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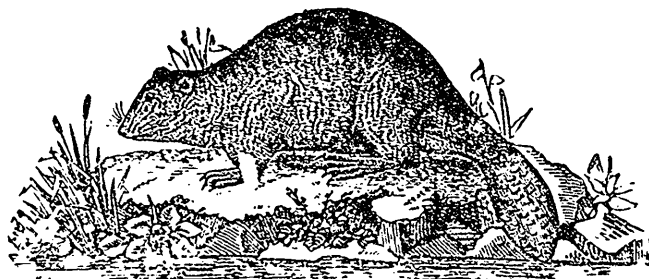
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Excursion to Borthwick's Springs, July 8th. See Notice Page 68.

July, 1893.

THE
OTTAWA NATURALIST

VOLUME VII. No. 4.



THE BEAVER (*Castor Canadensis*, Kuhl).

CONTENTS.

	PAGE
Food and Alimentation. Dr. Prevost	53
Report of Ornithological Branch	61
Ornithology	62
Excursions	64
Sub-Excursions	65
Valuable Experiments	66
Flora Ottawaensis	67
Entomology	68
Excursion No. 3	68

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FOOD AND ALIMENTATION

L. COYLLUX PREVOST, M.D.

Read January 19th, 1893

I most sincerely thank the officers of this Association for having conferred upon me the honour of reading a paper before the "Field Naturalist's Club," which possesses, among its members, names already illustrious.

I am happy to have the opportunity of contributing, as far as my feeble means permit, to the achievement of its aim, which is intellectual progress and advancement of science.

The physician, gentlemen, has another role to play on earth besides relieving or curing the evils that afflict our poor humanity. His duty, above all, must be to ward off diseases, in pointing out their causes and the best means of avoiding them.

These causes, alas! are manifold. They accompany man from the cradle to the tomb; they surround him at his birth, escort him all his life, being for him a perpetual threatening. But the most common, undoubtedly, are those which arise from some disorders of the digestive system.

It is by the digestive tube that life enters our body, and by the digestive tube also that enters death.

The intestines and the stomach can be considered as true laboratories where the most deadly poisons are incessantly produced. Nature, it is true, has provided us with powerful means of defence, but, some day, the foes will swarm and overcome the barriers opposed to them by physiological laws; disease then is constituted with all its sufferings and dangers.

These disorders, in the greatest majority of cases, are owing to ignorance or contempt of the laws of hygiene. It is, therefore, our duty to teach these laws and point out their importance.

In preparing this paper, gentlemen, I dreamt a moment of trying to dazzle you with the depth of my science. I had almost made up my mind to enter into transcendent considerations upon the physiological machinery of nutritive phenomena, penetrating the essence itself of the

composition of the tissues of human organism, endeavoring, in short, to create an imperishable monument worthy of being preserved in your archives, for the greatest glory of its author and the amazement of posterity. But - - - I changed my mind ; the scientist yielded to the hygienist's more practical obligations. I generously sacrifice, therefore, my ambitious and legitimate aspirations to simply try to be useful. I merely want to speak of alimentation, explaining, by the way, the phenomena of digestion and the rules which must preside to its normal working.

At first, gentleman, "*noblesse oblige.*" You have done me the honour of inviting me to lecture before you, I do not wish to remain in debt of courtesey : I invite you to dinner, here and now—But I must tell you that it is going to be a mere intellectual banquet, excellent means of avoiding indigestion and cramps in the stomach, you must confess.

Therefore, let us sit down to table ; here is the bill of fare, the simple lecture of which will make your teeth water :

Bill of Fare.

Oysters in shell. Sauterne. Chablis.

SOUP :

Pea with crumbs. Sherry, Madeira.

FISH :

Fried Haddock. Fresh boiled Salmon.

ENTRÉES :

Chicken with truffles. Omelette with ham. Veal chops, tomato sauce.
Chateau Lafitte.

ROAST :

Tenderloin steak. Roast beef. Mutton chops. Pork chops. Apple sauce. Ve. Clicquot.

