

CANADA
DEPARTMENT OF MINES
HON. T. A. CRERAR, MINISTER; CHARLES CAMSELL, DEPUTY MINISTER

NATIONAL MUSEUM OF CANADA

W. H. COLLINS, ACTING DIRECTOR

BULLETIN No. 82

Annual Report of the National Museum
for the Fiscal Year 1935-36

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OTTAWA
J. O. PATENAUDE, I.S.O.
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1936

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Wood Buffalo habitat group, National Museum of Canada. (*Presented by Mr. Harry Snyder.*)

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GENERAL ACTIVITIES OF THE NATIONAL MUSEUM OF CANADA

By W. H. Collins, Acting Director

The work of the National Museum is very much restricted by lack of sufficient space for exhibition halls and storage facilities. The staff is also much too small to carry on the work expected of an institution that is national in its scope. Notwithstanding these handicaps the museum organization is highly gratified by the substantial interest being manifested towards it by the public both in Canada and other countries. For many years individuals and industrial corporations, such as the Imperial Oil Company, the International Nickel Company of Canada, and the American Chemical Company, have responded generously to suggestions for the donation of exhibition materials. This year a munificent gift was received from Mr. Harry Snyder, of Chicago and Montreal, in the form of a group of wood bison and northern timber wolves that were collected by himself and prepared for exhibition at his expense by the James L. Clark Studios, of New York city, one of the most highly qualified organizations in the world for work of this kind. The donation as received by the National Museum represents an outlay by Mr. Snyder of many thousands of dollars. The group of animals, arranged in a most natural looking setting with painted landscape background (Plate I), is now safely installed in the Museum.

Another practical example of the interest of the public was a gift by the International Nickel Company of Canada of a copy of its moving picture film "Heritage," which illustrates admirably the processes whereby nickel, copper, and other metals are recovered from the great ore deposits at Sudbury. An exceptionally fine specimen of silver fox was donated by Mr. F. D. Burkholder, furrier, of Ottawa.

Grateful acknowledgment is also made to all those who contributed to the annual lecture series, a full account of which follows.

EDUCATIONAL WORK

This is one of the most valuable services that can be rendered by museums and one that reaches persons at a distance from the museum almost as readily as those living in its immediate vicinity.

MOVING PICTURE FILMS

Some additions were made to the steadily growing collection of moving pictures. These were obtained by presentation or purchase, or were taken by members of the staff. The film, "Heritage," presented to the Museum by the International Nickel Company of Canada, Limited, pictures the production and uses of the important industrial metal, nickel. "Cheenama, the Trail-Maker," by Harlan I. Smith and Diamond Jenness, and "Handicrafts of French Canada," by C. Marius Barbeau, are excellent additions to the Museum film library. These films, besides being used in lectures and other activities of the Museum, are lent to schools, scientific societies,

and other organizations interested in natural history. Except costs of transportation no charge is made. A catalogue of motion pictures available is provided to inquirers.

LANTERN SLIDES AND PHOTOGRAPHS

Sets of lantern slides, mostly coloured, on natural history subjects, are being added to regularly, and may be obtained on the same terms as the motion picture films. A large collection of photographs have been taken by officers of the National Museum and Geological Survey and furnish a basis for the Museum's service to the public.

SALE AND LOAN OF SPECIMENS

Many standard collections of minerals and rocks, as well as mineral and rock specimens, were distributed to schools and prospectors. Other specimens, because of their fragility, are not so easily shipped to places outside Ottawa, but extensive use is made by the schools of Ottawa and vicinity of specimens of birds, animals, and Indian relics set aside for this purpose.

MUSEUM LECTURES

Two series of lectures on natural history, geography, geology, forestry, industry and travel, and other subjects were given under the auspices of the National Museum. The lecture committee, consisting of M. E. Wilson (chairman), C. L. Patch, and Miss M. Godwin (secretary), reports a most successful year. Owing to the increasing popularity of these lectures, two additional were given at the end of the regular course. As in previous years, the lectures were given on Saturdays at 10 a.m. and 11 a.m. for children, and on Wednesday evenings for adults. Appropriate moving pictures were also shown. For the loan of films the Museum wishes to express its gratitude to the Canadian Government Motion Picture Bureau, Royal Canadian Mounted Police, Canadian Pacific Railway, Associated Screen News, Cunard-White Star Line (New York), United States Bureau of Mines, United States Department of Agriculture, Iowa State University, Fouke Fur Company (St. Louis), and Abrahams Brothers, Incorporated (New York).

Members of the Canadian Boy Scouts Association (Ottawa district) acted as ushers in the lecture hall during the children's lectures and their assistance was greatly appreciated.

Particular acknowledgment is made of the co-operation of the local newspapers in generously providing space for reports of the various lectures.

Below is a list of the lectures:

First Series:

- Some Mediterranean Countries, by F. C. Elford, Dominion Poultry Husbandman, Central Experimental Farm.
- The Stones of the Parliament Buildings, by M. F. Goudge, B.A., B.Sc., Engineer, Mines Branch, Ottawa.
- Policing the Canadian Arctic, by Superintendent V. A. M. Kemp, Adjutant, Royal Canadian Mounted Police.
- The Story of the Stars, by R. M. Motherwell, M.A., Astronomer, Dominion Observatory, Ottawa.

ANTHROPOLOGICAL DIVISION

Field and Office Work

During the year Museum Bulletin No. 75 "Folk-Songs of Old Quebec," by Marius Barbeau, was published both in English and in French, its French title being "Chansons Populaires du Vieux Québec." It includes an historical sketch about the songs, 15 songs, and a complete bibliography of the work so far done on Canadian folk-songs. Several other articles were published and lectures on Indians and French Canada were given.

Mr. Barbeau spent four and a half months in field work in the province of Quebec. Historical notes were taken from the archives of the Ursulines Convent, the Hôtel-Dieu, and Hôpital-Général in connexion with ancient manual arts, in particular embroidery as once taught to many Indian girls in training. A number of drawings were made of embroidered designs and several hundred photographs were taken. The voluminous parish records of the Notre-Dame church, Montreal, were carefully studied and annotated by Mlle. Antonine Bernier, acting as assistant, and the numerous entries about ancient craftsmen were copied and later classified. A number of other parish records were studied. The early traditions of the districts of Charlevoix and Chicoutimi received particular attention and many narratives and notes were taken from dictation. Miss Regina Shoolman, acting as assistant, studied the records of the seigniories of Murray Bay and of Mount Murray; she also made a collection of folk-songs at Cabano on lake Temiscouata. Mr. Barbeau also studied extensively the traditional craft of pottery making in various parts of Quebec. He made a museum collection of wood carvings and homespun. Moving pictures of ancient French-Canadian arts and folk life were taken under Mr. Barbeau's direction by Richard Finnie.

During the remainder of the year folk materials were collected through correspondents. They consist mostly of several hundred games for children, round dances and play rhymes, short folk tales and anecdotes, furnished by Adelard Lambert of Berthier-en-haut, Quebec. About two months were given to the sorting of a large part of the folk-song collections accumulated in the past twenty years. The work for the year covered more than 4,000 items, leaving only a small part of the collection still unsorted.

Diamond Jenness during the summer of 1935 continued preparation of a report on the Sarcee Indians of Alberta. He collaborated with H. I. Smith on the filming of an Indian motion picture at Golden and Rice lakes, Ontario. In September he left for British Columbia to investigate the Salish Indians of southeastern Vancouver island and the opposite mainland, returning to Ottawa on March 21. Although the work in British Columbia was primarily ethnological a number of ancient kitchen-middens were examined, from which many archaeological specimens, among them the skeleton of a narrow-headed type of Indian that has long been extinct, were recovered. While in the field he lectured, by invitation, at the University of British Columbia in Vancouver, at the University of Washington in Seattle, and, on the return journey, at the University of Toronto.

While in British Columbia Mr. Jenness prepared a lengthy article on the Indians of the Northwest Territories for the Department of the Interior,

and a second article, on the Archæological Problems in Canada, for "American Antiquity," the journal published by the Society for American Archæology.

Douglas Leechman spent from July 12 to October 2 in field work in the vicinity of Port Burwell, northeastern Quebec. About three weeks were spent at each of two sites: one on Button islands at the southeast point of Hudson strait, about 30 miles north of Port Burwell; and one at the southwest part of McLelan strait about 6 miles southeast of Port Burwell. At each of these sites, two ruined Eskimo igloos were excavated, measurements and photographs taken, and collections of specimens made. Traces of two distinct cultures, the Thule and the Cape Dorset, were found. About 800 specimens were obtained, either by actual collection in the field (700) or by purchase (100). A separate preliminary report on this work has already been submitted.

