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THE OTTAWA NATURALIST.

VOL. XIII.

OTTAWA, AUGUST, 1899.

No. 5.

EXTRA LIMITAL INSECTS FOUND AT OTTAWA.

By W. HAGUE HARRINGTON, F. R. S. C.

Read 21st February, 1899.

The tracing out of the geographical distribution of plants and animals is one of the most important and, at the same time, one of the most fascinating studies of a naturalist. In the investigation of the complex problems which are therein encountered, a society such as the Ottawa Field-Naturalists' Club may render very valuable assistance, by the publication of accurate floral and faunal lists, and of exact records of the occurrence and life histories of the various species studied by its members. The commonplace Ottawa citizen, especially if he be a property holder, observes with pride and pleasure the steady expansion of the city, and the corresponding increase of its population. The Ottawa naturalist, on the contrary, notes with deep regret his former haunts invaded and laid waste, and monotonous blocks of buildings rapidly covering the ground where so recently the forest flourished. The so-called march of improvement unfortunately means to him the disappearance of his happy hunting grounds; the cutting down of woodland monarchs, the draining of lush swamps and the production of barren uniformity where erstwhile plentiful diversity obtained.

The evolution of our country from a forest region to an agricultural and commercial district, not only in the immediate neighbourhood but over the areas spreading oceanward in every direction, produces important and easily recognized alterations in our flora and fauna.

As the untutored savage vanishes before the civilization for which he is not prepared, so many of our native animals and

Issued August 11th, 1899.

plants disappear and are replaced by intruders from afar. The primeval forest perishes ; its larger denizens are slaughtered or driven away, and the plants and animals that remain are such as can best adapt themselves to the changed conditions of the land.

Many persons may recognize these self-assertive changes and still not stop to think that our insect fauna and even those smaller forms of life that delight the microscopist are also similarly affected by the far-spread improvements or disturbances of the landscape.

Yet a moment's consideration will suffice to show that such is actually the result. An insect may be able to exist only upon a single species of plant, and the destruction of that host-plant involves the disappearance of its guest. Or, the actual change in physical conditions may equally well bring about a change in the insect life. The draining of a swamp and its gradual conversion into dry woods or open fields necessitate the withdrawal of those species which require a cold moist habitat, and correspondingly tend to create conditions favourable for forms from more southern localities. These changes go on steadily year after year whether we notice them or not, and the destruction of the forest, the cultivation of the land, the pasturing of flocks and herds, and ever expanding commerce accelerate the alterations in insect population. Our indigenous insects are supplanted by prolific and vigorous forms from lands where evolution has fitted them to successfully overcome the disadvantages of man's society and solitudes. The species whose food plants are destroyed, and which are unable to assimilate the new order of vegetation, disappear, accompanied by many of their parasitic and predatory associates. Replacing them come insects from near or afar, especially those thoroughly domesticated forms which follow man wherever he pitches his tent or builds his shack.

In a discussion of the insect population as it now appears to our collectors, a difficulty arises at the start in our inability, in many instances, to distinguish between the descendants of the

original fauna and late intruders. A considerable proportion of our insects belongs to a boreal fauna which is more or less circumpolar in its distribution, and of which many species pass with little or no change of facies through the northern regions of Europe, Asia and America. In regard to such forms it is consequently often impossible to declare positively whether they belong to the original fauna or have been introduced since the colonization of the country. There are, however, many species whose progress hither can be retraced successfully by the records in entomological or agricultural publications. The times and methods of their arrival are varied and numerous, and any full discussion of them would be long, and to many wearisome. Some, our settlers have carried among their goods and chattels or even upon their persons, while many have come with their beasts and fowls. Other forms living in less close communion with mankind have worked their own passage hither afoot or awing. Some come borne across long leagues of land and water by the winds ; a few possibly upon the floods, although as our streams flow usually to the east and south the currents are mainly against the oncomers. In these latter days of swift and universal transit, when Ottawa is a great and growing railway centre, they hasten to us both by freight and passenger trains. They are introduced with our animals, our plants, our provisions, with merchandise of divers sorts, and in ways innumerable and unexpected.

A large proportion come as immigrants to occupy and possess the land and to multiply their kind therein ; others are tourist visitors making summer excursions which terminate generally in their premature death through cold or the lack of proper nourishment.

