

APRIL, 1907  
VOL. XXI, No. 1

# THE OTTAWA NATURALIST

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Published by The Ottawa Field-Naturalists' Club.

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1907.

VOL. XXI.

1907.

THE  
OTTAWA NATURALIST,

Being Vol. XXIII. of the

TRANSACTIONS

OF THE

**OTTAWA FIELD-NATURALISTS' CLUB.**

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Organized March, 1879.

Incorporated March, 1884.

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# THE OTTAWA NATURALIST

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VOL. XVIII.

OTTAWA, APRIL, 1907

No. 1

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## THE REPORT OF THE COUNCIL OF THE OTTAWA FIELD-NATURALISTS' CLUB FOR THE YEAR ENDING MARCH 19TH, 1907.

The Club membership has now passed the 300 mark. During the year twenty-three new ordinary members have been elected, bringing the present membership up to 301, composed of 293 ordinary members and eight corresponding members.

### SOIRÉES.

The Soirée Committee is to be congratulated upon the excellent programme of lectures it has provided this winter, and also upon its departure in printing the programme in neat pocket form, besides publishing it as usual in *THE OTTAWA NATURALIST*.

The opening soirée was held on December 6th, when the President, Mr. Wilson, gave an able and timely address on the benefits and pleasures to be derived from a participation in the work of the Club. Dr. Jas. Fletcher then read a short paper, prepared by Prof. Bradley, of the University of California, on "An Entomological Excursion to the Selkirk Mountains." The paper was illustrated by a number of excellent slides. The remainder of the evening was given up to a demonstration exhibition. Rev. Mr. Eifrig, by means of mounted specimens, a field glass, and popular books on birds, gave a demonstration of first steps in ornithology, using color as a means of identification.

On January 8th, Mr. D. A. Campbell gave a demonstration on the Physics of the Atmosphere. The various laws of gases and many interesting phenomena were illustrated in a series of well-chosen experiments, so skilfully performed as to call forth frequent applause.

Dr. P. H. Bryce, Chief Medical Officer of the Dept. of the Interior, addressed the Club on The Relation of Climate to Health, with special reference to prevention and treatment of tuberculosis. This address, one of the ablest ever delivered before the Club, is shortly to appear in full in *THE OTTAWA NATURALIST*.

On February 12th, Dr. R. N. Daly gave an address before a large audience on The Physical Conditions of Life in the Deep Seas. He pointed out the factors, such as temperature, presence of light, heat, air, low pressure, wave motion, and the facility of obtaining food, that make life more abundant near the surface than at greater depths. Deep sea types were then described with the conditions under which they live.

In the absence of Dr. Robertson, the paper on The Macdonald College was given by Prof. Lochhead of that institution, who described the college at Ste. Anne de Bellevue, and dealt with the great educational value of the work which Sir Wm. Macdonald's generosity is making possible.

The paper to have been given on March 12th, by Mr. Stewart on The Forestry Problem had to be cancelled because of Mr. Stewart's removal to Montreal. On that date Dr. Fletcher read before the Club a chapter on The Grey Wolf, from the manuscript of Mr. Ernest Thompson Seton's forthcoming book, The Mammals of Manitoba. The chapter describes the appearance, habits, and range of the Grey Wolf, and is replete with stories gleaned from all sources from Hudson Bay days to the present time. On the same evening, Dr. Ami presented the Report of the Geological Branch, and gave an illustrated address on The Methods of Work of the Ottawa Field-Naturalists' Club. Some of the slides shown illustrated local geology, especially as observed in excavations made during the past few years, and others exhibited the kind of work done by the Club on its Saturday excursions and in connection with the Summer School of Science.

Mr. Ernest Thompson Seton, a valued member of the Club, very kindly gave an illustrated lecture on Animal Minds and Heroes, on the evening of February 16th, before an audience that completely filled the large Assembly Hall of the Normal School. Mr. Seton held his audience in the closest attention for a space of an hour and three-quarters while he described the famous heroes of animal history. To quote from a lengthy press notice, "Delivered with fire of oratory, and enlightened with frequent flashes of the keenest wit, the address was one of the best heard in Ottawa for many years."

#### EXCURSIONS.

The following programme of excursions was drawn up:

April 28th, Blueberry Point, Aylmer.

May 5th, Rockcliffe Park.

May 12th, Beaver Meadow, Hull.

May 19th, Cement Works, Hull.

May 26th, General Excursion, Chelsea.

June 2nd, Experimental Farm.

- June 9th, Rideau Park.
- June 16th, General Excursion, Galetta.
- June 23rd, Hemlock Lake.
- Sept. 18th, General Excursion, Chelsea.
- Feb. 9th, Snowshoe Tramp, Beaver Meadow.
- Feb. 23rd, Snowshoe Tramp, Rockliffe.

