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THE OTTAWA NATURALIST

VOL. XXIV. OTTAWA, OCTOBER, 1907.

No. 7

THE MARINE BIOLOGICAL STATION AND ITS WORK.

A REVIEW OF "FURTHER CONTRIBUTIONS TO CANADIAN BIOLOGY," 1902-1905. 39TH ANNUAL REPORT DEPARTMENT MARINE AND FISHERIES, OTTAWA, 1907.

The publication by the Department of Marine and Fisheries of Part II. of the Journal of the Marine Biological Station of Canada, is an event of no small scientific interest, and a brief review of its contents, and of the circumstances under which the staff of the Station carry on their work, may be acceptable to our naturalists generally.

The former report from the Station was entitled "Contributions to Canadian Biology," and the present series, of thirteen papers, bears the title "Further Contributions." It is of the usual 8vo Blue Book size, of about 130 pages, and includes ten very beautiful plates, and five half-tone illustrations in the text. Professor Prince, the Dominion Commissioner of Fisheries, prefaces the report with a short note of explanation, and refers to the success of the station in enlisting the aid of voluntary workers from practically all the Canadian Universities.

"Toronto and McGill Universities have been prominently represented," Professor Prince states. "Queen's University, Kingston, has almost every season sent some representative of its academic staff, while Dalhousie (Halifax, N.S.), Mount Allison, (Sackville, N. B.), Acadia (Wolfville, N. S.) and other universities, including some United States institutions, have sent workers." The staff has been unsalaried, and only scientific workers trained and qualified to conduct original researches have been given the free use of the Station, its library, apparatus, and other advantages. By the wise generosity of the Dominion Government it has been possible to partially meet some of the expenses of the staff, but the fishery and other laborious investigations have been carried on by voluntary scientific workers, without the stimulus or reward of an adequate honorarium. No Station of the kind in the world has been operated at such slight cost to the country, and with such substantial results.

The present publication amply bears out the claim just made. It contains twice the number of papers contained in the

former report. They cover very varied topics and many of them are of inestimable value from a practical fishery point of view, while all are valuable from the purely scientific standpoint. The papers admit of a five-fold classification; they are (a) those essentially practical in object and character; (b) faunistic; (c) embryological; (d) chemico-physiological, and (e) botanical. The authors are Professors Ramsay Wright, A. P. Knight, E. E. Prince, A. B. MacCallum and James Fowler; Dr. Joseph Stafford and Dr. A. H. MacKay; Mr. G. A. Cornish and Mr. C. B. Robinson; but neither the present scientific papers nor the foregoing list of authors indicate the whole of the researches conducted at the Biological Station, nor include all the staff of brilliant investigators who have spent more or less time in its laboratories.

The primary object of the Station was to aid the fisheries of the Dominion. As the fishes in the sea, indeed all the larger forms of life, depend for sustenance upon the microscopic organisms, which render sea-water "a kind of minute broth," as the late Dr. W. B. Carpenter happily styled it, Professor Ramsay Wright appropriately heads the series with an account of the "Plankton" of the Nova Scotian waters. Professor Wright shows how minute plants, invisible to the naked eye, crowd the surface waters. These build up the protoplasm necessary as food to fishes and other marine creatures. The herring and mackerel feed almost solely on this microscopic life, collectively called the "Plankton." They are not all tiny plants, some are infusorian animals, Foraminifera, Radiolarians and the like. "No one sailing over the Atlantic," Professor Wright observes, "suspects the presence of such a rich vegetation, and indeed it can only be disclosed by filtering the water through an exceedingly fine fabric—the finest silk gauze." Seven exquisite plates indicate something of the variety and beauty of the Plankton. More beautiful artistic illustrations it would be difficult to imagine. They are heliotype reproductions of Mr. J. R. G. Murray's drawings of Professor Wright's original sketches done at the Station. No less than three species of the tadpole-like larval Ascidians belonging to the Copelata were secured near Canso. As, according to the poet,

"The ancestor remote of man, says Darwin,
Was the Ascidian,"

these small tailed creatures, showing the first indications of a back-bone, are of uncommon interest. A most peculiar egg, no doubt that of some Gastropod shell-fish, is figured on the same plate as the Ascidians, and "suggests in its shape," as Professor Wright points out, "a low broad-brimmed hat." There are

described many beautiful Peridinians, usually regarded as plants, also Diatoms and various Foraminifers and Infusorians, as well as pelagic crustaceans and larvæ of higher forms, all of which are elements in that floating food upon which young fishes feed in Nova Scotian waters.

