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NOTICE—The August Excursion will be to the "Victoria Sulphur Springs," on 18th August. See Page 76.

August, 1888.

THE
* OTTAWA NATURALIST *

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The
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Of the
* Ottawa Field-Naturalists' Club *

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NOTICE.—The Treasurer begs to call the attention of members to the advertisements.

SUB-EXCURSION NO. 7, 14TH JULY.

A VISIT TO THE GOVERNMENT EXPERIMENTAL FARM.

Undoubtedly one of the most successful sub-excursions which has ever been held under the auspices of the Ottawa Field Naturalists' Club took place on Saturday afternoon, when, through the kindness of Prof. Wm. Saunders, director, the Central Experimental Farm, in connection with the Department of Agriculture, was visited and examined. A large gathering of members of the club and their friends met at the city Post-office, and taking the busses provided by the excursion committee, soon reached the place of interest which was to form the rendezvous for the afternoon. On their arrival the naturalists were cordially greeted by the genial professor, who, on invitation by the president of the club, Mr. R. B. Whyte, addressed the members, and in a clear manner sketched a general outline of the work performed, and gave interesting details regarding the distribution of the crops, etc., on the farm. Professor Saunders, in company with Mr. Fletcher, the Entomologist and Botanist, and Mr. Hilborn, the Horticulturist, then most courteously piloted the party through the more interesting parts of the farm, pointing out some of the manifold species of plants of especial interest which are being grown and tested. With eagerness and pleasure the various groups of naturalists listened to every word which fell from the lips of these gentlemen. Seed crops from various countries were seen growing in great abundance, and boreal species were particularly noted, as such forms are likely to be best adapted for cultivation in the more northerly regions of Canada. The different varieties of beans, potatoes (seedlings and otherwise), wheat, barley, oats, peas and many other agricultural products, were pointed out and noted, as were also the various kinds of apple, cherry and plum trees. The "shade" or "covering" for pine and other coniferous seedlings was also examined, and the tiny "monarchs of the forest" seen growing in great profusion and doing splendidly. In the garden proper many varieties of small fruits and flowers were seen, as well as many kinds of shrubs and trees. With the kind permission of the director and horticulturist, the excursionists had an opportunity of testing some of the new varieties

and seedlings of small fruits, which were greatly enjoyed, and many pronounced "excellent" by everyone.

This done, the party re-assembled at Professor Saunders's house, where refreshments had been generously prepared by Mrs. Saunders. A very pleasant and social hour was then spent by all, after which a series of addresses was given, in the course of which the aims and purposes of the farm, its horticultural, botanical and entomological, as well as geological aspects were considered.

Professor Saunders being called upon, said that it was not a difficult task for him to speak about the farm when he was surrounded on every hand by so many interesting objects. He referred to the progress made in every department of the work, and indicated many ways in which the Experimental Farms were being made practically useful to agriculture in Canada. Referring to the club's visit last year and the warm reception which greeted them at the hands of the mosquitoes on that occasion, Mr. Saunders recalled to mind the ignominious retreat of some of the naturalists, caused by the violent onslaught of vast multitudes of those fearless, winged creatures. There was then a thirty-eight acre swamp in the southwestern portion of the farm where no drainage system existed, and where from one to two feet of water lay over the greater part of the surface of that area all the year round—a perfect paradise and breeding ground for mosquitoes. On the farm to-day there are already six miles of main drains through the swamp, and now we can sit in peace without being disturbed by the melody of these swamp-dwellers. The work on the farm is many-sided. The old snake fences with the boulders alongside have been done away with; the large boulders which strewed the fields and covered a large area of land have been blown up with dynamite and the fragments utilized as road-metal; many of them contained rare and interesting fossils. Several roads have been built, consisting of the large boulders at the bottom, smaller ones above, broken macadam above that, and the Leda clays found on the farm capping all. These roads are dry and substantially built, and will be a permanent benefit to the farm. Several buildings have been built since last year, including a large barn, probably the finest barn in the Dominion, and five houses for the staff. Besides this work there were 150 acres of stumpy land, covered with