In addition to the species which have been introduced from abroad, we may consider perhaps as extra-limital insects certain indigenous forms which occur but rarely, or under special conditions. Such for example are the butterflies *Thecla Augustus* Kirby, *Thecla tricharis* Hub. and *Chionobas Jutta*. These butterflies have been captured in the Mer Bleue, but are species

having their metropolis, or region best suited to their full and regular development, much further northward. Examples of such forms occur in little out-lying colonies, whose ancestors found in their prehistoric wanderings a suitable habitat, or survived in more and more restricted isolation as the surrounding country became unfitted through climatic changes for the continuance of the species.

Without waiting to consider such, all too-common, insects as the cheerful House-fly, the industrious Clothes-moth, the "Jumpem-quick" and the "Walkem-slow," with numerous other crawling and creeping domestic pets and pests which, like the poor, are always with us, mention will be made of a few of the more noticeable species which within more or less recent years have come hither as permanent residents or as occasional visitors.

Commencing with the Lepidoptera there is, familiar to everyone, the common White Cabbage Butterfly, *Pieris Rapa* Linn, the caterpillars of which devour voraciously the succulent cabbages and cauliflowers of the kitchen-garden, or the fragrant mignonette of the flower plots. This butterfly came to America by way of Quebec about the year 1859 and has since that date become widely distributed across the continent. As the Europeans dispossessed the native Americans so this immigrant from across the Atlantic has become our most common species and has almost supplanted our native white butterfly, *Pieris oleracea* Har, and the last Entomological News (vol. x, p. 46) records a similar displacement of the species as far west as Salt Lake City.

An occasional visitor from across the line is *Aletia argillacea* Hub., the famous Cotton Moth of the Southern States, whose numerous and industrious progeny reduce by several million dollars annually the product of the plant from which is obtained such an important article of commerce, and one so necessary to the comfort of mankind. The moth is of moderate size, expanding scarcely one and one-half inches, and is soberly coloured; the front wings tawny or olivaceous with a few irregular trans-

verse markings and a small oval eye-spot; the hind wings are pale greyish; when at rest it is quite inconspicuous. Dr. Riley in his report upon Cotton Insects, has stated that this species "is probably indigenous to South America and is an introduced insect in the United States," where its appearance was first recorded in 1793. For a century it has levied toll, reaching thirty million dollars in some years, upon the cotton plantations, but fortunately its caterpillars will not feed upon any other plant, and its depredations are thus confined to the Cotton Belt. Unlike the larvae, the moths are more catholic in their tastes especially in the matter of sweets, and not content with rifling the nectaries of different plants they do considerable injury to fruits. Dr. Riley says that:—"Frequently the fig crop is completely destroyed in some sections of the cotton belt, as is also the August crop of peaches. The moths have also been known to feed on apples, grapes, melons and the jujube." This aptitude for a more savory diet than cotton permits the moths to earn a living almost anywhere, and accounts perhaps for their occasional appearance so many hundred miles from the scenes of their earlier labours. It is, however, possible that the specimens which occur here, perfectly fresh and unrubbed, have been reared upon some other plant in more northerly regions. In October, 1880, the moths occurred quite abundantly in this city; I captured many individuals at rest upon different buildings, and the following year I found it both at Hull and Aymer.

While these autumn arrivals of *Aletia* do not survive our winters nor propagate their species here, there is another resident of the cotton fields that apparently is able to do so and which may therefore become a permanent and unwelcome colonist. This is a somewhat large moth, known as the Boll worm, *Heliothis armigera* Hub., which in portions of the cotton-growing region is almost more dreaded than the Cotton Moth itself. The species is distributed over a large portion of the world and has been observed in Canada for a score of years. It has a varied menu, including such very important plants as corn and tomatoes. In the ears of the former and the fruit of the latter the cater-

pillars burrow as they do in the cotton bolls, and to some people the idea of a large fat grub busily at work within would spoil the taste of the largest and gayest tomato.

Of the many enemies of the fruit grower, one has been so long with us that we almost forget that it is not native to the soil. This is the destructive Colling Moth, *Carpocapsa pomonella*, recognized in America as early as 1819 and whose progeny one often finds snugly domiciled in the rosy-cheeked apple when it is eaten, resulting at times in the biter being bitten. This is by no means an insect new to science as wormy apples as said to be referred to in literature two thousand years old; when the fruit was presumably much less luscious and tempting than it is at present. Indeed we may reasonably assume that the first green apples with which the children of the cave-dwellers sharpened their teeth, already harboured the retiring and gentle grub.

Occasionally specimens have been captured in Ottawa of an unusually large and handsome moth named *Erebus alora*. The occurrence of this fine insect so far north is both remarkable and puzzling, as it is an inhabitant of the West Indies and Central America, and it seems scarcely possible that individuals, even aided by favourable winds, could accomplish such long flights without becoming very much travel-worn; yet the specimens observed have been in good condition.