The three reports by Professor Knight, of Queen's University, are in many respects the most valuable in the volume, for they treat of subjects of the highest public importance. The "Sawdust Question" is dealt with in a "further" and a "final" report, and the laborious investigations and experiments commenced by Dr. Knight in 1900 and continued season after season for four or five years, are here presented in concise and readable form. Our law-makers must in future consult these splendid reports before attempting legislation on the grave "sawdust *versus* fish" controversy. The killing of fish by dynamite has been much practised in spite of statutory prohibitions, and Dr. Knight, at the suggestion of Professor Prince, carried out with much skill and at some bodily risk, experimental researches which prove how wasteful such nefarious fishing is. Professor Knight's reports entitle him to the profound gratitude of the Canadian public.

Dr. Joseph Stafford, who continues to act as Curator of the Station, reports on the Atlantic fauna; his short list of sponges, Cœlenterates and Echinoderms, 70 species in all, is the preliminary instalment of a more complete list, which will form a desirable supplement to the splendid list published seven years ago by Dr. Whiteaves. A large collection has been made at each of the five locations where the work has been carried on. A knowledge of the animal and plant life in each locality is, from a fishery standpoint, a necessary preliminary. "The study of the environment of fish and fisheries" (the Director of the Station, Professor Prince justly observes) "is as necessary as the study of the fish themselves and their habits, and of the practical methods of exploiting fishery resources."

Dr. Stafford has established a wide reputation as an authority upon Trematodes and other parasites, and his numerous papers, published largely in Germany, are substantial contributions to science. His paper on Trematodes or parasitic sucker-worms (the tenth in the present series) is a concise account of the group and their life-history, so far as known, and he gives a list of 28 known and 10 undetermined species—a very creditable addition to American Helminthology. Dr. A. H. MacKay, Superintendent of Education for Nova Scotia, furnishes a list of the Diatoms of Canso, and he states that the 73 species which he determined do not exhaust all the material secured at the

Station. Indeed this excellent list must be regarded as a provisional one. It is a piece of careful and exact work and will be of value to all future students of these lowly plants. A similar observation may be applied to the "Seaweeds of Canso," by Mr. C. B. Robinson, formerly of Pictou Academy, and now of the New York Botanical Gardens, Bronx Park. The algæ named include 75 species.

Among the many diligent workers at the Biological Station none were more assiduous than Mr. G. A. Cornish, of Toronto University, now Science Master at Lindsay Collegiate Institute. His two papers on the Polyzoa and the Fishes of Canso might be criticised on two grounds, viz.: the lack of concise, orderly description, and the lack of drawings. Certainly the notes on fishes should have been thoroughly revised, as much of the matter is somewhat well-worn, and usually fragmentary, and might have been pruned down with advantage. As a beginning, each list has its value, and Mr. Cornish deserves credit for his patient work. Professor James Fowler, it is pleasant to note, once more appears with a very extensive list of the plants around Canso. The names of over 300 phanerogams and cryptogams are given, while the list is prefaced by some exceedingly interesting notes. Professor Fowler has been most faithful in his services to the Station, and it is said that, in spite of his years, he recently explored the wilds of Gaspé when the Station was located there (1905-1906), and it is to be hoped that his list of Gaspesian plants will be published at an early date.

