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June, 1888.

THE  
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## OUR SQUIRRELS.

BY J. BALLANTYNE.

*(Read 1st March, 1888.)*

As has already been announced, I have undertaken to read a short paper concerning the squirrels which are to be seen, more or less frequently, in the neighborhood of Ottawa. When I undertook to do so I was well aware of the fact that the Ottawa Field Naturalists' Club held in its membership a number of persons who were, perhaps, better acquainted with the subject than I was myself, and were consequently better fitted to speak about it. From an anatomical point of view, I know very little about them. My observations have been of a very casual kind, and have been restricted to their outward appearance and some of their habits. As, however, what I have to say is from personal observation, it may possibly be of some interest to those persons who, for want of opportunities or from other causes, have paid even less attention to the study of the wild animals existing round about us than I have myself. From my own experience I am sure that much can be added to the enjoyment of life by cultivating the acquaintance and getting ourselves on a friendly footing with many of our wild neighbors. Most of them quickly respond to kind treatment and manifest their confidence and trust in various ways; among some of our birds this pleasing trait is very marked. As an instance, I may say that we have had three different kinds of wild birds build their nests and bring out their young, at the same time, within a few feet of each other all under our verandah, and almost within reach from a door which we were constantly using. Some of them came into the house quite frequently, and showed very little fear. We took a great deal of pleasure in watching them in their nest-building and rearing of their young. The birds were not the only animals whose company we enjoyed. We derived no little pleasure from seeing about, the clean, active and graceful little rodents which are the subject of this paper.

Before attempting to describe the different Squirrels seen in this vicinity, it may be well in the first place to outline, in a general way

and in as few words as I can, how we may know a Squirrel when we see it, and in what respects it differs from other animals.

\* \* \* \* \*

A concise sketch was here given of the classification of the animal kingdom, and the Squirrels were traced down step by step to the Rodentia.

\* \* \* \* \*

By an examination of the little animal in question we learn at once that it belongs to the order of rodents. The animals of this order are easily distinguished by the arrangement of their teeth. They have no canine teeth, the incisors or cutting teeth being for the most part only two in each jaw, large and strong, and a vacant space between them and the molars or grinders. The front teeth have a plate of hard enamel on the outside which wears more slowly than the substance of which the rest of the teeth is composed, for this reason the teeth always remain sharp, acquiring a chisel like form, well adapted for cutting or gnawing; and unlike the teeth of most other animals, they are always growing from a fleshy pulp at the base so that compensation is made for wear at the cutting ends. Something over six hundred different kinds of rodents have been described and are to be found in nearly every part of the globe; about one hundred species have been described as belonging to North America.

Having located our little friend among the *Rodentia*, it is necessary to follow him just a little further in order to find out who he is. The divisions in the order are called families, each family having some peculiarity common to itself. Among the first of the family names we find that of *Sciuridæ*, deriving their name from a corruption of two Greek words, *skia*, a shade, and *oura*, a tail, from a habit they have of curling their tails over and along their backs so as to form a kind of shade. They are described as animals of rather small size with great variation in color, their bodies being longish, eyes large and bright, ears erect, upper lip always divided, the posterior limbs longer than the anterior, the former have five toes and the latter only four with a tubercle covered with an obtuse nail in place of a thumb, tail long with bushy hair and generally distichous or divided laterally, having somewhat the appearance of a thick feather. All the species of

this family live mostly on trees, their long flexible toes with acute nails enabling them to leap from tree to tree, and they very rarely miss their hold. They feed principally on vegetable productions, such as nuts, seed, grain, etc. We cannot but know from the above description that our little rodent is a member of the *Sciuridae* or Squirrel family.

The family of Squirrels is widely disseminated, Australia, Madagascar, New Zealand and the West India Islands being almost the only places where they are not found. According to Bachman about forty different species have been described, eighteen of which are natives of North America. Other Naturalists put the number of species at a much higher figure. Jordan, in his "Vertebrates of North America," states that the number of species is not so great as was at first supposed, many of the so called species being simply varieties. The Black and Gray Squirrels are now considered to be the same species.

In the neighborhood of Ottawa five different kinds of Squirrels have been seen; only two of these are very common, namely, the Common Red Squirrel (*Sciurus Hudsonius*) and the Chipmunk or Ground Squirrel (*Tamias striatus*).