Of Hymenoptera quite a number of species have come to us; of which probably the most important is the Honey Bee, *Apis mellifica* L., who labours during the hot Canadian summers to increase the sweets of our existence, but whose manifest virtues we will not stop to discuss. There are also several obnoxious forms belonging to the group known as Saw-flies, which have caterpillar-like larvæ. The blushing rose, that universal symbol of beauty and fragrance, among the many foes that stale and wither its infinite variety numbers three species of saw-flies, all of which, there is good reason to believe, are from over the ocean. *Monostegia rosæ* Harris has been known in America since 1841, *Emphytus cinctus* Linn., since 1867 and *Cladius pectinicornis*

Fourc. since 1880. A few years ago I had a solitary rosebush, and not much of a rosebush either, which nourished during the summer all three species. All growers and lovers of small fruits know only too well the worms which defoliate so rapidly the currant and gooseberry bushes. These also are the larvæ of a European saw-fly, *Nematus ribesii* Curtis, and the species is one of our earliest immigrants, making itself quite at home and prevailing in spite of hellebore and other applications.

Of insects that have made themselves conspicuous in recent years by their works of destruction *Nematus erichsonii* Hartig, holds a leading place, from the wide spread devastation it has wrought in the tamarac forests from the Atlantic westward. The Larch saw-fly is almost undoubtedly an importation from Europe, and, matriculating at Harvard in 1880 on European larches, it swept rapidly through New England and was reported three years later as causing serious injury to our native larches in the Province of Quebec. In 1885 it was found at work in this district and by 1890 it had overspread the whole country from historic Louisburg to points far west and north of Ottawa. The tamarac forests suffered as if a fire had overrun them, and it is difficult to estimate the loss that this insect has caused to the country. It still abides with us, ready each year to attack any trees that still struggle for existence and put forth a feeble foliage, or such young larches as may be found growing up.

A small black saw-fly, *Fenusa varipes* appeared a few years ago at the Central Experimental Farm upon imported Alders, of which the foliage was much disfigured by the larvæ mining in the leaves. The insects spread to the alders in Dow's swamp, but the species does not appear to have established itself.

Closely allied to the saw-flies is *Cephus pygmaeus* Linn., the larvæ of which burrow in the stems of wheat. It occurred here some years ago, but has not since been observed.

Of Diptera can only be mentioned a species which of recent years has become notorious, viz., the Horn-fly, *Hamatobia serrata* Rob.-Desv., first noted in America in 1887 and in Canada in 1892. It receives its name from its habit of massing

at certain times upon the base of the horns of cattle, and it seriously injures the cattle through the irritation caused by its persistent biting and blood-sucking. Turning to the Coleoptera we find an insect which is more generally known and persecuted than even the Cabbage Butterfly. This is the Colorado Potato-beetle, *Doryphora decemlineata* Say, a species from the wild and woolly west, which has fluttered its pink wings in heavy flight from the Rocky Mountains to the Atlantic surges. So great has been its voracity that its yellow coat with black stripes is as much detested as if it covered a convict with two instead of six legs. About the year 1820 the celebrated entomologist Say, otherwise an estimable gentleman, had the misfortune to discover this marauder and introduce him to the public. In the solitude of his native wilds he subsisted in scanty numbers upon a wild Solanum, but when he formed the acquaintance of the pioneer farmers some years later, he made himself quite at home in the potato-field and increased amazingly, until his offspring were forced to journey abroad in search of fresh fields to conquer. A few days ago there might still be seen in the rooms of the Ottawa Literary and Scientific Society the first potato-bugs received in Ottawa, which were then exhibited as interesting curiosities at one of the soirees of the old Nat. Hist. Society of Ottawa. They were in good spirits, although dead, but living examples soon followed them, whose descendants remain with us unto this day, in spite of unfriendly treatment and a diet of Paris green.

Some years ago Mr. Scrim found that in his rose-houses the plants were suffering greatly from the attacks of some beetle, and upon investigation we found that the species was *Aranigus Fulleri* Horn, a snout-beetle commonly known as Fuller's Rose-beetle. The larvæ were in great abundance feeding upon the rootlets and many of the valuable plants were destroyed. Energetic and effectual measures were taken to destroy them and, so far as known, there has been no subsequent infestation. Nor does the beetle appear to be established at any point in

Canada, although it is an American species, and for a score of years has been a serious pest in New York and other states.