The Club regards its excursions as the strongest means of awakening public interest in its work and enlisting new members. This year, special efforts had been put forth to make the excursions as successful as possible, but an unusual number of rainy Saturdays interfered with the plans of the Club. When weather conditions were favorable, however, the excursions were well attended, and much good work was done, as appears in the reports of the excursions published from time to time in *THE OTTAWA NATURALIST*. The snowshoe tramps have shown that a great deal of field work can be carried on in winter. The botanists, for example, observed at Beaver Meadow the distribution of evergreens and deciduous trees, the occurrence of species easily passed by unnoticed in summer, the branching of deciduous trees, the persistent fruit of the Climbing Bittersweet, the characteristic winter appearance of the Juniper, various methods of bud-protection, and many other interesting features of winter vegetation. A continuance of field work in winter would be certain to reveal many things to which attention has not yet been directed because of the unfamiliarity of people in cities with woods in winter.

#### THE OTTAWA NATURALIST.

Volume XX of *THE OTTAWA NATURALIST*, the official organ of the Club, has been published under the editorship of Mr. J. M. Macoun. It consists of twelve numbers which contain in all 253 pages and two plates. The following are among the papers that appear in this volume:

1. Notes on a Collection of Fossil Fruits from Vermont, in the Museum of the Geological Survey of Canada, Dr. H. M. Ami.
2. On the Structure of Roots, Theo. Holm.
3. A May Morning with the Birds in New Brunswick, W. H. Moore.
4. List of some Fresh-water shells from Northwestern Ontario and Keewatin, Dr. J. F. Whiteaves.
5. The Migration of Birds, Rev. C. Eifrig.
6. The Ottawa Species of *Eriophorum*, J. M. Macoun.
7. A Sagacious Crow, A. H. Gallup.
8. The Chambord Meteorite, R. A. Johnston.
9. Nesting of Wilson's Snipe, Wm. L. Kells.

10. Some Canadian Antennarias, Dr. Ed. L. Greene.
  11. The Caribou of Queen Charlotte Islands, J. M. Macoun.
  12. Ivy Poisoning and its Treatment, J. M. Macoun.
  13. The Great Gray Owl, Rev. C. W. G. Eifrig.
  14. The Species of Botryocrinus, F. A. Bather.
  15. Some New Plants from the Canadian Rockies and Selkirks, Edith M. Farr.
  16. Richardson's Merlin, W. J. Brown.
  17. Bird Migration, Sable Island, James Boutelier.
  18. Notes on *Cyrtoceras caneatum*, Dr. J. F. Whiteaves.
  19. Contributions to Canadian Botany, J. M. Macoun.
  20. Spring Migration of Birds at Ottawa, 1906, Rev. C. Eifrig.
  21. Animal Coloration, Prof. E. E. Prince.
  22. The Cryptogamic Flora of Ottawa, Prof. Jno. Macoun.
  23. A Visit to Duck Island, Hon. F. R. Latchford.
  24. The Teal Weed of St. Clair Flats, J. Maughan.
  25. Description of *Eupithecia Fletcherata*, Geo. W. Taylor.
  26. A Swarm of Butterflies, Geo. H. Bradshaw.
  27. Notes on the Skeleton of a White Whale, Dr. J. F. Whiteaves.
  28. Some Curious Facts about Fishes, Andrew Halkett.
  29. The Disappearance of the Passenger Pigeon, J. H. Fleming.
  30. Meteorological Observations at Ottawa, Wm. Ellis.
- In addition to these, there have been published several botanical and ornithological notes, book reviews, reports of soirées, excursions, and branch meetings.
- The series of articles on Nature Study, edited by Dr. James Fletcher, has been continued, bringing the number of papers published during the past four years up to 42. In this volume the following papers appear:
33. Definite Problems in Nature Study, Dr. S. B. Sinclair.
  34. A Cement Sidewalk, S. B. McCreedy, B.A.
  35. The Galt Park Wild-Flower Garden, R. S. Hamilton.
  36. The Foundations of Chemistry as seen in Nature Study, Jno. Brittain.
  37. The Cecropia Emperor Moth, Arthur Gibson.
  38. School Exhibits of Pressed Plants, Dr. J. Fletcher.
  39. Agencies for the Promotion of Nature Study in Canada, Prof. Lochhead.
  40. Manual Training—the Mechanical Hobby, Dr. Mark G. McElhinney.
  41. Manual Training—the Machinist's Art, Dr. Mark G. McElhinney.
  42. The Relation of Sparrows to Agriculture, L. H. Newman.