Harlan I. Smith continued to assemble, amplify, analyse, and classify information on the sites and subjects of Canadian archæology. Again valuable results were received from the volunteer field work of Mr. Francis J. Barrow, of Sidney, B.C., and from Mr. Russell A. Johnston, of Helmsdale, Alberta. For the third successive year Mr. Barrow has made a three months' voyage, of over 1,000 miles, along the coast of British Columbia, making notes, sketches, photographs, and maps of Indian pictographs, this year reporting on over thirty localities.

Mr. Smith spent four weeks in the field at Golden and Rice lakes, Ontario, taking a motion picture of Ojibwa Indian life, in collaboration with Mr. Jenness. This picture includes the making of a birch-bark canoe and the harvesting of wild rice.

Mr. Smith brought to the attention of those interested that birch-bark canoes may still be had in Canada for museum specimens, for practical use, or as souvenirs and tourist attractions. This has resulted in orders being received from over thirty places—one as far away as New Zealand—which provided employment for deserving Indians.

W. J. Wintenberg, on July 4 and 5, in collaboration with Dr. J. C. B. Grant, Professor of Anatomy, University of Toronto, partly excavated a prehistoric Indian cemetery in the city of Windsor, Ontario. Several bundle burials, surrounded by skulls, and two torso burials (that is, lacking the skulls and the arm and leg bones) were discovered. Five of the skulls have a hole drilled through the sagittal suture near the bregma. Extending across the parietals of another skull is a lenticular opening about 3 inches long and $\frac{3}{8}$ inch wide, which seems to have been made by sawing with a chipped chert knife. Two artificially perforated long-bones, one a humerus and the other a femur, were found in one of the bundles of bones.

Between July 9 and September 7, Mr. Wintenberg made an intensive exploration of the well-known double-walled Southwold earthenworks in Elgin county, Ontario, about 10 miles southwest of St. Thomas. Traces of the palisades and many moulds of the holes of wall posts of houses were discovered. Most of the archæological material discovered in the site (especially the pottery and earthenware pipes) is of the same character as that from some other Neutral village sites previously explored, and indicates that this site also was inhabited by Neutrals, and that it is prehistoric.

Mr. Wintemberg also spent a few days studying archæological material in two private collections in St. Mary's, Ontario, and in the Royal Ontario Museum of Archæology, Toronto. During the period of the year spent at Ottawa he continued his studies of the material from sites explored during the last few years, among others that from an ancient settlement near Tadoussac, Quebec, and from ancient Eskimo sites on the northwest coast of Newfoundland, his reports on these areas being nearly completed. He prepared a preliminary report on his explorations of the Southwold earthworks for the Historic Sites and Monuments Board of Canada, National Parks Branch, Department of the Interior. His article "Archæological Evidence of Algonkian Influence on Iroquoian Culture," read at the May, 1935, meeting of the Royal Society of Canada, was published in the Transactions of that Society (Section II, vol. XXIX, 1935).

Publications

Reports and scientific papers published during the year are:

- Ancienne Broderie au Canada. By C. M. Barbeau. La Presse, Montreal, Quebec, July 15, 1935.
 Anciens Orfèvres de Québec. By C. M. Barbeau. Transactions, Royal Society of Canada, 1935.
 Evidences of Algonkian Influence on Iroquoian Culture. By W. J. Wintemberg. Transactions, Royal Society of Canada, 1935.

Lectures

- Our Native Arts and Domestic Life. By C. M. Barbeau. Canadian Club of Smiths Falls, Ont., April 5, 1935; Canadian Club of Alexandria, Ont., April 6, 1936.
 How Indian Children Were Taught Embroidery, Marie de L'Incarnation. By C. M. Barbeau. Women's Press Club of Ottawa, Ottawa, Ont., Feb. 3, 1936.
 Ancient Embroidery in Quebec. By C. M. Barbeau. Women's Historical Association, Ottawa, Ont., Feb. 10, 1936.
 Golden Threads (Fils d'or et D'Argent). By C. M. Barbeau. Alliance française, Detroit, U.S.A., Feb. 22, 1936.
 The Arts of the Indians on the Northwest Coast. By C. M. Barbeau. The Museum of Arts, Cleveland, Ohio, U.S.A., Feb. 24, 1936.
 The Growth of Canadian Art. By C. M. Barbeau. The Ottawa Art Association, Ottawa, Ont., Feb. 27, 1936.
 Ancient Quebec. By C. M. Barbeau. Bonne Entente League, Ottawa, Ontario, March 31, 1936.
 Prehistory of Canadian Aborigines. By D. Jenness. University of British Columbia, Vancouver, B.C., Nov. 6, 1935.
 Backwardness of American Indians and Its Causes. By D. Jenness. Natural History Society, Vancouver, B.C., Nov. 6, 1935; University of Washington, Seattle, U.S.A., Dec. 2, 1935.
 The Problem of the Eskimo. By D. Jenness. University of Washington, Seattle, U.S.A., Dec. 3, 1935.
 Some Impressions of Java. By D. Jenness. Rotary Club, Duncan, B.C., Dec. 17, 1935.
 The Salish Indians of British Columbia. By D. Jenness. Women's Canadian Club, Nanaimo, B.C., March 10, 1936; Rotary Club, Nanaimo, B.C., March 13, 1936.
 Indian Background of Canadian History. By D. Jenness. University of Toronto, Toronto, Ont., March 20, 1936.
 Archæology of the Eastern Arctic. By J. D. Leechman. R.M.S. *Nascopie*, July 20, 1935; Science Association of the National Research Council, Ottawa, Ont., March 11, 1936.
 Canada's Eastern Arctic. By J. D. Leechman. Field Naturalists' Club, Ottawa, Ont., Dec. 11, 1935.
 Excavation of the Southwold Earthworks, Elgin County, Ontario. By W. J. Wintemberg. Kent and Elgin Historical Societies, St. Thomas, Ont., Aug. 17, 1935.

Exhibits

Two important permanent exhibits were rearranged by Mr. Leechman, namely: "Products Derived from Coking Coal" and "The Geology of Coal." Mr. Leechman also assisted in arranging several special exhibits, the most important being installed in an exhibition case that stands outside the Deputy Minister's office in the Motor Building. Other special exhibits were: historical photographs connected with the Canadian Pacific railway; the manufacture of silverware; and the manufacture of ceramics in Canada.

Accessions to Museum

The number of accessions during the fiscal year shows a considerable increase over last year, largely owing to resumption of field work. The largest single unit is a collection of archaeological material made by W. J. Wintemberg at the Southwold earthworks, which he estimates to contain about 4,000 specimens. Another 800 were obtained in the eastern Arctic by Douglas Leechman. Specimens acquired may be divided into the following groups:

Ethnology	2
Archæology	4,953
Osteology	8
French Canadian	10
Portraits (pastel)	4
Total	<u>4,977</u>

There have been a number of small loans during the fiscal year, most of them to students at the normal schools. A collection of French archaeological specimens was also loaned. There were no gifts or exchanges during the year. Details of accessions follow:

FROM THE STAFF

Collected by Diamond Jenness:

- Archæological specimens from British Columbia.
- Skeletal material from British Columbia.

Collected by Harlan I. Smith:

- Archæological specimens from Golden lake, Ontario.

Collected by W. J. Wintemberg:

- Archæological specimens from the Southwold earthworks.

Collected by Douglas Leechman:

- Archæological specimens from northern Labrador.
- Skeletal material from northern Labrador.

Collected by D. C. Maddox:

- Two chipped stone implements from Saskatchewan.

Collected by R. T. D. Wickenden:

- Chipped stone specimen from Saskatchewan.

BY DONATION

From Mr. F. J. Barrow:

- Archæological specimens from British Columbia.

From Mr. V. Evans:

- Two jet beads from British Columbia.

From Mr. A. Gilman:

- Two stone axes from Ontario.

From Mr. James Goulet:

- Perforated human skull from Ontario.

BY DONATION—*Concluded*

- From Mr. F. G. Jarrett:*
Petroglyph rock specimen from British Columbia.
- From Dr. N. S. Knapp:*
Bone ornament from Newfoundland.
- From Mr. Albert Leech:*
Copper point from Ontario.
- From Dr. A. G. McKinnon:*
Archæological specimens from Baffin island.
- From Mr. J. MacQuillan:*
Stone pipe from Ontario.
- From Mr. T. H. Manning:*
Archæological specimens from Southampton island.
- From Dr. W. W. Martin:*
Archæological specimens from Ontario.
- From Mr. A. Peake:*
Archæological specimens from British Columbia.
- From Mr. P. M. Pringle:*
Chipped stone point from Ontario.
- From Messrs. P. M. Pringle and T. F. McIlwraith:*
Archæological specimens from Ontario.
- From Mr. J. Lorne Turner:*
Ethnological specimens from the Arctic.
- From Winnipeg Museum:*
Piece of baleen fish-net from Mackenzie delta.

