CANADA

DEPARTMENT OF MINES

HON. W. A. GORDON, MINISTER; CHARLES CAMSELL, DEPUTY MINISTER

NATIONAL MUSEUM OF CANADA

W. H. COLLINS, ACTING DIRECTOR

BULLETIN No. 73

Annual Report for 1933

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OTTAWA
J. O. PATENAUDE
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1934

Price, 25 cents

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GENERAL ACTIVITIES OF THE NATIONAL MUSEUM OF CANADA

By W. H. Collins, Acting Director

No field work was carried on by the staff of the National Museum of Canada during the summer of 1933 owing to the continued financial stringency. Activities were chiefly limited to laboratory work, to the revision of exhibits in the public halls, and to the scientific study of materials collected in previous years and donated, and to the preparation of reports on the same.

In the Hall of Anthropology the Eskimo habitat group showing the interior of an igloo has been finished and is attracting much attention. An excellent series of framed, enlarged photographs, showing Indian and Eskimo types, their clothing and ceremonial dances, has been hung on the walls and adds greatly to the attractiveness of the hall.

Attention has been given in the Hall of Palæontology to the perfecting of certain exhibits illustrated by the fossils of lower forms of animal life. The attractiveness of these exhibits is greatly enhanced by the use of coloured sections, photographs, and paintings showing animals in their habitats.

In the Hall of Biology additions have been made to the small habitat groups of mammals and birds that have excited the admiration of visitors.

Special attention has been directed in all the exhibition halls to improving the labelling. Labels that were of a temporary nature have been replaced by those that may be considered more permanent in character. Many have been wholly re-written, the purpose being to make them more readily intelligible to the average museum-visiting public.

Four booths in the manufacturers' hall were placed at the disposal of the department for the purpose of making a display at the Central Canada Exhibition held in Ottawa in August. In one booth an exhibit of Indian material illustrated the differences between peoples of a nomadic and a sedentary life; one booth showed the corner of an old forest slashing with debris, tree-trunks, growing plants, sod, birds, mammals, reptiles, and amphibians as in nature; two booths were used by the Geological Survey to exhibit specimens of minerals mined in Canada and to illustrate the industrial application of minerals. Two special loan exhibits were prepared by the Division of Anthropology, one for the Handicrafts Guild, Toronto, and one for the Canadian National Exhibition, Toronto, Ontario.

On request of the National Parks Branch, Department of the Interior, three exhibits were prepared for display in the Riding Mountain Park Museum, Manitoba, to be opened during the summer of 1934. These are: (*a*) a collection of articles used by the aborigines of Manitoba; (*b*) representative fossils from the geological formations of the Mesozoic and Palæozoic systems represented in Manitoba; and (*c*) a collection of mounted birds.

The rotunda of the Museum has been brightened and made more attractive by the hanging of the portraits of several of the leading scientists of Canada who were associated with and largely responsible for the early growth of the Museum, the maintenance of which until within recent years was a function of the Geological Survey. Portraits recently finished and hung are those of Sir William E. Logan, first Director of the Geological Survey, T. Sterry Hunt, Chemist and Mineralogist, and Elkanah Billings, Palæontologist. The Logan portrait was copied by, and the other two painted by, Winnifred K. Bentley. With these has been hung the portrait of John Macoun, Naturalist, painted by Franklin Brownell.

The National Museum is indebted to other Government departments for kindly co-operation, and the Acting Director takes pleasure in here extending his thanks to the Dominion Lands Administration and the National Parks Branch, Department of the Interior, for co-operation and donations, the Entomological Branch, Department of Agriculture, for donations, the Department of Public Works for sympathetic consideration of requests for decorating and repairs, the Royal Canadian Mounted Police for dignified and efficient protective service, and to the members of the staff of the Geological Survey for setting up interesting and instructive exhibits. He is very grateful to many other organizations, Canadian and foreign, and to numerous individuals for donations and exchanges and for gratuitous assistance in scientific research. Dr. M. L. Fernald of the Gray Herbarium, Harvard University, generously examined botanical manuscripts left by M. O. Malte on his death, and prepared for publication in *Rhodora* sections that had been completed. Thanks are extended also to the Canadian press for assistance in bringing the activities of the Museum to the attention of the public.

It is with deep regret that we here record the death of M. O. Malte, Chief Botanist, on August 12, 1933, and of J. A. Rochon, Osteological Preparator, on May 26. O. E. Prud'homme, Senior Museum Assistant, having reached the age limit, was superannuated on February 1.

EDUCATIONAL AND EXTENSION SERVICE

The educational service of the National Museum is being extended gradually within the limits of its staff and facilities. The organization and administration of this branch of the Museum's activities were carried on by the staff of the Director's office incidental to other duties of the Geological Survey and the Museum.

The following is a review of the service the Museum offers at present:

MOTION PICTURES

The motion picture film library now includes the following subjects: biology, anthropology, geology, and miscellaneous. For a detailed list of the pictures *See* "Catalogue of Motion Picture Films," 1933, National Museum of Canada.

These motion picture films are available on loan to schools, universities, and societies or institutions. No rental fee is charged, but the borrower is required to pay the shipping charges.

LANTERN SLIDES

Sets of lantern slides are being assembled for loan to educational institutions and lecturers with the object of stimulating interest in natural history. A nucleus of sets has been established and includes the following series: Indians and Eskimos, dinosaurs, topographic forms, petroleum, fish, and water birds. The collection will be added to gradually and when present plans materialize sets of lantern slides will be available to represent adequately, and illustrate, Canadian fauna and flora, the Indians and Eskimos of Canada, the geography of Canada, and the natural sciences.

Special sets of lantern slides are arranged for use in the automatic balopticon installed in the rotunda of the Museum. This projector has already proved its usefulness as an educative medium.

STILL PHOTOGRAPHS

A large collection of photographic negatives has been accumulated by the National Museum and the Geological Survey, Canada, with which the Museum has been closely associated over a period of more than seventy years. Prints, enlargements, and lantern slides are made from these negatives and are sent at cost price to schools and universities requiring these visual aids in teaching.

Each year many requests are received from authors, journalists, and publishers for photographs to illustrate special articles. The National Museum welcomes such requests and aims to assist writers and publishers in every possible way.

LOAN OF SPECIMENS

Specimens of birds, small mammals, Indian clothing, and implements are available for loan to teachers, but up to the present very few loans have been made outside of Ottawa. This service has developed on account of the demand from teachers in local schools for this assistance and very little expense is involved either to the Museum or the teachers. The teachers call at the Museum for the specimens and return them within a time limit.

MINERAL AND ROCK COLLECTIONS

Three grades of collections of minerals and rocks are prepared by the Geological Survey for sale to educational institutions. The prices of these collections and full information about them may be obtained on application to the Director of the Bureau of Economic Geology.

A table indicating the number of collections sold in the past year is included in the report of the Chief of the Mineralogical Division.

LOAN COLLECTIONS

Four collections of museum specimens have been prepared for loan to museums, educational institutions, and other responsible organizations. The subjects are of a popular nature and the material selected is interesting and

attractive. The gross weight as packed for shipping ranges from 65 pounds to 190 pounds. The collections are as follows:

No. 1. Sea Shells. This collection consists of the following groups of shells from various parts of the British Empire:

1. Trumpet shell or dinner horn.
2. Edible Canadian shells.
3. Cone shells showing types of tropical colour pattern.
4. Carnivorous molluscs preying on oysters.
5. Tropical carnivorous snails.
6. Shells used as money.
7. Rock and wood boring shells.
8. Thorny oyster.
9. Drill shells.
10. Cowrie shells, used for ornaments, money, and for buttons.

No. 2. Indian Ornaments. This exhibit consists of five cases of articles used by the Indians of Canada in the adornment of their persons. It is, in a sense, an exhibit of Indian and Eskimo jewellery. The five cases bear the following labels:

1. Pendants and ear-rings.
2. Combs and hair-pins.
3. Brooches and bracelets.
4. Labrets and nose-pins.
5. Necklaces.

No. 3. Biology. There are six cases as follows:

1. Protective coloration. Specimens of the following species against natural backgrounds:
Mourning cloak butterfly.
Under-wing moth.
Tern's eggs in nest.
Whip-poor-will.
Weasel in winter.
2. Mimicry. Specimens of:
Flies mimicking bees and wasps.
Viceroy butterfly mimicking Monarch butterfly.
3. Geographic variation. Specimens of various geographic races of song sparrows with map showing distribution.
4. Distinctive characters of woodpeckers. Casts, models, and specimens.
5. Distinctions between flesh-eating and gnawing mammals. Specimens showing distinctions in teeth structure and their use.
6. Distinctions between frogs and toads. Casts and drawings.

No. 4. Canadian Dinosaurs. The exhibit consists of the following articles:

1. A cast of the skin impression of a horned dinosaur (*Chasmosaurus belli* Lambe): it shows that these animals were protected by rather thin, non-imbricating scales which varied considerably in size.
2. Nasal horn core.
3. Rostral bone or beak which was also covered with a horny sheath.
4. Miniature restoration model of a horned dinosaur. It shows the relative proportions and build of the animal.
5. Dermal plate or bone that fitted in the skin of one of the armoured dinosaurs.
6. Teeth of an armoured dinosaur.
7 and 8. Sections of jaws of a duck-billed dinosaur. The teeth were arranged in a magazine, in vertical as well as horizontal rows, and were continually growing up to replace the worn ones.

9. Bone from the hind foot of a large, duck-billed dinosaur. These animals probably spent much of their time in the water and always went there for protection.

10. Part of the lower jaw (dentary) of the large, flesh-eating dinosaur (*Gorgosaurus*), the restoration drawing of which is also shown.

11. Cast of a footprint of one of the small carnivorous dinosaurs from Peace River canyon, B.C.

12. Cast of the foot of a small flesh-eating dinosaur.

13. Teeth of a small carnivorous dinosaur.

Three strongly contrasted types of teeth are displayed in the collection.

MUSEUM LECTURES

Among the most important educational activities of the National Museum is the series of illustrated lectures given under the auspices of the Museum in the Museum lecture hall.

The lectures are given on Saturday mornings for children and are repeated on Wednesday evenings for adults. They embrace animal and plant life, the life of the aborigines, natural resources, industries, geography, travel, and related subjects, and each is given by a lecturer from his own experience. The Saturday lectures for children are supplementary to school work in geography and nature study. They are limited to less than forty-five minutes, are illustrated by specimens or lantern views, and are followed by motion pictures, the whole period not exceeding one hour.