Within three or four years our Coleoptera have been augmented by two European beetles which fortunately are not obnoxious, but which have spread and multiplied with great rapidity. Ten years ago *Sphæridium scarabeoides* L., had only once been recorded from Canada, but since then it has rapidly increased and has become apparently fully established. The late Mr. Caulfield of Montreal about 1886 sent to me specimens of *Aphodius prodromus* Brahm. collected by him in that city. The beetle has now become one of our commonest species, and several introduced species of the same genus are also abundant (*fossor*, *inquinatus*, *functarius*, *granarius*, etc.)

The foregoing illustrations will have shown that it would require a very extended list to enumerate all the additions that from year to year have been made to the original insect life of this region, so in conclusion will be stated merely two generalizations which this consideration of the subject seems to establish.

First ; that all our most attractive insects, such as the gaily-painted butterflies and moths, the flashing dragon-flies in "sapphire mail" and the beetles of varied shapes and colours, belong to the indigenous fauna, and that, with the exception of some aggressive diptera such as deer-flies, black flies and mosquitoes, few of the members of that fauna have proved to be very obnoxious or serious pests.

Second ; That nearly all the common and destructive insects, against which our farmers, fruit-growers and gardeners have to wage persistent and costly warfare, have been introduced at various times from Europe, and that these species, through the absence of the parasites and other influences which keep them in check in their original habitat, often multiply with startling rapidity and occasion continual and grievous losses to our community.

ORNITHOLOGICAL NOTES.

Edited by W. T. Macoun.

After the arrivals of the birds have been recorded there are usually few other notes taken during the season. There is so much to be learned about the habits of our birds that it is surprising that more young people do not become interested in them. Many a pleasant hour might be spent during the holidays in watching birds and taking notes on what is observed. Very little information is received regarding the nesting of birds. Are boys becoming lazy or has the bicycle greater charms than the woods? How few really desire to know more about birds.

BIRD NOTES FOR MAY.

1899.

- May 18—BLACKBURNIAN WARBLER, *Dendroica blackburniac*. Mr. George K. White.
- 18—BAY-BREASTED WARBLER, *Dendroica castanea*. Mr. White.
- 18—NASHVILLE WARBLER, *Helminthophila ruficapilla*. Mr. White.
- 18—TENNESSEE WARBLER, *Helminthophila peregrina*. Mr. White.
- 19—CAPE MAY WARBLER, *Dendroica tigrina*. Mr. White.
- 19—BLACK AND YELLOW WARBLER, *Dendroica maculosa*. Mr. White.
- 20—WILSON'S THRUSH, *Turdus fuscescens*. Mr. W. A. D. Lees.
- 20—MARYLAND YELLOWTHROAT, *Geothlypis trichas*. Mr. Lees.
- 20—RED-SHOULDERED HAWK, *Buteo lineatus*. Mr. Lees.
- 20—WILSON'S WARBLER, *Sylvania pusilla*. Mr. White.
- 20—CEDAR WAXWING, *Ampelis cedrorum*. F. N. Sub Excursionists; May 21st, Mr. White.
- 21—RUBY-THROATED HUMMINGBIRD, *Trochilus colubus*. Mr. White.
- 21—BLACK-POLL WARBLER, *Dendroica striata*. Mr. White.
- 23—NIGHT HAWK, *Chordeiles virginianus*. Mr. Lees.
- 24—BLACK-THROATED BLUE WARBLER, *Dendroica ceruleascens*. Mr. White.
- 25—WOOD PEWEE, *Contopus virens*. Mr. Lees.
- 25—TRAILL'S FLYCATCHER, *Empidonax pusillus trailii*. Mr. Lees.
- 26—VIRGINIA RAIL, *Rallus virginianus*. Mr. Lees.
- 28—CANADIAN FLYCATCHING WARBLER, *Sylvania Canadensis*. Mr. White.

ERRATA: The PECTORAL SANDPIPER was seen by Mr. White on 30th April, not by Mr. Lees. The bird recorded as AMERICAN PIPIT seen by Mr. Lees on 13th April was not that species, but the WATER THRUSH, *Seiurus noveboracensis*.

Young bronzed grackles were able to fly on 31st May, also young robins. Young song-sparrows were just leaving the nest 24th May.

On 21st May hermit thrush had three eggs in nest. Summer Warbler had three eggs in nest on 12th June.

On 24th May, saw a pair of herring gulls at Lake of Islands, Gatineau. They appeared to have a nest in that vicinity. Also saw Myrtle Warbler, but was unable to find nest. G. R. W.