BY PURCHASE

- From Mrs. A. G. MacMillan (via Douglas Leechman):*
Spruce-root basket from British Columbia.
- From Mr. James Allan (via Douglas Leechman):*
Archæological specimens from the eastern Arctic.
- From several unnamed persons (via C. M. Barbeau):*
Ten French-Canadian specimens.
- From Mr. N. A. Grandmaison:*
Four pastel portraits of Indians.

BIOLOGICAL DIVISION

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

Field Work

Five botanists and two zoologists from the University of Toronto, under leadership of Professor Robert C. Hosie, Faculty of Forestry, worked from July 12 to September 20 in Batchawana Bay region, Ontario, on the eastern side of lake Superior. The botanical results of this expedition are discussed under "Botany." The zoological part of the work was in charge of Dr. C. H. Douglas Clarke, assisted by Horace P. Stovell, who had previously worked in the field for four years for the Royal Ontario Museum of Zoology. Messrs. Clarke and Stovell collected and preserved 538 mammals, skins with skulls, including 20 preserved in formalin, with 16 additional ligamentary skeletons; 52 bird skins; and 13 amphibians and reptiles; 86 additional small mammals were taken in traps, sexed, measured, and examined for ecto- and endo-parasites; 29 species and subspecies of mammals were collected and notes obtained on several other species known to occur. In addition to the ordinary routine of collecting and preserving vertebrate specimens, nearly all the specimens obtained were carefully

examined for ecto- and endo-parasites, and blood-smear slides were taken from several hundred specimens, in continuation of work done by Dr. Clarke during previous years in Ontario in study of parasites in connexion with animal diseases and fluctuations in populations of wild mammal and bird species.

Dr. Clarke spent the winter of 1935-36 working up the results of his studies of animal parasites in the laboratories of the Department of Hygiene and Preventive Medicine, University of Toronto.

From a distributional standpoint the most important feature was obtaining what are apparently the first authentic specimens of Michigan beaver (*Castor canadensis michiganensis*), Great Lakes water shrew (*Sorex palustris hydrobadistes*), and black-nosed jumping mouse (*Napaeozapus insignis frutectanus*) in Canada. Another interesting result was demonstrating the occurrence of Brewer mole (*Parascalops breweri*) at least 150 miles farther west than heretofore known. The yellow-cheeked rock vole (*Microtus chrotorrhinus chrotorrhinus*) was also found in very restricted localities.

Although considerable collecting of terrestrial species has been done on the southern half of Vancouver island, B.C., large sections of the coast and interior of the northern half of this great island have never been intensively worked by mammalogists and ornithologists. Mr. Hamilton M. Laing, of Comox, B.C., who had carried on field work for the National Museum of Canada during many seasons in the past, was engaged to make collections at suitable points in this area, with Mr. Kenneth Racey and Mr. Robert E. Luscher of Vancouver as assistants.

The party started from Comox, July 14, and established Camp I, July 15 to 31, at the lower end of upper Campbell lake, elevation 635 feet. In this region extensive logging operations and subsequent forest fires have virtually denuded the land of its former stands of mighty timber from coast to foothills. New plants have taken possession, birds that like the light have come in, and original forms that like the conifers have departed. On extensive burns most forms of mammalian life are wiped out, and although the regions are becoming repopulated, some species may not come back. Mammals and birds have seldom faced more drastically changed conditions. Camp II, Snake lake, elevation 1,000 feet, was occupied by Laing alone July 19 to 24. Camp III, upper end of upper Campbell lake, by Laing and Racey July 25 to 31. Camp IV, Brooklyn creek, near Comox, by Laing August 2 to 5. Camp V, Sayward, at sea-level, August 7 to 20, was worked by all three men; and Cormorant island, Alert bay, was visited August 20 to 21. Camp VI was established near Port Hardy, Hardy bay, August 21, and occupied until September 4. A change in the forest was noted here, with much virgin timber of Amabilis fir, western hemlock, and cedar, mixed with Sitka spruce. The Douglas fir had reached its northern limit on the east coast here, and was only found on warm, sheltered points. Salmonberry and salal formed dense jungles. August 27 to September 2, Laing made a collecting trip over the road to Coal harbour on the west coast. Camp VII was at Shushartie, northeast end of Vancouver island, September 5 to 12. The settlement is small, climate damp and cold, and coast rocky, so that agricultural development is slight. Camp was moved by boat via Pine island and Fisherman bay to cape Scott, northwest corner of Vancouver island,

where Camp VIII was occupied from September 12 to October 1. The forest for the most part is more dwarfed and stunted than farther south, with wide, open stretches of muskeg. Water birds were observed in migration in some abundance. A side trip was made on foot, September 24 to 26, to Cache creek, 12 miles east of Scott, and some interesting observations made. The next move was about 40 miles down the west coast to Quatsino sound, where Camp IX was established October 2 to 12. Ingersoll river was visited October 3, and Cayeghle river, near port Alice, on southeast arm of Quatsino sound, October 5 to 10. The climate was much milder inside Quatsino sound, away from the inclemency of the exposed coast-line of north and west. The return trip was made by coast vessel around the north end of Vancouver island to Campbell river. Mr. Laing later spent a few days at Mirror lake in Campbell Lake area collecting some species that had been missed earlier in the season. The collections made by the party numbered: 438 mammals; 276 birds; 21 amphibians and reptiles; and a few miscellaneous specimens, including some species, notably a series of Vancouver Island weasel, Vancouver Island mink, and Vancouver Island ruffed grouse, which were not hitherto represented in the museum collections, as well as large series of several other Vancouver Island forms.

The vertebrate fauna, particularly the distribution of the smaller species of Cape Breton island, had never been intensively studied and the representation of species from that area in the National Museum being limited, Mr. Victor E. Gould, of Wolfville, Nova Scotia, with Mr. W. Earl Godfrey, was sent to make collections and investigations. The party was unable to start soon enough to make early summer investigations, but were fortunate enough to carry on until considerably later than our museum field parties usually do in autumn, and were successful in getting good series of mammals in autumn coat, as well as collecting birds during autumn migration. The party left Wolfville August 16, and at Cape North, Victoria county, the northern extremity of Cape Breton island, Camp I was established on September 18. Headquarters was maintained at Cape North until September 26, and collections made on Middle Aspy and North Aspy rivers, and at Dingwall fishing village.

The party then moved down the west coast of the island to Frizzleton, Inverness county, near the mouth of Margaree river, where Camp II was maintained from September 26 to October 16. Margaree, on Sea Wolf island, was visited on October 11. The next move was to the southwest part of the island where Camp III was maintained at St. Peters, Richmond county, from October 16 to 26. The party crossed the strait of Canso to the mainland of Nova Scotia and established Camp IV, at East Ronan valley, Guysborough county, October 26 to November 17. Good collections were made in this area and an effort made to ascertain what species are found in the northern part of the mainland coast without extending their range on to Cape Breton island. No insular forms of mammals have been described from Cape Breton island, but the Eastern Canada porcupine and the Canada woodchuck are found widely distributed on the mainland, although not known to cross the strait of Canso. The moose and the caribou formerly occurred on both sides of the strait, but the caribou are now extinct in all parts of Nova Scotia, and the moose is extinct on Cape Breton island, although still common on the mainland. The col-

lection made by Gould and Godfrey numbered: 259 mammals, including 27 skeletons and alcoholic preparations; 229 birds, including 46 skeletons and alcoholic preparations; 20 amphibians; 10 reptiles; and a few other specimens.

P. A. Taverner devoted part of the season to collecting and photographing flowering plants in the vicinity of Ottawa. One purpose of this work is to secure good illustrations, coloured and uncoloured, for lantern slides, and eventually, perhaps, for a popular book on the most interesting Canadian plants.

Charles H. Young and Ronald W. Smith made a brief field trip to Meach lake, Gatineau county, Quebec, to collect local material of Ottawa district, and obtained 55 birds and 14 mammals between September 19 and 30. Mr. Smith took advantage of an unusual migration of winter birds while on a visit at Wolfville, Nova Scotia, and collected 48 birds and 1 mammal between January 1 and 10.