RELEVÉS.

Black Duck. Patridge on toast. Chambertin.

VEGETABLES :

Potatoes a la Lyonnaise. Sweet corn.

FRUIT :

Pears, apples, oranges, grapes. Cheese, milk, porridge. Bread, butter
coffee. Chartreuse.

Now, you must admire, gentlemen, the intelligence which presided at the confection of this truly royal bill of fare. It is the deed of a thorough "*gourmet*" and also of a friend who aims at your most perfect gastronomic welfare and of a physician who attended to all the requirements of hygiene.

"But," some of you will say, "your bill of fare contains indigestible ingredients: I never can taste such and such dish without experiencing the most violent indigestion." Let us explain ourselves.

There are no indigestible aliments, in the etymological sense of the word. All eatable substance is digested, more or less completely, if you like, and more or less rapidly, but it ends always by going through. The word "indigestible" is relative and if any one hears again in a rather disagreeable fashion, of what he has eaten, it is because this unfortunate individual is ill, or the privileged possessor of some peculiar idiosyncrasy which departs from the general rule.

But as I consider you all as I wish you to be, that is, perfectly sound and devoid of all caprices as far as your material organization is concerned, I am convinced of having found for the composition of this repast, the most agreeable and most nutritive aliments.

I said "agreeable" because we never do well but what we do with pleasure. In fact, let you sit down to table with an anxious and pre-occupied mind, the stomach will pout for your paying such a little attention to the fulfilment of its functions and will punish you with indigestion, for having diverted, for the benefit of the brain, the concentration of energy which it has a right to claim when it is its turn.

A meal may be a regular work, but that work must be recreative and one cannot exaggerate the importance of dining in good company, and, besides, food must be artistically prepared in order to be palatable and stimulate the appetite. This accounts for my calling forth all the secrecies of culinary art to impart to my bill of fare the most irreprouchable character.

At last, you must remark that the dishes are numerous and varied in order to supply the tissues of organism with the whole scale of the elements they want, for their intimate rebuilding. In fact, all aliments do not possess the same nutritive value and the same digestibility and the most nutritious are not always those we digest the most easily.

The aim of alimentation is to supply the animal economy with the principles it requires for the production of its energy, and with the primordial elements which directly or indirectly go to the repair or growth of tissues. The more an aliment contains of these elements in quality and quantity, the greater is its nutritive value.

In the admirable paper read before you last year, your worthy vice-president has made you acquainted with the principles which constitute the chemical composition of our body. Here they are briefly enumerated : Oxygen, hydrogen, nitrogen, carbon, sulphur, phosphorus, calcium, sodium, potassium, magnesium, chlorine, iron and fluorine.

These elements are found in various combinations with one another and form nitrogenous and non-nitrogenous compounds, carbo-hydrates and salts. They enter into the composition of all the tissues of the body. Since food is destined to the rebuilding of those tissues, it is evident that the ideal aliment, the perfect type, would be the one into the composition of which would enter in the meantime, all the chemical elements I have enumerated. But that ideal does not exist. There are, for example, nutrients which contain a considerable proportion of nitrogen, making them eminently proper to repair the tissues, but which, on the other hand, possess too small a quantity of carbo-hydrates to meet the wants required by respiration and the production of animal heat. Others, while they are rich in carbon and hydrogen, are very poor in azote. Hence, the necessity of a mixed alimentation to properly supply nutrition with all its requirements.

Formerly, primordial foods were divided in two classes, namely : the plastic and the respiratory aliments.

The plastic aliments were constituted by albuminous substances to which the name of quaternary was given, because they possessed a more or less great number of atoms of oxygen, hydrogen, carbon and nitrogen. They were found in almost all the tissues and fluids of the body, forming the base of muscular tissue, gelatine of the bones, fibrin of the blood, casein of the milk, albumen of the egg, gluten of the bread, etc., etc. Respiratory aliments, so called because they are used for respiration and are consumed in the body, formed the base of fats, sugars and feculents.