Three spotted sandpipers' nests were found at the Experimental Farm during the month of June. All of these were on high ground a long distance from water. One nest was about half a mile from the water. Nests of the bay-winged bunting are also numerous on the lawns in the Arboretum during this month. All of those found had eggs in them. W. T. M.

Four humming-birds' nests have been found in this district this year, one in an ash tree, the others in conifers.

Miss J. M. Ballantyne sends the following note on birds seen at Cumberland during the excursion of the 15th inst: "Cumberland woods on the hillside at the back of the village proved an exceptionally interesting place for the observation of bird life. Twenty-two species were identified there, while several others were seen on or about the shore.

The American Goldfinches were numerous; their notes and those of the Red-eyed Vireo might be heard almost constantly during the day. Most of the birds seen were common to our city parks or gardens. The Red-breasted Grosbeak, Redstart, and White-breasted Nuthatch are less frequently seen at Ottawa at this season of the year."

We are indebted to Mr. S. Osborne Scott and Mr. Bedson, Winnipeg, Man., for the following notes on birds observed at Winnipeg. It is interesting to compare the dates of arrival of birds there with some species at Ottawa.

1898.

Nov. 24—SNOWBIRDS, which stayed until after Christmas, then disappeared until Feb. 26, and were gone again before the middle of April.

1899.

March 9—PRAIRIE HORNED LARK—This bird breeds here.

- April 6--DOWNY WOODPECKER.
 6--CHICKADEE. Breeds.
 6--CROWS seen flying in flocks.
 6--HOUSE SPARROWS re-building their nests.
 7--WHITE-RUMPED SHRIKE. Breeds.
 9--REDPOLL.
 9--SLATE-COLOURED JUNCO.
 10--AMERICAN GOLDFINCH Breeds.
 10--WESTERN RED-TAILED HAWK. Breeds.
 13--MEADOW LARK. Breeds.
 14--ROBIN. Breeds.
 15--NIGHT HAWK. Breeds.
 15--MALLARD. Breeds.
 15--WOOD DUCK. Breeds.
 15--PINTAIL.
 22--Cold spell with snow. No more birds arrived for some time. Snow seemed to drive away some of those which had already arrived.
 23--Fine again.
 23--SONG SPARROW. Breeds.
 23--HOUSE WREN. Breeds.
 23--FLICKER. --Breeds.
 23--RED WOODPECKER. Breeds.
 23--HOARY REDPOLL.
 26--KILDEER PLOVER. Breeds.
 26--PURPLE MARTIN. Becoming common. Breeds.
 27--SPARROW HAWK. Breeds.
 27--PINE GROSBEAK.
 27--CEDAR WAXWING.
 27--WOOD PEWEE. Breeds.
 28--GREAT CRESTED FLYCATCHER. Breeds.
- May 1--SPOTTED SANDPIPER
 4--UPLAND PLOVER.
 6--COWBIRDS.
 6--This evening there was a heavy thunder storm with a strong wind from the south. At about 11.30 p. m. the wind was at its height. Many birds going north were driven against the college and some stopped in the pond in front of it, among which were Water-hens, Water-rails, Gulls, Snipe and Yellowlegs.
 7--KINGBIRD. Breeds.
 7--WHITE-BREADED NUTHATCH. Breeds.

- 7—FOX SPARROW. Breeds.
 8—Flock of from 30 to 40 Evening Grosbeaks in tall maples; going north. Breeds.
 8—WHITE-THROATED SPARROW. Breeds.
 8—WHITE-CROWNED SPARROW. Breeds.
 8—CHIPPING SPARROW. Breeds.
 10—FIELD SPARROW. Breeds
 12—BLACK-THROATED GREEN WARBLER.
 18—PINE WARBLER.
 19—CHIMNEY SWIFT. Breeds.
 20—BALTIMORE ORIOLE. Breeds. This bird is becoming much more common than it used to be.
 20—BLUEBIRD. Breeds. This bird is becoming much scarcer than it used to be. There was only one breeding in this locality where there used to be twenty.
 21—TREE SWALLOW. Breeds.
 22—BLACKBURNIAN WARBLER. Breeds.
 23—CATBIRD. Breeds.
 24.—AMERICAN BITTERN. Breeds.
 25—MOURNING DOVE. Breed.

ED. NOTE: A few other birds mentioned in this list are known to breed in Manitoba but the list is printed as received from Mr. Scott.

PRELIMINARY DESCRIPTION OF A NEW CARIBOU

By ERNEST SETON-THOMSON.