The Red Squirrel is of a dark brownish red along the back gradually turning lighter as we approach the sides; the cheeks are grey and all beneath is white. In some individuals a black line runs from the shoulders along the flank immediately above the white, the tail is of a rusty brown with black hairs on the borders, on the under side it is lighter in color along the middle and grows darker on the outer edges. The length of the head and body is about eight inches and the bony part of the tail about five inches, and including the fur it is between six and seven inches.

The Red Squirrel is a noisy little animal, and makes several distinct sounds expressive of its likes and dislikes. When hunted, so long as it feels that there is danger, it keeps very quiet, but the moment it feels that a place of safety has been reached it makes a quick, short and squeaky bark as much as to say the danger is past. If the supposed place of safety should be a tree it will ascend high enough to be fairly out of the reach of its pursuers, and perching itself upon a branch with its tail

turned up along its back with the point turned outwards, will open out upon its pursuers with a continuous volley of barking defiance.

“ Ascends the neighboring beech, then whisks his brush and perks  
His ears, and stamps and scolds aloud, with all the prettiness  
Of feign'd alarm, and anger insignificantly fierce.”

Its note of call or endearment is a kind of prolonged “chirr.” Whon this sound is made it is immediately answered by its mate, if within hearing distance. Squirrels choose their mates early in life, and so far as known remain faithful to their first love. The mother gives birth to three or four young ones about the beginning of June, and watches over them with great solicitude. The first nest of young squirrels which came under my notice was in a hollow stump at the edge of a pine woodland. The mother would not leave the nest at my approach, nor could I make her do so without resorting to forcible means which I never did. If often disturbed, the mother will remove her young carrying them in her mouth, after the manner of a cat, to another place of safety or concealment. A family of four squirrels took up their residence at our place in the early part of the summer of 1886, and remained with us nearly a year. The young ones were at the time rather more than half grown and were very playful, often playing a game which resembled a popular one with young children called “tag.” From the time the apples in our garden were fit to eat until late in the fall they seemed to live on them almost exclusively. They not only pulled what they wanted for present use, but they stored away a great many in a pile of wood which we had near the house. They also carried off hundreds of crab apples depositing them on trees wherever they could find a forked branch which would hold one securely. They were very particular in selecting such places, and would not leave an apple until they were fully satisfied that it would remain where they put it. They also gathered up a great many plum stones depositing them in hollows made in the ground, and covering them over with an inch or so of leaves or earth; they had dozens of these little hoards scattered about with no great quantity in any of them. As the cold weather approached they began house building; selecting a place between the wall plate and the roof of an outbuilding. The nest consisted principally of cedar bark torn into fine shreds; it was completely covered

over, there being only a small hole at one side for getting in and out. There was no appearance of their having eaten or stored any food in the nest. In the late fall and early winter months when the ordinary supply of food had failed they had recourse to their elevated accumulations, and could be seen every day going from branch to branch or from tree to tree eating up the withered and decayed fruit. They may have eaten only the seeds. In the cold and stormy time of winter they sometimes would not be seen for several days, but on sunny days they always came out and would sit for hours on our wood pile basking in the sun. We fed them frequently and they became so tame that they would come at our call and take food from our hands, of course it took some time to gain their confidence. After their supply of apples had failed they began eating the terminal buds on the balsam spruce trees, of which we have several in our garden. They next began eating flower buds of the red maple. The buds on those trees swell out very early in spring and are sometimes in full flower early in April. We have one tree of the American Larch in our garden, more commonly known hereabouts by the name of Tamarac; when the Squirrels found it they seemed to prefer it to any of the other trees, and made sad havoc among the small branches. When eating the buds of the balsam and maple they did so without cutting off any of the small branches, but when they began at the tamarac they first cut off the little branches, varying in length from a few inches up to one or two feet, and sitting upon their haunches and holding the little branches with their forepaws, moved them along, eating off the buds as they did so, much in the same way as we have seen some members of the *genus homo* do in eating green corn from the cob. In the spring, when the snow began to go away, the remains of numerous runways were to be seen made by the Squirrels under the snow in search of the deposits made by them the previous autumn. Later in the season dense clumps of young plum trees came up in places where the Squirrels had previously buried the plum stones and had failed to find them in winter. It is highly probable that our fruit and nut bearing trees are often taken into new localities in this way. The food of Squirrels, as already mentioned, consists principally of vegetable productions, but they can live and thrive on animal food. A gentleman living in this vicinity informed me lately that