It is hoped that these lectures may be suggestive to the children of subjects of intensive study and may inspire them to become in adult life workers in, or supporters of, the scientific and cultural activities of the nation.

The Saturday children's lectures were announced for both ten and eleven o'clock. On many occasions the lecture hall did not accommodate the crowds and a third lecture was given to the overflow.

For adults the same subjects as presented to the children were treated at greater length. These evening lectures likewise often taxed the seating capacity of the lecture hall, and on some occasions a number of people were unable to obtain seats. The large and well sustained attendance, considering adverse weather conditions, at both the lectures to children and those to adults, proves that this educational effort of the Museum is appreciated. Fourteen illustrated lectures were given during the season of 1933-34, divided into a first series beginning November 18 and ending December 16, and a second series beginning January 6 and ending March 7.

Many of the lecturers are in the service of various Government departments, and others are prominent in industry and the professions. All gave their time and skill for this public service without compensation other than the satisfaction of diffusing the knowledge they have gained. The Lecture Committee takes this opportunity to thank them most heartily for their cordial co-operation.

The Boy Scouts Association of the Ottawa district has provided ushers at the children's lectures on Saturday mornings, an assistance greatly appreciated by the Lecture Committee, especially as it tends to make the children feel that Saturday morning at the Museum is a youthful occasion and to develop in them a spirit of co-operation and responsibility.

For the loan of motion picture films during the past year the Lecture Committee acknowledge the courtesy of the following: Cunard Steamship Company, Montreal; National Parks of Canada; Bray Pictures Corpora-

tion; United States Department of Agriculture, Washington, D.C., U.S.A.; Pathe Educational Films; Commander G. M. Dyott; Canadian Government Motion Picture Bureau; Ontario Motion Picture Bureau; and D. F. Kidd.

The co-operation of the *Ottawa Citizen,* the *Ottawa Journal,* and *Le Droit,* is also very much appreciated. By giving announcements of the lectures, space for news reports of them, and editorial comment, these local newspapers have greatly contributed to their success.

The Lecture Committee is composed of: Harlan I. Smith (Chairman), M. E. Wilson, and Clyde L. Patch.

The programs follow:

First Series:

Ireland, by H. Bowers, M.A., D.Paed., of the Normal School, Ottawa.

The Wild Animals of the National Parks of Canada, by Hoyes Lloyd, M.A., Supervisor, Wild Life Protection, National Parks of Canada, Department of the Interior.

Meteors and Meteorites, by R. Meldrum Stewart, M.A., F.R.A.S., F.R.S.C., Director of the Dominion Observatory, Department of the Interior.

Insect Invaders, by Leonard S. McLaine, M.Sc., of the Entomological Branch, Department of Agriculture.

Children of All Lands.

Four reels of motion pictures.

The Little Indian Weaver; The Wee Scotch Piper; The Little Dutch Tulip Girl; and The Little Swiss Wood Carver.

This was a special pre-Christmas meeting entirely devoted to motion pictures for children and was not repeated on Wednesday evening for adults.

Second Series:

Amidst the Volcanoes of Ecuador, by J. H. Sinclair, B.A., M.Sc., of New York.

A Travel Dialogue on Some Pacific Islands of Canada, by Clyde L. Patch and Harlan I. Smith, National Museum of Canada, Department of Mines.

Four Hundred Years Ago in the Gulf of St. Lawrence, by Harrison F. Lewis, M.A., Ph.D., Chief Federal Migratory Bird Officer for Ontario and Quebec, Department of the Interior.

Frazil and Anchor Ice, by John Murphy, M.E.I.C., F.A.I.E.E., of the Board of Railway Commissioners and the Department of Railways and Canals.

Honey Bees, How They Live and Work, by C. B. Gooderham, B.S.A., Dominion Apiarist, Central Experimental Farm.

A Town Planner's Trip Across Canada, by Horace L. Seymour, B.A.Sc., C.E. (Tor.), Town Planning Consultant, Province of Alberta.

A Trip Through Central Europe, by F. C. Elford, Dominion Poultry Husbandman, Central Experimental Farm.

The Story of Great Bear Lake, by D. F. Kidd, B.Ap.Sc., Ph.D., of the Geological Survey, Department of Mines.

The Romance of Flowers, by Rowley Frith, B.S.A., Ottawa.

The attendance was as follows:

First Series

	Five children's lectures	Four adult's lectures
Total attendance	3,800	1,485
Average attendance	760	371

Second Series

	Nine children's lectures	Nine adult's lectures
Total attendance	6,280	3,560
Average attendance	698	396

First and Second Series

	Children	Adults
Total attendance	10,080	5,045
Total attendance at all lectures		15,125

DIVISION OF ANTHROPOLOGY

The activities of the staff were limited almost wholly to office work.

During the early part of the fiscal year Diamond Jenness assembled and examined the anthropological papers to be submitted at the Fifth Pacific Science Congress, and guided through the press a special volume, on the " Origin and Antiquity of the American Aborigines ", that he had compiled and edited for the occasion. He attended the congress meetings in Victoria and Vancouver during the months of June and July, organized and presided over its anthropological section, and presented the opening paper at a general symposium on the origin of the American Indians.

After his return to Ottawa Mr. Jenness completed the preparation of the monograph on the Carrier Indians of Northern British Columbia, and attended to the numerous routine duties of his office, particularly those relating to inquiries concerning the Indians and Eskimos of Canada. He advised and assisted the Department of Anthropology of Columbia University, the Philadelphia Museum, and the University of Pennsylvania, in the preparation of plans for field work within Canadian territory, and acted also as a member of the Interdepartmental Reindeer Committee. For the Department of the Interior he prepared a memorandum on the relation of the Eskimos to the Indians, and compiled a map showing the distribution and boundaries of the Indian tribes in northeastern North America in the year 1774, just before the outbreak of the War of Independence.

C. M. Barbeau's work during the year proceeded partly along the same lines as previously. The Asiatic origin of our northwestern natives was further investigated in the light of abundant materials still to be marshalled on their migrations across Bering strait. A large number of Chinese song records, recently acquired, are being studied, and whatever similarities with British Columbia themes exist are being traced. A collection of northeastern Siberian records, loaned by the American Museum of Natural History, New York, is now being transcribed, for close comparison with our materials; they are part of the same cultural system. Two papers, in the nature of advance instalments on the subject, were published during the year (Musical Quarterly, January, 1934, and Fifth Pacific Science Congress). Further progress was also made on prospective monographs on the southward migrations of the Tsimsyan.

A number of papers were prepared on request, and addresses were given, since they facilitate incidental research without any Museum outlay. A large body of pictorial documents of the Indians of the St.

Lawrence and of ancient folk life and crafts by the early painter Cornelius Krieghoff have in that way been discovered this year and some of them brought together for study. The Indians of Caughnawaga and Lorette were the usual theme of the painter's compositions, during the period of their evolution from 1842 to 1867. The number discovered exceeds four hundred, all of which have been analysed, annotated for further use, and some of them photographed at the Museum. They contribute the most valuable pictorial record on the subject in existence.

During the lecture tour in the Maritimes, the museums and archives of Halifax and Saint John were visited; the new provincial museum at Saint John contains much valuable materials on folk crafts. Some study was also made of ancient local folk crafts at Saint John, St. Andrews, and St. Stephen, and a number of photographs were taken.

The new folk-lore collections of this year consist mostly of excellent materials collected and communicated without charge, as in former years, by Mr. Adelard Lambert, of Drummondville, Quebec; also some texts found in the papers of the late Mrs. Mount-Duckett, of Montreal.

The new Lambert collection contains fifty-nine folk songs, with melodies recorded on the phonograph; forty-four chilren's games and play-parties; sixteen folk rhymes; and seven folk tales and anecdotes.

Mrs. Duckett's collection included ten texts of folk songs, nineteen folk rhymes, four fragments of English-Canadian songs; and a few photographs.

Nine songs with texts and melodies, collected by Miss Berthe Mantha, of Orleans, near Ottawa, were received from Mr. Gustave Lanctôt, of the Archives, Ottawa.

Mr. Barbeau also collected information on lumberjacks and their life in the woods, and took photographs in the Gatineau district.

Harlan I. Smith continued to assemble and arrange information on the archæological sites and numerous other subjects of Canadian archæology. In this work Mr. Smith completed a list of all the data so far assembled on archæological sites in north and central Alberta. He described pictographs and petroglyphs from photographs and sketches made by Mr. Francis J. Barrow of Sidney, B.C., on a three months' trip of over 1,100 nautical miles in search of pictographs and petroglyphs among the fiords and islands of eastern Vancouver island and the adjacent mainland. The resultant notes, photographs, colour sketches, and key maps to the locations of the sites were most generously donated by Mr. Barrow to the National Museum of Canada.

Mr. Smith continued his efforts to bring to the attention of artists and manufacturers the possibilities of using designs from Canadian Indian art and archæology for distinctive Canadian manufactures and souvenirs. These designs reproduce some of the earliest art of Canada, which illustrates the first mythology of the country.

His services were lent to the Quebec Government as consultant on the preservation and erection of a totem pole from Nass river, British Columbia, in the new Zoological Gardens near Quebec city.

W. J. Wintemberg revised his report on the Roebuck Indian village site and continued his study of material from other village sites. His services were given for a short time to supervise excavations at Fredericton, New Brunswick.

Douglas Leechman, in addition to carrying on the routine work of inspecting, cleaning, and repairing anthropological specimens in the possession of the National Museum, was able to complete, with the exception of a few minor details, the habitat group showing the interior of an Eskimo igloo or snow-hut. He selected and supervised the hanging of a series of photographic enlargements, thus adding greatly to the attractiveness of the Hall of Anthropology.

A number of special exhibits were prepared. One was for the Central Canada Exhibition held in Ottawa in August, and consisted of Iroquois and Algonkin material contrasting the cultures of sedentary and nomadic tribes. One was prepared for the Toronto Exhibition and one for the Handicrafts Guild, Toronto. An exhibit of Indian articles of personal adornment was prepared for loan to museums and educational institutions. A collection of ethnological material was assembled for the National Parks Branch, Department of the Interior, for display in the Riding Mountain Park Museum, Manitoba.