second growth poplar and birch, which have been cleared. The second growth trees have been pulled up bodily with chains, and dynamite used for removing the stumps, and the land thus cleared is now yielding grain, ploughing having been done early in the season. Last season's work might be styled the period of foundation, and it is hoped rapid improvements will follow. The newly cleared land referred to will afford excellent opportunities of experimenting with fertilizers. In the use and application of fertilizers many errors have been made. In this virgin soil the Professor hoped to elucidate this important question, eliminating as much as possible the errors which have crept in on account of applying the fertilizers to partially or wholly exhausted lands, or to lands already highly manured. We shall be able, he added, to test the different fertilizers and combinations of fertilizers, by continuous experiment year after year on the same soil and with the same crops until some definite conclusions are reached regarding their relative merits in bringing about an increased yield. Fertilizers will necessarily be much more used in the future than in the past, especially on the more or less exhausted lands in the older Provinces where the three important elements required, viz., phosphoric acid, nitrogen and potash are becoming rapidly exhausted. Those portions of Canada which had been under cultivation for a long period needed fertilizers most, while such lands as those of Manitoba and the great North-West had little need of fertilizers at present. Professor Saunders then briefly referred to the able work performed by Mr. Fletcher, the Entomologist and Botanist, and by Mr. Hilborn, the Horticulturist to the farm. These gentlemen would speak each on his particular branch. He continued, and said that if they succeeded in introducing from time to time such new varieties of wheat, barley and oats as would be useful to the country, the good resulting from this alone would be found of inestimable value. Much had been done in procuring trees, shrubs and fruit trees from various parts of the world. Directors of botanical gardens in various countries had given handsome donations and had promised to send more. Perhaps the most interesting received were those which came from the Agricultural College in Japan, where they grow many varieties of grain, shrubs, trees and vines peculiar to that country. He had received a letter from Japan this week in which the Canadian Experi-

mental Farm authorities received the thanks of the Japanese Government for exchanges sent from Canada. Many varieties had been sent, which, it was expected, would be of much use in the northern provinces of that country. Hitherto the Japanese had done very little in the way of cattle-raising, but were now devoting more attention to this important branch of industry. Prof. Sargent, of the Arnold Arboretum, Boston, had been kind in sending seeds to the Experimental Farm, and more had been received from Kew and St. Petersburg, so that quite a large number of useful trees and shrubs had been added to the stock on the Central Experimental Farm. Collections of these and other useful trees and shrubs are being sent to the different Experimental Farms of Canada, in Nova Scotia, Manitoba, the North-West Territories and in British Columbia, so that these would soon be stocked in this way with valuable material for experimental work. Prof. Saunders then thanked the members present, said he was glad to see them all, and hoped they would meet there again at some future time. Mr. Hilborn, the next speaker, was introduced by Mr. Whyte, who, in doing so, described the various parts of a flower, and the functions which each was called upon to perform. On rising, Mr. Hilborn said that he was highly pleased to meet with the club on this occasion, it being the first excursion at which he had been present, although he had been a member for some time past. He dwelt at length upon the various methods and devices used in cross-fertilization so as to produce hybrids, and therefrom obtain hardy varieties. In his department of the farm work, considerable attention had been given to fruit trees, etc., and the following would serve to illustrate the work done. There had been planted 300 varieties of apples, 110 varieties of pears, 80 varieties of cherries, 90 varieties of plums, 150 varieties of grapes, 110 of strawberries, 50 or 60 of raspberries, and 50 varieties of currants and gooseberries. There were some very fine fruits amongst these which were well adapted to the climate of this country. There were experiments being made to test which of these varieties would stand best, and a careful selection of such would be employed in cross-fertilizing; thus he hoped to get useful and hardy fruits. It was done in this way: Select a hardy variety for the female parent and get stamens from another—the male

parent—which are ready to open, and dust the pollen over the pistils. Cover the flower with a close fitting paper bag, which is left on four or five days so as to leave no chance for fertilization by wind or insects. Gauze bags are then placed over the young fruit, and retained there until the fruit ripens. The seed is then carefully washed out and planted, and every seedling produces some fruit, possibly each one different. Perhaps only one in a thousand will produce a good hardy variety; but one such occasionally amply repays for the trouble, and no limit can be definitely placed in this line of research, time alone can tell what can be done in that direction. The past and present seasons were both very dry, and the fruit trees and vines did not present so good an appearance as he would have desired.