For this altogether theoretical division, we have nowadays substitute ð

another more in harmony with the modern teachings of physiological chemistry, and we divide the primordial elements of food in two great classes, namely, the organic and inorganic principles. In the latter class enter the salts and water, and the organic compounds are considered under two divisions: nitrogenous and non-nitrogenous.

It is to the groups of organic substances that belong the albuminoids, the chief flesh formers of our body. Still, in spite of their great nutritive value, these albuminoids, taken separately cannot alone sustain animal life and in order that they should acquire a real nutritive value, it is necessary that they must be associated, not only to the other substances of other classes of food, but even to the different kinds of albuminoids themselves. For instance, an animal fed on albumen or on gelatine alone, would very soon succumb, as it has been demonstrated by Papin, Magendie and Hammond's experiments.

Now, gentlemen, the food which contains the greatest quantity of nutritious substances is not always the one that is digested the most easily; on the contrary, we shall see that certain very nutritious aliments are of a slow and painful digestion. We must acknowledge, besides that several causes bring modification to the precise rules that we might establish with regard to the digestibility of food; it would be difficult nowadays to classify alimentary substances into light and heavy aliments. One of the chief objections to this classification would be individual predisposition. In fact many would easily digest foods which would infallibly produce indigestion in others.

We must add to this: Habit, which permits the digestive tube to get accustomed to such and such aliment.

But there is a point upon which physicians and physiologists agree; it is the importance of the state of cohesion, and the looser is that cohesion the easier is the digestion. There exists, in the same substance, very wide differences, according to the different states in which that substance is presented, and nothing is more interesting than the results given by Schiff upon the digestibility of a given quantity of albumen taken in solid and compact mass or else administered finely divided.

Digestive value and nutritive value of food, are therefore two different things and we could say with Trousseau: "That the most

digestible food is that which supplies the body with the greatest quantity of reparative elements, requiring in the meantime the less possible exertion from the digestive functions."

Now that we have made these few restrictions, perhaps it would not be without interest to examine the experiments made to determine the digestibility of food and the conclusions arrived at on the subject.

Were the human body transparent, it would be an easy matter to follow the phases which alimentary bolus undergoes from the moment it is formed in the mouth until it has given up all its nutritive particles in the depth of the digestive tract. If the Creator, instead of kneading our body with clay, had made our tissues in crystal, anybody would, at a glance, determine the precise moment that the mouthful of bread, the piece of meat cease to be what they were, to become absorbable paste. But the opaque substance, of which our integuments are formed, hide to our view the phenomena that take place within ourselves, and we have to resort to certain crafts in order to uncover the mysterious operations of the digestive system.

For instance, Spallanzani would introduce alimentary substances in tubes or hollowed balls which he would make his patients swallow. When these balls would be returned, either by vomiting or by a more indirect by-way, he would examine the modifications undergone by the substances contained inside.

But we may easily understand, that as these foreign bodies were rejected at indeterminate hours, it was difficult to obtain, by these experiments, anything like serious and reliable results.

Gosse, of Geneva, was endowed with a peculiar privilege : he could vomit whenever he wanted to. He availed himself of this talent to study the degree of digestibility of foods. He observed that the substances which he would most easily digest, that is, within one or two hours, were : Fresh boiled eggs, milk, lamb, veal, fresh fish, gruel, potatoes. He would take four to six hours to digest : pork, hard eggs, oysters and pastry—other substances would remain very long in the stomach such as : rind of pork, orange peels, mushrooms.