Loans were numerous during the year. The usual requests from teachers and students were met, and specimens were lent to the Royal Canadian Mounted Police, the Ottawa Drama League, the Toronto Art Gallery, and others.

Classes from schools—including Normal schools—local and from out of town, visited the Museum. Several students of dentistry from the University of Toronto called to inspect the collection of Indian and Eskimo teeth.

Publications

The following articles by members of the staff were published during the year:

The American Indians. Edited by D. Jenness. Published by the University of Toronto Press for the 5th Pacific Science Congress, 1933.

Origin and Antiquity of the American Indians. By D. Jenness. Fifth Pacific Science Congress, June, 1933.

The Vanished Red Indians of Newfoundland. By D. Jenness. Canadian Geographical Journal, Jan., 1934.

Two Centuries of Wood Carving. By Marius Barbeau. The Royal Society of Canada, Section II, May, 1933.

Le Dernier de nos grands artisans—Louis Jobin. By Marius Barbeau. The Royal Society of Canada, Section I, May, 1933.

"Le Nid de l'Aigle"—un totem. By Marius Barbeau. La Presse, Montreal, July 1, 1933.

At the Heart of the Laurentians. By Marius Barbeau. Canadian Geographic Journal, July, 1933.

French Survival in Canada. By Marius Barbeau. Washington Academy of Sciences, August, 1933.

Rocher Malin—Temiscouata. By Marius Barbeau. The Canadian Geographic Journal, October, 1933.

The Tree of Dreams. By Marius Barbeau. Canadian Geographic Journal, December, 1933.

Le "Royal William". By Marius Barbeau. La Presse, Montreal, December, 1933.

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Asiatic Survivals in American Indian Songs. By Marius Barbeau. Musical Quarterly, New York, January, 1934.

Cornelius Krieghoff Discovers Ancient Canada. By Marius Barbeau. Canadian Geographic Journal, March, 1934.

Dental Caries in Prehistoric Canadian Skulls. By Douglas Leechman. Dominion Dental Journal, February, 1934.

Lectures

Art and Life. By Marius Barbeau. Heliconian Club of Toronto, April 29, 1933.

Why Canada Should Be Interested in Her Handicrafts. By Marius Barbeau. Women's University Club, Toronto, May 1, 1933.

Canadian Handicrafts. By Marius Barbeau. Handicrafts Association of Canada, Toronto, June 25, 1933.

Traditions of French Canada. By Marius Barbeau. The Rotary Club, Ottawa, September 11, 1933.

Canadian Handicrafts. By Marius Barbeau. Canadian Club, Halifax, Nova Scotia, October 5, 1933.

Art and Life. By Marius Barbeau. Women's Canadian Club, Saint John, New Brunswick, October 9, 1933.

French Canada, Its Survival. By Marius Barbeau. Men's Canadian Club, Saint John, New Brunswick, October 9, 1933.

Why Canadians Should Be Interested in Their Handicrafts. By Marius Barbeau. Women's Canadian Club, St. Andrews, New Brunswick, October 11, 1933.

Art and Life. By Marius Barbeau. Women's Canadian Club, St. Stephen, New Brunswick, October 12, 1933.

Les Arts et la Vie au Canada. By Marius Barbeau. Le Caveau, Ottawa, November 10, 1933.

How Canada Was First Peopled. By Marius Barbeau. Royal Canadian Institute, Toronto, Ontario, November 25, 1933.

Art and Canadian Life. By Marius Barbeau. Daughters of the Empire, Ottawa, December 19, 1933.

Cornelius Krieghoff Discovers Ancient Canada. By Marius Barbeau. Art Gallery of Toronto, January 8, 1934.

The Georgian Bay. By Marius Barbeau. Women's Canadian Club, Midland, Ontario, January 10, 1934.

Art and Life. By Marius Barbeau. Women's Canadian Club, Stratford, Ontario, January 11, 1934.

Mongolian Survivals in Our Indian Songs. By Marius Barbeau. Young Men's Canadian Club, Montreal, Quebec. Transcontinental broadcast, January 28, 1934.

Cartier Discovers Canada. By Marius Barbeau. Young Men's Canadian Club, Montreal, Quebec, January 29, 1934.

Cartier Discovers Canada. By Marius Barbeau. Young Men's Canadian Club, Toronto, Ontario, February, 1934.

Art and the Life of the French-Canadians. By Marius Barbeau. Teachers' Institute, Ottawa, March 2, 1934.

Art and Canadian Life. By Marius Barbeau. Cornwall Art Association, March 14, 1934.

Canadian Indian Musical Instruments. By Douglas Leechman. Devonshire Street School, Ottawa, December 4, 1933.

Canadian Indian Art. By Douglas Leechman. University Women's Club, Ottawa, Ontario, January 8, 1934.

Acccessions to Museum

Owing to there having been no field work accessions were few, comprising 9 in ethnology, 13 in osteology, and 96 in archæology.

FROM THE STAFF:

Collected by W. J. Wintemberg:

Skeletal remains from Fredericton, New Brunswick.

BY EXCHANGE:

From W. J. Orchard:

Archæological material from Saskatchewan.

BY DONATION:

From Major L. T. Burwash:

Soapstone pot from King William island.

From P. M. Pringle:

Stone pipe bowl from the Blackfoot tribe.

From Mrs. Beverly MacLaughlin:

Three Prairie Indian specimens.

From F. G. Neate:

Bow and arrows from Coronation gulf.

From Prof. E. E. Prince:

Wooden spoon from British Columbia.
Maori skull from New Zealand.
Skeletal remains from British Columbia.

From Norman Wilson:

Archæological material from the Mackenzie delta.
Skeletal remains from the Mackenzie delta.

From Cons. Nilsson, R.C.M.P.:

Archæological material from Nova Scotia.

From J. C. Beidelman:

Grooved stone hammer from Sturgeon Lake, Ontario.

From H. C. Gunning:

Archæological material from cape Wolstenholme.
Archæological material from Mansell island.

From L. S. Russell:

Chipped stone point from Saskatchewan.

From J. Dowler:

Grooved stone ax head from Alberta.

DIVISION OF BIOLOGY

R. M. Anderson, Chief of the Division, reports:

Owing to lack of appropriations for field work the activities of the staff were limited almost entirely to office and laboratory work, although some local investigations were made in the Ottawa district by members of the staff, mainly outside of office hours. At the end of the year the catalogued specimens of mammals numbered 12,304, an addition of 654 specimens during the year; the birds numbered 25,727, an addition of 548 during the year; and reptiles and amphibians 4,561, an addition of 79 during the year.

It is generally recognized that systematic work in zoology and botany is primarily based on collections made in the field, and without specimens for detailed examination there is little progress. Experience has also shown that to carefully study, determine, and correctly label a collection made in the field takes at least as much time as is required to collect the specimens. During the past year the opportunity has been taken to make considerable progress in studying, identifying, labelling, and arranging the accumulated reserve collections and recent accessions, making them more useful and convenient for reference in further studies. A scientific natural history museum is much more than a repository for curios of more or less scientific interest. A collection of selected scientific specimens, tastefuly exhibited, has considerable value in popular education, and the reserve collections are as important as the scientific library for "source material" in more advanced studies, and should be preserved as carefully as other historical archives for revisionary work as science progresses in the future.

The Biological Division specialists are always glad to identify specimens of mammals, birds, reptiles, or amphibians which are taken in any part of Canada, and correspondence on any specimens of interest is welcomed in regard to economic aspects, as well as for the purpose of obtaining authentic records of the distribution and spread of different species. Specimens have been determined from time to time for other Dominion and Provincial departments, institutions, private collectors, and other persons.

During the year specimens have been obtained on loan from the Smithsonian Institution, U.S. National Museum, Washington, D.C.; American Museum of Natural History, New York; Provincial Museum, Regina, Saskatchewan; Experimental Fisheries Station, Halifax, Nova Scotia; Grand Coteau Museum of Canadian Club, Shaunavon, Saskatchewan; Kenneth Racey, Vancouver, B.C.; Stuart Criddle, Treesbank, Manitoba; Wm. H. Moore, Scotch Lake, New Brunswick. Reciprocally, specimens have been loaned to the Smithsonian Institution, Washington, D.C.; Bureau of Biological Survey, U.S. Department of Agriculture, Washington, D.C.; Museum of Comparative Zoology, Harvard University, Cambridge, Mass.; Museum of Vertebrate Zoology, University of California, Berkeley, California; Laboratory of Ornithology, Cornell University, Ithaca, N.Y.; American Museum of Natural History, New York; and to various private investigators.

The Biological Division of the National Museum is charged with part of the work which in some countries is covered by a regularly organized Biological Survey, and in this capacity makes such investigations and surveys of the status of wild life in Canada, as time and a limited staff will

permit. The officers of the division co-operate freely with other departments, especially the Departments of Agriculture, Interior, and Fisheries, on matters relating to wild life that are not adequately covered by any one department, and the accumulated notes and observations of many years often provide valuable and needed information.

R. M. Anderson and P. A. Taverner have served as members of the Inter-departmental Advisory Board on Wild Life Protection. They attended the fiftieth anniversary meeting of the American Ornithologists' Union held in the American Museum of Natural History, New York City, November 14-16, 1933. Mr. Anderson also served as a member of the Northern Advisory Board, the Inter-departmental Reindeer Committee, and as honorary advisory zoologist for the Gatineau-Lièvre-Nation division of the Province of Quebec Association for the Protection of Fish and Game.

Field Work

Considerable fresh material was collected near Ottawa for making habitat groups and a number of small mammals and birds were collected and mounted to fill out the school loan collections. Charles H. Young during the summer evenings collected insects, particularly *Microlepidoptera,* and added about 2,400 mounted specimens to the National Collection of Insects, including several forms that appear to be undescribed. Insect larvæ, pupæ, and cocoons were also collected and reared in order to have fresh, perfect material for display cases prepared by Mr. Young and Mr. Johnson.

Office Work

R. M. Anderson continued systematic work on the mammal collections of the museum, making special studies of several Canadian genera, especially pocket gophers (*Thomomys*), red-backed mice (*Clethrionomys*), jumping mice (*Zapus*), hoary marmots of the *Marmota caligata* group, and red squirrels of the *Sciurus hudsonicus* group.