Mr. James Fletcher was then called upon to say a few words. He was particularly engaged, in connection with his office at the farm, in entomological and botanical researches. Whilst, for accuracy's sake, the scientific aspect of the question was never lost sight of, he hoped to be able to show that the work done was pre-eminently of an economic nature. Besides the numerous problems of great interest to the student of nature, the practical requirements of a great country with agricultural capabilities such as Canada possessed, were the first to engage the attention. Science now-a-days no longer meant theory and speculation, but that word should be taken in its true sense as synonymous with knowledge. Whilst his researches in plant and insect life were closely related to each other in many respects, in some points they were quite different. An area of 65 acres had been appropriated on the farm for the purpose of laying out a Botanical Garden. This would be an object of special interest to the members of the club. He hoped by next year to have some work done on it to show scientific visitors. The land was being prepared and material was being gathered together. Large collections of seeds and plants had been sent to the Experimental Farm from all parts of the world, including many excellent things which would be of use in many parts of this country. Collections of young forest trees had been received and planted, France and Russia having contributed a large number, last autumn he had collected and had planted vast numbers of seeds of our most useful native trees. It was already necessary to replace

the wool removed by the farmer or lumberman, so as to produce not only new timber, but also to preserve important and beneficial results affecting the climatic conditions of a district. Fodder plants were receiving special attention and collections of our native Canadian grasses were being tested with a view of obtaining such a mixture as would make a good and "permanent pasture." This was greatly needed in Canada. Farmers in this country were in the habit of importing their grass seed from Europe, but this did not always prove satisfactory. Seeds of certain plants grown in northern countries were better and produced more vigorous plants than when grown in more southerly regions. Clover seed grown in Canada realized a much higher figure and was sought for more eagerly in the American markets than that grown in the United States. During his visit to the North-West last summer Prof. Saunders had obtained seeds of several species of grasses, and others had been obtained from correspondents. Experiments were now being tried with them, and it was hoped that good results would follow the testing of some of the more promising sorts. It was strange that there should be so few of our native grasses known to farmers and utilized by them. Many meadows needed to be replenished, as they were quite worn out. Regarding his duties as entomologist, Mr. Fletcher said everybody will see that they are a necessity this year. Ravages by insects are reported in all quarters, from the Atlantic to the Pacific. In Europe the same troubles are felt this year as we feel in Canada. In Canada farmers had applied readily for remedies, and it had been a great pleasure to him on many occasions to be able to advise them how to cope successfully with their enemies. There were two leading modes of treatment, depending upon the nature of the insect injury. Injurious insects might be divided into two classes. (1). Those which took their nourishment by means of masticating jaws, or (2) by sucking with a tube—for the first a poisonous substance had to be applied over the surface of the plant likely to be destroyed—whilst for the other, a substance which gives off volatile matter (like pyrethrum) was applied. Pyrethrum or "Insect Powder" was a most useful substance, and its properties were graphically illustrated from an experience he had recently had in the Nepigon district—a place

noted (1) for its trout, (2) for the abundance and variety of representatives of the mosquito tribe. "Insect powder," or pyrethrum, was used with great advantage, and the simple act of burning a small pile of this substance in the room quieted every mosquito and afforded an excellent opportunity of enjoying a good sleep, which it would otherwise have been impossible to obtain. He had just returned from an expedition to the locality mentioned with the eminent American entomologist, Mr. S. H. Scudder. They had gone to collect the eggs of some rare butterflies and had been very successful, having secured eggs of no less than 14 species. An important investigation now being carried on was with reference to the timber-boring beetles. The life-history of these insect enemies, which destroy annually a large quantity of timber, especially that which has to remain in the woods after being cut for a season or two, was not yet fully known, and a link was necessary to complete the chain of our knowledge regarding them. He was of the opinion that if the time and manner in which the beetles laid their eggs, whether on the surface or in crevices and holes of the bark, or in other ways, as had been variously stated, were accurately determined, a remedy might then be found. If the beetle as is supposed by some, gnaws a hole in the bark in which she lays her eggs, it is possible that the old reliable poison, Paris green, as had been suggested to him by Mr. J. M. Irwin, of Peterboro, might be useful in poisoning or deterring the insects from depositing eggs on logs protected by this substance. In a knowledge of the life history of an insect lies the secret of success in the work of an economic entomologist.