Clyde L. Patch, D. J. Blakely, and C. E. Johnson made small additions to the local collections of the museum.

Routine work occupied much of the year for the chief of the division. Some further progress was made on a book on the "Mammals of Canada" and in revising a detailed technical manuscript "Check-List of Canadian Mammals." Revisionary studies of some of the lesser known groups of mammals were carried on as part of the necessary foundation for the above works. He also served as member of several interdepartmental advisory boards and standing committees.

Publications

Reports and scientific papers published during the year are:

- Our Birds of Prey. By P. A. Taverner. Forest and Outdoors, Montreal, Que., Sept. 1935.
 Avian Murder. By P. A. Taverner. Canadian Field-Naturalist, Ottawa, Oct. 1935.
 Reviews of Ornithological Literature. By P. A. Taverner. Canadian Field-Naturalist, 1935-36.
 Taxonomic Comments on Red-tailed Hawks. By P. A. Taverner. The Condor, Berkeley, California, March-April 1936.

Lectures

- Some Problems of Mammal Distribution in Southern British Columbia. By R. M. Anderson. Carnegie Museum, Pittsburgh, Pa., U.S.A., May 2, 1935.
 Biological Work. By R. M. Anderson. Normal School, Ottawa, series of lectures, Sept. 30 to Oct. 4, 1935.
 Bird Life Zones in Southern British Columbia. By R. M. Anderson. A.O.U., Royal Ontario Museum, Toronto, Oct. 23, 1935.
 Canadian Mammals. By R. M. Anderson. Normal School, Ottawa, Ont., Dec. 11, 1935.
 Mammals of the Ottawa District. By R. M. Anderson. Field Naturalists Club, Ottawa, Ont., Feb. 27, 1936.
 Backstage in a Museum. By C. L. Patch. Westboro Men's Club, Westboro, Ont., Dec. 15, 1935; Normal School, Ottawa, Feb. 12 and March 11, 1936.

Educational Work

Sixteen new specimens of mammals and birds were added to the School Loan Collection, which now contains 138 specimens. Four hundred and seventy-five loans were made to educational institutions for use in nature

study and in art work during the year. A number of new lantern slides and replacements of damaged slides were coloured by C. E. Johnson and Miss W. K. Bentley for the educational loan collection of lantern slides.

Exhibition Work

Mr. C. L. Patch and his assistants placed fifty-one new specimens of mammals and birds on exhibition: mule deer, black-footed ferret, Canadian beaver; Nova Scotia varying hare, presented by Cyril K. Coldwell; silver fox, presented by F. D. Burkholder; brown thrasher, purple martin, pair of goldfinches, pair of red-eyed vireos, albino robin and house sparrow, golden-eye duck, oven-bird, Wilson's thrush, pair of marsh hawks with nest and eggs, pair of black terns, pair of water-thrushes, black-billed cuckoo, mourning dove, common tern, pair of Bohemian waxwings, broad-winged hawk, pair of rose-breasted grosbeaks, bobolink, rusty blackbird, white-crowned sparrow, five piping plovers, pair of Franklin's gulls, western grebe, northern phalarope, western willet, pair of blue-grey gnatcatchers, pair of sharp-tailed sparrows, sparrow hawk, yellow-bellied flycatcher, lark sparrow, scarlet tanager.

A west coast Indian village, on a scale of 1 inch to 1 foot, was also completed by Clyde L. Patch, assisted by Audrey Patch and John M. Garland. With a painted background, it portrays four totem poles, fifteen Indian figures engaged in various activities, and a house 45 feet square of hewn timber. This model was shown in the Anthropological booth at the Central Canada Exhibition, Ottawa, and then placed on temporary display in the lobby of the museum building.

Mr. Patch arranged a 28-foot by 10-foot booth at the Central Canada Exhibition to depict part of a beaver colony.

D. J. Blakely prepared 413 birds and smaller mammals for the study collection. The number of large birds, particularly water birds, collected by field parties, is greatly increased by sending in the skins in a green salted state. The more commodious quarters in the Motor Building allowed the tanning tanks to be rebuilt and enlarged, and the large power-driven drum for cleaning and drying large tanned hides with hardwood sawdust was rebuilt and enlarged to handle hides as large as moose, elk, and buffalo. This allowed Mr. J. E. Perron to finish some delayed tanning of a number of large mammals, including elk, caribou, bears, lynxes, beavers, foxes, marmots, and mink. Mr. Perron spent the remainder of his time at osteological preparation, cleaning and bleaching about 250 mammal skulls and a considerable number of leg bones and other skeletal material. This is important work, as skeletal material is essential for study purposes, and cleaned skulls are necessary before certain mammal studies can be completed.

Claude E. Johnson accomplished the following work:

Lantern slides coloured.	50
Line drawings.	11
Case labels, large letters (lettered and mounted).	12
Colour plates.	7
Departmental office signs lettered.	20
Plaster moulds.	4
Plaster casts of dinosaur (<i>Chasmosaurus</i>) reduced size model.	1
Wax pieces, accessories to bird and insect exhibits and <i>Chasmosaurus</i> and <i>Gorgosaurus</i> model.	1,192

Photo enlargements, coloured, retouched, and lettered.	10
Collections:	
Mammals, made into skins.	5
Birds, made into skins.	5
Birds, in the flesh.	2
Nest <i>in situ</i> , long-billed marsh wren.	1
Exhibits completed, minus mounts:	
Warbling vireo.	2
Material completed but not assembled <i>in situ</i> , loggerhead shrike, in wild plum branch.	1
Cedar waxwing, in maple branch.	1
Entomological exhibit: species of tent caterpillar, food spray, etc., in regulation size entomological case.	1
Species of oak caterpillar, in case same as above, completing series of 25 entomological cases on exhibition.	1
<i>Chasmosaurus</i> and <i>Gorgosaurus</i> (miniature scale model of dinosaurs) overhauled and reassembled in a more scientifically correct background; introducing models of several species of cycads to scale. Part of this job was completed during the latter part of 1934.	

Miss Winifred K. Bentley continued oil portraiture of distinguished Canadian naturalists for hanging in the halls of the National Museum. Portraits of Professor A. P. Coleman and Sir Daniel Wilson were completed and framed, and portrait of Dr. Willett Miller was begun.

Accessions to Museum

At the end of the fiscal year, March 31, 1936, the catalogued specimens of mammals numbered 14,113; of birds 26,675; of amphibians and reptiles 4,875; and of plants 132,100. The greater part of the additions made during the year were the result of the revival of active field work after virtual cessation of such activities during the preceding four years. The catalogued additions of plants consist mostly of old material that has been mounted, numbered, and filed in the herbarium. A field party in Batchawana Bay region, east of lake Superior, in 1935 collected 8,000 to 10,000 specimens of plants, comprising between 600 and 700 species and varieties. These are being worked up at the University of Toronto, and the accessions will be included in subsequent reports.

A considerable number of zoological specimens were added through donations from other departments and private individuals. Particular thanks are due to the Royal Canadian Mounted Police, the Lands, Northwest Territories and Yukon Branch and the National Parks of Canada, Department of the Interior, for valuable collections made by members of their staffs. Mr. Harry Snyder, president of Champlain Oil Products, Limited, of Montreal, has presented the museum with valuable collections of big game animals taken on his northern expeditions of 1934 and 1935, including a beautiful group of wood buffalo and timber wolves mounted in their natural surroundings, and four wapiti from northeastern British Columbia, three white sheep from Nahanni mountains, Northwest Territories, and one caribou from region east of Great Slave lake.

ZOOLOGICAL COLLECTIONS

Mammals received and catalogued.	1,458
Birds received and catalogued.	739
Amphibians and reptiles received and catalogued.	91

MAMMALS

By Gift

Royal Canadian Mounted Police, through the Commissioner's Office, Ottawa. 1 barren ground caribou, in summer coat, with skull and leg bones, 1 Arctic hare, 1 tundra weasel, collected by Staff Sergt. J. E. F. Wight, Chesterfield inlet, Keewatin district, N.W.T.; 1 skull of red fox, collected by Corporal J. Robinson, at Reliance, east end of Great Slave lake, N.W.T.; 1 male polar caribou (*Rangifer arcticus pearyi*), skin with complete skeleton, 1 Arctic fox (*Alopex lagopus*), skin with skeleton, and 3 skulls of same, 2 Ellesmere Island Arctic hare (*Lepus arcticus monstrabilis*); skins and skulls, collected by Corporal H. Kearney at Craig harbour, Ellesmere island.