I must confess, gentlemen, that we cannot grant much credit to these experiments, deprived as they were of the accuracy exacted by a truly scientific method. But it is not so with regard to the knowledge

supplied by the phenomena observed in individuals bearing gastric fistula. Amongst these observations, there is one renowned above all, and cited everywhere, I mean the case of the Canadian, Alexis St. Martin, related by Dr. Beaumont. That celebrated patient received one day a shot wound in the pit of the stomach. Fortunately for the man and for science, the wound did not prove fatal, but the result was an opening which never closed and established a permanent communication between the outside and the stomach. Dr. Beaumont, during several years, studied the functions of digestion on this robust Canadian. He would make him swallow all kinds of food, watching their exit on a level with the artificial opening and could then calculate the time taken by alimentary substances to undergo a complete digestion in the stomach. He made us know the results of his experiments in a rather curious table of which I will give you a brief abstract. He observed that the following foods were completely digested at the end of the periods mentioned :

Rice.....	1 hour.	Fried oysters	3 hrs. 15 m.
Boiled milk	2 hours.	Roast beef	3 hours.
Roast turkey.....	2½ hours.	Beefsteak	3 “
Boiled turkey.....	2 hrs. 44 m.	Boiled beef ..	3½ “
Boiled goose.....	2½ hours.	Roast mutton	3 hrs. 15 m.
Suckling pig.....	2½ “	Roast veal	4 hours.
Fresh lamb	2½ “	Boiled fowl.....	4 “
Fresh eggs, boiled hard.....	3½ “	Roast duck.....	4 “
Fresh eggs, boiled soft.....	3 “	Roast pork.....	5 hrs. 15 m.
Fresh eggs, raw.....	2 “	Sausage.....	3 hrs. 20 m.
Fresh eggs, fried	3½ “	Bread	3 hrs. 30 m.
Salt codfish	2 “	Boiled potatoes	3 hrs. 30 m.
Salmon trout.....	1½ “	Fried potatoes	2 hrs. 30 m.
Oysters, raw.....	2 hrs. 55 m.	Boiled cabbage.....	4 hours.
Oyster soup	3½ hours.		

The experiments of Dr. Beaumont on his Canadian were made as well by Ch. Richet on a man named Marcellin upon whom Surgeon Verneuil performed a gastric fistula. I do not wish to enter into the details of this case which I mention only on account of a curious fact that happened with that man, Marcellin, a fact showing how hard it is, sometimes, to resist the impulse of a passion even in spite of the greatest obstacles to its gratification.

Marcellin, aged 17 years, swallowed by accident on the 4th February, 1876, a solution of caustic potash. The most intense inflammation followed, and brought on the obliteration of œsophagus. He could therefore no more be fed in any manner whatever. Verneuil saved his life, in making in the pit of the stomach an opening through which they then introduced the solid and liquid foods necessary to his subsistence.

This poor man at last died of consumption brought on, do you know by what cause? He was deprived of œsophagus, and consequently could not drink, but this did not prevent his becoming a drunkard: he would introduce, through his fistula, the alcoholic beverages which took him to his grave.

But let us return to our bill of fare, gentlemen, I want to say a few words of the ingredients of which it is composed. To facilitate this description allow me to somewhat alter the order of their disposition. Let us divide them all, at first, in two classes: the solids and the liquids. Amongst the solids we shall examine meat and vegetables, sprinkling afterwards this dry subject with milk, broth and wine. But enough of words, time has come to act—Waiter—bring on the oysters.

Oysters, gentlemen, contain carbon, nitrogen, salts and water and constitute a very useful aliment, easily digested, provided that they are eaten raw. Fried or in soup they are a great deal more indigestible. William Roberts has tried to give the explanation of this fact. The small yellowish mass which is called the “eye” and which is the most palatable part of the oyster, is the liver—which is but an agglomeration of glyco-gruic substance. That liver during life contains, besides a digestive ferment, the hepatic diastasis. By the mere fact of mastication, these two substances are brought in contact, so that the glyco-gruic is immediately digested by its own diastasis.

Raw oysters therefore digest themselves without any other intervention. This advantage is annulled by cooking, because the heat, even moderate, destroys the ferment associated with the glyco-gruic substance. According to Roberts, alcohol has the same inconveniences, so that we should not drink any wine while eating oysters and be satisfied with milk, which did not prevent my ordering Sauterne to sprinkle these delicious mollusks. It is the fashion, do you see. In France and in Canada amongst those who eat “*à la Française*” white wines are indispensable with oysters.