Your Council, believing that this series of articles is one of the most important contributions made to the science of Nature Study, regrets to report that Dr. Fletcher finds himself compelled to cease editing this department of THE OTTAWA NATURALIST. The Club has on hand 250 copies of each of the forty-two articles printed, and the publishing committee has under consideration the question of binding these in book form.

#### REPORTS OF BRANCHES.

These reports, showing the work done throughout the year by the various branches, are being presented at this meeting, and will be published in THE OTTAWA NATURALIST at an early date. Your Council has instituted a Department of Meteorology under the leadership of Dr. Otto Klotz. One of the leaders of this department, Mr. Campbell, gave a Demonstration on the Physics of the Atmosphere before a largely attended meeting in the Ottawa Collegiate Institute.

#### ENTOMOLOGICAL BRANCH.

The members of the Entomological Branch of the Club have continued their good work in the collection and study of the insects of the Ottawa District. The leaders report that, although the season was not a particularly good one for insects, still many interesting species were taken, and considerable progress made in adding to the lists of the various orders. Notable features of the year were a remarkable outbreak of plant lice on almost all cultivated and wild plants up till midsummer, followed by the appearance of hordes of lady-bird beetles, which very soon destroyed the larger number of the plant lice. It was noticed that very many of these predaceous friends were similarly destroyed by parasites. The White Cedars throughout the district were very much injured by the larvae of two minute moths, *Argyresthia thuiella*, and in far smaller numbers, *Recurvaria thuiella*. An interesting occurrence was of a Nitidulid beetle, the larvae of which were very destructive to the seeds of the Silver Maple. The entomologists announce the appearance in the Ottawa district of an undesirable visitor in the shape of the Asparagus Beetle, which has done so much harm in western Ontario. An insect which last season appeared in vast numbers was the Greenhouse White-fly (*Aleyrodes vaporariorum*), which was abundant on many herbaceous plants and ornamental shrubs in gardens.

#### ORNITHOLOGICAL BRANCH.

Since the last annual report the Ornithological Section has held meetings at more or less regular intervals. More than

usually complete observations on the spring migration of birds in the district were made and recorded, also anomalies, rareties and irregularities in the air forms of the vicinity considered. Further progress was made in the revision of the published air-faunal list of the Ottawa district, with a view of augmenting and correcting it to date. As a none too common occurrence in the bird world of the vicinity may be mentioned the unusual migration of the Goshawk (*Accipiter atricapillus*) noted last October and November.

#### THE LIBRARY.

In accordance with the report of the Library Committee adopted at the last annual meeting, the bound volumes and the exchanges were transferred from the Normal School to the Carnegie Library. All exchanges received during the past year are now stored in the Normal School. Many of these are of a technical nature, but the Club receives a number of publications which are of a more popular character, including:

1. The Nature Study Review.
2. The Journal of Geography.
3. The Auk.
4. The Canadian Entomologist.
5. The Wilson Bulletin.
6. The Ohio Naturalist.
7. Le Naturaliste Canadien.

Under present conditions no use is made of these by the members.

In addition to its periodical exchanges, the Club has received numerous government reports from Washington and Ottawa, and the following bound volumes have been placed on the shelves:

1. Anatomical Nomenclature, Dr. Barker, Prof. of Medicine, Johns Hopkins University.
2. A Loose-Leaf System of Laboratory Notes, Theo. Scheffer, Kansas State Agricultural College.
3. Annual Report of the Smithsonian Institute.
4. Report of the Welcome Research Laboratories at the Gordon Memorial College, Khartoum.

A Summer School of Science under the direction of Mr. J. H. Putman, gave a three weeks' course for teachers in July. Several members of the Club delivered lectures at the Normal School and aided in the field work. Mr. Putman gave a course in Botany, Mr. Attwood one in Mineralogy, and Mr. Sullivan took charge of the field work. Dr. Fletcher gave two lectures on Birds, and two on Insects. The leaders of the Club also contribute very largely to the lecture programmes of various societies in the city.

The Club notes with pleasure the honor conferred upon two former Presidents. Dr. J. F. Whiteaves has been awarded the Lyell medal by the Geological Society of London, an honor that has been conferred upon only two other Canadian scientists, Sir William Dawson, and Prof. Frank Adams; and Dr. R. Bell has been awarded the Patron's Gold Medal by the Royal Geographical Society, the Cullum Gold Medal by the American Geographical Society, and the Queen's Coronation Gold Medal for geological work in Canada.

The Club desires to express its gratitude for the appreciation of its work shown by the Ontario Legislature in increasing the annual grant from \$200 to \$300.

The Treasurer's Report shows a balance on hand of \$48.63.

The thanks of the Club are due to Principal White for placing the Normal School at its disposal, to the Library Board of the City Council, and to the Librarian, Mr. Burpee, for the use of the Lecture Hall of the Carnegie Library, and to the Press of the city for its efforts in furthering the work of the Club.