National Parks of Canada, Department of the Interior, Ottawa: 5 specimens of Rocky Mountain cougar (*Felis concolor hippolestes*), 1 male adult, 1 female adult, 1 male subadult, 1 male and 1 female half-grown cubs, skins and skulls, with 2 adult skeletons complete, collected by Ed. R. ("Cougar") Lee, special predatory animal hunter, in Banff National park, Alberta, under direction of Mr. P. J. Jennings, Park Superintendent, from November 11, 1935, to January 1, 1936.

Harry Snyder, Champlain Oil Products Company, Montreal, Que.: habitat group of wood buffalo (*Bison bison athabascae*) and northern timber wolves (*Canis lycaon occidentalis*), collected by Harry Snyder expeditions of 1934-35. Mounting, backgrounds, and accessories done at James L. Clark Studio, New York, and the whole presented to the National Museum; 4 Rocky Mountain wapiti (*Cervus canadensis*), 2 bulls, 1 cow, 1 calf from Prairie river, northeastern British Columbia; 3 black-tailed white sheep (*Ovis dalli*), 2 old rams, 1 young ewe, from Nahanni mountains, Mackenzie district, N.W.T.; 1 barren ground caribou (*Rangifer arcticus*), from east of Great Slave lake, N.W.T., collected in 1935.

Dr. Ivan W. Parnell, Institute of Parasitology, McGill University, Macdonald College, Que.: small mammals sent in for determination after partial dissection and examination for ecto- and endo-parasites; skin and skulls salvaged for museum purposes as follows: 1 mink, 1 weasel, New Brunswick; 3 varying hares, 1 muskrat, 1 chipmunk, 2 woodchucks, from lake Timiskaming, Que.; 1 porpoise (skeleton), gulf of St. Lawrence; 1 cottontail rabbit from near Macdonald College, Que.; 2 Labrador collared lemmings from Belcher islands, Hudson bay; 1 cottontail rabbit from Huntingdon county, Que.; 1 raccoon from north of Port au Chene, Que.; 3 Dawson red-backed mice from Aklavik, Mackenzie district, N.W.T.

F. D. Burkholder, Ottawa, Ontario: 1 skin of silver fox, from Burkholder fur farm, mounted for exhibition in museum.

H. U. Green, Dauphin, Manitoba: 1 red squirrel, 3 grey chipmunks (*Tamias striatus griseus*), collected on Vermilion river, near Dauphin; 1 lower molar of bison, found in valley of Valley river, near Ashville, Dauphin district, near Dauphin, Manitoba.

John C. Shelford, Wistaria, B.C.: 15 mammals, skins with skulls (4 cinereous shrews, 1 mountain water shrew, 2 Richardson's flying squirrels, 2 bushy-tail wood rats, 1 least weasel, 2 red squirrels).

Kenneth Racey, Vancouver, B.C.: 2 Vancouver Island marmots (*Marmota vancouverensis*), 2 Vancouver red squirrels (*Sciurus hudsonicus vancouverensis*).

Major Allan Brooks, Okanagan Landing, B.C.: 2 pikas (*Ochotona princeps cuppes*), topotypes, from Falls creek, Monashee mountains; 2 little brown bats (*Myotis*).

Dr. R. E. DeLury, Ottawa: 1 male New York weasel, in the flesh.

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

W. E. Saunders, London, Ontario: 3 rufescent woodchucks, in the flesh.

Elgin R. S. Hall, Kenora, Ontario: 2 red squirrels, in the flesh, from Lake of the Woods region.

Ronald W. Smith, Ottawa, Ontario: 4 red squirrels, 1 woodchuck.

Dr. A. R. Cahn, Urbana, Illinois: 1 cinereous shrew, 1 red-backed mouse, from Quetico, Ontario.

C. M. Barbeau, Ottawa, Ontario: 1 big brown bat, in the flesh.

MAMMALS—Conc.

By Gift—Conc.

- M. L. Prebble, Entomological Laboratory, Grand Cascapedia, Que.; 1 cinereous shrew, in formalin; 1 woodchuck.
- L. J. Simpson, Entomological Laboratory, Grand Cascapedia, Que.: 1 woodchuck (partly melanistic).
- G. A. Armstrong, Ottawa, Ontario: 1 big brown bat, in the flesh.
- P. McLaren, Ashton, Lanark county, Ontario: 1 porcupine, killed in a buckwheat field.
- Mrs. A. A. Anderson, Churchill, Manitoba: foetus of white whale (*Delphinapterus leucas*) 13.25 inches long.
- James Allan, Hudson's Bay Company, cape Wolstenholme, Hudson strait, Que.: skull of polar bear.
- Lloyd Sivyer, Ottawa, Ontario: 1 red bat, alive.
- Victor H. Williamson, Ottawa, Ontario: 1 Brewer mole (*Parascalops breweri*) taken at Kingsmere, Que., Oct. 11, 1935.
- Major D. L. McKeand, Ottawa, Ontario: 2 skulls of polar bear, 1 skull and 1 pair of tusks of Atlantic walrus.
- R. W. Tufts, Wolfville, N.S.: 1 Bonaparte weasel, in the flesh.
- William H. Lunn, Hillier, Ontario: 1 Mearns flying squirrel, taken near Trenton, Northumberland county, Ontario.
- Victor E. Gould, Wolfville, N.S.: 5 Nova Scotia varying hares (*Lepus americanus struthopus*), 1 woodchuck (*Marmota monax*).
- H. F. Hughes and Charles Guiget, Shaunavon, Sask.: 2 black-footed ferrets, 2 skins and 1 skeleton.
- H. M. Laing, Comox, B.C.: 2 Columbian black-tailed deer (*Odocoileus columbianus*) from Vancouver island.
- E. F. G. White, Ottawa, Ontario: 2 Mearns cottontail rabbits, in the flesh.
- Joseph F. Bernard, Cordova, Alaska: 2 skins of shrews (*Sorex obscurus alascensis*) from Hawkins island, Alaska.
- Hugh S. Bostock, Geological Survey, Ottawa: 1 skull of large wolf, from west side of Yukon river, about 4 miles south of mouth of Sixtymile river, Y.T.
- A. LaRocque, Ottawa, Ontario: 10 white-footed mice (*Peromyscus maniculatus gracilis*) from Algonquin park, Ontario.

BIRDS

By Gift

- Royal Canadian Mounted Police, through the Commissioner's Office, Ottawa: 1 great horned owl, 1 glaucous gull, 2 Sabine gulls, 1 red-breasted merganser, 3 willow ptarmigan, 1 rock ptarmigan, collected by Staff-Sergt. J. E. F. Wight, Chesterfield inlet, Keewatin district, N.W.T.; 1 rock ptarmigan, collected by Corporal H. Kearney at Craig harbour, Ellesmere island.
- Lands, Northwest Territories and Yukon Branch, Department of the Interior, Ottawa: 1 American magpie, taken by Indian in southeastern part of Wood Buffalo park, near delta of Athabaska river in northern Alberta, about 58°30' north, 111°45' west, and sent in by park warden, F. C. Dent.
- R. W. Tufts, Chief Federal Migratory Birds Officer for Maritime Provinces, Wolfville, N.S.: 1 wing of ring-necked duck, 18 skeletons of birds killed at Grand Manan, New Brunswick; 1 rough-legged hawk.
- T. H. Manning, Dallington, Northampton; England: 3 downy young geese (2 snow geese and 1 blue goose) from a brood of mixed parents, lesser snow X blue goose, 1 downy goose (snow X blue), from Southampton island, N.W.T., summer of 1934.
- Frank Farley, Camrose, Alberta: 1 Hudsonian curlew, from Bittern lake, Alberta; 1 red-tailed hawk, 1 broad-winged hawk, 1 prairie falcon, from Camrose, Alberta.
- Major Allan Brooks, Okanagan Landing, B.C.: 1 California murre, 1 New Zealand shearwater, 1 pale-footed shearwater, 1 harlequin duck.
- Dr. R. E. DeLury, Ottawa: 1 chimney swift, 1 robin, 1 ruby-throated hummingbird, juv., 1 sharp-shinned hawk, 1 barred owl.
- C. F. Holmes, Dollard, Saskatchewan: 1 sage grouse hen, 1 downy young sage grouse.
- Ronald W. Smith, Ottawa, Ontario: 2 cowbirds.