At the request of Professor Saunders, Mr. Henry M. Ami, of the Geological Survey staff, and leader in geology of the O.F.N.C. was called upon to give an account of the geological features which characterized the farm, a subject which had engaged his attention for some time past. Mr. Ami began by stating that the rocks which were found on the farm belonged to two great periods or systems in geology, widely separated in time and differing in many characters. The older and underlying series had been deposited in palaeozoic times, a period long anterior to the advent of man or even of mammalia upon the earth. The limestones which were seen to crop out in various places contained many remains of fossils entombed in them, such as trilobites, eucrinites.

and numerous varieties of shells. These served to tell the age of the rocks in which they were found. There were fossils found which belonged to the Trenton formation, and many rocks, especially those around Prof. Saunders's house, showed evidence of the Black River age. The outcrop last referred to, had been puzzling for a long time, as the dips in the strata exposed, varied very much and went in every direction. A large shell belonging to the genus *Maclura* had been observed that afternoon and other genera which showed that Black River limestone occurred there. Reference was then made to the newer series of rocks, namely, those belonging to the latest periods in the history of this continent. Overlying the old Trenton and Black River rocks could be seen large accumulations of boulders of all sizes, rounded, smooth and polished pebbles, which show in habitable evidence of the action of glaciers, which were prevalent at that period in the world's history. The "great ice age" then prevailed over this part of the continent, and was followed by a great submergence of the continent on account of the superincumbent weight of the great ice sheet. The sea encroached upon the land, and marine deposits were made. Several species of marine shells had been found by the speaker on the farm, which were easily recognized as being quite similar to others now found living in the Gulf of St. Lawrence, along the Labrador, Newfoundland and Greenland coasts, as well as elsewhere. This period of submergence, or flood, was followed by another of elevation, and the marine condition of affairs, which at one time prevailed on the farm, were changed and dry land appeared—the deposits of this post-tertiary sea—forming the soil, which is now under cultivation. The continent was still rising, as far as could be judged, along the shores of the St. Lawrence. The presence of raised beaches was a good proof of it. The most recently formed beds were caused by the wind and overlaid all the others. These were still going on. The light sandy soil or loam so widely distributed on the farm seemed to contain a good deal of vegetable matter, whilst the underlying clays afforded heavier soil. The geology of the farm was interesting and many points were well worthy of careful study. Mr. Ami thanked the members for listening to him so attentively, after which Mr. Boardman arose and proposed a hearty vote of thanks to Prof. and Mrs. Saunders for their hospitality and kindness,

which was ably seconded by Mr. T. J. MacLaughlin. The first speaker bore testimony to and spoke in very flattering terms of the grand work which it was apparent to all was being accomplished by this institution—the Central Experimental Farm—and anticipated illimitable benefits to such members of the farming profession as availed themselves of its advantages.

Mr. T. J. MacLaughlin, the secretary of the club, in seconding the vote of thanks, said he was sure that all present had enjoyed themselves very much. That new and comparatively unfinished as the Experimental Farm was, compared with what it would be in the near future, and immature as its aims and objects must yet necessarily be, all present must have been surprised at what they had seen and heard in connection with it. The vast improvement wrought in so short a time was astonishing, and the director and his assistants had every reason to be gratified at the results of their labours. In pointing to the benefits to be derived from such an enterprise, he said that the farmers readily admitted that they were sorely in need of scientific knowledge as to the best methods of cultivating and preserving their crops. Such information this institution would be the means of disseminating amongst them, and he hoped, when the time came for them to do so, they would show their keen appreciation of the Hon. Mr. Carling and the Government he represented, for propounding and carrying into effect this important system, which was, as he understood it, designed to raise the standard of the agricultural profession, the most important of all our industries, from a state of ignorance and drudgery to one of enlightenment and ease. From what they had seen and heard at this excursion, and from what they knew of the energy and ability of Prof. Saunders and his able assistants, he had the utmost confidence that under his supervision and with their assistance the designs of the Experimental Farm system would be fully carried out, and the benefits anticipated by the country at large fully realized.