All of which is respectfully submitted.

T. E. CLARKE,  
Secretary.

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TREASURER'S STATEMENT FOR YEAR ENDING  
19TH MARCH, 1907.

RECEIPTS.

Balance from previous year.....		\$61 62
Subscriptions—1906-1907.....	97 00	
Arrears.....	58 00	
		155 00
Advertisements in OTTAWA NATURALIST.....		101 40
Author's extras sold, including separates of Nature Study articles.....		61 60
OTTAWA NATURALISTS sold.....		26 10
Government Grant.....		300 00
		\$705 72

EXPENDITURE.

Printing OTTAWA NATURALIST, Vol. XX, 12 Nos., 253 pages.....	\$316 10	
Illustrations.....	6 93	
Author's extras, including Nature Study separates.....	121 50	
Miscellaneous printing—wrappers, post cards, etc.....	60 40	
	\$504 93	
Postage.....	24 31	
Editor.....	50 00	
	\$579 24	
Less 5 per cent. for cash on part of printers' accts..	23 88	
		555 36
Secretary.....		25 00
Treasurer.....		25 00
Soirée expenses.....		20 75
Library expenses.....		16 20
Sundry expenses, postage, etc.....		14 78
Balance.....		48 62
		\$705 72

ARTHUR GIBSON, *Treasurer.*

Examined and found correct,

R. B. WHYTE, }  
A. H. GALLUP, } *Auditors.*

Subscriptions for the new club year are now due, and should be paid at once.

The Treasurer would again direct attention to the advertisements in our new volume. Some of these appear now for the first time, and members are asked to remember the different firms when making purchases. They are all good, reliable firms, and, as they are helping the Club by giving advertisements, we should all make it a point to deal with them.

## ON A TOOTH OF OVIBOS, FROM PLEISTOCENE GRAVELS NEAR MIDWAY, B.C.\*

By LAWRENCE M. LAMBE, F.G.S., F.R.S.C., of the Geological Survey of Canada. (With plate).

An upper molar tooth of a ruminant has lately been presented to the Geological Survey by Mr. C. B. Bash, of Greenwood, British Columbia, who states in a letter accompanying the specimen that it is from Rock Creek about eight miles above its entry into Kettle River, and about four miles north of the International Boundary. Rock Creek joins Kettle River from the west about thirteen miles west of Midway. The tooth was found on a rock surface beneath a deposit of unconsolidated gravel, about two hundred feet in thickness, in a tunnel run into a hill in connection with placer mining.

The tooth received from Mr. Bash is the posterior true molar from the right side, and is referred provisionally to the genus *Ovibos*. In comparison with the corresponding tooth of an adult male musk-ox (*O. moschatus*, Zimm.) from Fort Rae, Great Slave Lake, in the Museum of the Geological Survey, it is seen to be slightly smaller and less robust but otherwise remarkably similar.

Remains, principally the hinder portion of skulls with horncores attached, from the Pleistocene of the United States, have been assigned to the genus *Ovibos* or related genera under a number of specific names, some of which are apparently synonyms. *Ovibos bombifrons* (Harlan) is from the Pleistocene of Kentucky; *O. cavifrons* (Leidy) is recorded from deposits of the same age in Indian Territory, Missouri, Kentucky, Ohio, Iowa, and Alaska, and both were included by Leidy in his genus *Bootherium*. A third species is *O. appalachicolus* (Rhoads), from the Pleistocene of Pennsylvania.

There are few records of the finding of the remains of *Ovibos* in Pleistocene deposits in Canada. Dr. George M. Dawson, in his Summary Report for 1898, p. 19 A, mentions the finding of portions of a skull of a musk-ox in old gravel deposits (Pleistocene) near Edmonton, Alberta. In his Report on the Klondike Gold Fields, 1905, p. 29B, Mr. R. G. McConnell refers to musk-ox, mammoth, buffalo, bear and mountain sheep and goat remains in the "low level creek gravels" of the Klondike district which are most probably of Pleistocene age, judging from the occurrence of mammoth bones in them. Lydekker in his Catalogue of Fossil Mammalia in the British Museum, pt. II, 1885, p. 39, refers, under the heading *Ovibos moschatus*, to a specimen

\*Communicated by permission of the Acting Director of the Geological Survey of Canada.



consisting of the "hinder portion of the cranium of a small individual with part of the horn-cores," from the Pleistocene of the Upper Porcupine River, Yukon.