The "Check-list of Canadian Mammals" is in card catalogue form, and with some revision of ranges of certain species and subspecies is nearly in shape for publication. Some special work has been done on a descriptive and illustrated work on the "Mammals of Canada," to which all other revisionary and life history work on Canadian mammals is directly contributory. A bulletin on "Animal Life and Life Zones of Southern British Columbia," particularly the mammal life, is under way.

Two papers were prepared by Mr. Anderson for the Division of Biological Sciences, Fifth Pacific Congress, held at Victoria and Vancouver, British Columbia, June 1-14, 1933. One paper was entitled "The Distribution, Abundance, and Economic Importance of the Game and Fur-Bearing Mammals of Western North America" (illustrated with revised map of life zones, and map of inter-mountain sub-faunas, and maps showing ranges of the species of fifteen groups of the more important game and fur-bearing mammals), and one paper on "Effect of the Introduction of Exotic Animal Forms."

By request of the Department of the Interior, which is issuing a book covering the different phases of history, natural resources, and development of the eastern Arctic region of Canada, Mr. Anderson wrote a chapter on "The Mammals of the Eastern Arctic and Hudson Bay Region."

Without the opportunity for field work the activities of P. A. Taverner, ornithologist, have been restricted to routine office work and researches in the collection of birds. There has been the usual rather considerable correspondence with other ornithologists in the Dominion and elsewhere, and in answering inquiries that grow more numerous from year to year. A continuing work in the intervals between other duties has been keeping the bibliographical files and species maps up to date and extending them back into older literature. Thus, some three thousand cards have been added to these records.

The division has prepared a set of educational exhibits for the inter-museum loan series. The specimens, with descriptive labels, are in six individual glazed cases, 16 by 19 inches, fitting into an adequate shipping case, and all constructed to withstand usual transportation risks.

Some work was necessary to bring the manuscript of the "Birds of Canada" up to date before going to press. A revision was made of the vernacular specific names and, with the assistance of Dr. Harrison F. Lewis who was kindly detailed by the National Parks of Canada, Department of the Interior, for the purpose, and of A. La Rocque of the Geological Survey, a similar list was prepared in French.

The "Birds of Churchill, Manitoba", written in collaboration with Dr. George Miksch Sutton, was finally sent to press and under the auspices of the Carnegie Museum of Pittsburgh at latest information has advanced to galley proof.

A manuscript on "The Birds of the Eastern Arctic Islands", embodying an outline of the latest researches in this region, was prepared for the Department of the Interior and awaits publication.

A radio address entitled "The Study of Birds as a Cultural Pastime", was prepared and delivered under the auspices of the Professional Institute of the Civil Service of Canada, January 12.

A paper on "French Vernacular Names for Canadian Birds" was prepared by this office and delivered in French by Dr. Harrison F. Lewis before the French-Canadian Society for the Advancement of Science, in Montreal, November, 1933.

The following mammals and birds have been prepared and installed in the biological exhibition hall under the supervision of C. L. Patch: white-tailed jackrabbit (winter pelage), varying hare (winter pelage), western cottontail rabbit, grey squirrel, Iceland gull, magnolia warbler, loggerhead shrike, sharp-tailed grouse (2), black-crowned night heron, long-eared owl, and northern spotted owl. The last named specimen is a rare species. Some of these were new additions to the biological exhibition collection, others replaced antiquated specimens.

The following mammal skeletons were placed on exhibition: white-tailed deer, varying hare, marten, mink, skunk, black squirrel, flying squirrel, chipmunk, pika, woodrat, and domestic cat.

Twenty-two specimens, including a porcupine, muskrat, and weasel were added to the school loan collection. Since the specimens in this collection were installed in boxes damage to them has been slight. Four hundred and ninety-six mammals, birds, amphibians, reptiles, and photographs were lent to educational institutions for use in art and nature study.

Four hundred Ottawa Normal School students in twelve groups, and eighty North Bay Normal School students in four groups were conducted through the biological hall and initiated into the uses of the mammal and bird exhibits.

Mr. Patch, assisted by Mr. J. E. Perron, collected material for and installed a biological and botanical display at the Central Canada Exhibition held in Ottawa from August 21 to 26.

Inquiries for information relating to herpetology and taxidermy were received from coast to coast and from the northern states. Suggestions were given officials of the Canadian National Parks concerning material and the construction and arrangement of exhibits for the new museum in Riding Mountain national park.

Joseph Rochon, who had been osteological preparator in the Museum since 1919, having been transferred to this department after long service in the Department of Marine and Fisheries, on the closing of the old Fisheries Museum, died in May, 1933.

Claude E. Johnson, artist of the Biological Division, accomplished the following work:

Lantern slides coloured	224
Drawings	25
Colour plates	15
Range maps (mammals)	18
Plaster moulds	86
Plaster casts	6
Wax pieces (leaves, accessories, etc.)	908
Photo enlargements, coloured, retouched, or altered	29

Special colour-work on celluloid coal-area models:
One 17-section model of Hillcrest coal area, Alberta.
One old model of above given general all-over retouching.
One 26-section model of International Coke and Coal Company area.
One 22-section model of Michel coal area.

Miss W. K. Bentley, museum assistant, in addition to colouring numbers of lantern slides, spent much of her time making large portraits in oil of pioneers in natural science work in Canada who have been directly connected with the Geological Survey and National Museum of Canada.

Publications

A Study of Kumlien's Gull (*Larus kumlieni*). By P. A. Taverner. Canadian Field Naturalist, May, 1933.
Flicker Hybrids. By P. A. Taverner. Condor, January, 1934.
Purple Martins Gathering Leaves. By P. A. Taverner. Condor, January, 1933.
The Madeira Petrel in Ontario. By P. A. Taverner. Auk, January, 1934.

Lectures

The Wild Mammals of Quebec. By R. M. Anderson. Province of Quebec Society for the Protection of Birds, Mechanics' Institute Hall, Montreal, Que., April 24, 1933.
The Study of Birds As a Cultural Pastime. By P. A. Taverner. Radio address, January 12, 1934.

Accessions to Museum

ZOOLOGICAL COLLECTIONS

Mammals received and catalogued.. 554
Birds received and catalogued.. 564
Amphibians and reptiles received and catalogued.. 79
Nests and eggs received and catalogued.. 7

MAMMALS

By Gift.. 530

R. T. D. Wickenden, Geological Survey, Ottawa, 1 red squirrel.

Russell G. Foster, Mankato, Minnesota, 1 Minnesota grey squirrel and 4 Minnesota red squirrels.

H. F. Hughes, Curator, Grand Coteau Museum of Canadian Club, Shaunavon, Saskatchewan, 1 hunter's skin of long-tailed weasel, 1 silver-haired bat.

Laurence B. Potter, Eastend, Saskatchewan, 1 least weasel, hunter's skin.

F. Bradshaw, Director, Provincial Museum, Regina, Saskatchewan, 1 black-footed ferret (*Mustela nigripes*), hunter's skin, with dried carcass for preparation of skeleton, taken near Climax, Saskatchewan.

Jos. Skillen, Ottawa, 1 European hare, in the flesh, taken near Toronto, Ontario.

Mrs. Susan K. Squires, Fredericton, New Brunswick, 1 short-tailed shrew in the flesh.

Charles F. Hughes, Dollard, Saskatchewan, long-tailed weasel (*Mustela longicauda*), 1 skin in summer coat, 1 skin in winter coat, with one skull.

Kenneth Racey, Vancouver, B.C., 1 skin and skull of California harvest mouse (*Reithrodontomys megalotis longicaudus*), taken at Berkeley, California.

Stuart Criddle, Aweme, Manitoba, 1 white-tailed jack-rabbit in the flesh, winter coat.

Dominion Lands Administration, Department of the Interior, Ottawa, 337 mammals collected by J. D. Soper, in Wood Buffalo park, Alberta and Northwest Territories; 14 skins of wolf cubs (*Canis lycaon occidentalis*) without skulls taken near Peace point, Alberta, surrendered for bounty at Chipewyan, Alberta; 2 skulls of brown bear, and 5 skins of Dawson red-backed vole, from Mackenzie Delta region, collected by A. E. Porsild.

Major E. Mallandaine, Creston, British Columbia, 1 meadow mouse (*Microtus pennsylvanicus modestus*), a species said to be bothering orchardists in Creston district.

Gifford Johnson, Ottawa, 1 northern grey squirrel in the flesh.

W. Ray Salt, Rosebud, Alberta, 1 least weasel, alcoholic specimen.

Fenley Hunter, Flushing, Long Island, New York, 4 skulls (kit fox, coyote, badger, lynx-cat) from state of Nevada, U.S.A.

Dr. R. E. DeLury, Dominion Observatory, Ottawa, 1 young black squirrel, in the flesh.

A. La Rocque, Ottawa, 1 short-tailed shrew, 1 red-backed mouse.

E. M. Kindle, Geological Survey, Ottawa, 2 reddish woodchucks in the flesh.

National Parks of Canada, Department of the Interior, Ottawa, 1 skin of northern plains skunk, 1 skull of black bear, from Jasper park.

John C. Shelford, Wistaria P.O., British Columbia. 54 small mammals—2 woodchucks (*Marmota monax petrensis*), 5 red squirrels (*Sciurus hudsonicus*), 3 flying squirrels (*Glaucomys sabrinus alpinus*), 9 bushy-tailed woodrats (*Neotoma cinerea*), 4 snowshoe rabbits (*Lepus americanus macfarlani*), 4 red-backed mice (*Clethrionomys gapperi*), 2 long-tailed shrews (*Sorex cinereus cinereus*), 4 Hollister chipmunks (*Eutamias amoenus ludibundus*), 12 jumping mice (*Zapus princeps*), 1 northwestern muskrat (*Ondatra zibethica spatulata*), 1 Chilcotin hoary marmot (*Marmota caligata raceyi*), 1 beaver skull (*Castor canadensis*).

L. J. Simpson, Entomological Laboratory, Kelly's Camp, Grand Cascapedia, Quebec, 1 skin and skull of woodchuck (*Marmota monax*).

George H. Hammond, Entomological Laboratory, Apple Hill, Ontario, 1 jumping mouse (*Zapus hudsonius*) in the flesh, 2 long-tailed shrews, 8 meadow mice, 10 deer mice, 1 house mouse.