BIRDS—*Conc.**By Gift—Conc.*

- Gifford Johnson, Ottawa, Ontario: 1 black-crowned night heron, found dead on Rideau river.
 Harry Ramsdel, Ottawa, Ontario: 1 red-eyed vireo.
 Christopher Riley: 1 pomarine jaeger, from Tazin river, Mackenzie district, Northwest Territories.
 T. E. Randall, Boyle, Alberta: 1 red-winged blackbird, 1 shrike, 1 rosy finch (*Leucosticte tephrocotis*).
 Conrad Potvin, Ottawa, Ontario: 2 nighthawks, juvenile fledglings.
 Professor W. C. Baker, Kingston, Ontario: 1 water-thrush, found dead.
 Adrian A. St. Laurent, Ottawa, Ontario: 1 sharp-shinned hawk, in the flesh.
 R. Meredith, Quebec, Que.: 1 yellow rail, in the flesh, taken at Petit Pre, north shore of St. Lawrence river about 15 miles below Quebec, Oct. 13, 1935.
 R. W. Sheppard, Niagara Falls, Ontario: 1 blue goose (*Chen caerulescens*), in the flesh, at foot of Horseshoe falls, Oct. 28, 1935.
 Dr. W. E. Huriburt, Vineland, Ontario: 1 blue goose, in the flesh, a goose that was carried over Niagara falls, Oct. 27 or 28, 1935.
 Dr. J. A. Ruddick, Wakefield, Que.: 1 mounted Kiwi (*Apeteryx* sp.) from New Zealand.
 John Marshall, Ottawa, Ontario: 1 male American goldeneye, in the flesh.
 J. McManus, Ottawa, Ontario: 1 male American merganser, in the flesh.
 E. E. Wall, Ottawa, Ontario: 1 pine grosbeak, in the flesh.
 Arthur C. Peake, Quatsino, Vancouver island, B.C.: 6 skins, great horned owl, 2 goshawks, juvenile, salted skins.
 A. L. Gormley, Arnprior, Ontario: 1 hawk owl, in the flesh, taken near Barrys bay, Renfrew county, Ontario, Dec. 20, 1935.

By Purchase

- Major Allan Brooks, Okanagan Landing, B.C.: 27 pelagic sea birds collected off British Columbia coast (9 albatrosses, 4 fulmars, 5 shearwaters, 2 horned puffin, 2 California murre, 4 Cassin's auklet, 1 ancient murrelet).

AMPHIBIANS AND REPTILES

By Museum Expeditions 64

- Victor E. Gould and W. Earl Godfrey, north and west coast of Cape Breton island and northern part of Guysborough county, Nova Scotia: 3 toads, 8 frogs, 8 red-backed salamanders, 1 spotted salamander, 8 garter snakes, 1 red-bellied snake, 1 green snake—30 specimens.
 C. H. Douglas Clarke and Horace P. Stovell, Batchawana Bay region, Algoma district, east side of lake Superior, Ontario: 3 toads, 2 green frogs, 1 leopard frog, 2 wood frogs, 2 hylas, 2 newts, 1 garter snake—13 specimens.
 Hamilton M. Laing and Kenneth Racey, northern Vancouver island, from Comox around the coast to Quatsino sound, B.C.: 4 toads, 8 frogs, 9 salamanders—21 specimens.

By Gift 63

- J. Roland Brown, Hamilton, Ont. 3
 J. S. Charleson, Moose Lake, Manitoba 23
 Cyril K. Coldwell, Gaspereau, Nova Scotia 1
 B. J. Hales, Sandilands, Manitoba 1
 H. M. Laing, Vancouver island, B.C. 14
 Andre Laroche, Montreal island, Que. 1
 A. LaRocque, Algonquin park, Ont. 1
 G. D. McKinstry, Britannia, Ont. 1
 Phyllis Patch, Burbidge, Que. 1
 L. S. Russell, Alberta 2
 H. L. Seamans, Lethbridge, Alberta 1
 J. C. Shelford, Wistaria, B.C. 3
 C. M. Sternberg, Dauphin, Manitoba 3
 J. J. Way, Wooler, Ont. 1
 M. Y. Williams, Manitoulin island, Ont. 2
 A. W. G. Wilson, Minaki, Ont. 5

LAND AND FRESHWATER MOLLUSCS

By Staff

- A. LaRocque, Geological Survey: 200 lots, Algonquin park, Ontario: 7 lots, White bridge, Ottawa; 4 lots, Manotick, Ontario; 6 lots, Rideau park, Ontario; 50 lots, White lake, Ontario; 20 lots, McKay lake, Ottawa; 10 lots, Meach lake, Que.; 20 lots, McGregor lake, Que.
 E. M. Kindle, Geological Survey: 4 lots, Loughborough lake, Ontario.
 E. M. Kindle and A. LaRocque, Geological Survey: 4 lots, Loughborough lake, Ontario.
 Kenneth Racey: 1 slug and 1 snail from Port Hardy, Vancouver island.

By Gift

- A. LaRocque and A. N. Morling, Ottawa: 10 lots, Manotick, Ontario.
 Rev. Bro. Etienne, Hull, Que.: 4 lots, vicinity of Montreal.
 Harlan I. Smith, Ottawa: 1 lot, swamp near Keene, Ontario.
 G. F. Fairbairn, Ottawa: 1 lot, near Ottawa.

Botany

After a cessation of field work since 1933, one field party was sent out during 1935, which was largely engaged in botanical work. An area was selected that was comparatively unworked and that was important in connecting with work done by University of Toronto field parties during several seasons on Bruce peninsula, between lake Huron and Georgian bay, and the botanical work done on Keeweenaw peninsula, in northern Michigan. The party was in charge of Professor Robert C. Hosie, Faculty of Forestry, University of Toronto, with four botanical assistants. Although all the men were engaged in collecting plants and gathering general botanical data, Dr. Thomas M. C. Taylor and Dr. R. E. Fitzpatrick were principally occupied with collecting and identifying plants. Andrew P. Leslie was largely occupied with studies of the soils and with photography, and Professor Hosie and S. T. B. Losee with the ecological relations and enumeration of plant associations. Professor Hosie submits the following brief summary of the botanical work of the party. A more detailed report on the systematic botany and ecological work is in course of preparation.

Biological Expedition in Batchawana Bay, Lake Superior

The territory covered includes that section of Algoma region lying between the lake shore and a line from Mica bay, passing south of Pancake lake to a point where this extended line would cross Harmony river.

The purpose of the expedition was to obtain collections and records of the flowering plants, mammals, and birds, and to gather information on the habit, ecological relations, and economic considerations, where possible within the time available.

From Mica bay southwards, for several miles along the shore-line the rock series of vegetation could be studied. From Coppermine point southwards the shores are variable, in places rocky, in places sandy beaches, and elsewhere stony. In Pancake bay and in practically all of Batchawana bay the shore-line is sandy and is bordered by flat, low-lying, swampy lands extending inland in places for several miles. Paralleling the whole shore, within about 5 miles, the land rises into the rolling hill type so characteristic of the Algoma region. The area thus offers a great range of habitat conditions and presents a fruitful field for a biological study.

Field work was carried on from a base camp established in one of the Ontario Northern Development road camps, situated on the trans-Canada highway almost in the centre of the area investigated. The highway served as a base line from which excursions to points farther inland could be made, and the lake offered easy access to Batchawana island, which was also included in the survey. Ten weeks were spent in the field, from Friday, July 12. During the last month an automobile was placed at the disposal of the party so that it was possible to cover a great deal of territory within the limited time available.

The following places were more or less intensively studied: (1) the rocky shore-line from Mamainse point to Mica bay; (2) the rocky shore-line from Mamainse point south to Coppermine point; (3) Pancake river for about 4 miles inland; (4) Batchawana river for 6 miles inland; (5) Carp river for 12 miles inland; (6) Mamainse mountain and surrounding area; (7) the shore-line of lake Superior from Batchawana river to Coppermine point, 30 miles; (8) various plant associations at different points along the highway between Mamainse harbour and Harmony river; (9) Batchawana island; (10) the rock faces north of Carp lake and west of Batchawana river; (11) open meadows around Batchawana village. Many other less important places were visited.

As a result of the survey it has been possible to give a partial sketch of the successional relations for the hydrosere and the xerosere. The climax forest for the region is composed of, principally, the northern hardwoods, sugar maple, and yellow birch, with an admixture of white pine, balsam fir, hornbeam, and hemlock. The larger part of the area is, however, populated with transitional stages in the development of this climax. Many of the plant communities that represent these developmental stages were studied and an account of them will be presented in a later report.

Upwards of 2,500 collections of flowering plants were made, wherever possible three specimens of each collection being taken. It is estimated that there will be between 600 and 700 different species and varieties. A few mosses and lichens were also taken, but such species were not included within the scope of the investigation.

An excellent assortment of photographs illustrating the main characteristics of the vegetation of the area has been made. Upwards of 300 pictures were taken and the majority of these are suitable for inclusion in the department collection.