In the "Smithsonian Miscellaneous Collections," Vol. III, pt. 2, 1905, is a paper on "Scaphoceros\* *tyrrelli*, an extinct ruminant from the Klondike gravels," by Wilfred H. Osgood. This paper is descriptive of the skull of an animal considered by Mr. Osgood to be "evidently related to the existing genus *Ovibos*, but sufficiently different to rank as a separate genus." The type skull is from Bonanza Creek. The remains of musk-oxen in the Yukon mentioned by Mr. McConnell in his report are the specimens on which this new genus has been established. Mr. Osgood in his important and interesting paper also reviews the literature of Pleistocene species of *Ovibos*. He assigns *O. cavifrons* (Leidy) to *Scaphoceros*, and retains the genus *Boötherium* with *bombifrons* as the type. In the skull of *Scaphoceros tyrrelli* from Bonanza Creek the teeth are preserved, an important feature, as no teeth have been found with the Pleistocene remains generally hitherto referred to the genus *Ovibos* under different specific names in Canada and the United States.

The tooth from Rock Creek, B.C., is in diameter about three-fifths the size of the last upper molar of *S. tyrrelli*, and its proportions are quite different. As already mentioned, it is nearly but not quite the size of the posterior molar of an adult male of *Ovibos moschatus* in the Museum of the Geological Survey, and in most particulars agrees very closely with it. As the styles or costæ are more slender, it is for the present only provisionally referred to the living form. In comparison with the corresponding tooth of an adult specimen of *Ovis montana* Cuv., the Mountain sheep or Big-horn, there are general resemblances. It is in size between the tooth of the mountain sheep and the musk-ox, but more nearly approaches the latter.

Figures in the accompanying plate are given of the tooth from Rock Creek. In comparing it with the corresponding tooth of the adult male musk-ox from Fort Rae, the three costæ or styles of its outer surface are seen to be more slender, but the proportionate development of the intermediate costæ or longitudinal ribs is about the same, and the tooth pattern is almost identical. The Rock Creek specimen is moderately worn and the posterior cement lake (valley) in the grinding surface connects at its anterior end with the longitudinal depression between the lobes on the inner side of the tooth. The complete enclosure of

\*The generic term *Symbos* has since been substituted by Mr. Osgood for *Scaphoceros* (preoccupied). Vide, Proceedings Biological Society of Washington, Vol XVIII, p. 223. Oct. 17, 1905.

this lake would have taken place when the tooth had been worn down about 12 mm. more. The transverse section (Fig. 1 c) a little below the mid-height of the tooth (at *d*, Fig. 1) shows the posterior lake isolated with the addition near the inner division point of the lobes of the "small accessory valley" (*e*, Fig. 1 c), to which attention is called by Dr. E. Lönnberg in his paper 'On the Structure and Anatomy of the Musk-ox.'\*

In the Fort Rae musk-ox the first and second upper true molars show this accessory valley well developed, and the third molar, which is not so much worn as the other two teeth, shows it in process of formation, but still attached to and continuous with the anterior cement lake. In this specimen only the small portion of the teeth above the alveolar border is available for examination.

In the specimen of *Ovis montana* neither of the cement lakes in the grinding surface of the last upper molar (very little worn) are completely enclosed; the anterior one communicates with the inner longitudinal furrow and also by a narrow surface with the posterior lake. With further wear (Fig. 2, section at mid-height of tooth) the two lakes become enclosed and distinct, but without the formation of the "small accessory valley." A second section nearer the base of the tooth reveals this small valley well formed. The first upper true molars in the same skull show this valley very plainly in the grinding surface, and it appears in a section at mid-height in the second molar. The "small accessory valley" is thus seen to be developed in both the musk-ox and the mountain sheep in the true molars. The styles of the Rock Creek tooth have about the same prominence and thickness as those of the sheep.

The Rock Creek tooth is without the "accessory column" that is stated to arise in *Ovibos*\* at the base of the inner surface of the molars between the two lobes. This column is, however, apparently absent in the third upper molar† of *Ovibos*. In the second and third upper molars of the mountain sheep examined there is no trace of this column.

Measurements of the Rock Creek tooth (moderately worn), and those of the corresponding tooth in *Ovibos moschatus*

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\*Proceedings of the Zoological Society of London for the year 1900, p. 712.

\*Lönnberg, op. cit., p. 712.

†Osgood, op. cit., p. 177.

(much worn), and *Ovis montana* (slightly worn) are here given:

	ROCK CREEK TOOTH.	OVIPOS MOSCHATUS.	OVIS MONTANA.
Height or length of tooth.....	54 mm.	Ap. 40 mm.	55 mm.
Maximum anteroposterior diameter at grinding surface.....	25 mm.	31 mm.	18 mm.
Same at mid-height.....	29 mm.		25 mm.
Transverse diameter (width) of posterior lobe at grinding surface.....	10 mm.	12 mm.	6 mm.
Same at mid-height.....	13.5 mm.		11 mm.
Transverse diameter (width) of anterior lobe at grinding surface.....	12 mm.	13 mm.	9 mm.
Same at mid-height.....	15.5 mm.		12.5 mm.