he kept a Red Squirrel in confinement for upwards of two years and fed it exclusively on animal food, and that it became quite fat and glossy in its coat, and showed every sign of perfect health. I have frequently seen them eating the eggs of birds in my own place. This habit is a serious one, as no nests are safe if Squirrels are about. I must say that I like the feathered songsters of the spring so well that if it comes to a matter of choice between them and the Squirrels, I think the latter will have to go. My attention has been called to an article in "Science Gossip" for the year 1873, where it is stated that in one of the large parks in the City of Philadelphia the Squirrels became so destructive of the eggs of the wild birds (there nesting) that, in order to save the birds, it was found necessary to destroy the Squirrels.

Many people suppose that Squirrels are very much averse to water and will never voluntarily take to it. It is not uncommon to read of them—when compelled to cross a stream—making rafts of chips or pieces of bark and getting on board, hoist their tails so that they will catch the wind, and so manage to secure a dry passage across; of course they select a time when the wind is blowing from the right direction. These are pretty stories and quite complimentary to the intelligence of the little navigators. I am afraid, however, that the important element of truth is a missing factor. At one of the Club excursions to Meech's Lake as I was sitting on a rock near its outlet, about fifty or sixty feet from where a bridge spans it, a Red Squirrel came jumping along, and, without a moment's hesitation, plunged into the water and swam across. It was evidently a matter of choice as it could easily have crossed by the bridge.

The Chipmunk or Ground Squirrel is not of the same genus as the Red Squirrel, but as it is far more common in the Ottawa district than the others which are to follow, I will take it up before them. The Chipmunk is smaller in size than the Red Squirrel, a full grown one being about seven inches long, including the head and body; the tail, without the fur, is about four inches long. It is easily distinguished from the other Squirrels inhabiting this part of Canada by the markings along its body, there being always five dark longitudinal and parallel stripes extending from the head to the rump, the spaces between being of a lightish grey. The rump is of a bright tawny color; all the under

parts are white. The tail is not so long nor bushy as in the last named species, the part or dividing line of the fur is well marked. The Chipmunk rarely ascends trees. If its retreat is cut off from its hiding place it will do so, but it will not remain for any length of time on a tree, even if it has to face its enemy in coming down, particularly if the tree is shaken or beaten with a stick or other weapon. It is usually seen running along fences, and, if there are piles of stones about, will invariably become attached to such places as affording him a ready retreat. Under these he makes his burrow, in which he lays up his store of food. Its food is the same as that of the other Squirrels. A Chipmunk took up its abode at our place four years ago and remained with us for upwards of two years. It had apparently lost its mate; it became quite tame, and would come at our call, expecting to get something to eat, nor was it often disappointed. When working about the garden or sitting down on the grass, Dick (we called him by that name) would frequently come and make quite familiar with us, investigating our hands and pockets to ascertain if anything eatable was to be had. Dick had always an eye to business, and displayed much intelligence in his line. One Sunday mornin' as we were sitting on our verandah, Dick came along on his usual mission, one of the boys brought out a box with a sliding cover containing beech nuts, and set it down for him, with the cover just far enough back to allow him to get into it. In a moment he was in the box filling his cheeks with the nuts. When he had done so, he immediately hurried off to his storehouse, which was in a burrow under the verandah. Knowing that he would be back in a minute or two, we nearly closed the box, leaving a space of less than one-fourth of an inch. When he came he jumped on the box and putting one of his paws in the small opening pushed the cover back as easily and as quickly as if he understood the thing exactly. When he was away the second time we closed the box tight, on coming back he jumped on the box, and, finding it closed, tried to push the cover back from one end, but finding that it would not work, being the wrong end, he quickly went to the opposite end, and, taking hold of the cover with his paws, pulled it back without any difficulty, and in a trice was at the beech nuts again. It is well known that Chipmunks lay up large stores of food in the fall to serve