The vote of thanks was presented by Mr. Whyte, the President of the Club, and passed unanimously.

The party then took the vans and returned to the city delighted with all the interesting objects witnessed as well as grateful for the opportunity which had been afforded them of seeing the farm under such favourable auspices.

SUB-EXCURSION NO. 7, 30th JUNE.

In answer to an invitation received from Mr. G. C. Holland, a member of the club, a visit was paid to a tract of country not previously examined, lying near Hintonburgh.

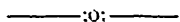
Upon arriving at the Holland Farm, the party struck down towards the Ottawa River, where there is a piece of marshy land. Here many marsh plants and aquatics were collected.

The Geological Branch, under the able guidance of Mr. H. M. Ami, turned up the river towards Skead's Mills to examine an outcrop of the Chazy formation, which there occurs. Specimens of *Stromatocerium rugosum*, Hall, were obtained from the calcareous strata.

At 4.30 the whole party re-assembled at Mr. Holland's residence, "The Elms," where they were made heartily welcome and hospitably entertained by Mrs. Holland.

The usual addresses were then delivered. Mr. Ami was the first speaker. He gave a concise account of the geology of the locality, and illustrated his remarks with specimens collected during the afternoon. The President, Mr. R. B. Whyte, then spoke for the botanical leaders, and drew attention to the most interesting species of plants collected and especially explained the structure, character and uses of the "Cruciferae," or Cress family.

The hearty welcome accorded the naturalists, the rich locality, the fine weather, and the good addresses, all combined to make a successful and enjoyable outing. The vans reached the city again a few minutes after six o'clock.



EXCURSION NO. 3—TO THE "MER BLEUE."

The third regular excursion of the season took place on Saturday, July 21st, when Eastman's Springs and the Mer Bleue were visited. Through the kindness of Mr. Elbs, of the Canada Atlantic Railway, arrangements were made by which a special car was placed at the disposal of the club. This car was attached to the Boston express, and dropped at Eastman's. The run down was soon and very comfortably made, the naturalists enjoying fully the pleasure of travelling over a

road in splendid condition, in a beautifully clean car, and with polite officials who seemed to do everything in their power to make the journey agreeable.

On arriving, the President, Mr. R. B. Whyte, addressed the members, giving out the programme to be followed during the afternoon. First of all the various springs of mineral water and gas were examined. The proprietor had kindly thrown open the springs and the picturesque grounds surrounding them, so that those who desired to taste the medicinal waters or to rest in the shade, were enabled to do so. A party was then formed to visit the Mer Bleue, a very extensive and interesting peat bog. This lies about a mile distant. Owing to the excessive drought, which has now lasted for nearly two years, the ladies and children were all able to go any where over the bog without wetting their feet. The gas spring was first visited, where *Utricularia coruata*, Mx., *Triglochia maritimum*, L. var. *ebitum*, Nutt., and the two beautiful little sundews (*D. rotundifolia*, L., and *D. longifolia*, Mx.), as well as several grasses and sedges, were collected by the eager botanists. After investigating thoroughly the treasures of the gas spring, small parties branched off in different directions over the swamp. One party visited the gravel ridge or island running down the middle of the bog, a few even going beyond.

The soft, elastic covering of Sphagnum moss, with which the whole surface of the Mer Bleue is covered, made walking pleasant for a short way, but it soon became very tiring, and at 4.30, the time for returning to the Springs, all were ready to start.

At 5 p.m. the party re-assembled at the Springs, and having partaken of the contents of their baskets, met together for the usual addresses.

