FOR TRELLISES.

BY BETH DAY.

Those to whom economy of space, as well as greater productiveness of the vines, is an object, as with truck farmers, market gardeners and those who raise vegetables for the canning factories, will find that the surest way to secure both, in the cultivation of cucumbers for instance, is to train the vines on trellises.

Almost any of the many varieties of woven wire fencing may be used for this purpose, and will be found economical, as it can be used year after year. Trained on a trellis the vines are out of the way, and when the hot, dry weather comes, the earth about the roots may be well stirred and a thick mulching of coarse, strawy barn yard litter put about them, thus keeping the roots moist and cool and prolonging the bearing season for several weeks.

The vines take to climbing readily, and need but little training. The cucumbers hang down through the meshes of the fence—it should not be set straight, but should be at an angle of about forty-five degrees—and none are missed in the gathering and left until too large, as is often the case when they are allowed to trail over the ground. The gardener walks behind the trellis and can see at

a glance just which are ready to cut. Neither does the gardener crush the vines under his feet in searching for the fruit. Ripening fruit exhausts the plant rapidly.

Those who once test the convenience and benefit of growing them in this way will never go back to the old method of letting them trail over the ground. Tomatoes may be advantageously trained to trellises of this description, as they need, when fruiting heavily, some strong support; but, not being of a climbing nature, they will require to be tied to the wires here and there.

As a support for sweet peas there is nothing equal to the woven fencing. For all ornamental vines, whether climbing over porches, around windows, or used as a screen in the open garden, there is nothing else that can be so quickly put in place, or that will answer the purpose so well.

When the season is over the trellis may be removed and housed for the winter; it may be laid down with the vines, if tender, still upon it, and covered for the winter, or, if desired, it can be left in its place for another season.





The illustration depicts a woman with a large, pointed hat and braided hair, holding a tray with a cup and a bottle of Bovril. The scene is framed by a decorative border.

**BOVRIL**  
For Health and Strength.



# 10<sup>th</sup> Standard Works on Agriculture and Horticulture

Practical Floriculture, by Peter Henderson	\$1.50	Cook's Manual of the Apiary	\$1.25
Gardening for Profit " " "	2.00	Bees and Honey, by Thos. G. Newman	1.00
" " Pleasure " " "	2.00	How to make the Garden Pay, by T. Greiner	2.00
Hand Book of Plants " " "	4.00	Mushrooms. How to Grow them, by Mr Falconer	1.50
Nicholson's Illustrated Dictionary of Gardening	5.00	Allen's New American Farm Book	2.50
4 vols. each			

SENT POST PAID ON RECEIPT OF PRICE.

**W. DRYSDALE & CO.,** School and College Books a Specialty.

Publishers, Booksellers and Stationers 232 St. James St., MONTREAL.

**THIS SPACE  
TO LET.**

## Seal Brand Coffee

Only ripe full grown perfect coffee used in this famous brand.

## Chase & Sanborn,

MONTREAL,  
BOSTON, CHICAGO.

## G. A. GRIER,

Wholesale Lumber  
and Timber Merchant.

OFFICE:

2704 Notre Dame Street.

# JOHN ALLAN,

CARPENTER  
AND BUILDER...

Conservatory Building a Specialty

Estimates cheerfully furnished on application.

26 STANLEY STREET, MONTREAL.

**...IMPORTANT NOTICE...**

A Popular Edition  
of the Celebrated  
Work entitled

**Familiar  
Wild...  
Flowers**

is now being published, to be completed in 21 parts, at 20 cents per part or \$4.00 for the complete set—payable in advance. This is just one-fifth of its former price.  
"The Colored Plates in 'Familiar Wild Flowers' are exquisitely beautiful; they are more like finished paintings than print."—*Gardener's Magazine*.  
"This is a charming work. The lover of wild flowers will be sure to add it to his store. The colored illustrations are perfectly true to nature, and are in the highest sense 'things of beauty.'"—*Irish Times*.

**F. E. GRAFTON & SONS,**

Publishers, Booksellers and Stationers,

250 St. James St., MONTREAL.

Send for Catalogue of  
Standard Rural Books,

Bell Telephone 1665.

**D. Nicholson & Co.,**

**.. ROOFERS ..**

41 ST. ANTOINE STREET.

Gravel Roofing a Speciality.  
Repairs of all kinds promptly  
attended to.  
Charges very moderate.  
A trial solicited.

**Alex. Bremner,**



Drain Pipes,  
Farm Tiles,  
Land Plaster,  
Portland Cement,  
etc.

50 BLEURY ST.,

...MONTREAL.

Bell Phone 356. Merchants' Phone 50.

**Squire, Watson & Co.,**

ARE SOLE AGENTS FOR

FOX CUTLERY CO.—Razors, Scissors, Pocket,  
Pruning and Budding Knives.

F. DUMOULIN & CO.—Guns, Rifles and Revolvers...

A. & F. PARKES & CO., Ltd.—Shovels, Spades,  
Draining and Garden Tools of all kinds.

CHRISTOPHER JOHNSON & CO., Sheffield.—  
Finest grade goods in Pocket Knives, Table  
Cutlery, Carvers, etc.

JOHN YATES & SONS—Silver Spoons and Forks,  
and Electro Plated Ware.

Temple Building, - MONTREAL.

Solicit Orders for Import.

**Wm. F. Coupland,**

129 1/2 ST. ANTOINE STREET,  
MONTREAL.

**CARPENTER  
and BUILDER.**

Orders promptly attended to.

...Telephone 1973.

**Desks, and  
Office Furniture.**

Why write on the kitchen table  
When you can buy one of  
TEES' DESKS?

**TEES & CO.**

300 St. James St.

**Get your**

**Magazines and  
Library Books**

BOUND BY.....

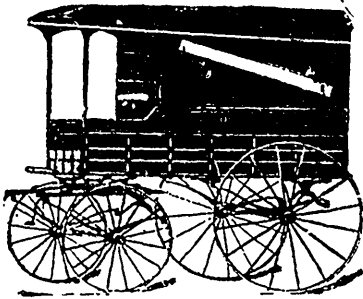
**Plow & Sully,**

**General Bookbinders,**

448 ST. JAMES STREET.

The "Horticultural Magazine" neatly  
bound for 60 cents.

Tel. 406



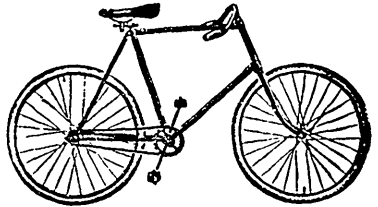
**Express . .**  
 and Delivery **Wagons**  
**Phaetons, Buggies,**  
**Carts, Farm Carts and Wagons**  
 FARM IMPLEMENTS OF ALL KINDS.

**Nichol's Chemical Coy's "FERTILIZERS"**

Plant Food, Etc.

**BICYCLES . . . .**

For Men, Women and Children.  
 All Sizes. All Prices.



**R. J. LATIMER, 146 McGill Street.**

**WM. EVANS,**  
 Seedsman,

ESTABLISHED 1855

Cor. McGill and Foundling

☀  
**FRESH**  
**FLOWER and**  
**VEGETABLE**  
**SEEDS**  
 —  
**GARDEN**  
**TOOLS**  
 —  
**FERTILIZERS**  
 Etc., Etc.



☀  
**SPRING and**  
**FALL**  
**BULBS**  
 Large  
 Assortment.  
 ☀  
**Lawn**  
**Grass**  
**Seed**  
 A Specialty.

☀ 81  
 5391 K.W.

SEND FOR ILLUSTRATED CATALOGUE.