(Continued on page 69.)

REPORT OF THE ORNITHOLOGICAL BRANCH FOR THE YEAR 1892.
To the Council of the Ottawa Field Naturalists' Club:

LADIES AND GENTLEMEN,—The Leaders in Ornithology in presenting their report for the year 1892 have to regret that in the section of the work under their oversight there has not been so much activity shown as in some former years. But four observers have reported, and the total number of species recorded reached only 118. None of these were new to the list but a number of previously doubtful records have been corroborated.

The department of "Editorial Notes" in the Naturalist has contained from month to month items in connection with bird-life deemed of sufficient interest for publication, and these need not be recounted here. In addition to these the following records are worthy of notice:—

Field sparrow, *Spizella pusilla*, 2nd July, about 4 miles south-east of King's Mountain; in full song and evidently breeding, though nest not found (F. A. Saunders).

Tree sparrow, *S. monticola*, 8th January, on the "mine road" north of Hull (F. A. Saunders). This species, common enough in the season of migration has never before been known to winter with us; indeed there is said to be but one previous record of its appearance during winter anywhere north of latitude 44° (Cooke's Bird Migration Miss. Valley).

Wood thrush, *Turdus mustelinus*, 26th May, near McKay's Lake (A. G. Kingston), and 29th June on King's Mountain (F. A. Saunders).

Blue-grey Gnatcatcher, *Polioptila cerulea*. Previous to this year there has been but one record of this little bird for this locality—about 12 years ago. This year it is reported twice, once on 26th May by Mr. Kingston and again on 10th July by Miss Gertrude Harmer. No specimen was secured, however, and at most the visits of this resident of the Alleghanian district to our neighborhood must be regarded as merely casual.

Common tern, *Sterna hirundo*, 11th August near Brockville (Miss Harmer). Though somewhat beyond our limits, the appearance of a flock of these birds at a point so far from the sea and the great lakes is worthy of note.

A. G. KINGSTON, }
 JOHN MACCOUN, } *Leaders.*
 WM. A. D. LEES, }

ORNITHOLOGY.

EDITED BY A. G. KINGSTON.

Winter visitants.-- The winter of 1892-3 was marked by a great scarcity of bird life in the neighbourhood of Ottawa. Irregular and uncertain though the movements of the winter birds always are, it is seldom that the winter season passes without the appearance of some one or more species in considerable numbers. Probably these visits depend more upon food supply than upon the mildness or severity of the temperature; but in both of these respects our district showed itself last winter a very inhospitable quarter for the birds. The weather here, as throughout the whole of North America was marked by unusual and almost unbroken cold; and as the rowan-berry crop of 1892 had been a total failure, with tamarac cones and cedar seeds much below the average, the "visible supply of breadstuffs" for the feathered population must have been alarmingly short.

Of Crossbills, Redpolls and Pine Siskins there have been no reports whatever. The Purple Finch which is usually fairly well represented throughout the winter in suitable localities did not put in an appearance until the 4th May, and the Goldfinch came seven days later, after having donned his summer plumage elsewhere. A few straggling Pine Grosbeaks, (one 25th January), and an occasional small flock of Snowflakes (one 11th February) were the only representatives of these frequently abundant species.

It is often asserted, however, by ornithologists that in their favorite study, at all seasons and in every locality, the diligent student is sure of some reward, and that there is much truth in this claim the following further records will show:

Robin.—One seen 18th January on Wellington Street, by Prof. Macoun. Mr. Fletcher also reports one, a fine male, in Archville on 12th March, and another has been reported as appearing several times in New Edinburgh. It is possible that all these records refer to the same individual—perhaps a wounded bird that was unable to undertake the hardships of migration, and was yet so fortunate as to find food throughout the severe weather.

Prairie Horned Lark.—(*O. alpestris praticola*). On 27th February three or four were seen along the roads on the Experimental Farm.

The next day several appeared, and during the milder weather of March they were abundant.