The President first called upon Mr. James Fletcher, the leader in Entomology, to address the meeting. Mr. Fletcher spoke of the interest which attaches itself to the study of the science with which he was particularly connected, and showed what great advantages might be derived from these investigations. He described the captures which had been made during the day in such a manner as to interest those who were present. Some of the most convenient forms of collecting apparatus were described, and taking from his bottle some specimens they were exhibited and their habits given. Beneficial predaceous beetles, protective mimicry amongst spiders, and wood-boring beetles were treated of.

Dr. Bapic was then invited by the President to speak on "Natural Gas," a subject occupying the public mind at Ottawa very much just now. The speaker entered into the origin, formation, composition and mode of occurrence of gas, pointing out some of the results which had already been accomplished. He spoke also of the possibility of finding gas about Ottawa, and held that the fact could only be ascertained by boring.

Mr. Henry M. Ami then followed, giving a general sketch of the geological formations which would be likely to be met with by boring at this locality, as also along the line of the Canada Atlantic Railway. The approximate thickness of various formations was given, and valuable data for those who might wish to bore for gas. Mr. Ami pointed out that in strata of precisely the same age as along the line of this railway between Ottawa and Eastman's, gas had been struck with a considerable pressure, such as would be of great value for manufacturing and other purposes.

As the time for the train was approaching, after the above addresses, it was thought best to move to the station and have Mr. Robert Whyte's address on the botanical treasures there. Accordingly, upon reaching the station the party re-assembled around the President and listened to an eloquent address upon the plants collected. Mr. Whyte spoke of his subject only as those can who love it and understand it thoroughly. All listened intently as he took each plant in its turn and explained its points of interest. Amongst the plants specially treated of were some rare and local orchids. *Habenaria blephariglottis*, Hook, the beautiful White Fringed Orchis, which had been found in some profusion, was shown, as well as *Calopogon pulchellus*, the Beautiful Bearded Orchis. All too soon the whistle of the train put a stop to his agreeable disquisition.

The city was reached in good time after a most enjoyable and profitable day's outing, the naturalists bringing home with them many treasures.

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ANNOUNCEMENTS.

EXCURSION No. 4 FOR AUGUST.—The next excursion will be to the Victoria Sulphur Spring, Montreal Road, on Saturday, the 18th. The vans will leave the Post Office at 1.30 p.m., and it is hoped to reach the city again by 7 o'clock. Tickets, members, 25c.; non-members, 30c.; children, 15c.

SUB-EXCURSIONS.—It has been decided to hold no sub-excursions during the month of August.

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CENTRAL CANADA EXHIBITION ASSOCIATION.

The attention of the members is called to the prize list issued by the above association. Every effort is being made to render the exhibition, which is to be held here from Sept. 24th to 29th, a success. The club has been particularly requested to make exhibits of natural history objects. It is to be hoped that exhibits may be made by us in all the classes, as this will show better than anything else the activity of our members. A liberal appropriation has been made for prizes in this department.

(FLORA OTTAWAENSIS.—Continued from page 64.)

125. *C. ROTUNDIFOLIA*, Michx.

Springy wood^l. Billings Bridge. This is a weak-stemmed few-flowered plant with angular root leaves upon long petioles. Stem fleshy at the base. May—3.

129. *C. PRATENSIS*, L. (Ladies' smock. "Cuckoo-pint.")

Peat-bogs and wet meadows. Dow's swamp, Billings Bridge, Beechwood, Lake Flora, (J. F.); Janeville, (R. B. Whyte). The Canadian plant, as noticed in Macoun's catalogue is more slender than the European, and always white-flowered. Young plants are produced in great abundance from the leaflets which fall off and float on the top of the water. May—2. (B.)

130. *C. HIRSCUTA*, L. (Small Bitter-cress.)

Low ground and springy woods. An inconspicuous plant with a very inappropriate name, being almost glabrous. June—2.

ARABIS, L. Rock-Cress.

135. *A. HIRSCUTA*, Scot. (Hairy Rock-cress.)

Rocky open woods and pastures. Little Chaudiere, Britannia, Hull, Aylmer, Chelsea, &c. May—4.