Professor Prince's memoir on the eggs and young of certain members of the herring family (the shad, alewife, herring, etc.), with three remarkably beautiful plates, some of them tinted, is of biological interest, and the general conclusion reached is that these fishes are far less rapid in growth than has been usually surmised. Professor Huxley once stated that the herring matured in one year, in his opinion, though he modified his view later; but it now appears from the more thorough and exact researches of authorities like Professor Prince, that the third or fourth year may elapse before the herring reaches its mature spawning condition. It is a striking circumstance that the herring tribe differ so greatly in the nature of their eggs and spawning habits. The sea-herring's eggs are heavy, cling together firmly and are attached to the bottom of the ocean. The egg is about one-twentieth of an inch in diameter. The sprat, so like a small herring, deposits a most delicate floating egg. Each egg floats separately and cannot be touched without being crushed, it is so delicate, while it is barely one-twenty-fifth

of an inch in diameter. The shad's eggs are separate and neither cling to each other nor float at the surface of the water. They are comparatively large (one-seventh of an inch in diameter) and roll about amongst gravel, etc., in shallow streams and rivers above tidal limits. As Professor Prince's four beautiful drawings of the young alewife or gaspereau (on Plate X) are the first ever executed of these early stages, they are of great scientific value, while the detailed drawings of the scales, etc., are of extreme interest. Professor Prince also furnishes a very readable account of the profound and technical researches of Professor A. B. Macallum, one of the most distinguished scientific men whom Canada has produced. The researches of the brilliant Professor of Physiology in Toronto University are better known in England and Germany than in our own country, and London last year honoured Dr. Macallum with the coveted F. R. S. of England. Professor Macallum investigated the "Chemistry of Medusæ" for several seasons in the Biological Station and published his results in the *Journal of Physiology*, Vol. XXIV. Professor Prince, who edits the present publication, desired a less technical and more popular version of the published paper; but for various reasons, it is understood, that a simplified account could not be prepared by the author in time for the present issue. Professor Prince himself therefore wrote this very fascinating version of Dr. Macallum's paper, minus technicalities, and presented in a revised popular form. The lovely floating medusæ or jellyfish, often brilliantly coloured, are generally thought to be composed of delicate, transparent skin and water. There is certainly little solid matter in them. Professor Owen dried a jellyfish, which weighed two pounds when alive, and found that its weight was barely thirty grains, or about one-five-hundredth of the original weight. Professor Macallum establishes the complex composition of the "jellyfish juice," and the amazing physiological independence and stability of the jellyfish cells. He disproves Professor Loeb's contention that the chemical nature of the surrounding water directly affects either the chemical nature of the medusa or its living movements and functions. Professor Macallum proves that each has its own individual resisting power and a wonderful independence of outside chemical changes, while the cells, composing the medusa's body, have a surprising selective power, and accept or reject the various salts in the surrounding sea-water, as the experiments demonstrated. Nay, more, their chemical constitution appears to be that which must have characterized animals in the primal seas of our planet. May it not be that the serum, the clear part of our own blood, is the

same as the blood of the animals in the early ages of the world, and transmitted to us in the course of æonic development? Professor Macallum's results suggest this. Mammalian serum in its proportions of sodium, calcium and potassium, is not unlike the fluid contents of the jellyfish. The evolutionist can now claim that our blood, apart from the red corpuscles, has come down to us from an ancestral stock as lowly as the medusæ, and as remote in time as the Jurassic and even the primitive Palæozoic epochs! Hardly less wonderful is the conclusion that the inorganic composition of jellyfishes is not due to the sea-water environment of to-day, but "reflects the composition of sea-water . . . of past geological periods, possibly very remote periods." Divested of technical terms and abstruse expressions, Professor Prince's account of Dr. Macallum's remarkable researches, compressed into seven pages of these "Further Contributions," furnishes reading of rare and profound interest to all scientific students.