In attempting, therefore, to determine whether the Rock Creek tooth is properly referable to the musk-ox or to the mountain sheep, the absence of the "accessory column" in the specimen does not afford any help in this particular case, and the presence of the "small accessory valley" is a character belonging to both animals. According to Dr. Lönnberg, "in sheep and goats this 'accessory valley' seems to be less constantly developed" (op. cit., p. 712), than in many members of the Bovidae. Depending principally on its size and general robustness the Rock Creek tooth is provisionally referred to the musk-ox (*Ovibus moschatus*, Zimm.) in the belief that it may have belonged to a rather small individual.

The unconsolidated gravel under which the tooth was found is evidently of Pleistocene age. The enamel of the specimen varies in places from deep to light bluish-grey in colour, with a few irregular patches that are almost white. The dentine is of a very dark brown or almost black colour, with the cement a shade lighter. Dr. Reginald Daly, geologist for Canada to the International Boundary Commission, who is familiar with the geology of the Rock Creek district, says that the only unconsolidated gravels occurring there are, in his judgment, of glacial origin and of Pleistocene age.

#### EXPLANATION OF PLATE.

FIGURE 1—Right posterior upper true molar of ruminant (*Ovibus*) from Rock Creek, B.C.; exterior aspect.

FIGURE 1a—The same viewed from within.

FIGURE 1b—The grinding surface of the same viewed from below.

FIGURE 1c—Transverse section of the same at *d*, fig. 1.

FIGURE 2—Transverse section at mid-height of the crown of the corresponding tooth of an adult mountain sheep (*Ovis montana*, Cuv.)  
*e*.—"Small accessory valley."

All the above figures are of natural size.

## THE EVOLUTION OF THE MACDONALD COLLEGE.

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Professor W. Lochhead, of the Macdonald College, Ste. Anne de Bellevue, gave an address to the members of the Field Naturalist's Club on the above subject in the Normal School on the evening of February 26th.

The speaker said, in part: The Macdonald College, as a future training school for young men and women for rural life, like every other great work, is the product of adequate causes; it is the result of ideas and tendencies that have been manifesting themselves for many years in the educational world; it is an expression of the Educational Unrest that makes for real progress in the efforts to adapt our educational system and methods to the conditions and needs of our time.

There is a rural life, and there is a town or urban life, with distinctly different conditions and problems. A large percentage of our people live on farms, while all are dependent, either directly or indirectly, on the farms for their sustenance and prosperity. One would naturally suppose, therefore, that the study of rural life would be given much prominence in our elementary schools, and that every encouragement would be given the larger boys and girls who had passed through the usual grades of the rural schools, to equip themselves still further for their life work. As a matter of fact, however, the studies in most rural schools are quite similar to those carried on in town and city schools, while the high schools give practically no attention to the requirements of rural life. Their courses are admirably adapted to those desirous of becoming teachers and university students, but they fail to meet the needs of the great majority of the pupils passing through the public schools. The high schools practically compel every student to "face about and march" for the Normal School or College, for the course of studies gives no alternative. (Of late years Commercial courses are given in many high schools).

For some time, then, thoughtful people have felt that the studies in rural schools do not deal definitely enough with rural things and conditions. There is no longer any real doubt that such studies are valuable educationally, for the agricultural colleges have shown that these possess high cultural value as well as practical utility.

Owing to the constant changes in agricultural conditions which result from the new applications of knowledge, each individual citizen needs a higher degree of adaptability than was formerly the case. Professor Sadler says: "These changes in the

condition of life call for a new spirit in education from the earliest years upward. A vast body of new knowledge has to be brought into educational account. The old tradition has to be examined, readjusted to new needs, and in part discarded, new studies have to be introduced, and scientific thought has to be given to the training of the senses. Science has furnished an immense amount of usable information that has practically revolutionized the older methods of agriculture; and it is very important that the coming rural citizens should enter into the possession of this information with the ability to apply this new knowledge to practical ends, to bring together different portions of knowledge into new combinations, to realize quickly the bearing of new developments of knowledge upon customary ways of doing things and upon the probable demands for new kinds of service." Besides a trained intelligence, the rural citizen should have a sympathetic interest in the world of nature about him; he should see something of the beauty of the web of life, and understand that his physical welfare depends largely upon his obedience to the laws of nature that he has tried to grasp. More than this, the cultivators of the soil require training in organization and co-operation, for these spell success in agricultural as they do in other commercial lines.