138. *A. DRUMMONDII*, Gray. (Tower-mustard.)

Rocky pastures. A large distinct species. May—4. (B.)

140. *A. PERFOLIATA*, Law. (Smooth Tower-mustard.)

Sandy woods and pastures. A tall slender plant with yellowish flowers and leaves on^l, apparently, not really, perfoliate. June—2.

141. *A. LEVIGATA*, Poir.

Mountain side. King's Mountain, Chelsea, P.Q. June.

BARBARÆA, R. Br. Winter-cress.

145. *B. VULGARIS*, R. Br. (Yellow Rocket).

On rocks and by waysides. Lovers' Walk, New Edinburgh, Billings Bridge. Ju.—3.

———— var. *STRICTA*, Regel (Native winter-cress).

Swampy woods. Beechwood. A much less conspicuous plant than the type, with slender stem and small flowers. Ju.—2.

ERYSIMUM, L. Treacle Mustard.

146. *E. cheiranthoides*, L. (Worm-seed Mustard)

Everywhere. June (B).

SISYMBRIUM, L. Hedge Mustard.

150. *S. officinale*, Scop.

Roadsides. July--1. (B.)

BRASSICA, Tourn. Cabbage. Mustard.

159. *B. sinupistrum*, Boiss. (Wild Mustard, "Charlock.")

Cultivated ground. A most troublesome and persistent weed in many parts of Canada. Pods knotty, smooth, one-third consisting of a stout two-edged and one-seeded beak. Seeds reddish black. June. (B).

160. *B. alba*, Gray. (Garden Mustard.)

A garden escape. Easily known by its bristly pods, more than half of which consist of the one-seeded beak. Seeds yellow. July—1.

161. *B. nigra*, Koch. (Black Mustard.)

Roadsides. Scarce at Ottawa. Pods smooth, four-cornered, erect on appressed pedicels. Seeds dark brown. June.

CAMELINA, Crantz. False Flax.

191. *C. sativa*, Crantz.

An occasional weed in fields of grain. Ju.—2.

NESLIA, L.

2107. *N. paniculata*, L.

Rarely introduced with bird-seed. A small plant with sparse stellate-pubescence, small bright yellow flowers and round pods. Ju.—3.

CAPSELLA, Vent. Shepherd's Purse.

197. *C. Bursa-pastoris*, Mönch.

Everywhere around inhabited localities. May. (B.)

THLASPI, Tourn. Penny-cress.

199. *T. arvense*, L. (Mithridate Mustard.)

Waste places. Ju—1.

LEPIDIUM, L. Pepper-wort.

202. *L. sativum*, L. (Garden-cress.)

A garden escape frequently found in waste places. Ju—2.

207. *L. VIRGINICUM*, L.

Rocky pastures. Ju—1. (B.)

RAPHANUS, L. Radish.

213. *R. sativus*, L. Garden Radish.

Introduced borders of fields and way sides. Ju—1.

VIOLACEÆ—Violet Family.

VIOLA, L. Heart's-Ease. Pansy.

229. *V. BLANDA*, Willd. (Small Sweet White Violet.)

Damp woods. May—1. (B.)

230. *V. RENIFOLIA*, Gray. (Kidney-leaved Violet.)

Damp woods and swamps. Sometimes confounded with the above. The leaves, however, are pubescent and more or less kidney-shaped one always decidedly so, and the flowers are scentless. May—2.

234. *V. SELKIRKII*, Pursh. Large-spurred Violet.

Damp shaded rocks. Our earliest Blue Violet. A very distinct species, easily recognized by the leaves being smooth beneath and sparsely hairy above, and by the large blunt spur. Hemlock Lake, Beechwood, Chelsea. May—1.

235. *V. CUCULLATA*, Ait. Hooded Violet.

Damp woods or meadows. A most variable species both as to flowers and foliage. There are, however, two very distinct forms. (1.) A large plant with blue flowers and very pubescent leaves, and (2.) a smaller plant growing in meadows or beside water with larger violet flowers, and almost smooth leaves. May—3. (B.)

240. *V. CANINA*, L., var. *SYLVESTRIS*, Regel. (Dog Violet.)