In reviewing a publication so welcome and of such unusual interest to all scientific students, it might appear to be superfluous to call attention to errors and to faults, typographical or otherwise. Some such faults there are, and it would have been well to have avoided or corrected them before issue from the press. In Professor Wright's paper the references to the literature are in some cases detailed in the text, in other cases they are relegated to the last page of the paper. This should have been avoided. The magnification of the figures in the plates should have been given in all cases, whereas in nearly half the figures there is no clue to the size of the organisms. Many readers will wonder what size, for example, are the interesting tailed Ascidian larvæ on Plate VII. (figs. 11 and 12). An even graver complaint is justifiable regarding the description of plates in Professor Prince's paper. Thus on Plate VIII, figs. 6c and 7 are described as the pilchard (they are evidently young gaspereaux), while figs. 10 and 11, described on page 109 as gaspereaux, are pilchard, and are copied as stated on page 108 from Mr. J. T. Cunningham's well-known and not very good figures in the Journal of the Marine Biological Station of Britain. On page 57 in Dr. MacKay's very accurate paper *Licmophora* is misprinted *Licmphora*, while the only misprint apparently in the venerable Dr. Fowler's botanical list is œ for æ in Gramineæ (page 67). On page 76 *Membranipora* is there spelt *Men* not *Mem*, while on page 101 the familiar term Clupeidæ has the grotesque form Clupieidæ. Finally, on page 89 the page heading to Mr. Cornish's notes on the fishes of Canso appears as "The Marine Polyzoa of Canso, Nova Scotia."

Naturalists generally will readily overlook these slight errors, and will be glad to see so important and valuable a series of contributions to Canadian biology issue from the Station on the Atlantic coast. Much work has been done at Malpeque, P.E.I., at Gaspé, P.Q., and at Seven Islands, on the north shore of the St. Lawrence, and the issue of reports on still further contributions from the pens of the accomplished and zealous staff of the Station will be awaited with impatience.

The Director of the Station (Professor Prince), who occupied the honoured position this year of President of Section IV (Biology, etc.) of the Royal Society, stated to one of the most brilliant audiences of leading Canadian biologists ever assembled in Ottawa, that a Pacific coast station is to be opened for marine researches immediately under Dominion Government auspices. With the station on the west coast and a new (permanent) station at St. Andrew's on the Atlantic shore, and a Great Lakes Station near Parry Sound, future "Contributions to Canadian Biology" will no doubt surpass even the present most interesting and valuable scientific publication.

C.

DATES OF ARRIVALS OF BIRDS AT CAMROSE, ALTA.,
IN 1906 AND 1907.

By F. L. Farley

	1906		1907	
Tree Sparrow.....	March	31	March	23
Mallard.....	"	31		
Canada Goose.....	"	31	March	23
Crow.....	April	6	"	31
Junco.....	"	10	April	19
Red-tail Hawk.....	"	11		
Swainson Hawk.....	"	11	March	31
Killdeer.....	"	13	April	20
Robin.....	"	11	"	19
Bluebird.....	"	10	May	26
Meadow Lark.....	"	14	April	23
Song Sparrow.....	"	14	"	14
Sparrow Hawk.....	"	17		
Red-winged Blackbird.....	"	20	May	10
American Snipe.....	"	23	"	10
Bronzed Grackle.....	"	24	"	12

Purple Finch.....	"	24	"	21
Yellow-shafted Flicker.....	"	25	"	16
Horned Lark.....	"	23	April	23
Vesper Sparrow.....	"	24	May	14
Brewer Blackbird.....	May	2	"	9
Sapsucker.....	"	5	"	26
Wilson Thrush.....	"	5	"	15
Pewee.....	"	5	"	21
White-crowned Sparrow.....	"	5	"	17
Savanna Sparrow.....	"	7	"	19
Lincoln Sparrow.....	"	7	June	9
Field Plover.....	"	10	May	21
White-breasted Swallow.....	"	10	"	27
Franklin Gull.....	"	11	"	12
Red-breasted Nuthatch.....	"	10		
Clay-colored Sparrow.....	"	12	May	20
Sprague Skylark.....	"	12	"	21
Yellow Warbler.....	"	13	"	23
White-throated Sparrow.....	"	17	"	26
House Wren.....	"	17	"	27
Catbird.....	"	18	"	28
Myrtle Warbler.....	"	18		
Barn Swallow.....	"	19		
Least Flycatcher.....	"	20	June	5
Wood Pewee.....	"	20	May	28
Northern Yellowthroat.....	"	23	June	14
Baltimore Oriole.....	"	23	May	26
Rose-breasted Grosbeak.....	"	23	"	26
Accentor.....	June	1		
Night Hawk.....	"	1	June	14
Leconte Sparrow.....	May	30	"	1
White-rumped Shrike.....			April	9
Yellow-legs.....			May	9
Spotted Sandpiper.....			"	11
Cowbird.....			May	11
Solitary Sandpiper.....			"	12
Fox Sparrow.....			"	21
Cliff Swallow.....			"	27
Yellow-headed Blackbird.....			June	6
Redstart.....			"	8
Mourning Dove.....			"	9
Red-eyed Vireo.....			"	11
Cedarbird.....			"	11
Trail Flycatcher.....			"	11
Warbling Vireo.....			"	12