For ages the farmer did not feel much need for co-operation; he required little beyond his own farm; he was self-contained. His earnings were small in spite of the hard work, and he had no desire to speculate, lest he lose his hard earned money. He became independent, but his independence prevented him from getting all he could from his land. He shunned co-operation in matters of common interest to all his neighbors. The products of his farm went to the market alone, very frequently in inconvenient and unattractive forms. Latterly, however, through the desire to have good roads, good local government, good schools and good churches, the spirit of co-operation is invading the communities.

Good rural schools, however, imply good teachers—teachers able "to articulate the country school closely and smoothly with the country home, the neighborhood and the country at large; only so can the instruction of the school take on the reality needed to make it vigorously and practically effective. The teachers should be able to utilize the local community life, its occupations, resources, organisations, traditions and customs, for the rural school."

But again back of this, properly prepared rural teachers must be trained at suitably equipped and suitably located normal schools. Our city normal schools have failed to a large



extent in the training of teachers for the special work of the country schools. These results are not due to the staff, but to the environment of the normal schools. The city is not a suitable place to study rural life, to gain that practical and scientific knowledge of farm life that is so essential to the teacher, or to get practice work in ungraded, one-master, rural schools. "City schools teach city life and the facts that go with city life."

There should, therefore, be a rural normal school for the special training of rural teachers; and probably such a school could do the most effective work if it were attached to an agricultural college. This opinion coincides with that expressed in the recent report of the Committee on Industrial and Technical Education, appointed by the Legislature of Massachusetts, and presided over by Dr. Carrol D. Wright, the noted educationist and economist. This report recommends the establishment of a normal school for the training of teachers for the rural schools at the State Agricultural College.

Many efforts have been made to improve our rural schools. The task is more difficult to-day than it has been for centuries on account of the new conditions that have arisen as a result of the recent scientific investigations in agriculture and the rivalry of the great agricultural countries for the best markets.

The ideal system of schools for the rural districts would appear to be: (1) One or two agricultural high schools in each county, each equipped with one or more teachers on its staff trained at an agricultural college, acquainted with the practical side of agriculture, and able to use the farm in connection with the high school to demonstrate in a practical way the best scientific principles and methods advocated by the Experiment Stations. These schools would act as feeders for the Agricultural College of the province. (2) A good consolidated school for each township, where the first year of the high school would be connected in course with the elementary grade work. (3) Good rural schools where nature study would form the basis of the school effort, as in the lower grades of the consolidated school. This secondary course would be adapted to the needs of the larger boys and girls, who spend most of their time on the farm, but who would be willing to spend two or three months each year in a study of the activities of the district for the purpose of bettering their knowledge of farm processes, and thus gaining power for service.

But such a system of rural schools cannot be established without the hearty support of the farmers themselves, for it means increased taxes. They must first be shown the value of education, as applied to the various branches of agricultural

industry, in making for increased profits, and more comfortable living. To this end many agencies have been in operation during the last ten years. First and foremost of these agencies is the Ontario Agricultural College. The speaker here referred at length to the great work this institution was doing not only for the farmers' boys and girls, but also for the farmers themselves through the Experimental Union, the Special Short Courses, The Farmers' Institutes, and the other allied associations aided by the Government of Ontario and the Department of Agriculture at Ottawa.

The second agency, the speaker said, was the wonderful series of object-lessons carried out by Dr. Jas. W. Robertson, as Commissioner of Agriculture for Canada. These were illustration experiments on a large scale to show the value of the application of intelligent labour (education) to the agricultural industries. Dr. Robertson's policy in all his efforts to make the farms more productive was simply to break the way for new and vast interests, and then to withdraw in favour of the spirit of self-help that they had aroused and directed. It aimed to help the farmer to make more of himself and of his farm through education.

While directing this movement of the application of science, organization and co-operation to farm labour, Dr. Robertson was not forgetful of the boys and girls of the farm. He was planning a kind of training in which the duties and joys of the farm would be emphasized. For example, to show the importance of the planting of selected seed in the improvement of crops, and to create an interest in this matter among the boys and girls, he established a seed grain competition, the results of which are familiar to most persons. In this work he secured the co-operation and financial help of Sir William C. Macdonald. From this time forward these two men have planned and laboured together for the advancement of education.

The educational work in seed selection formed in reality one phase of the Manual Training Movement organized by Dr. Robertson and Sir William Macdonald, whereby Manual Training was introduced into the schools of the chief cities and towns of Canada, and its value as an educational subject was recognized both by the educational authorities and by the people.

Encouraged by the great interest shown in this work, they planned what is now known as the Macdonald Rural Schools Movement. It had a three-fold object: (a) To show the value of consolidation of schools by the establishment of a rural consolidated school in each of the eastern provinces, well equipped with a competent staff for teaching, along with the ordinary

subjects, Manual Training, Domestic Science and Nature Study, where school garden work is emphasized. (b) To train teachers in the new subjects of Manual Training, Domestic Science and Nature Study. (c) To provide school gardens at a group of five schools in each province, with a travelling instructor in charge of each group, spending one day each week at each of the schools of the group, guiding both teacher and pupils.