The welfare of the party in the field was very materially assisted by the officials of the Ontario Department of Northern Development, Sault Ste. Marie; the officials of the Ontario Forestry Branch, Sault Ste. Marie; the departments of Botany and the Faculty of Forestry, University of Toronto. To all of these and to many others, resident within the area, thanks are due.

Herbarium Work

The work of mounting, labelling, and filing specimens that were received during the year, and also from the mass of material that has accumulated in previous years, was carried on, and 2,889 sheets of

specimens were labelled and numbered. The number of sheets officially registered and numbered in the herbarium totalled 132,100 on March 31, 1936. The details of accessions follow:

<i>Plants Received on Account of Exchange</i>	912
Gray Herbarium, Harvard University, Cambridge, Mass.	246
M. P. Porsild, Danish Arctic Station, Godhavn, Disko, Greenland.	185
Naturhistoriska Riskmuseet, Botaniska Avdelningen, Stockholm, Sweden.	481
<i>Plants Received as Donations</i>	779
Dr. Jacques Rousseau, Université de Montréal.	347
Botaniska Museum, Helsingfors, Finland.	305
Dr. Hans Steffen, Allenstein, Germany.	1
F. J. Alcock, Ottawa, Ontario.	99
Dr. A. J. Grout, Newfane, Vermont.	5
Cpl. H. Kearney, R.C.M.P., Craig Harbour, Ellesmere island, N.W.T.	21
Mr. H. Groh, Experimental Farm, Ottawa, Ont.	1
<i>Plants Distributed on Account of Exchange</i>	665
L. H. Bailey, Cornell University, Ithaca, N.Y.	4
K. M. Wiegand, Cornell University, Ithaca, N.Y.	9
N. C. Fassett, University of Wisconsin, Madison, Wisconsin.	5
M. L. Fernald, Gray Herbarium, Cambridge, Mass.	225
Department of Botany, University of Montreal, Montreal, Que.	422
<i>Plants Loaned</i>	131
Dr. A. J. Grout, Manatee, Florida.	103
J. M. Greenman, Missouri Botanical Garden, Herbarium, St. Louis, Missouri.	15
A. LeRoy Andres, Ithaca, New York.	9
Eric Hultén, Lund, Sweden.	3
Mr. Wm. Dore, Experimental Farm, Ottawa.	1

PALAEONTOLOGICAL DIVISION (Geological Survey)

E. M. Kindle, Chief of the Division, reports as follows upon those activities that relate to the Museum. Other work of the division is given in the Annual Report of the Geological Survey.

E. M. Kindle studied a series of Devonian sections in eastern Quebec in the lower part of Dartmouth River basin and Forillon peninsula, which extend from the upper part of the Gaspé sandstone into the black slates and limestones at the base of the eastern Gaspé Devonian. The fossil collections and the studies made are designed to show the faunal and lithologic changes that develop in a northwest to southeast direction in this area. In Nova Scotia study of the geological distribution of manganese concretions was extended over a considerable part of the eastern half of the province. A small area occupied by the Knoydart formation was studied near the coast northwest of Antigonish, N.S.

C. M. Sternberg spent the month of July collecting a mosasaur skull from a well 37 feet below the surface in Riding Mountain region, Manitoba, and in examining the shale exposures in this area. This is the first mosasaur discovered in the Riding Mountain beds. He spent most of August and September in Calgary, Alberta, assisting the Calgary Zoological Society in the construction of a life-sized dinosaur model, and a fossil garden.

Some work was also done on Red Deer river in connexion with a map that is being made, and a mammal jaw was collected from the Pale Beds.

Mr. A. LaRocque spent some weeks collecting fresh water shells from a series of lakes in Algonquin park.

Office and Laboratory Work

Miss A. E. Wilson continued work on the catalogue of type fossils.

W. A. Bell has made progress with a report on a Coal Measure flora. He was engaged from January to March, inclusive, in preparation of manuscript on the fossil floras of Nova Scotia.

L. S. Russell has continued studies of the fossil mammals from Alberta and Saskatchewan, and guided the investigation of the invertebrate fauna of the Pakowki formation by R. W. Landes of Princeton University.

C. M. Sternberg studied the dentary teeth of duck-billed dinosaurs and prepared a paper on "The Systematic Position of Trachodon." He began a study of a new species of *Thescelosaurus*. An exchange of vertebrate fossils was arranged with Amherst College. In the laboratory Mr. Sternberg and his staff mounted a Cretaceous turtle, finished the mount of a horse skeleton, and began the preparation of a dinosaur skull and a slab of rhinoceros skeletons.

Exhibits

Four good specimens of fossil insects in amber were added to the amber exhibit.

A Cretaceous turtle, with splendidly preserved tail and feet, and a skeleton of the Pleistocene horse *Equus scotti* were placed on exhibit. A skeleton of the gazelle camel is ready to exhibit when space is available. About 20 mammal skulls were acquired by exchange with Amherst College. A large painting of the American mastodon by Mr. Lefebvre was placed in the vertebrate section of the exhibition.

An exhibit relating to the work of the National Museum was prepared and installed at the Central Canada Exhibition in August.

One hundred sets of fossils were prepared for the use of schools.

As in previous years opportunities were supplied for visiting scientists to study the collections in the Museum. Professor Lull, Director of the Peabody Museum, spent about a week studying the dinosaur collections.

Publications

The following papers were published during the year:

Observations on Chance Experiments in Consolidation of Sediments. By E. M. Kindle. *Journal of Palæontology*, 1935.

Hooded Hadrosaurs of the Upper Cretaceous. By C. M. Sternberg. *Proc. Geological Society of America*, 1935.

Accessions to Museum

VERTEBRATE FOSSILS

By Purchase

Theodore Roy, Miguasha, Que.: a collection of fossil fishes, including a shark, from near Miguasha, Que. Upper Devonian.

VERTEBRATE FOSSILS—*Conc.**By Exchange*

Professor F. B. Loomis, Amherst College: mounted skeleton of *Stenomylus hitchcocki* and skulls of the following mammals: *Hoplophoneus robustus*, *Hyaenodon cruentus*, *Cynodictis gregarius*, *Entelodon mortoni*, *Aceratherium copei*, *Hyracodon nebraskensis*, *Hyracodon* sp., *Mesoreodon megalodon*, *Promerycochoerus thompsoni*, *Poebrotherium wilsoni*, *Mesohippus bairdi*, *Ischromys* sp., and *Stenofiber* sp. Also three dinosaur tracks, batrachian-track, and two fish from the Triassic of Massachusetts.

INVERTEBRATE FOSSILS

Presented

- G. A. Cooper, U.S. National Museum, Washington, D.C., U.S.A.: two valves of *Yoldia*, Ottawa, Ont.—corner of Cooper and O'Connor streets. Pleistocene.
- B. F. Howell, Princeton University, Princeton, N.J.: types of new species described by Dr. B. F. Howell from Franklin county, Vermont. Cambrian.
- I. W. Jones, Quebec Bureau of Mines, Quebec, Que.: a small collection of fossils from the basins of St. Johns and York rivers, Gaspé co., Que.: (field Nos. F-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 17, and 18 were examined and part of some of them kept). Silurian and Devonian.
- A. Keith, U.S. Geological Survey, Washington: 3 lots of fossil corals from Rimouski district, Que. Helderbergian.
- Professor J. W. Russell, Western Ontario University, London, Ont.: 1 specimen of *Favosites turbinatus*, Arkona, Ont. Devonian.
- U. S. National Museum, Washington, D.C.: a collection of plaster casts of types of Edrioasteroids and three (3) specimens, topotypes of the same.