Blue Jay.—15th February.

Canada Jay.—(*Perisoreus Canadensis*). 15th February (A. G. K.) about 25 miles up the Gatineau.

Chickadee.—18th February.

Crow.—As for this sable scavenger, he is always to be found where there is work for him to do; and the enterprising local reporter who at any time during the long winter is in want of material for an item headed "Harbingers of spring" has only to visit the neighbourhood of one of the slaughter-houses beyond the Rideau river, in order to be favored with a sight of, and if the weather is mild, perhaps even a "caw" from one or all of the proverbial black three.

House Sparrow.—It has been a matter of general remark that the "English Sparrow" population suffered heavily during the past winter. Apparently their numbers on the opening of spring did not exceed one third of what they had been when the first snow fell. It is worthy of record that the first to disappear under the severe weather were the albino specimens referred to in these notes in October last. Not a single case of albinism has been noticed since 1st January. The first brood of young sparrows, however, is now (15 June) on the wing, and as each pair of old birds raises three or four families in a season there is no doubt that they will have replenished the earth ere October returns again.

Spring Migration.—This is not the place to publish a list of spring arrivals. Suffice it to say that although the opening of vegetation this year was unusually late, the birds do not seem to have delayed their movements much on that account. The Robins and Song Sparrows appeared in small numbers on the 24th March, then retired before a short spell of cold weather, and returned again in force on the 29th, when they were accompanied by the Blue-birds. The Bronzed Grackle arrived on 2nd April and the Redwing Blackbird on the 3rd. Turning to the Swallows, an unusually early appearance of the Tree Swallow (*Tachycineta bicolor*) was noted on 1st April by Mr. W. A. D. Lees and several other observers. No other tree swallow was reported until 22nd April. Purple Martin 2nd May; Barn Swallow 5th May.

EXCURSIONS Nos. I AND II.

The first excursion for the present season was held on May 27th and proved very successful, there being three hundred members and their friends present. The point selected was the village of Wakefield, or La Pêche, and the Gatineau river, at the height of its spring flood, afforded some fine views as the train skirted its rapids and falls. The morning was bright and clear but unfortunately before noon it clouded up and showers and light rains continued during the afternoon. In spite of the moisture, however, many of the collectors continued their explorations and some good botanical collections were made. Two prizes which had been offered by the Council were awarded to Miss Blaikie and Mr. McCurdy for their very creditable collections. The adjacent school-house gave shelter to many during the day, and probably had within its walls a more learned and scientific body than on any previous occasion. The excursion cars also formed a rallying point, and in them were delivered the usual interesting addresses by Dr. Ells and Messrs Ferrier, Craig and Cowley, the leaders of the Geological and Botanical sections. Ed.

The second Excursion was held on Saturday, the 18th June, and those who attended spent a delightful day. After a pleasant sail down the Ottawa on the fine Str. Empress, the party on reaching Rockland was met by a steam launch, on which a short cruise was made among the adjacent islands and bays. Then the quarries were visited, from which is being excavated the stone for the Soulanges canal, and which furnish a very fine, massive limestone. The geological exposures of this neighbourhood are exceedingly interesting, several formations being visible, and good series of fossils were obtained from the various strata, of which notes will appear later. The members were then conveyed in carriages to Mr. Edwards's splendid farm, and they were much interested in the fine stock exhibited. The neighbouring fields and woods were found to be most inviting; strawberries were abundant, and various flowers in profusion. During the afternoon the mills were inspected and the river banks examined. The thanks of the Club are due to Mr. Edwards, M.P., for his kind invitation to visit his extensive mills and farms, and for placing his launch and carriages at the service of the members. Also to Mr. Archie Stewart, who has the contract for

the canal for which the stone is being taken out, and who very generously provided a bountiful supply of fruits and refreshments. Mr Angus McLean kindly escorted the party, and Mr. Gardner, the Superintendent of the quarries, was most obliging in describing the operations.

SUB-EXCURSIONS.