The term of three years during which the Fund agreed to maintain these agencies is now nearly over, and we are able to see the results, as it were, from a distance. These results are: (a) A great interest has been aroused throughout Canada in the matter of education, more especially rural education, and more attention is now being given to the improvement of school grounds and buildings, to the better remuneration of teachers, and to the courses of study. (b) The leaders of education feel that they have now a strong backing of public opinion for the improvements they have in mind. (c) Nature Study, with the school garden, Manual Training and Domestic Science are subjects that vitalize and give interest to the work of the school. They relate the school to the home, remove the tendency to restlessness that prevails to an alarming extent in rural communities, and furnish during the early years of the child "exercises through which he acquires unconsciously the taste and capacity for work," and also the mental attitude of enquiry into the meanings of things in the presence of the facts. (d) The rural people can be brought to appreciate good education whenever good illustrations are brought to their attention, and they show that they appreciate it by increasing their school tax to maintain the new school. The rate-payers of the consolidated schools have seen visions during the last three years that disturb contentment, and they will never be satisfied again with the old, poorly equipped school of preconsolidation days. For example, the average daily attendance has been *trebled* at the Consolidated School, Kingston, N.B., and *doubled* at the Guelph School.

The people naturally ask if by two men's work so much good can be done, how much good can the State do with its resources behind it?

The Macdonald Movement is, in other words, a grand demonstration of the application of improved methods of education which our most advanced educators have devised, but which the state was unwilling to adopt into its educational system on account of lack of public support. It is the forerunner of the system of rural education supported by public funds, that prepares the child for complete living on the farm.

Finally came the establishment of the Macdonald College

at Ste. Anne de Bellevue, near Montreal, an institution which will bring together the scattered agencies making for an educated rural people into a great educational centre. It will include (a) an Agricultural College, carrying on work similar to the one at Guelph, where young men will receive instruction in all branches of agriculture; (b) a Household Science College where young women will get instruction in those subjects that make for better home making, and (c) a College of Education for the training of teachers, especially for rural schools. Agencies will be put in operation for the extension of the work to all parts of Quebec, and perhaps to the other provinces as well, so as to reach as many of the rural people as possible. The 560 acres of land and the magnificent group of buildings now nearing completion, will cost over a million and a half; and an Endowment Fund of two millions has been provided for maintenance, so that it will be self sustaining for all time to come.

The Macdonald College will open its doors to students in September next, when the work of instruction will begin. Tuition will be free to all students from Quebec, and no distinction will be made for language or creed; all will be made equally welcome

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#### PROGRAMME OF EXCURSIONS.

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April 20—Rockliffe.

27—Beechwood.

May 4—Blueberry Point.

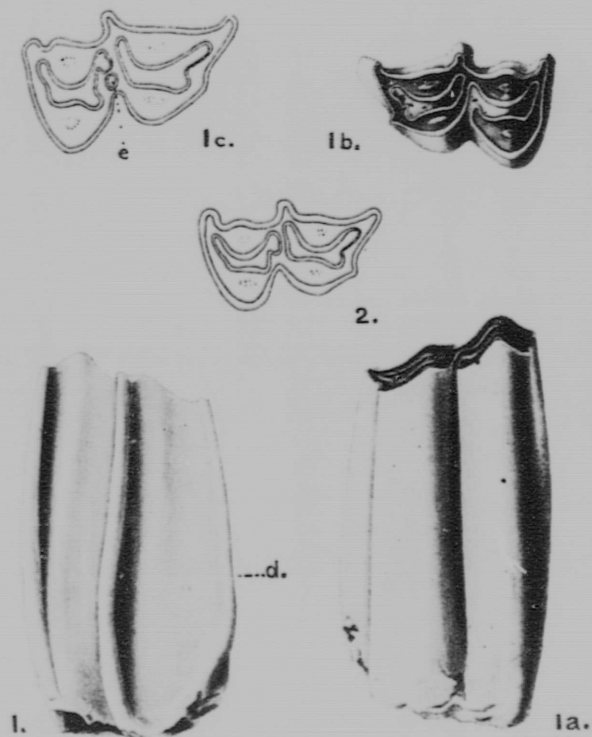
11—Leamy's Lake.

18—Beaver Meadow.

25—Victoria Park and Experimental Farm.

June 1—General Excursion to Chelsea.

The time and place of meeting will, for all but the general excursion, be 3 p.m. at the point on the electric railway, nearest the places mentioned above.



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