as a winter's supply, and it has very generally been supposed that they remained active during the cold and stormy season, consuming the food previously gathered. In a book entitled "A Naturalist's Rambles about Home," by Charles C. Abbott, we learn from his personal observations that they become quite trepid in cold weather. Speaking of a pair which he watched, he says: "Until the weather became fairly settled and really spring-like in character, these little Chipmunks did not often show themselves, and when they did it was only in the middle of the day. They appeared to foresee the occurrence of a cold rain storm twenty-four hours in advance and resumed their hibernating slumbers, becoming lethargic and very difficult to arouse. A pair that I had dug out in March, having two days before re-entered their winter quarters and become quite torpid, were apparently lifeless when first taken into the hands, and it was not until after several hours' warming that they became lively and altogether like themselves. This seemed to me the more curious, in that they can respond to a favorable change in the weather in a short time, even when the thermometric change is really but a few degrees." In another place he says: "The food gathered, usually nuts and corn, is, I believe partly consumed when they go into winter quarters, and before they begin their hibernating sleep, which may not be for some time. This impression is based on the result of digging out a nest as late as the 3rd of November, I found four Chipmunks very cozily fixed for winter in a roomy compartment and all of them thoroughly wide awake. Their store of provisions was in a smaller room or storehouse immediately adjoining. How long this underground life lasts before hibernation really commences it is difficult to determine; but as the torpid state does not continue until their food supply is again obtainable outdoors, the Chipmunks, no doubt, store away sufficient food for their needs throughout the early spring."

I well remember my first sight of a Chipmunk. I had then reached the inquisitive age of five years. Our family had just arrived at Smith's Falls direct from Scotland, and were on their way to the house of a relative who had come to this country some years before. The little animal was seen running along a fence, and some of my brothers who were older than myself immediately gave chase with the intention of capturing it, being under the impression that it was an

American mouse. We had heard so many wonderful things about the new country that we were quite prepared to believe that even mice might have taken the form and appearance of Chipmunks. Our paternal grandfather, to whom we owed allegiance at the time, being a Presbyterian of the old school, stern and strict, with a high sense of duty and the maintenance of law and order, and not being fully conversant with the game laws of America, immediately ordered a cessation of hostilities, which was reluctantly obeyed, and our American mouse was allowed to pursue its way in peace and quietness.

The Black Squirrel (*Sciurus niger*) is seldom seen in the vicinity of Ottawa and they do not appear to have established themselves hereabouts. I have only seen two or three individuals altogether and they were in the neighborhood of Beechwood Cemetery. I have been informed that they are never seen in the Provinces of Nova Scotia and New Brunswick and very rarely in the adjoining Province of Quebec. A few years ago they were very plentiful around Smith's Falls, which is about 40 miles from here. As the country became cleared of its forests they gradually disappeared until at the present time they are seldom seen at all. The Black Squirrel is the largest in size of any of our Canadian Squirrels, the head and body being about 13 inches long and the tail, without the fur, about 10 inches. The color on the back and sides is of a glossy black; on the under parts it is not so glossy and is often dark brown rather than black. Its habits and ways of life are much the same as those of the Red Squirrel. It is not so active in its movements and is more afraid of the presence of man, probably owing to the fact that it has been more persistently hunted on account of its greater value. In common with the Red Squirrel it has the habit of dodging around a tree when approached and keeping on the side, so that it is not easy for the hunter who is alone to get a shot at it. They will, if no other way of escape presents itself, stretch themselves along the upper side of a branch, pressing their bodies so closely to the bark that they can scarcely be seen, and then remain absolutely motionless.

I well remember when I was a boy having a race with a Black Squirrel which ended with results which remain in the form of a scar to this day. The Squirrel was first seen on a small hickory tree gathering nuts. The tree stood by itself, and was, perhaps, one

hundred and fifty yards away from a neighboring forest. Another boy, who was with me, and I, immediately made an attack upon it; the Squirrel seeing that its only safety lay in reaching the other larger trees jumped to the ground and set off at full speed in that direction, we pursued and after a hard race overtook it; I then threw my hat over it and then held it fast, and taking hold of its tail, which protruded beyond the rim of my hat, held it out at arm's length by its tip, thinking it could not bite me when held in that position. I was, however, deceived, for in less time than it takes to say it, the teeth of the Squirrel had met in the fleshy part of my hand; you may well believe I did not hang on to the tail very much longer.