The continued rains and unpleasant weather of the early spring months rendered it often impossible to hold the regular Saturday afternoon outing, but members took advantage of any propitious days. A very pleasant visit was made on May 20th, to the Beaver Meadow, Hull, and many interesting plants and insects were obtained. Among the more conspicuous plants which were in charming profusion, and of which several fine nosegays were gathered, may be mentioned Trilliums, (white and red) *Uvularia*, *Dicentra* (Squirrell-corn, very abundant,) *Dentaria* and Violets of several kinds. A nice addition to the Ottawa List of Coleoptera was made by Master T. MacLaughlin who captured a fine male of *Dicelus teter*, Bon. Among the Carabidæ captured may also be noted *Calosoma frigidum*, Kirby and *Harpalus vulpeculus*, Say.

The Mer Bleue, a favorite resort of our botanists, was visited on June 3rd and the masses of bloom which decked the surface of the "Big Swamp" gave it a most attractive appearance. Among the more showy plants growing around the borders or scattered among the prevailing *Cassandra calyculata* (Leather-leaf) mention may be made of *Menyanthes trifoliata* (Buck bean), *Kalmia glauca* (Sheep Laurel), *Pirus arbutifolia* (Choke-berry,) *Andromeda polifolia*, with its lovely delicate blossoms, *Vaccinium corymbosum* (Swamp-Blueberry) and three species of *Eriophorum* (Cotton Rushes) one of them (*Eriophorum russeolum*) being new to our local flora. Insects were not abundant but several interesting species were taken, including two examples of a previously unrecorded butterfly, (*Thecla angustus*.)

Casselman which has always proved a rich collecting ground was visited on June 10th, by a strong botanical contingent among whom was Prof. Fowler, F.R.S.C., of Queen's University, Kingston. As usual the party was well rewarded by the occurrence of many fine plants including the following additions to the local lists:—*Polygonatum giganteum*, *Polygonum erectum* and *Phragmites communis*. Some of the party went on three or four miles, where the land becomes swampy as

at the Mer Bleue and offers almost the same plants. *Cypripedium parviflorum* was abundant, but the flowers were mostly faded, and *Lonicera oblongifolia* occurred in great profusion. Those who remained at the river obtained among other fine plants *Cypripedium acaule* and *Orchis spectabilis*. Insects as on the previous Saturday seemed unusually scarce, but towards evening the Black flies and Mosquitoes were sufficiently abundant.

Some members, lovers of botany and the muses, made a trip to North Wakefield on the 18th June, for the purpose of visiting a swamp discovered last autumn to contain great numbers of the Showy Ladies-slipper (*Cypripedium spectabile*). The display of these lovely plants was even more extensive than had been expected, and charmed and delighted the party, who returned laden with spoil.

VALUABLE EXPERIMENTS.

Mr. Frank T. Shutt, M.A., chief chemist of the Dominion experimental farms, read an interesting paper at the recent meeting of the Royal Society, descriptive of a preliminary series of experiments with the object of ameliorating certain alkaline soils in Manitoba and the North-west territories. He opened by drawing attention to the occurrence of the "alkali patches" in many parts of these provinces. These patches or barren spots, which vary greatly in extent, always occupied low places or natural depressions in the soil. In dry weather they were covered with a white incrustation, but when moist the affected soil was usually black. Apart from the presence of the injurious chemical, analysis had shown these alkali soils to possess all the elements of fertility. Complete analyses of the three samples of soils—supposed to be typical of these spots—were given. They showed that in addition to comparatively small quantities of salts of soda, a considerable amount of magnesium sulphate (Epsom salts) was present. To get rid of the soda salts, thorough drainage was instanced as the most effective means. The soda salts were usually either carbonate or sulphate—the latter was not as injurious as the former. The use of an application of gypsum had proved efficacious to soils impregnated with carbonate—which was thereby converted into the less injurious form of sulphate. To ascertain the effect of magnesium sulphate on vegetation, Mr. Shutt

had carried out a series of pot experiments with corn, wheat and peas. The results showed clearly that this chemical proved most disastrous to vegetation. He therefore inferred that in many instances the sterile character of the soil was due in part, and in some instances, perhaps, wholly to the presence of magnesium sulphate (Epsom salts).