The unprecedented cold and backward Spring, all over the northern part of this continent has been the cause of much discussion among weather men and the public generally, and no doubt ornithologists have noticed the effect the unusual conditions have had in the arrival of Spring birds.

Having taken notes on the arrival of Spring birds for the past fifteen years, on and between the Red Deer and Battle rivers, in 113 degrees of West Longitude as a centre, I find they are later this Spring than in any other year. It seems strange also, that the two extremes should be reached in the two years 1907 and 1906: arrivals in 1906 were earlier than in any other year since my arrival here.

ERUCA SATIVA, MILL.

Mr. J. Dearness has sent from London, Ont. to the herbarium of the Geological Survey specimens of *Eruca sativa* which may become a very troublesome weed in Canada. Mr. Poland, Yarmouth township, Elgin county, has written Mr. Dearness that this weed came to him and to a neighbour of his as an impurity in alfalfa seed, that it was scattered all over the field in which the alfalfa was planted, and that when he had pulled out all he could see it made a heap as large as half a ton of hay. Later he cut the tops off plants that had been missed, and these on October 15th were again making considerable show in parts of the field.

Since the above note was in type specimens have also come to us from Mr. T. N. Willing, Chief Inspector of Weeds for the Province of Saskatchewan. The seed from which these plants grew came from Russia mixed with alfalfa seed. The home of *Eruca sativa* is along the Mediterranean. It is not indigenous in Russia and must be growing there as a weed.

J. M. M.

NOTES ON THE GENUS VACCINIUM.

By E. Wilson, Armstrong, B. C.

The four species here named are in our collection: *V. membranaceum*, *V. ovalifolium*, *V. Canadense*, and *V. parvifolium*.

V. membranaceum was collected in fruit, July 16th, on the mountain side close to Revelstoke, also at Trout Lake, Poplar, Seymour River, and the Horsefly River. This species produces the finest fruit of any of the species collected. The fruit is of a purplish black when ripe and much sweeter than *V. Canadense*, so common in northern Ontario. It also averages larger in size than *V. Canadense*, but does not yield so heavily. It is, however, a very heavy producer and is much valued for household use. The plants grow and produce the best in open or thinly wooded places, at between 2,500 and 4,000 feet. I have not often seen it above 4,500 feet. It seems to prefer a drier soil than *V. ovalifolium*, and also grows less scattered, the plants generally being abundant where it grows.

V. ovalifolium was collected at the same places as *V. membranaceum*, excepting near the Horsefly River. It, however, grows at a much lower altitude and generally in damper and more shady places, often in quite heavy timber. It is seen in its best state on the lower benches of the river valleys of the Gold ranges. There it produces heavily, bright-blue berries, much more solid and tart than those of *V. membranaceum*, but not so large. A peculiarity of the fruit is its very heavy bloom. The berries are round while those of *V. membranaceum* have the diameter from calyx to stem much shorter, thus producing a flat berry. The fruit is also more scattered on the bushes and thus more difficult to gather. It hangs on though much longer than that of the other species, thus producing a late fall fruit. The shrub of this species grows often 3 or 4 feet high, and sometimes higher, much higher and more diffuse than *V. membranaceum*. I have never seen it in thick patches, but always scattered thinly over quite large areas. We may say, then, that *V. ovalifolium* begins at a much lower altitude than *V. membranaceum*, goes up with, but drops out before the limit of the latter is reached. The flower of *V. ovalifolium* is quite a bright pink, while that of *V. membranaceum* is a yellowish green, sometimes pinkish.