It has long been known among sportsmen that the caribou of the western mountains differed strikingly from those found in the Barren Grounds, the northern woodlands, or Newfoundland. The fine specimen brought from British Columbia by Dr. Geo. M. Dawson, of the Canadian Geological Survey, has given me the opportunity of satisfying myself regarding the alleged differences. These are very obvi-ous, and are moreover coupled with the fact that it is geographically isolated from its near ally, the *Rangifer Caribou*, so that I feel justified in giving it full specific rank.

RANGIFER MONTANUS, sp. nov.

The Mountain Caribou.

Chief characters: Its very dark colour and its great size; in the latter particular it is said to equal, or even exceed the

R. terre-novae. The specimen brought by Dr. Dawson is now mounted in the museum of the Canadian Geological Survey at Ottawa. And I have to thank that gentleman for the privilege of describing this fine animal.

This specimen, which I make the type of the new species, is a male, and was taken in the Illecillewaet watershed, near Revelstoke, Selkirk Range, B.C., in 1889.

It stands $46\frac{1}{2}$ inches high at the withers; is 95 inches from tip of the nose to the root of the tail; the tail is 5 inches long; the head from nose to occiput $19\frac{3}{4}$, the hind foot 26 inches; the ear $7\frac{1}{2}$ inches.

The general colour is a deep umber brown, very glossy, and darkening nearly to black on the lower parts of the legs.

The neck is dull greyish white, also the underside of the tail, the buttocks, lips and belly. Along the ribs on each side is a greyish patch a little lighter than the surrounding brown.

The white fringe above each hoof is shining white and *very narrow*.

The antlers of this specimen are not noticeably different from those of the woodland species, but in general those of the Mountain Caribou are distinguished by their great number of points, a specimen with 72 points having been recorded. They are, I believe, less massive than those of the Newfoundland species.

The species ranges or did range through the interior mountains of British Columbia, extending northward into South Eastern Alaska, eastward into the Rockies of Alberta, and southward along the higher ranges of Idaho half the length of that state. According to Lord it formerly was found along the summits of the Cascade range as far as Oregon. It does not seem to breed at all in the coast ranges of British Columbia.

So far as I can learn it is separated geographically from the woodland species by a vast caribou-less basin, running up east of the mountains as far as latitude 54.

EXCURSION TO THE QUEEN'S PARK, AYLMER.

The second general excursion of the season under the auspices of the Club was held on Saturday afternoon, June 24th, 1899 when the Queen's Park, Aylmer, Que., was visited.

The attendance was not large, but *five* of the leaders appointed by Council were present and a profitable time was spent by those who were fortunate enough to visit this beautiful Park.

BOTANY:—In this section of the Club's work, seventy-nine species of plants were noted and recorded from the Park. They are for the most part common species. Among the most interesting plants were a series of flowering shrubs: *Ceanothus Americana*, *Prunus pumila*, *Rosa blanda*, *Corylus rostrata*, *Shepherdia Canadensis*, *Viburnum pubescens*, *Cornus paniculata*, *Carpinus Americana*, *Rhus typhina*, *Juniperus communis* and *Crataegus*. Amongst the trees were noted two kinds of oaks, *Ulmus Americana*, *Pinus Strobus*, *Thuja occidentalis*, *Abies balsamea*, *Populus balsamifera*, *P. tremuloides*, *Betula lenta*, *Tilia Americana*.

The number of plants now growing in the Park would, no doubt, far exceed that recorded on a single day by a single visit of a few of the members of the botanical section, nevertheless it would be interesting to have a complete list of the species recorded from this locality as in a few years the ground will have been so trodden as to leave but few of the more humble and modest herbaceous flowering plants that now adorn the shady nooks and pretty spots of this Park.

It is to be hoped that the pines and oaks and every tree growing within the limits of the Queen's Park will be protected, that not only their shade may be enjoyed but their beauty and characters. The Botanical branch was led by Messrs. R. B. Whyte and A. E. Attwood, M. A.

GEOLOGY.—The geology of the Queen's Park is very simple. Two geological formations are there to be seen. First, the Calciferous formation consisting of fine grained and compact magnesian or dolomitic limestones, which are at times rather

siliceous and pass upwards into very fine grained and rather thick bedded soft mudstones or shales with peculiar concretionary structure and conchoidal fracture.