MAMMALS—*Concluded*

By Gift—Concluded

Hoyes Lloyd, Ottawa, 1 adult and 2 young Cottontail rabbits (*Sylvilagus floridanus mearnsii*) taken in Rockcliffe park; 6 big brown bats (*Eptesicus fuscus*) in the flesh.

M. L. Preble, Entomological Laboratory, Kelly's Camp, Grand Cascapedia, Quebec, 1 woodchuck (*Marmota monax*); 2 red-backed mice, 1 short-tailed shrew.

C. C. Smith and W. A. Peeks, Entomological Laboratory, Kelly's Camp, Grand Cascapedia, Quebec, 1 woodchuck (*Marmota monax*).

Joseph Coplan, Ottawa, 3 mummified heads of male northern white-tailed deer for skull collection, taken near Campbells Bay, Carleton County, Ontario.

E. C. Powell, Ottawa, 1 big brown bat, in the flesh.

B. R. MacKay, Geological Survey, Ottawa, 3 Columbian ground squirrels, from Michel, British Columbia.

H. B. Kirkland, Almonte, Ontario, 2 little brown bats (*Myotis lucifugus*) in the flesh.

M. W. Curtis, Athens, Ontario, 1 jumping mouse, in the flesh.

H. C. Gunning, Geological Survey, Ottawa, 1 skull of Arctic hare (*Lepus arcticus labradorius*), from Pangnirtung, Baffin island.

R. E. Balch, Entomological Laboratory, Fredericton, New Brunswick, 2 skins and 8 specimens in formalin from Gaspe county, Quebec (meadow mice, red-backed vole, jumping mouse, short-tailed shrew, and long-tailed shrew).

Dr. Ivan W. Parnell, Institute of Parasitology, Macdonald College, Quebec, 21 lemmings (*Dicrostonyx hudsonius* and *D. groenlandicus*), 2 weasels (*Mustela cicognanii*), from northern Quebec and southern Baffin island (in formalin).

Hudson's Bay Company, through Mr. Hugh Conn, district manager, Nelson River district, 6 flat ("cased") skins of meadow mice (*Microtus*) and white-footed mice (*Peromyscus*) from Hudson's Bay Company's post at Trout lake or Fawn lake, Ontario.

Douglas Leechman, Ottawa, 1 big brown bat, in the flesh.

C. F. Holmes, Dollard, Saskatchewan, 1 long-tailed weasel (alive).

Dr. J. M. Swaine, Ottawa, 1 chipmunk from Highland Park, near Ottawa, Ontario.

Ronald Lane, Rockcliffe park, Ottawa, 1 star-nosed mole in the flesh.

Wm. H. Moore, Scotch lake, New Brunswick, 11 skins of red-backed vole (*Clethrionomys gapperi*), in both summer and winter pelage. Contribution in aid of special study of this group.

In Exchange: 8

Museum of Vertebrate Zoology, University of California, Berkeley, California, 2 red tree mice (*Phenocomys longicaudus*), male and female; 2 California red-backed mice (*Clethrionomys californicus*), male and female; 1 Cascade red-backed mouse (*Clethrionomys mazama*), male.

Bureau of Biological Survey, U. S. Department of Agriculture, Washington, D.C., 1 skin and skull of male Wyoming Kangaroo rat (*Dipodomys ordii luteolus*) and male and female Oregon pocket mouse (*Perognathus parvus parvus*), skin and skull.

By Purchase: 2

Howard McMillan, Carmacks, Yukon Territory, 1 skull of large grizzly bear, through H. S. Bostock.

Wm. H. Moore, Scotch lake, York county, New Brunswick, 1 large bobcat, in the flesh.

By Staff: 17

BIRDS

By Gift: 529

Kenneth Racey, Vancouver, B.C., 1 skin of Columbian sharp-tailed grouse (Okanagan).

Dr. M. Y. Williams, Vancouver, B.C., 1 skin of surf scoter.

Department of Game and Fisheries, Toronto, 8 northern sharp-tailed grouse in the flesh.

Murray W. Curtis, Lyndhurst, Ontario, 1 domestic goose in the flesh. Killed by flying into hydro-electric wire and sent in for identification.

Bureau of Colonization, Game, and Fisheries, per L. A. Richard, Quebec, 13 northern sharp-tailed grouse in the flesh, from Canton Privat, Abitibi, Quebec.

Dr. A. Déry, Quebec, 2 northern sharp-tailed grouse, fresh skins, from Amos, Abitibi district, Quebec.

Stuart Criddle, Aweme, Manitoba, 1 screech owl in the flesh.

Kalmbach, E. R., Food Habits Research Laboratory, Bureau of Biological Survey, Denver, Colorado, 2 ligamentary skeletons of birds, white-necked raven (*Corvus cryptoleucus*), and Gambel's sparrow (*Zonotrichia leucophyrs gambeli*), to illustrate cleaning of skeleton of dermestid beetle larvæ.

Allan Moses, Grand Manan, New Brunswick, 1 sharp-tailed sparrow, 2 eider ducks, downy young.

W. E. Whitehead, Macdonald College, Quebec, 1 pine siskin, in the flesh.

W. Ray Salt, Rosebud, Alberta, 6 skins of great horned owl.

Dr. R. E. DeLury, Dominion Observatory, Ottawa, 1 shrike, 1 yellow-bellied sapsucker, 1 redstart, 1 robin, 1 Tennessee warbler, 1 bay-breasted warbler, 1 white-crowned sparrow—in the flesh.

John Richard, Ottawa, 1 Wilson thrush, in the flesh.

National Parks of Canada, Department of the Interior, Ottawa, 3 mounted birds (2 loons, 1 pied-billed grebe), seized at Toronto and Cornwall for violation of the Migratory Birds Convention Act; 24 woodcock (frozen), seized in Nova Scotia for violation of the Migratory Birds Convention Act.

John H. Warden, Good Hope, Northwest Territories, 1 goshawk and 1 loon, rough skins.

Corporal E. S. Covell, Royal Canadian Mounted Police, Moosonee, Ontario, 1 salted skin of red-breasted goose (*Bernicla ruficollis*), one of pair killed by Indian on Partridge creek, 18 miles from Moose Factory, east side of James bay, about May 30, 1933, and bearing bands "266 Augusta, Mich., Kellogg Game Sanctuary." Also 1 goshawk and 1 snowy owl, in the flesh, November 6, 1933.

Edgar Lester, Ottawa, 1 cedar waxwing, found dead.

Constable C. B. Tidd, Royal Canadian Mounted Police, Mayo Landing, Yukon Territory, wing and foot of buff-breasted sandpiper.

H. F. Hughes, Curator, Grand Coteau Museum of Canadian Club, Shaunavon, Saskatchewan, 6 hybrid flickers (*Colaptes auratus* x *C. cafer*), ♂ ad., ♀ ad., and four fledgling young.

F. W. Wilson, Blue Sea lake, Quebec, 1 broad-winged hawk in the flesh.

Dr. Ross Miller, 1 wood duck skin from Nova Scotia-New Brunswick boundary.

R. W. Tufts, Wolfville, Nova Scotia, 6 gulls (*Larus kumlieni* and *Larus leucopterus*) in the flesh.

James Austin, Ottawa, 1 Madeira petrel (*Oceanodroma castro*) in the flesh, found dead near Brighton Beach, Ottawa, August 28, 1933. The first Canadian record of this species.

R. Romeo Sarault, Ottawa, 1 American bittern, picked up injured on Ottawa street.

Dominion Lands Administration, Department of the Interior, Ottawa, 405 bird skins from Wood Buffalo park, collected by J. Dewey Soper; 14 bird skins collected by A. E. Porsild in Mackenzie Delta region.

Reid McMannus, Memramcook, New Brunswick, 1 black tern skin from New Brunswick.

BIRDS—*Concluded*

By Gift—Concluded

National Parks of Canada, Ottawa, 1 skin of parasite jaeger, from Blanc Sablon, Quebec, seized by H. F. Lewis, under Migratory Birds Convention Act.

Joseph Skillen, Geological Survey, Ottawa, 1 short-eared owl, in the flesh, from mounted exhibit collection, 4 black ducks, and 1 pintail (heads, for skull collection).

M. Lebeau Storiant, Belleview, Ottawa, Ontario, 1 Swainson's hawk, alive.

H. S. Bostock, Geological Survey, Ottawa, 1 skin of sharp-tailed grouse, from Yukon.

Gifford Johnson, Ottawa, 1 juvenile black-crowned night heron, picked up dead.

E. F. G. White, Ottawa, 3 greater snow geese in the flesh, with incoming white plumage, from Cap Tourmente, Que.

G. S. Ahern, Ottawa, 1 widgeon, in the flesh.

T. L. Thacker, Hope, British Columbia, 1 skin of northern spotted owl (*Strix occidentalis caurina*), taken in Skagit valley, B.C., December 4, 1933.

In Exchange 13

James Moffitt, San Francisco, California, 4 skins of black brant, from Tomales bay, Marin county, California.

Major Allan Brooks, Okanagan Landing, British Columbia, skins of kittiwake (*Rissa tridactyla*), lark bunting, Macgillivray's warbler, pale goldfinch, western tanager, white-winged crossbill, lazuli bunting, Nuttall's sparrow, California purple finch.

By Staff:..... 22

NESTS AND EGGS

By Gift:..... 4

Arthur C. Twomey, Camrose, Alberta, 1 nest and eggs of Harris sparrow (*Zonotrichia querula*), from Churchill, Manitoba.

H. M. Laing, Comox, Vancouver island, 3 eggs of white-cheeked goose (*Branta canadensis occidentalis*), taken on Vancouver island.

Dominion Lands Administration, Department of the Interior, Ottawa, specimens collected by J. Dewey Soper, 1 set of eggs American coot (*Fulica americana*), 1 nest of Alberta marsh wren (*Telmatodytes palustris laingi*).

C. E. Johnson, National Museum, Ottawa, 1 nest and eggs of Red-eyed Towhee (*Pipilo erythrophthalmus*) from Constance bay, Ottawa river, Ontario.

In Exchange:..... 3

Dr. K. Dernedde, Hanover, Germany, 3 nests of humming birds (*Saucerottea warscewiczi, Phaëthornis angusti,* and *Bellona cristata*).