The Grey Squirrel, which for a long time was held to be a distinct species, is now generally classed as the same species as the Black Squirrel. Jordan, in his "Vertebrates of North America," states that the color of this species varies from almost pure white through various shades to jet black; the lighter colors prevailing north and westward and the darker ones southward. The grey variety is certainly a rare visitor in Central Canada. The late Mr. Billings states in the Canadian Naturalist that it had never been seen in the Ottawa district at all. I have seen one individual of this color which I shot a few years ago on a small tributary stream of the Rideau which empties some miles this side of Smith Falls. I have been informed by Mr. Lees (a member of this Club) that he saw one a very short distance from where he lives—about one mile from this place. In size the Grey Squirrel is about the same as his black kinsman. It is said that they do not lay up a hoard of winter provisions. They are known to feed on the *larvæ* of various species of insects, but their principal food consists of grain, nuts, etc.

The Flying Squirrel (*Sciuropterus volucella*) is the fifth and last which I have seen in this part of the country. While occupying a place in the family of squirrels, having some of the common characteristics, it differs in some important points, and is in consequence placed in another genus *Sciuropterus*, which simply means winged squirrels. It is particularly marked by an expansion of the skin extending between the fore and hind legs which, when spread out, forms a sort of parachute which enables it to make

short flights from place to place. Nine or ten different species have been named, only two of which are found in North America, one in Northern Europe and the remainder in Java. The small American flying squirrel being the only one I have seen in this neighborhood. It is smaller in size than any of our other squirrels. The extreme length of a full grown one being about ten inches, the head and body being a little more than five inches. The head and body are often of a mouse grey color, sides of the nose and all beneath white. On the upper side of the flying membrane the predominating color is brown which on the edge is bordered with white. Its fur is very dense, short and smooth, much finer in texture than the other squirrels. I have seen it stated that these squirrels could fly as far as fifty yards at a time; perhaps they might do so if their starting point were high enough. I never saw them fly more than half that distance, their ordinary flights being twenty or thirty feet. Owing to the fact that flying squirrels are largely nocturnal in their habits they are less frequently seen than they otherwise might be, as they are not so scarce as many people suppose. They are easily tamed and become very amusing little pets. A member of the club informed me lately that he had a tame one for sometime which showed some strange peculiarities, one was, that only at certain hours of the night did it show any activity, namely from about two to four o'clock, a.m. Another, was its simulation of death when it thought itself in danger or when suddenly cornered, keeping at the same time a sharp look out for a way to escape, and the moment the way appeared to be clear it would suddenly come to life again and dart away as quick as thought. Mr. Abbott, whom I have already quoted, states that years of familiar acquaintance with these squirrels have not enabled him to detect much in their habits indicative of intelligence, he continues, "I feel sorry to have so poor an account to give of the beautiful creatures, but I am compelled to say it of them, they are not "smart." Notwithstanding all their vivacity in their native haunts and their eminently gregarious habits, they do not suggest by any of their movements so far as I was able to detect any decided indication of that sociability characteristic of some of the other squirrels. Each on the contrary jumps, runs and flies solely on his own account, associated together indeed but never acting in concert."

The order *Rodentia* as a whole does not stand high in point of intelligence from an anatomical aspect, the brain being proportionally small in size and with few convolutions. Some notable exceptions to this ruling will occur to most of us. As an instance, our common rat displays a wonderful amount of ingenuity in applying means to an end. A case illustrative of its resources came to my knowledge a short time ago. The occurrence took place this winter. One of my neighbors having placed a basket containing eggs on a shelf at the head of a stair-way leading down to a cellar, went the following morning to get some of them; to her astonishment they had all disappeared without a trace of the remover. Knowing that there were a few rats about, suspicion fell on them and justly so. An investigation having been made the eggs were all found sound and whole under the cellar floor fifteen or twenty feet away. How the rats managed with the resources at their command to take the eggs out of a basket and carry them down a stair-way without breaking even one, certainly points to the fact that their reasoning faculties were exercised to some purpose. Another illustration and I am done. I am indebted to a friend for it. He does not vouch for its authenticity as he did not see it himself. One Mr. Cobb, a respectable gentleman of Lusty Mills, Kentucky, says he saw a Squirrel acting in a very peculiar manner on the top of a tree, and it caused him to stop and watch its actions. Pretty soon it came down the tree bearing a bunch of something in its mouth and went directly to the creek. When it got to the edge of the water it turned around and backed into the creek until the water covered it entirely except the tip of its nose, when it let go the bunch which floated off down the creek. In gratifying his curiosity Mr. Cobb went down and got the bunch and found, he says, a million fleas on it.