The outcrop of this formation along Deschenes Lake Shore affords just sufficient material to enable the geologist to identify the horizon there represented in the stratigraphical column of formations. The occurrence of the gastropod: *Pleurotomaria gregaria*, Billings, a form characteristic of the Calciferous sand-rock of Ste. Anne and St. Eustache in the Eastern extremity of the Ottawa Palæozoic Basin where it forms part and parcel of the present (same geologically) St. Lawrence Basin, affords sufficient evidence to enable the reference to be made with a degree of accuracy.

Then the newer or Pleistocene deposits are very poorly represented in the Park, but in the Island south of the Park, on which the Lighthouse is built, are sands and gravels of post-glacial origin and made up for most part of debris of Palæozoic and Archæan rocks. The geological party was led by Mr. T. W. E. Sowter, who proved a very valuable leader and also by the President.

ARCHÆOLOGY. —Mr. Sowter informed the members present that the shore of the lake in the vicinity of the Park, especially along the line of the terminus of the Electric Railway line, was a favourite resort of the aborigines of this country and the site of an old camping ground.

One of the members of the geological section visited the Lighthouse Island opposite the Queen's Park and obtained a number of bones of the former inhabitants of this district, who had been interred in this sequestered spot. Some of the bones were found strewn along the northern and eastern shores, bleached and partly submerged, others were found in the gravels on the bluff or west side of the Island.

This district is well worth visiting and studying from an Archæological or Ethnological standpoint, and from the success which has already attended the researches of Mr. T. W. E. Sowter the club hopes to be able to chronicle very interesting result before long. H. M. A.

EXCURSION TO CUMBERLAND, ONT.

The third general excursion of the Club was held at Cumberland, a pretty village situated on the Ottawa River, Ontario side, some twenty miles below the Capital. It was the first time in the history of the Club that Cumberland had been visited and although the attendance was not large, nevertheless, those who took part or were present, all speak in glowing terms of the beauty of the view and surroundings as well as of the many interesting natural features of special value to a field naturalist. Three members of the Council and Leaders were present and considerable work done.

In Ornithology Miss Ballantyne noted the occurrence of not less than twenty-five birds during the day, whilst Miss M. Whyte prepared a list of the flowering plants noticed along the face and on the top of the escarpment south of the village and along the roadsides and shore of the Ottawa, on behalf of the Botanical section. Mr. Andrew Halkett, as Leader in general Zoology, made notes of observations on squirrels, chipmunks, slugs, millipedes and spiders, besides a number of butterflies. Amongst these were: White admiral (*Limenitis Arthemis*).

Milk-weed butterfly (*Danais Archippus*), Yellow butterfly (*Colias philodice*), White Cabbage butterfly (*Pieris rapæ*.)

Regarding the Chipmunk (*Tamias striatus*, Linn.,) Mr. Halkett writes:—"An interesting sight was a Chipmunk at his burrow which was a regular hillock with both entrance and exit. The entrance was constructed of sticks and stones."

Two Cyprinoids were secured by Mr. Halkett for examination, from a pool adjacent to the Ottawa caused by the receding of the water.

GEOLOGY.—The strata between the Ottawa river front and the top of the hill south of Cumberland afford perhaps the most perfect undisturbed and continuous section of Palæozoic rocks in the Ottawa Valley in a very compact and easily accessible form and limited space. The Calciferous, Chazy, Birds' Eye and Black river and Trenton formations were all observed and examined in their natural sequence.

The lower plateau between the hill and the river shore is occupied for the most part by the Calciferous formation and a series of strata which may be termed a transition series between the Calciferous and Chazy. The magnesian limestones and concretionary argillaceous beds such as were noted at the Queen's Park, Aylmer, crop out at this locality and are superimposed by sandy shales and marls which compose "the hill" south of Cumberland village. On the top of the hill and brow thereof, bands of a limestone full of the characteristic *Rhynchonella* (*Camarotoxchia*) *plena* were seen from which excellent specimens were obtained. Above this a few characteristic fossils of the Black river and Trenton formations were also noted. Above all of these and along the cultivated flats and farm lands occur the fossiliferous clays and marls of Pleistocene age. Thousands of shells of *Saxicava rugosa* occur together imbedded in a sandy clay at the foot and along the slope of the hill on the road to Ottawa on Mr. Gamble's farm. *Balanus crenatus* also occurs rarely along with the former named species.

The limestones of Lower Trenton and Black river age are well exposed along the roadside and exhibit beautiful examples of glacial striæ. The majority of the markings, trend for the most part due north and south, but at times are very irregular in direction which fact indicates the oscillatory movements and shifting of the direction of the great ice sheet carrying boulders of Archæan age, many of which can be seen on the upper ledges of the Ordovician strata as they were deposited or left by the ice as it melted at the close of the glacial period. H. M. A.