V. Canadense was collected in two places only, one on a small burned-over area of about an acre at about 2,500 feet altitude at Revelstoke; the other locality was near the Horsefly River. The plants are much smaller than the eastern type and produce much smaller fruit. It produces, however, as heavily

if not more so, the berries being often quite crowded. This species does not seem to thrive in British Columbia as in the east, and appears to be dwarf-like in every particular.

V. parvijolium was collected along the Seymour River running into Seymour Arm at the northern end of Shuswap Lake. The shrub grows about the height of *V. ovalifolium*, but more erect, often producing the appearance of a small cherry tree. It grows at the lowest altitude of any of the species, being common on the shores of the lake, which is about 1,100 feet above the sea. Our trip up Seymour River was for about 20 miles, and ended at nearly 7,000 feet. *V. parvijolium* began at the lake shore and at about 10 miles up *V. ovalifolium* began, followed soon after by *V. membranaceum*. At one time for two or three miles we had the three together, but the species dropped out in the order named as we proceeded. All disappeared at 4,500 feet. The fruit was beginning to ripen at this date, July 24-27, and the appearance of the three shades of color was quite interesting. *V. parvijolium* was, however, in advance of the others. Its fruit production is in about the same ratio as that of *V. ovalifolium*, perhaps less scattered on the branches.

The fruit production of the blueberry does not seem to be so certain in British Columbia as in eastern Canada, there being many off seasons, or it may be abundant in one locality and very scarce in others. The early springs of British Columbia may be one cause of this, combined with a light snowfall. When the snowfall is light the plants get an early start in the spring, and often are in bloom early in May, or even the last week in April. If a heavy frost comes at this season, as it often does, the result is a light crop of fruit. This may account for a better fruit production at over 3,000 feet, as the altitude retards the spring growth as well as being less subject to late frosts.

It can readily be seen in British Columbia that *Vaccinium* delights in a moderately damp climate, since it disappears altogether in the dry parts, except in rare situations at high altitudes.

REPORT OF THE ENTOMOLOGICAL BRANCH, 1906.

(Read at meeting of Club on evening of March 19, 1907).

The Entomological Branch has been actively at work. Throughout the past summer several members collected assiduously and regular meetings have been held during the winter. Notwithstanding the somewhat unproductive nature of the season, as a whole, many interesting insects in various orders were captured. Good progress has also been made in working up the systematic lists for the locality. Large numbers of species of diptera, hemiptera, lepidoptera, odonata and arachnida have been named by specialists, and records of these will appear before long in the pages of THE OTTAWA NATURALIST. The fortnightly meetings held at the houses of the members have been most helpful in holding the members of the Branch together, and in creating and keeping up an interest in the general subject of entomology; they have also been the means of the distribution of much valuable knowledge to those who have been fortunate enough to take part.

Some of the members of the Ottawa Field-Naturalists' Club living at a distance have done valuable work in Canadian entomology, and also in helping to complete our knowledge of the insects of the Ottawa district. The Rev. G. W. Taylor, of Wellington, B.C., continues to study the North American Geometridæ; he has identified many species of these moths for our local students and has contributed some valuable papers upon them to THE OTTAWA NATURALIST. Mr. Norman Criddle, of Aweme, Manitoba, and Mr. T. N. Willing, of Regina, Sask., have collected many plants and insects and have helped not only to work up the fauna of their own districts, but have sent many interesting specimens to their fellow workers in Ottawa. Great advance has been made in our knowledge of the local microlepidoptera. This is chiefly due to the enthusiasm of Mr. C. H. Young, and to the generous help of Mr. W. D. Kearfott, of Montclair, N. J., U.S., who has identified many hundreds of specimens which have been sent to him by our collectors from various parts of Canada. Mr. Young has collected at Ottawa and has had named by Mr. Kearfott no less than 250 species, and there are still probably another hundred species mounted and ready to go forward. During the past summer Mr. Young collected and set up in admirable manner over 1,500 specimens of these exquisite little insects. Mr. W. Metcalfe continues his studies of the hemiptera, and has added many new names to the Ottawa list. Mr. J. W. Baldwin has been very successful in collecting nice series of moths at sugar. Amongst these were most of the species of *Catocala* found at Ottawa.