It is very doubtful if we, who claim to be the lords of creation, with all our boasted intelligence, could devise a better plan for persuading undesirable and unwelcome visitors to so quietly take their departure.

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ON THE OCCURRENCE OF "PHOSPHATIC NODULES"  
IN THE CHAZY FORMATION ABOUT OTTAWA,  
CANADA.

By Henry M. Ami, M.A., F.G.S.

In the April number of the OTTAWA NATURALIST Mr. Sowter has an interesting article on the Chazy formation at Aylmer, Que., in which he records some valuable discoveries made respecting its stratigraphy and palaeontology. One statement made in this paper, however (p. 21), requires a few words of explanation, and that is, regarding the occurrence of those "phosphatic nodules" at Hog's Back, in Nepean, Ont., which I had observed in the summer of 1884, and described March 4th, 1885, at one of the Club's winter Soirées.

Mr. Sowter remarks that "during the past season these 'nodules' have been examined and recognized as very diminutive members of the Brachiopoda and Lamellibranchiate, as yet unclassified," adding a footnote regarding certain organic-like forms which he compares with *Pasceolus globosus* of the Trenton.

I am quite astonished indeed at Mr. Sowter's conclusions resulting from an examination made of the nodules which I discovered in 1884, at Hog's Back, in the Chazy formation. To begin, I am not aware that Mr. Sowter has ever even seen a single one of the "phosphatic nodules" which I described, and had that gentleman desired or asked to see them, he would never have arrived at his conclusion. Moreover, in order to ascertain definitely the minute structure and characters of these "nodules," which were in the cabinets of the Geological Museum, Mr. Weston very kindly prepared careful microscopic slides of them, and the sections soon revealed that they were truly "phosphatic nodules," and very akin to those described and figured in the "Report of Progress of the Geological Survey of Canada" for 1876 (page 433). Mr. Weston recognised them as such immediately, having already prepared a great number of such from different formations.

As to the occurrence of "diminutive Brachiopoda and Lamellibranchiata," these have been observed at several localities before.

In further corroboration of the fact that "phosphatic nodules" are met with in the Chazy formation, the following extracts from the



"Report of Progress" of the Geological Survey of Canada for 1851-52, by Sir Wm. Logan, are here given :—

On page 28, this eminent authority says : "Small black phosphatic nodules are mentioned by Mr. Murray as occurring at the base of the Chazy limestone. On the 33rd lot of the 7th concession of Lochiel, where they are sparingly disseminated in the rock, they occur in precisely the same stratigraphical place, on the rear of the 10th lot of the 1st concession of West Hawkesbury, where they are rather larger, but still in sparing quantity. As the nodules, however, when separated from the rock, hold, according to the analysis of Dr. Hunt, a large amount of the phosphate, they would probably render the limestone beds in which they occur of more than ordinary value, to be burnt for agricultural application when lime is required, as the phosphate can scarcely fail to be of additional service. Small black phosphatic nodules exist also in thin sandstone beds interstratifying green slates at Grenville. \* \* \* \* \*

"Brown nodules of the same description, but larger in size, occur in a conglomerate, supposed to be of the same age as the Grenville beds, at Allumette Falls on the Ottawa."

It will be clearly seen, then, that *phosphatic nodules* are eminently characteristic of the Chazy throughout the entire length of the Ottawa Valley. I have observed them, not only in the calcareo-argillaceous and partly arenaceous shales of Hog's Back, in Nepean, to the west, but also in strata of the age at the lower Gatineau ferry's wharf.

The most practical question now seems to be the use to which the shales might be put in affording a fertilizer. Perhaps the Central Experimental Farm authorities might be induced to take the matter up and ascertain the practical value of the beds which hold these phosphatic nodules along with Lingula. A fair trial on a small scale would be of considerable interest, and the result on the crops would be looked forward to with much interest. An analysis of the Hawkesbury nodules gave Dr. Hunt the following result :—

Phosphate of lime (bone earth).....	44·70
Carb. of lime.....	6·60
"    magnesia.....	4·76
Per ox. of iron and trace of alumina.....	8·60
Insoluble silicious residue.....	27·90
Volatile matter.....	5·00

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97·56

For further information respecting the minute descriptions given by Dr. Hunt, the reader is referred to the same "Report of Progress," pages 110, &c.