NOTE.

GOOD GEOLOGICAL SECTIONS.—The Leaders of the geological section desire to draw the attention of members of the Club to the numerous excavations going on in the City for the Main Drain. These excavations afford excellent sections, and as in the case of earlier public works of the same nature when valuable notes were taken, it is hoped that records will be kept to show the character of the strata traversed in various portions of the City and afford material wherewith to lay down the boundaries of the various geological formations traversed with greater accuracy. H. M. A.

OBITUARY, O. C. MARSH.

OTIINIEL CHARLES MARSH, professor of palæontology in Yale University, New Haven, vertebrate palæontologist of the United States Geological Survey and president of the National Academy of Sciences from 1883 to 1895, a past president of the American Association for the advancement of science, corresponding member of learned and scientific societies in France, Belgium, Germany, Italy, Austria, and Denmark, died in his sixty-eighth year at his residence, New Haven, Connecticut, after a brief illness. Prof. Marsh was one of the most brilliant and distinguished palæontologists in the world.

He was educated at Yale, Berlin, Heidelberg and Breslau. He achieved a vast amount of work before he died and had in his hands a very large amount of material to describe and illustrate had the untimely hand of death not snatched him, as if in an instant, from his favourite studies and researches. Honours were showered upon him by the Institut de France, the Geological Society of London and other distinguished bodies.

Prof. Marsh crossed the Rocky Mts. twenty-one times, visited the Alps and Hills of Germany and carried on many explorations in the Western portion of the New World. He brought to light more than 1,000 species of extinct vertebrates, birds with teeth, flying reptiles, two new orders of mammals, the earliest monkeys and bats in the New World and series of specimens illustrating the evolution of the horse, together with the discovery of gigantic reptiles, dinosaurs, both χ carnivorous and herbivorous are to be numbered amongst his best known finds. He has left a monument behind him of great importance and significance. The vast amount of treasures he had gathered during the forty-five years of his active life, when properly housed and cared for and exhibited to advantage, as we trust it will be ere long, will form a magnificent series which will illustrate a most important phase of the past history of North America in an admirable manner.

The earliest paper which appeared from the pen of Prof. Marsh related to the minerals of Nova Scotia. In writing of Prof. Marsh's work, Dr. Charles E. Beecher says :

"His three mineralogical papers, published between 1861 and 1867, show the results of considerable labour and careful investigation. They treat of the gold of Nova Scotia, a Zeolite mineral from the same region and a catalogue of the Mineral Localities of the Maritime Provinces of Canada"

The following papers specially relating to Canada are here extracted from the "Bibliography" prepared by Dr. Beecher and kindly communicated to me :

1861 "*The Gold of Nova Scotia.*" Amer. Journal of Science (2) vol 32 pp. 395-400.

1862 "*On the Saurian Vertebræ from Nova Scotia*" Ibid. vol. 43 p. 278.

"*Description of the Remains of a New Enaliosaurian (Eosaurus Acadianus) from the Coal Formation of Nova Scotia.*" Ibid. vol. 34, pp. 1-16, pls. I.-II.

1863 "*Catalogue of Mineral Localities in New Brunswick, Nova Scotia and Newfoundland.*" Ibid. vol. 35, pp. 210-218.

1867 "*Contributions to the Mineralogy of Nova Scotia.*" Ibid. vol. 44, pp. 362-367. No. 1. *Ledererite* identical with *Gmelinite*.

Prof. Marsh was one of the leading contributors to the American Journal of Science and his writings certainly did much to add zest and interest to that publication.

His genial and courteous manner as well as characteristic good nature won for him a vast concourse of friends and admirers on both sides of the Atlantic. We shall long miss his beaming countenance and striking individuality.

The "Bibliography" of Prof. O. C. Marsh as prepared by Dr. Beecher for the American Journal of Science, 4th Series, Vol VII, pp. 420-428 is most complete and shows clearly what a master mind the subject of this brief sketch possessed. I shall close with words from Dr. Beecher's pen. (loc. cit. p. 419.)

"In closing the outline of the discoveries made by this investigator one cannot help being impressed with their signal brilliancy, their great number and especially by their unique importance in the field of organic evolution. Were all other evidence lost or wanting the law of evolution would still have a firm foundation in incontrovertible facts. The study of variation and Embryology in recent animals gives hints as to the truth, but Palæontology alone can give the facts of descent." H. M. AMI.

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