From Members of Staff

- M. F. Bancroft: A collection of vertebrates (vertebra of a whale), invertebrates, and plants from Escalante point, Vancouver island, B.C. Tertiary. A small collection of fossil invertebrates from Moyeha river, Vancouver island. Triassic.
- H. S. Bostock: A few fossil fragments from small hill (3,150 feet) on south side of the main fork of Klondike river, Yukon Territory. Palæozoic.
- C. E. Cairnes: *A small collection of pelecypods, gasteropods, and plants—(algæ), Bridge River mining district, B.C. "Post-Palæozoic."
- S. C. Ells: A few fragmentary fossils from township 91, range 16, Clearwater river, N.W.T. Silurian?
- Roy Graham (through R. T. D. Wickenden): a collection of fossil invertebrates, north side Saskatchewan river, Sask. Cretaceous or Tertiary.
- George Hanson: 6 lots of fossils, Cassiar district, B.C., field Nos. and formations as follows: 1, Silurian, probably Niagaran. Lots 2, 96, 97, and 98, horizon indeterminate.
- M. S. Hedley: a collection of invertebrate fossils from north of Tahtsa river, B.C. Jurassic (Hazelton series).
- J. F. Henderson: large slab with Cephalopods, near Ville-Marie, Quebec. Ordovician?
- G. S. Hume and C. O. Hage: a collection of fossil invertebrates from eastern Alberta and western Saskatchewan. Upper Cretaceous.
- E. M. Kindle: invertebrate fossils from Dartmouth River basin, Que., Forillon peninsula, Que., Campbellton, N.B., and Doctors brook, N.S. Devonian to Cambrian.
- E. M. Kindle and C. H. Kindle: graptolites from near cape Rosier and Griffin cove, Gaspé peninsula, 1935. Ordovician.
- D. Leechman: 3 lots of fossil mollusca from Southampton, Pangnirtung (50 feet above sea-level), and Wolstenholme (100 feet above sea-level). Pleistocene or Recent.
- E. J. Lees: a small collection of fossils from Teslin-Quiet Lake area, Yukon. Triassic?
- F. H. McLearn: a collection of invertebrate fossils from Etomani and Red Deer rivers, Hudson Bay junction, Sask. Upper Cretaceous.
- D. A. Nichols: a collection of fossil invertebrates from various points in the eastern Arctic. Pleistocene.

INVERTEBRATE FOSSILS—*Conc.**From Members of Staff—Conc.*

- L. S. Russell: a large collection of marine fossils from the Pakowki formation, Milk river, southeast Alberta. Pakowki. A small collection of non-marine fossil invertebrates from Milk River valley, Alberta. Cretaceous, Belly River formation.
- J. C. Sproule, Geological Survey, Canada: a collection of marine and non-marine fossil vertebrates from Oldman and South Saskatchewan rivers. Upper Cretaceous.
- A. E. Wilson: a small collection of invertebrate fossils from Ottawa district. Ordovician.

PLANTS

Staff Collections

- W. A. Bell: a collection of fossil plants from Springhill area, N.S. Carboniferous.
- J. R. Johnston: 2 lots of fossils (plants and invertebrates), (a) A-35-1-358, bank of Pelly river, Yukon; (b) 7-1-35, limestone bluff between Pelly and Macmillan rivers, lat. 62° 50', long. 135° 30'.

Presented

- Professor J. W. Russell, Western Ontario University, London, Ont.: section of Devonian tree from Kettle point, Ont. Devonian.

SHELLS

Staff Collection

- A. LaRocque: shells from lakes in Algonquin park, Ont., White, Meach, and McKay lakes.

CONCRETIONS AND SEDIMENTS

Staff Collections

- W. A. Bell: current ripple-marks and rain pits from (a) Wallace river, N.S., (b) southwest of McAra brook, N.S. Middleborough member and Windsor series. Carboniferous.
- E. M. Kindle: iron spikes altered to iron oxide, Delaware and Chesapeake canal, north side of shark tooth locality. Recent. Bottom sediments, gravel, till, and sand, Point Pelee region. Recent. A large collection of manganese concretions, lakes Eden, Milford, Kijimkujik, Christopher, and others in Nova Scotia. Recent. Iron spikes, oxidized, Grand Lake shore at Grand Lake post office, Nova Scotia. Recent?
- E. M. Kindle and A. LaRocque: marl from Loughborough lake, Ontario, with many freshwater shells.
- A. LaRocque: one manganese concretion from Cedar lake, Algonquin park, Ont. Recent.
- D. Leechman: dolomitic limestone composed of re-cemented fragments, Dundas harbour, North Devon island, Arctic archipelago.
- D. A. Nichols: dolomitic conglomerate limestone from debris at base of limestone cliffs, Dundas harbour, North Devon. Silurian or Devonian.

Presented

- B. R. Harris, 44 Hasteley avenue, Ottawa: 2 nodules with *Mallotus villosus*, 2 specimens conglomerate, Hamilton, Ont. Pleistocene or Recent.
- Miss Olivia McHugh, 17 Exchange place, Salt Lake city, Utah, U.S.A. (through A. E. Wilson): a sample of oolite, warm spring material. Probably Pliocene.
- B. J. Miller, Department of Geology, Lehigh University, Bethlehem, Pa.: two concretions formed by blue algæ, Little Conestoga creek, Lancaster co., Pa.

MINERALOGICAL DIVISION (Geological Survey)

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

J. R. Marshall spent two months in Ontario, Quebec, and the Maritime Provinces collecting minerals and rocks required for the preparation of prospectors' and educational collections.

An exhibit of minerals was prepared for the Central Canada Exhibition at Ottawa by H. V. Ellsworth and R. J. C. Fabry.

This year there has been a largely increased demand from the public for mineral collections and specimens. The Quebec Bureau of Mines gave a particularly large order for prospectors' and rock collections. Altogether 2,110 collections, containing 78,004 specimens, were distributed. The greatest previous distribution was in 1934-35 when 1,464 collections, containing 53,630 specimens, were issued. For the past five years there has been a decrease in the demand for educational collections specially prepared for schools, etc., whereas there has been an increase in the demand from prospectors and others directly interested in the mining industry for collections of minerals and rocks. A large amount of waste mineral chips not listed below was given to various institutions for educational purposes. In addition, Mr. Marshall prepared numerous specimens for loan to students of various schools in Ottawa.

The educational collections were distributed as follows:

Province	Standard	Grade 2	Grade 3	Grade 4	Miscel- laneous	Prospector's	
						Minerals	Rocks
Yukon.....	0	0	0	0	0	1	1
British Columbia.....	0	0	2	0	1	100	92
Alberta.....	0	0	0	0	0	7	5
Saskatchewan.....	0	0	0	0	1	7	4
Manitoba.....	0	1	0	0	6	4	4
Ontario.....	0	1	13	0	24	90	75
Quebec.....	1	0	0	1,600	14	20	16
New Brunswick.....	0	0	0	0	1	0	0
Nova Scotia.....	0	0	0	0	1	1	1
Foreign.....	1	0	0	0	6	5	4
	2	2	15	1,600	54	235	202
No. of specimens.....	288	88	600	62,000	5,480	4,700	4,848
Total number of collections.....						2,110	
“ “ specimens.....						78,004	

Accessions

The following specimens were received and added to the Museum collections:

By Gift

- Asbestos Corporation of Canada, Thetford Mines, Que.: brucite and 1,000 pounds of chromite ore.
- Canadian Refractories, Limited, Grenville, Que.: 200 pounds of magnesite.
- Cariboo Quartz Mining Company, Limited, Wells, B.C. (through Mr. R. Randal Rose, General Superintendent): gold specimen.
- V. L. Eardley-Wilmot, Mines Branch: very fine cluster of sphalerite crystals from Lucky Jim mine, B.C.
- H. V. Ellsworth (described by Ellsworth and Graham in *American Mineralogist*, June, 1930): cenosite, lot 8, con. 5, North Burgess tp., Lanark co., Ontario.
- Elie Frenette, Allens Mills, Que.: 300 pounds diatomite.
- Federal Lead and Zinc Company, Quebec (through J. C. Beidelman, Montreal, Que.): 500 pounds lead ore and 700 pounds zinc ore.
- Lake George Mining Company, St. John, N.B.: 700 pounds stibnite ore.
- Ivor Peterson, Brookfield, Lac du Bonnet, Man.: ruby red granite.
- Renfrew Minerals, Limited, Lyndoch, Ontario: 100 pounds rose quartz.
- Pioneer mine, Calabogie, Ontario: 300 pounds molybdenite ore.

By Exchange

- Geoffrey W. Crickmay, Assistant State Geologist, Atlanta, Georgia: fluorescent hyalite (three specimens) from Stone mountain, Georgia.
- Kuri-mura, Nima-gun, Iwami province, Japan: aragonite.
- Mr. Shimmatsu Ichikawa, Kitashinjo-mura, Imatate-gun, Fukui-ken, Japan: jamesonite on quartz from Kuratani, Ishikawa-gun, Kaga province, Japan.
- R. P. Bower, Trade Commissioner at Batavia, Java, on behalf of Exploitation en Handel mij. v/h F. Buning, Cheribon: suite of specimens consisting of gypsum in large crystals, phosphate minerals, asphalt minerals, chalcidony, and serpentine.
- Prof. A. Lacroix, Paris, France: anhydrite from Ampandrandava, Madagascar.
- M. Vonsen, California: provertite (radiated) borax in clay, Kramer, Kern county, California.