AMPHIBIANS AND REPTILES:

By Members of Staff and by Gift:

W. J. Annand, Ottawa, Ont.....	1
H. D. Bond, Salem, West Virginia.....	1
H. S. Bostock, Carmacks, Yukon.....	4
Fred. Duchene, Ottawa, Ont.....	1
Roy L. Fowler, Aldersyde, Alta.....	2
Chas. F. Holmes, Dollard, Sask.....	1
Fenley Hunter, Clark county, Nevada.....	2
C. E. Johnson, Casselman and Gloucester, Ont.....	13
Ernest Junkins, Ottawa, Ont.....	1
E. M. Kindle, Pelee island, Ont.....	1
H. Leech, Vernon, B.C.....	1
Harold T. Lucas, Lachine, Que.....	1
Dr. L. P. MacHaffie, Danford Lake, Que.....	2

AMPHIBIANS AND REPTILES—*Concluded*

By Members of Staff and by Gift—Concluded

H. Miles, Woodstock, Ont	30
Wm. H. Moore, Scotch Lake, N.S	1
J. A. Munro, Horse Lake, B.C	6
L. S. Russell, Hull, Que., Grand Prairie, Alta	2
Leslie Stone, Ottawa, Ont	1
M. M. Thomson, Kingsmere, Que	1
A. C. Toner, Arden, Ont	2
E. Trevor, Portland, Ont	1
Robie W. Tufts, Wolfville and Sable River, N.S	2
C. R. Twinn, Algonquin Park, Ont	1
M. Y. Williams, Bowen Island, B.C	1
The total number of amphibians and reptiles now in the herpetological collection is	4,561

FISHES

By Gift:

W. A. Gunter, Ottawa, 1 gar-pike (*Lepidosteus osseus*), from Ottawa river, near Ottawa.

INVERTEBRATE: MOLLUSCS

By Gift: 182

Royal Ontario Museum of Zoology, Toronto, 30 specimens of snails (*Limnaea stagnalis* of four varieties), from Ontario, Saskatchewan, and British Columbia.

Norman Criddle, Aweme, Manitoba, 25 specimens of *Stagnicola* species, from Whitewater lake and Plum Coulée, Manitoba.

G. E. Fairbairn, Geological Survey, Ottawa, 1 *Oxychilus cellarius* from Ottawa; 1 *Sphaerium rhomboideum* from Moncrief lake, Quebec; 100 specimens of *Naiades* (*Lampsilis* species) from Britannia bay, Ottawa river, Ontario.

A. La Rocque, Geological Survey, Ottawa, 15 specimens from Rideau canal and river, Ottawa.

H. S. Bostock, Geological Survey, Ottawa, 3 snails from Carmacks, 5 from Willow creek, and 1 from Little Salmon river, Yukon Territory; 1 gastropod from Laberge lake, Yukon Territory.

C. E. Johnson, National Museum, Ottawa, about 40 specimens of *Limnaea stagnalis* from Rideau river.

In Exchange: 3

G. D. Hanna, California Academy of Sciences, San Francisco, California, 3 specimens of *Carychium magnificum* Hanna, collected at Union bay, Vancouver island, British Columbia.

INSECTS

By Gift:

Charles H. Young, National Museum, Ottawa, 2,400 specimens of *Lepidoptera* mounted, collected in vicinity of Ottawa, and deposited in National Collection of Insects.

H. S. Bostock, Geological Survey, Ottawa, 1 beetle and bottle of insect larvæ from Yukon Territory.

R. W. Tufts, Wolfville, Nova Scotia, 2 insect parasites from sharp-shinned hawk and woodcock, respectively.

National Herbarium

M. O. Malte, Chief Botanist, made considerable progress during the early part of the year on the Flora of Arctic Canada. Several genera of plants were virtually monographed, numerous keys were worked out, and about seventy-five pages completed and typed and a considerable quantity of manuscript notes written. This work was begun in 1927, when the National Museum arranged for Mr. Malte to have the co-operation of the late Professor C. H. Ostenfeld, Director of the Botanic Garden of Copenhagen, and considered the leading European authority on Arctic plants. The plan was to consolidate the knowledge of the flora of Arctic Canada now found in scattered publications and in the form of only partly or imperfectly described collections in various herbaria in Europe and North America, the same to form the first of a proposed series of works on floral provinces of Canada. This was to be a systematic work on the phanerogamic flora (seed plants or flowering plants) of the Canadian Arctic archipelago and the mainland of North America from Hamilton inlet along the coast of Labrador to Ungava bay, thence to Richmond gulf, from Churchill to Mackenzie delta and thence along the Arctic coast about to Nome, Alaska, this line to coincide approximately with the northern limit of trees. Professor Ostenfeld worked intermittently, as his other duties permitted, until his untimely death on January 16, 1931, and made critical examination of the most important material in Ottawa, London, and in the Scandinavian countries. After the death of Professor Ostenfeld, the work was continued by Mr. Malte alone. The progress of the work was greatly aided by loans of Arctic plants from the Gray Herbarium, Cambridge, Mass.; The New York Botanical Garden, New York; The Danish Arctic Station, Godhavn, Greenland; the Botanical Division of the Government Museum, Stockholm, Sweden; and the Division of Botany, University of Lund, Sweden; and the National Herbarium collections were also greatly benefited by corrections in labelling made during the progress of the revisionary work.

Mr. Malte made three Arctic voyages in the prosecution of this work, accompanying the Canadian Arctic Expedition of 1927 on S.S. *Beothic* from July 16 to September 4, visiting thirteen posts on Ellesmere, Devon, Baffin, Beechey, and Somerset islands and two posts on Hudson strait, collecting 3,778 sheets of herbarium specimens, of which 27 species were not previously recorded from Devon island, and 20 species were not previously recorded from Baffin island. In 1928 he obtained passage on the Hudson's Bay Company's S.S. *Nascopie* from July 10 to September 10, and visited one post on Labrador coast, three on Hudson strait, four on Hudson bay, and two on Baffin island, collecting a total of 5,683 herbarium sheets. In 1933, the S.S. *Nascopie* was engaged to transport personnel and supplies for the Canadian Government to the eastern Arctic posts, and Mr. Malte accompanied the expedition visiting Lake Harbour (Baffin island), Port Burwell, Wakeham bay, and Sugluk (Hudson strait), and cape Smith and Port Harrison (on east side of Hudson bay), collecting 1,364 herbarium sheets between July 7 and August 5. Unfortunately, he was taken ill at Charlton island, James bay, and had to be sent home, being transferred to the Temiskaming and Northern Ontario railway at Moosonee, but died

on August 12, 1933, before reaching Ottawa. His collections made during the summer were shipped out from Churchill.

On the invitation of the Acting Director of the National Museum, Professor M. L. Fernald, of the Gray Herbarium, Harvard University, Cambridge, Mass., a leading authority on the plants of eastern Canada, Newfoundland, and northern Ungava, came to Ottawa, and helped to make a survey of Mr. Malte's unpublished manuscripts and scientific notes. It was decided that some of the manuscript, on account of descriptions of nine new species, one new variety, and seven new combinations in the genera *Antennaria, Potentilla, Castilleja, Armeria,* and *Vaccinium,* deserved early publication. These were arranged by Professor Fernald, under the titles "Antennaria of Arctic America" and "Critical Notes on Plants of Arctic America", and are now in press in Rhodora Journal of the New England Botanical Club.

Plants received on account of exchange	600
U.S. National Museum, Washington, D.C.	102
New York Botanical Garden, New York, N.Y.	396
Dr. B. Floderus, Botanical Div., Royal Museum, Stockholm, Sweden	102
Plants received as donations	920
Dr. John Dearness, London, Ont.	1
Marcel Raymond, St. Johns, Quebec	2
Staff Sergt. J. E. F. Wight, R.C.M.P., Chesterfield inlet, N.W.T.	1
Mr. F. A. Kerr, Ottawa, Ontario	96
Mr. H. S. Bostock, Ottawa, Ontario	30
Prof. N. C. Fassett, Madison, Wisconsin	25
Arnold Arboretum, Jamaica Plain, Mass.	765
Plants distributed on account of exchange	1,359
Gray Herbarium, Harvard University, Cambridge, Mass.	1,359

DIVISION OF PALAEONTOLOGY (Geological Survey)

E. M. Kindle, Chief of Division, reports:

During the year plans for the publication of the Illustrated Card Catalogue of North American Devonian fossils were completed. The essential features of this project, which is being carried out through the co-operative work of a number of North American palæontologists, were outlined in the report of this division for 1932. The Wagner Free Institute of Science of Philadelphia, which has undertaken to publish the several units as they are completed, announces the publication of the first unit, which will cover the Devonian ammonoids, in the autumn of 1934. Professor B. F. Howell in announcing the early publication of the first section of this work states:[1]

"The preparation of this illustrated card catalogue and bibliographic index is one of the most ambitious pieces of work ever undertaken by palæontologists of any continent. The catalogue and index will be historic landmarks on the highway of palæontological progress, and will, it is hoped, set the standard for future work of the same sort."

1 Howell, B. F.: "An Illustrated Card Catalogue of North American Fossils", Bull. Wagner Free Inst. Sci., vol. 9, No. 1, p. 108 (1934).

E. M. Kindle attended the Washington meeting of the International Geological Congress as a delegate of the Geological Survey and participated in the six-day Chesapeake Bay geological excursion that preceded it. Representative collections of the fossils of the Cretaceous and Tertiary formations of Maryland and Virginia were secured during this excursion for the reference collections of the Museum.

Office Work

During the early months of the 1933-34 year L. S. Russell prepared a model restoration of the horned dinosaur *Chasmosaurus belli* on a scale of $\frac{1}{10}$ natural size. The skeleton was modelled to scale, and upon this the muscles were reconstructed. A layer to represent integument was added and the skin pattern modelled on this. Plaster casts of this model are being prepared by C. E. Johnson. Several labels for vertebrate exhibits were prepared by L. S. Russell.

In response to an invitation from the Central Canada Exhibition an exhibit was prepared and installed. A member of the division was present during the week of the exhibition to give any desired information.

In the laboratory of vertebrate palæontology seven skulls of the hooded, duck-billed dinosaurs were unpacked and partly prepared. Mr. Sternberg is at present confining his preparatory work and study to this group of dinosaurs.

A. E. Wilson continued work on the catalogue of type fossils and further work on the synoptic exhibition cases.

Museum Exhibits

Four water colour paintings of Palæozoic marine life by Mr. Lefebvre have been added to the systematic exhibits of fossils. Two tusks of the hairy mammoth were added to the exhibits.