Elaborate pot experiments were then instituted with wheat, pea^s and corn, to find out if the addition of (a) carbonate of lime and (b) lime to a soil containing magnesium sulphate would render this substance non-injurious and allow the plants to come to maturity. While the carbonate of lime proved beneficial, lime proved much more so. During the course of the experiments careful records were made at intervals of a week, and mathematical plottings of these were shown to the meeting. Photographs, also illustrating the growth of the plants in the treated and untreated soil, were exhibited. The chemistry underlying the changes induced in the alkaline soils by these remedial agents was explained. The value of lime in improving soils impregnated with magnesium sulphate was fully established by the scientific data here brought forward.—*Toronto Empire*.

(In our brief report of the proceedings of the Royal Society we were able only to refer to the papers read in section IV, and we therefore reproduce with much pleasure this abstract of the paper presented to Section III by our Delegate. Ed.)

FLORA OTTAWAENSIS.

BY JAMES FLETCHER, *F.R.S.C.*

The annotated list of the Flora of the Ottawa district which was begun three years ago in the *Ottawa Naturalist* and the completion of which was unavoidably delayed, first of all by illness of the writer and afterwards by press of official work, will be completed in this volume of the *Naturalist*. Members will please observe that the sheets issued with each number are unattached and that the pagination begins at page No. 78 in continuation of the part issued with the May number 1890. Some members will receive the forthcoming sheets who were not subscribers to the Club when the former parts were issued. They may perhaps be able, with a little enquiry, to procure the first 77 pages from some members not specially interested in Botany.

ENTOMOLOGY

Edited by JAMES EIEICHER, F. R. S. C.

Meloe niger, Kirby. The Black Oil-beetle makes its appearance in the first sunny days of spring, while the snow still lingers in shady corners, and may often be seen crawling on the city sidewalks, apparently having issued from the adjacent lawns. There are certain sections of sidewalk upon which they may then be captured daily. This beetle is easily recognized by its abbreviated elytra and absence of wings; its colour is a greenish black. W. H. H.

Toxotus vittiger, Rand. A specimen of this pretty longicorn was beaten from Oak at Casselman, on June 26th, 1883, and on the 10th of present June, Mr. Fletcher secured a dozen specimens flying about, or on the flowers of *Osmorrhiza longistylis*, in the same locality. W. H. H.

Donacia pubescens, Lec. This distinct species appears to be local, and to appear early in the season. In 1878, Mr. Fletcher took six examples near Billings Bridge, and it was not collected again until this June, when it was specially looked for in the same locality, and several specimens were taken by sweeping bullrushes (*Typha*) and grasses along the banks of the Rideau river. *D. jucunda* and *D. subtilis* were abundant, and a few *D. proxima*, which is more abundant later in the season, and frequents the lily pads. W. H. H.

Sphinx Kalmia. I have received from our Canadian veteran botanist, Mrs. C. P. Traill, of Lakefield, Ont., now in the 93rd year of her age, a fine specimen of the Lilac Sphinx, *Sphinx Kalmia*. Mrs. Traill also writes a long and interesting letter on the Holy Grass (Indian Sweet Hay,) *Hierochloa borealis*. The bed of this grass on the Experimental Farm is now a mat of flowering stems, and well worthy of a visit from our botanists. J. F.

EXCURSION No. III, TO BORTHWICK'S SPRINGS.

A Saturday afternoon Excursion will be held on the 8th July, to Borthwick's Springs, by special invitation of Mr. Borthwick. The Club vans will leave the Post Office at 2 p.m. *sharp*. The price of tickets has not been definitely fixed, but will probably be 25 cents.



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*, shall not be more than 1500 feet in length, nor more than 600 feet in breadth. A location for mining *Iron*, 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 1892.

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