OTTAWA, June 21st, 1888.

## SUB-EXCURSIONS.

No. 1.—The first Sub-Excursion of the season was held on Saturday, 5th May, and was under the direction of the President. The lateness of the present spring affected the attendance, scarcely a dozen members appearing at the appointed hour.

The place chosen for investigation was Beechwood, always one of the first localities to reward those seeking for early spring flowers. Eleven species only were collected, which were named and described by Mr. Whyte. The *Liliaceae* being specially examined and explained.

No. 2 was held to the Beaver Meadow, Hull, on 12th May. It was a lovely warm afternoon, and the botanists turned out well. When the party reassembled to hear the addresses of the leaders 23 were found to be present. The baskets were well filled and provided ample material for the leaders' addresses.

Mr. Robert Whyte gave an interesting address upon the plants collected and drew particular attention to the *Cruciferae* or Cress family, all of which might be easily recognized. These plants are all characterized by their cross-shaped flowers, and many of them have a pungent taste. All are edible and wholesome. Prof. Macoun also spoke at request of the leaders upon the best way to study the willows. The different divisions and groups of the *Salices* were explained, and the best way to collect and study these different plants was explained in a simple and attractive manner. The Mosses and Liverworts were also referred to, and the members were urged to collect them.

Mr. Fletcher then followed as Entomological Leader, and spoke at some length upon some of the malformations found upon plants known as Galls. These, he explained, were formed by an interesting group of insects, of which Mr. Harrington and he had made a special study. He also advised the members to decide at once what line of study they were going to take up, and get their apparatus in order. Frequently valuable specimens in all branches of natural history were lost or destroyed from the collector not having at hand the proper apparatus for preserving them. Speaking of the branches in which he was a leader, he said that bottles, boxes and cyanide bottles could be procured, by those wishing to study insects, of Mr. Henry Watters, Sparks St.; gauze for nets from Messrs. Crawford Ross & Co., and

botanical collecting cases and Trowels of Messrs. H. Meadows & Co.

Before leaving for home the President requested Prof. Macoun to speak about some of the spring birds. This he did, making this always interesting topic more charming by the manner in which he described the habits of some of the specimens he had collected. He urged the members never to kill one they did not actually require for study, and pointed out how much pleasure and knowledge might be acquired without this destruction, although occasionally it was essentially necessary for scientific accuracy.

No. 3 (19th May).—Only a few members appeared at the Post Office on this occasion, as the weather was excessively hot. The botanists, led by Mr. Whyte, and entomologists, led by Mr. MacLaughlin, visited the north shore of the Ottawa west of Hull, Que., and obtained some interesting specimens. The geological party, led by Mr. Ami, went to the "Siphonotreta bed," opposite the Rideau Rifle Range, and interesting forms were obtained.

No. 4, May 26th (Geological Section).—The geological measures which crop out at and below the mouth of the Rideau River along the Ottawa River front, forming so conspicuous a physical feature in the delineation of the shores of that river were examined as far as the Lower Gatineau ferry. Two great dislocations were noticed; the first and westerly one affecting the measures of the Trenton, bringing what appear to be the lower beds of that formation in contact with the uppermost strata of the same. The second and more easterly, a fault of more importance, which causes the Chazy formation to abut against the lower Trenton beds last mentioned. The district visited was particularly interesting, and fossils were collected at all the localities. Specimens of *Rusichnites* (Dawson) were detected in the lower measures of the Chazy near the ferry wharf, and fine specimens of *Modiolopsis parviuscula* (Billings) obtained in a calcareous band in the upper beds exposed along with *Rhynchonella plena* (Hall), &c. Notes on the leading stratigraphical and palæontological features observed were taken for future use and reference by one of the leaders.

(Botanical Section.)—A small party led by the President visited Rockcliffe. The plants specially studied were the Liliaceæ. The threatening appearance of the weather made it advisable to return home sooner than would otherwise have been the case; but some collections were made and the time of opening of many kinds of flowers was recorded.



## 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.

NOV 1 3 1886

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