Woods and pastures. May—2. (B.)

241. *V. ROSTRATA*, Muhl. (Long-spurred Violet.)

Governor-General's Bay, New Edinburgh. Ju.—1.

242. *V. CANADENSIS*, L. (Canada Violet.)

Rich woods. A charming species, flowering in May and November. (B.)

243. *V. PUBESCENS*, Ait. (Downy Yellow Violet.)

Rich woods. A lovely plant, with golden yellow flowers and fine foliage. There are two forms.

Var. *eriocarpa*, Nutt, has the pods covered with woolly white pubescence. This is probably the type of the species. May—3. (B.)

————— var. *SCABRISCUOLA*, T. & G.

In this the pods are perfectly smooth and the leaves almost so. Some forms of this variety resemble closely the western *V. glabella*, Nutt. May—3.

247. *V. tricolor*, L., var., *arvensis*, Ging. (Wild Pansy.)

Cultivated ground. Billings Bridge, Hintonburgh. Ju.—1.

POLYGALACEÆ.—Milk-wort Family.

POLYGALA. Milk-wort.

251. *P. SENEGA*, L. (Seneca Snake-root.)

Rocky banks. Not uncommon. Ju.—1. (B.)

253. *P. FAUCIFOLIA*, Willd. (Fringed Polygala.)

Dry open woods. A lovely little flower. Ironsides (*J. F.*)

Near St. Louis Dam. (*H. M. Ami.*) May—3. (B.)

CARYOPHYLLACEÆ.—Pink Family.

SILENE, L. Catchfly. Champion.

255. *S. inflata*, Smith. (Bladder Champion.)

Introduced. Waysides and grain-fields. July—2. (B.)

258. *S. ANTIORRHINA*, L. (Sleepy Catchfly.)

Sandy and rocky banks. Ju.—1.

260. *S. Armeria*, L. (Sweet-William Catchfly.)

A garden escape. Billings Bridge, and occasional in waste places. July. (B.)

261. *S. noctiflora*, L. (Night-flowering Catchfly.)

Introduced. An abundant weed in fields and gardens. Ju.—3. (B.)

LYCHNIS, Tourn. Lychnis, Cockle.

268. *L. Githago*, Lam. Corn-cockle.

Introduced. Grain fields. July—2.

269. *L. vespertina*, Sibth. Evening Lychnis.

Introduced with grass seed. July.



SUMMARY

— OF —

Canadian Mining Regulations.

NOTICE.

THE following is a summary of the Regulations with respect to the manner of recording claims for *Mineral Lands*, other than Coal Lands, and the conditions governing the purchase of the same.

Any person may explore vacant Dominion Lands not appropriated or reserved by Government for other purposes, and may search therein, either by surface or subterranean prospecting, for mineral deposits, with a view to obtaining a mining location for the same, but no mining location shall be granted until actual discovery has been made of the vein, lode or deposit of mineral or metal within the limits of the location of claim.

A location for mining, except for *Iron* or *Petroleum*, shall not be more than 1500 feet in length, nor more than 600 feet in breadth. A location for mining *Iron* or *Petroleum* shall not exceed 160 acres in area.

On discovering a mineral deposit any person may obtain a mining location, upon marking out his location on the ground, in accordance with the regulations in that behalf, and filing with the Agent of Dominion Lands for the district, within sixty days from discovery, an affidavit in form prescribed by Mining Regulations, and paying at the same time an office fee of five dollars, which will entitle the person so recording his claim to enter into possession of the location applied for.

At any time before the expiration of five years from the date of recording his claim, the claimant may, upon filing proof with the Local Agent that he has expended \$500.00 in actual mining operations on the claim, by paying to the Local Agent therefor \$5 per acre cash and a further sum of \$50 to cover the cost of survey, obtain a patent for said claim as provided in the said Mining Regulations.

Copies of the Regulations may be obtained upon application to the Department of the Interior.

A. M. BURGESS,

Deputy of the Minister of the Interior.

DEPARTMENT OF THE INTERIOR,
Ottawa, Canada, December 19th, 1887. }

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