During the month of May, the Rev. G. W. Taylor and the Rev. Dr. Bethune, while attending the meeting of the Royal Society of Canada, had an opportunity of meeting the members of the Branch, several of whom had the great pleasure of making excursions with them. Mr. Taylor was present at the General Excursion of the Club to Gilmour's Grove at Chelsea, held on the 26th May, where he delivered an interesting address on the Geometridæ taken during the afternoon. The members also had the pleasure of meeting Mr. T. N. Willing, Zoologist to the Saskatchewan Government, at one of the autumn evening meetings of the Branch. He exhibited a large collection of north-western insects and explained his plans for building up a reference collection at Regina.

Among the more interesting insects taken at Ottawa or within the district, as limited by the Club, the following may be mentioned:—

LEPIDOPTERA:

Charadra deridens, Gn., June 4, (Fletcher), June 22, (Young).

Hadena rorulenta, Sm., June 23, (Young).

Hadena plutonia, Grt., Meach Lake, July 7, (Young).

First record for the Ottawa district.

Rhynchagrotis rufipectus, Morr., August 9, (Young).

Noctua phyllophora, Grt., June 22, (Fletcher).

Mamestra distincta, Hbn., Meach Lake, May 16, (Young).

Mamestra cristifera, Wlk., Meach Lake, July 10, (Young).

Mamestra assimilans, Morr. Four mature larvæ found feeding on the Common St. John's-wort, *Hypericum perforatum*, Sept. 22, 1905, emerged, June 7, 1906, (Gibson).

Barathra curialis, Sm. This interesting noctuid which was mentioned in last year's report under the name of *Barathra occidentata*, Grt., was again met with in the Ottawa district in small numbers during 1906.

Graphiphora rubrescens, Wlk., April 23, (Young).

Xylina fletcheri, Sm., Meach Lake, Sept. 6, (Young).

Papaipema harrisii, Grt. var. An interesting form of this species was reared from larvæ boring in the base of fronds of *Pteris aquilina*; Meach Lake, August, (Young and Gibson).

Papaipema appassionatea, Harvey. Larvæ of this very rare species were found by Mr. Young at Meach Lake, in the roots of *Sarracenia purpurea* in August. Many of the larvæ were parasitized by the small

dipterous fly, *Masicera myoidea*. This is a most beautiful moth, and one which is still rare in collections.

Tapinostola variana, Morr., Meach Lake, one specimen, August 17, (Young). A new record for the Ottawa district.

Gluphisia lintneri, Grt., var. *arimacula*, Huds., May 23, (Young).

Cymatophora latiferrugata, Wlk. Larva found on *Prunus pennsylvanica*, (July 1), black, with conspicuous white spots on sides. Moth emerged in August, (Fletcher).

Therina athasiaria, Wlk., Meach Lake, June 17 (Young). A new record for the district.

COLEOPTERA:

Ludius abruptus, Say., June 20, (Fletcher).

Malachius aeneus, L., June 6, (Fletcher); July 1, (J. A. Guignard). An interesting addition to the Ottawa list.

Prionus californicus, Mots., Grierson's Wharf, on the Ottawa, near Fitzroy Harbour, July 30, (Metcalf). A wanderer from the Pacific coast.

Crioceris asparagi, L. Larvæ found Sept. 20, buried Sept. 22, emerged at end of October; the furthest eastern record in Ontario, (Fletcher and Gibson). Not previously found at Ottawa.

ODONATA:

Gomphus adelphus, Selys., Hull, June 29, 1886, (Fletcher). The first Canadian record.

Gomphus brevis, Selys., Hull, June 29, 1886, (Fletcher); Cumberland, June 16, (Gibson).

Basischna janata, Say, May 2, 1902, (Gibson).

Macromia illinoiensis, Walsh, Hull, June 29, (Fletcher).

Helocordulia uhleri, Selys, Buckingham, May 31, (Fletcher).

Tetragoneuria spinosa, Selys, Hull, May 22, 1886, (Fletcher).