Considerable progress has been made in preparing an exhibit of marine and freshwater shells.

To the series of exhibits in stratigraphic palæontology a case of fossils has been added showing the succession of Palæozoic faunas that characterize the Rocky Mountains section near the Canadian Pacific railway, the Palæozoic faunas of Jasper park, and the Devonian faunas of Mackenzie River valley.

An exhibit has also been installed showing fossils preserved in amber, various concretions preserving fossils, and also a large variety of concretions that simulate fossils.

Educational Work

The divison has contributed to the educational work of the Museum by assembling during the winter two carefully prepared exhibits, which with other collections prepared by the biologists and anthropologists of the Museum, will be available as loans to Canadian educational institutions wishing to borrow them. One of these is a dinosaur exhibit confined chiefly to fossil material displaying the contrasted types of teeth that have been evolved to correspond with the different feeding habits of various kinds of

dinosaurs. A life-like restoration by L. S. Russell of an Alberta dinosaur, $\frac{1}{10}$ natural size, accompanies this exhibit, which was assembled by C. M. Sternberg.

A loan collection, prepared by A. La Rocque, representing sea shells, displays examples of the Canadian shell fish most highly prized for food, and includes a series of tropical shells selected largely with reference to the uses man has made of them and the beauty of their colours. Foremost in their human interest among the shells of this collection are the cowries, which were once extensively used as money by many native races. The coloured races of Africa used them as a medium of exchange just as the white man has used gold.

Twenty-five sets of fossils were supplied during the year for the use of teachers in High Schools.

Classes from the Normal School in Ottawa were conducted through the Hall of Palæontology on six occasions early in the school year, by L. S. Russell.

During the summer Dr. G. A. Stewart of Ohio State University and Dr. M. A. Fritz of the Royal Ontario Museum spent some time at the National Museum in connexion with work on the Illustrated Catalogue of North American Devonian fossils.

The following addresses were given by members of the division:

Concerning "Lake Balls", "Cladopora Balls", and "Coal Balls". By E. M. Kindle, Washington meeting International Geological Congress, July, 1933.

The Role of Facies in Stratigraphic Palæontology (Presidential address). By E. M. Kindle, Palæontological Society of America, Chicago, December, 1933.

Discovery of Middle Eocene Mammalia in British Columbia. By L. S. Russell, Palæontological Society, December, 1933.

Restoration of the Horned Dinosaur Chasmosaurus. By L. S. Russell, Palæontological Society, December, 1933.

Publications

The following papers by members of the division were published during the year:

The Ammonoid Genera, Gastroplites, and Neogastroplites. By F. H. McLearn, Trans. Roy. Soc. Canada, 3rd ser., sect. IV, vol. 27, pp. 14-24, Pls. 1-4 (1933).

Pelecypods of the Lower Cretaceous Clearwater Formation, Northern Alberta. By F. H. McLearn, Trans. Roy. Soc. Canada, 3rd ser., sect. IV, vol. 27, pp. 139-156, Pls. 1-3 (1933).

Erosion and Sedimentation at Point Pelee. By E. M. Kindle, 42nd Ann. Rept. Ont. Dept. of Mines, vol. XLII, pt. II (1933).

Report of Committee on Illustrated Catalogue of North American Devonian Type Fossils. By E. M. Kindle, Pal. Soc. Service Committee Information Bull. No. 10, (1933).

Carboniferous Tracks from Nova Scotia. By C. M. Sternberg, Bull. Geol. Soc. Am., vol. 44, pp. 951-64 (1933).

Notes on Certain Recently Described Dinosaurs. By C. M. Sternberg, Canadian Field-Naturalist, vol. 48, pp. 7-8 (Jan. 1934).

A New Ornithomimus with Complete Abdominal Cuirass. By C. M. Sternberg, Can. Field-Nat., vol. 47,, pp. 79-83 (May 1933).

An Upper Eocene Vertebrate Fauna from Saskatchewan. By L. S. Russell and R. T. D. Wickenden, Transactions of the Royal Society of Canada (1933).

Reclassification of the fossil Unionidae (freshwater mussels) of western Canada. By L. S. Russell, Canadian Field-Naturalist (Jan. 1934).

Pleistocene and Post-Pleistocene Molluscan Faunas of Southern Saskatchewan. By L. S. Russell, Canadian Field-Naturalist (Feb. 1934).

New Fossil Freshwater Mollusca from the Cretaceous and Paleocene of Montana. Journal, Washington Academy of Sciences (March 1934).

Accessions to Museum

VERTEBRATE FOSSILS

Presented:

H. M. Ami collection.
Two mammoth teeth.

F. Bradshaw.
Teeth and bone fragments from Wood Mountain gravels, Sask.

W. R. Maher.
Fish bone? *Arthrodire.*

W. R. Wilson.
Two teeth of? *Tragosus minor* Marsh.

Prof. L. C. Petry, Cornell University, Ithaca, N.Y.
Fossil fish *Scaumenacia curta,* from Miguasha, Que. Upper Devonian.

H. S. Bostock, Geological Survey, Canada, Ottawa—field party.
Mammal bones. Pleistocene.

L. S. Russell, Geological Survey, Canada.
Fossil fish from Campbellton, N.B., and Miguasha, Que. Devonian.

Exchange:

Prof. P. S. Warren, University of Alberta, Edmonton.
Teeth from the Cypress Hills beds of Saskatchewan. Oligocene.

INVERTEBRATE FOSSILS

Presented:

H. M. Ami estate, Ottawa.
Radiolites sp., 3 specimens—Combe Capell, France. From archæological collections, through Mr. D. Leechman. Cretaceous.

A. G. Brighton, Sedgwick Museum, Cambridge.
3 rock specimens with *Climacograptus inuiti* Cox and 8 specimens of the same suspended in glycerine. Akpatok island, Ungava bay. Ordovician.

A. C. Cole.
3 specimens fossils from limestone bed, north shore Moose river at bridge of Temiskaming and Northern Ontario railway. Devonian.

Dr. G. Gardner, University of Montreal, Montreal, Que.
2 specimens *Orthoceras* sp. and *Gomphoceras* cf. *whitfieldi,* loose, Moose river near Moose Factory. Devonian.

C. H. Kindle, New York city.
Fossils from Percé region, Gaspe peninsula, Ordovician, Silurian, and Devonian.

L. F. Kindle, Toronto.
Fossils (Corals *?Microcyclas, Zaphrentis*—brachiopods, trilobite crinoid stem.) Thedford, Ont. Hamilton, Devonian.
Fossils, Port Colborne, Ont. Onondaga, Devonian.

L. F. and C. H. Kindle.
Identified specimens from Cayuga lake, N.Y. Devonian.

Rev. Fr. Louis Marie, La Trappe, Oka, Que.
A small collection of *Saxicava rugosa, Macoma* sp., from Institut Agricole at La Trappe, Oka, Que. Pleistocene.

W. W. B. McDougall (through J. G. Walker).
Fossil from extreme north end of Sonora island. *See* Map 65A accompanying Memoir 23.

Benjamin J. Miller, Bethlehem, Pa.
Fossils in paint ore (shale), Bethlehem, Pa. Onondaga, Devonian.

H. C. Pearce, 131 Inkster Ave., St. Johns, Winnipeg, Man.
Fossils from Stony Mountain, Man. Ordovician.
Fossils from Eastleigh, Sask. Mesozoic.

INVERTEBRATE FOSSILS—*Concluded*

Presented—Concluded

Jacques Rousseau, Laval University, Montreal.
2 trays of fossils:
(*a*) In sand terrace (150 feet above St. Lawrence), Neuville, Portneuf county, Que. August, 1925.
(*b*) In clay, Saint Vallier, Bellechasse county, Que., July 16, 1926. Marine, Pleistocene.

P. D. Wilson, 77 James Street, Ottawa.
A collection of miscellaneous fossils collected by the late W. J. Wilson.

U.S. National Museum, Washington, D.C., U.S.A.
Casts of Cretaceous *Inoceramus* from the interior of the United States. Cretaceous.

Exchange:

U.S. National Museum, Washington, D.C., U.S.A.
Hypothyridina venustula from two localities, near Laurens, near New Lisbon, New York state. Devonian.

From Members of Staff:

H. C. Gunning.
A small collection of fossils from three localities:
(*a*) glacial drift, Port Burwell, Que.;
(*b*) 20 to 50 miles up Moose river, from Moosonee;
(*c*) Coral harbour, Southampton island. Palæozoic.

G. S. Hume.
Fossils from Front ranges of Rockies, Red Deer River region. Carboniferous, Devonian, and Cambrian.

E. M. Kindle.
Onondaga fossils from Pelee island, Lake Erie.
Silurian fossils from Hen island and Chicken island, Lake Erie.
Fossils from railroad cut northeast side of South March quarry, Ont. Cambrian (Potsdam sandstone).
Fossils from Jacquet River region, N.B. Devonian and Silurian.

L. S. Russell.
Fossils from various localities in Percé district, Que. Cambrian, Ordovician, and Devonian.

J. F. Wright.
Fossils from cliff south of Hansen lake, about 8 miles west of Sturgeon-weir river, from 12 miles northwest of Amisk lake, Sask. Coll. July 1933. Ordovician.

A. E. Wilson.
Fossils from various localities near Ottawa. Ordovician.

SHELLS

From Members of Staff:

E. M. Kindle.
Thirteen specimens of *Anculosa carinata*—Potomac river below Mount Vernon, 5 miles. Coll. by donor, 1933. Recent.
A small collection of recent freshwater shells—Drift line, Bells Landing, Deschenes lake, Ottawa river. Recent.
Collections of freshwater shells from Pelee island and Point Pelee, Lake Erie. Recent.
Marine shells, Nova Scotia and Maine.
Freshwater shells—Nova Scotia.
A small collection of marine gastropods from Wood's Hole, Mass. Recent.
A small collection of freshwater shells from St. Lawrence river, below Waddington, N.Y. Recent.
A small collection of marine gastropods from Elm Tree Pier, N.B. Recent.

A. E. Wilson.
A small collection of marine shells—shore of St. Lawrence river, near St. Simon, Que. Recent.

SHELLS—*Concluded*

Presented:

Olaf O. Nylander, R.R. No. 4, Cariboo, Maine, U.S.A.
Three specimens of *Helisoma antrosum portagense* (F. C. Baker) (topotypes)—Portage lake, on Fish river, Aroostook county, Maine. Recent.