All of the above species of Odonata have recently been kindly determined by Dr. E. M. Walker, of Toronto.

W. H. HARRINGTON,	} Leaders.
JAMES FLETCHER,	
ARTHUR GIBSON,	
C. H. YOUNG,	
J. W. BALDWIN.	

WITH THE FIELD NATURALISTS' CLUB, ROCKLIFFE
WOODS, SEPT. 28TH, 1907.

A grey day, with just enough of a suspicion of cold in the air to make the blood tingle, and give intense enjoyment to a walk in the woods, greeted the Ottawa Field Naturalists' Club at their meeting at Rockliffe, Saturday, Sept. 28th. The "Father" of the Club, Dr. James Fletcher, was there, with ever abundant store of information on nature lore; Dr. Sinclair, Vice-Principal of the Normal School, with his large family of Normal School students, with their intelligent, bright faces; Mr. Arthur Gibson, of the Experimental Farm, and Mr. Power, of the Normal School, a new addition and a most helpful one, and about sixty interested followers of Nature Study and lovers of "God's great out of doors."

The meeting place was the pavilion, and having strolled through the woods, the "round up" was held at the south end of MacKay's Lake (Hemlock Lake). Here the stores of flowers, plants, and insects were brought and commented upon, and valuable lessons learned from wood, tree and flower.

Dr. Sinclair, in a few words introduced Dr. James Fletcher as the "Father" of the Club, and remarked that Cicero's celebrated quotation might be used here, as there were so many generals to call upon. In speaking of the different trees, Dr. Fletcher called attention to the plentiful flowers on the maple, the only specimen of the beech to be seen, the ash, the locust, and others in the neighborhood. The interdependence of the animal and vegetable world was commented upon. The last spring, the cold had killed the insects which should have fertilized the trees and flowers, the birds had suffered and died for want of insects to feed upon. Dr. Fletcher spoke also of his success in the destruction of the Miller moth, by the application of intense cold, which was a pest to flour millers. He showed the wise provision of Nature for the trees and shrubs for the approaching winter, after their leaves drop in the autumn, and that of the evergreens and those having peculiarly shaped foliage which stood the strain of the winds and snow. Mr. Power on being called upon spoke on the same subject, and told in a humorous strain of the dearth of fruit at one time in Australia, which resulted from the loss of bees because there were too many mice, and too many mice because there were not enough cats, and too few cats because there were not enough old maids to care for them. Mr. Power spoke very highly of the great good the Club was doing in Nature Study and the great assistance it was to Normal School students. Mr. Arthur Gibson showed specimens of the

tussock moth which has caused much havoc to vegetation, and spoke of four different kinds of caterpillars which he had collected. These were the hedge-hog caterpillar, the checkered tussock moth (*Halisidota*), the hickory tussock moth (*Halisidota Caryae*) and the salt-marsh caterpillar. All of these are common species belonging to the family *Arctiidae*, and with the exception of the first named, which live as a caterpillar all through the winter under boards, etc., spin their cocoons during the autumn, the moths emerging the following spring. The curious caterpillars of the large skipper butterfly *Edamus Tityrus* were found in their snug tents among the leaflets of the black locust and elicited much interest from their curious markings. They have black heads with two large orange eye-like markings, crimson throats and large yellow bug-like bodies dotted and streaked with black. Several handsome spiders were also found. Mr. Clark the secretary added his quota of interest and information.

Plants of interest found were:—

Linaria vulgaris, the interesting Peloria or monstrous form which bears flowers of an entirely different form from those of the typical plant. These do not perfect seed.

Maples.—Sugar Maple, Striped Maple, Spiked Maple, Red Maple, Silver Maple.

Ash.—Red, White and Black Ash.

Birch.—Cherry Birch, Yellow Birch and two forms of the Canoe Paper Birch.

Beech.—Blue Beech, and the True Beech.

Iron Wood.

Purple Vervain and Lop-seed.

With a regretful turning away from the woods and lake side covered with burs and glory through paths carpeted with falling leaves "The Swan song of the leaves" gold, crimson and brown, the Club returned from a most enjoyable, if the last of the summer's excursions.

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