CONCRETIONS AND SEDIMENTS

Presented:

H. M. Ami estate (through D. Leechman).
A concretion in cherty matrix from France, probably Dordogne. ? age.
A. L. Carter, 172 Parkwood Ave., Kenmore, N.Y., U.S.A.
(816) and (838). Marcasite concretions from Alden, N.Y. Devonian.
Prof. C. V. Douglas, Dept. of Geology, Dalhousie Univ., Halifax, N.S.
One specimen illustrating crossbedding, Nictaux Falls district, N.S.
H. W. R. Gemmil, Dauphin, Man.
Concretion ? with central hole, from gravel pit at Bield, Manitoba.
I. G. Reimann, Buffalo Museum of Science, Buffalo, N.Y., U.S.A.
Marcasite concretions with fossils as nuclei.
Prof. Will Scott, University of Indiana.
Marl ball from lake bottom: East Littoral, 3rd. basin, James lake, Indiana. Recent.
H. A. S. Vokes, Dungannon, Ont.
Oolite (composed of SiO_2) found loose near school, Dungannon, Ont. Silurian?

From Members of Staff:

E. M. Kindle.
Sediment from spring break-up flood. Greens creek, east of Ottawa, 300 yards north of Montreal road. Recent.
Manganese concretions, various lakes in Nova Scotia. Recent.
Stove lid encrusted with gravel cemented with ferruginous deposit. West dock, Pelee island, Lake Erie. Recent.
E. D. Kindle.
Concretions in Pleistocene clay, 6 miles north of Amos, Quebec. (From clay in upper 4 feet of well.) Pleistocene.
B. R. MacKay.
Rocky Mountain quartzite showing honeycomb weathering, Blairmore ridge, Bluff Mountain, Blairmore, Alta., 1932.
Rocky Mountain quartzite (Carboniferous).
(*a*) Concretions in phosphate ore.
(*b*) Fossil in phosphate ore. Jurassic.
(*c*) Sample of phosphate ore.
D. C. Maddox.
Ripple-mark. Drift—north shore South Saskatchewan river, sec. 31, tp. 19, range 11, W. 3rd mer.
M. E. Wilson.
Three specimens? concretions—south shore of South channel, 1 mile northwest of Fitzroy Harbour, Ont. Potsdam or Beekmantown.

DIVISION OF MINERALOGY

Eugene Poitevin, Chief of the Division, reports as follows:

After many years of faithful service Mr. A. T. McKinnon, Senior Museum Assistant, was superannuated on February 1, 1934.

During the fiscal year just ended the mineralogists of the division, Eugene Poitevin and H. V. Ellsworth, examined a very large number of minerals and rocks for prospectors, and others interested in the mineral industry. Over 450 memoranda were issued through the Director of the Geological Survey.

A great number of verbal reports were also given to visitors who brought in specimens for determination. A large number of short reports were given to officers of the department. Altogether more than 3,500 specimens were studied and reported upon.

In addition to his duties as Chief of the Division and to his work mentioned above, Eugene Poitevin supervised the preparation of special exhibits displayed at Chicago, Ottawa, and Montreal.

At the request of the Ontario Department of Health he has been for the last six months making investigations of mineral residues from silicotic lungs. So far six lungs have been examined and the work is still in progress.

H. V. Ellsworth collaborated in the determination of, and reporting on, minerals sent in by prospectors and others and in the general work of the division. He made many special qualitative and quantitative determinations of rare elements and radioactivity. The investigation of possible Canadian sources of vanadium ores was continued and a new vanadium mineral was discovered.

During the year H. V. Ellsworth submitted two papers for publication: "Uraninite from Lac Pied des Monts, P.Q." (in collaboration with Prof. F. F. Osborne, McGill University) and "Nickeliferous and Uraniferous Anthraxolite from Port Arthur, Ont."

R. J. C. Fabry, rock analyst, has carried on the following chemical investigations:

Rocks	*Locality*	
Norite No. 1	Copper Cliff, Ont.	For W. H. Collins
Norite No. 2	Copper Cliff, Ont.	For W. H. Collins
Bigwoodite	Bigwood, Ont.	For T. T. Quirke
Hornblende andesite	Cross Lake, Man.	For H. C. Horwood
Minerals		
Scapolite (two analyses)	Lot 3, range III, Aug. of Grenville tp., Que.	For Eugene Poitevin
Scapolite	N. ½ lot 18, range II, Harrington tp., Que.	For Eugene Poitevin
Manganese concretion	Lake Ossipie, N.H.	For E. M. Kindle
Jarosite (?)	Manitoba	For J. F. Wright and C. H. Stockwell

Silicotic Lung Residue

One complete analysis (Ont. Bur. Health No. 1448) for Eugene Poitevin.
One partial analysis (Ont. Bur. Health No. 1539) for Eugene Poitevin.

Mr. Fabry also did a considerable amount of qualitative work required in the determination of specimens sent in by the public. Among the more numerous tests may be cited those for nickel, sulphate, alumina, manganese, phosphate, lime, and magnesia, as well as other common elements.

During the summer months Mr. Fabry helped in Museum work and in the preparation of exhibits.

Exhibition

During the fiscal year just ended the Division of Mineralogy prepared a number of exhibits which were displayed at the following localities:

Two large collections for Canadian Section, Century of Progress, Chicago.
One large exhibit for the Central Canada Exhibition, Ottawa.
One large exhibit for Canada's Foreign Relations Exhibition, James A. Ogilvy, Ltd., Montreal, Que.
Collection of pitchblende ore from Labine point, Great Bear lake, N.W.T., loaned to Mr. G. D. Russell, Winnipeg, Man.

Some 300 specimens belonging to the systematic collection were numbered and catalogued by Mr. R. J. C. Fabry.

The following mineral species were added to the collections of the National Museum:

DONATIONS:

Two specimens of marble (crystalline limestone and serpentine) from Marble Bluff, Darlington tp., Lanark county, Ont. Presented by Mrs. Mabel Fair.
Iron meteorite, Henbury, Central Australia. Presented by Mr. R. A. A. Johnston, Toronto, Ont.
Galena from Iskut river, B.C., sent in by Mr. F. A. Kerr through Mr. J. R. Marshall.
Magnesite, Veitsch (Styria), from Prof. Dr. W. Petrascheck, Institut fur Geologie und Lagerstallen Lehre der Montanistischen Hochschule, Loeben (Osterreich), Austria, through Mr. W. Malcolm.
Placer tin from operations of Yukon Consolidated Gold Corporation in Klondike valley, presented by company.

EXCHANGE:

Tourmaline in quartz from Brazil; *iolite (cordierite)* from Madagascar; *lepidolite (shell structure)* from Bennetts Lodge, Buckfield, Me., from Mr. W. D. Nevel, Andover, Maine, U.S.A.
Cinnabar from Kamloops district, B.C., from G. C. Scatchard, Chase, B.C.
Quartz crystal carved in form of elephant; zinc blende crystal, from Ami mine, Ugo province, Japan; arsenopyrite crystals with fluorite, etc., from Obira mine, Bungo province, Japan, from Mr. Shimmatsu Ichikawa, Kitashinjo-mura Imatate-gun, Fukui-ken, Japan.
Two specimens of willemite from Franklin Furnace, N.J., from Mr. Jay A. Weber, 151 Grand Ave., Leonia, N.J., U.S.A.

PURCHASE:

One specimen gold ore from Hollinger mine, Ont.; sheet of native silver and smaltite in greywacke; two specimens of smaltite and native silver with calcite; one piece of smaltite—from Kerr Lake mine, Cobalt, Ont.; one piece of smaltite and cobalt bloom from Old Green Meehen mine, Cobalt, Ont.; one piece of galena, Wright mine, Timiskaming, Ont.; two specimens of argentite and native silver from Chambers-Ferland mine, Cobalt, Ont.; from Mr. E. C. Wright, Ottawa.

Educational Collections

J. R. Marshall, since he has been lent to the division, has made several changes contributing to the facilities for assembling and distributing the various collections.

The following collections of minerals and rocks were distributed during the fiscal year:

Province	Standard	Grade 2	Grade 3	Grade 4	Special	Prospector's	
						Minerals	Rocks
British Columbia	0	1	0	0	4	46	41
Alberta	0	0	0	0	1	51	51
Saskatchewan	0	0	0	0	1	16	11
Manitoba	0	0	1	0	15	9	6
Ontario	0	0	33	0	8	65	22
Quebec	1	0	2	250	9	5	3
New Brunswick	0	0	0	0	1	0	0
Nova Scotia	0	0	0	0	1	10	0
Foreign	0	0	0	0	9	4	3
	1	1	36	250	49	206	137
No. of specimens	144	44	1,440	10,000	1,169	4,120	3,288

Total number of collections distributed 680
Total number of specimens distributed 20,205

In addition to the above three boxes of mineral chips consisting of 120 bags were sent out.

Standard collection No. 1 comprises 144 specimens of Canadian minerals and rocks, size of specimens 2¾ inches by 2¼ inches, contained in an upright, varnished oak cabinet. Price $35. This collection is accompanied by a printed list of the minerals and rocks included in the collection and the localities where they were obtained, and with a book on mineralogy and geology as an aid in teaching these sciences.

" No. 2 " collection comprises 44 specimens of Canadian minerals and rocks, size 2¼ inches by 1¾ inches, contained in a flat, varnished, oak cabinet. Price $12. This collection may be carried conveniently from one classroom to another.

" No. 3 " collection consists of 40 specimens of sedimentary and igneous rocks, crystals, and fossils, specially arranged for teaching physiography in Collegiate Institutes, High Schools, Continuation Schools, and Normal Schools. The size of each specimen is about 3½ inches by 2¾ inches, and they are contained in two unpainted pine trays. Price $6. This collection is accompanied by a typewritten descriptive pamphlet. Extra copies of this pamphlet may be obtained at the price of 15 cents a copy.

" No. 4 " collection is a special collection prepared for the Quebec Bureau of Mines. It consists of 40 specimens of minerals contained in a heavy cardboard box.

In addition to the above collections, prospector's sets composed of the more common minerals and rocks may be obtained at a price of 50 cents a set, postage prepaid.