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ROYAL ONTARIO MUSEUM OF ZOOLOGY**

**No. 12: ONTARIO AND ITS AVIFAUNA. BY L. L. SNYDER  
AND  
THE MUSEUM'S BIRD COLLECTION, BY J. L. BAILLIE**

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# ONTARIO AND ITS AVIFAUNA

By L. L. SNYDER

## *Extent, Physiography and Vegetational Features*

THE Province of Ontario embraces a total of 412,582 square miles. Perhaps a better appreciation of its size is given by describing it as about equal to the combined areas of Maine, Vermont, New York, Pennsylvania, Ohio, Indiana, Michigan, Wisconsin and Minnesota. Its east-west spread reaches from eastern New York State to western Minnesota, and it is more than a thousand miles in a straight line from the extreme southern boundary to the north-west point on Hudson Bay. Besides having more than six hundred miles of salt-water coast line, it borders all of the Great Lakes except Michigan.

The succession of geological changes which have taken place in Ontario has affected to a notable degree the distribution and relative proportions of its present-day bird fauna. Somewhere in the neighbourhood of seventy-five per cent. of the provincial area is covered by hard rocks, mostly granite and gneiss of Precambrian age. This occupies the middle section, all but the far north and the more southern counties. The slow erosion of these rocks and the periodic scouring of their surfaces by at least five successive ice sheets have prevented or disrupted the formation of deep soils. Drainage is largely a matter of basin overflows in youthful stages and is altered considerably by the filling in of vegetation. Consequently, Ontario is notoriously a land of deep, clear and cold lakes, bogs, relatively siltless rivers and rock hills of low or moderate relief. The area has become occupied by a bird fauna in accordance with these conditions. As an example of groups which for ecological reasons are but poorly represented as breeding birds of the region, one might mention the duck family.

In southern portions of the province and in the extreme north, deposits of sedimentary rocks were laid down in invading seas. In southern Ontario, the products of disintegration of these comparatively soft rocks, together with the drift from glaciers, have formed deep rich soils in a latitude favourable to agriculture. Some agricultural land, the so-called Clay belt, exists partly on the Precambrian shield and partly on the sedimentary rocks north of the

height of land, as a result of deposits formed in glacial lake Ojibway, but extensive cultivation is largely limited to southern sections.

Ontario is still principally a forested area, although fires and cutting have affected great tracts. In the thousand miles of its north-south extent, there is sufficient progressive change of climatic conditions to produce four forest types worthy of name—the southern hardwoods (which occur as relic stands in the cultivated sections of the south), the mixed forest, the eastern coniferous forest and the sub-arctic forest. They may be further subdivided on the basis of the effects of climate, soil and drainage conditions. Fragments of treeless areas are to be found along the exposed coast of Hudson Bay.

From this brief sketch of the physiographic and vegetational conditions prevailing in Ontario, it should be understood that the large number of avian forms which can be ascribed to the area is consequent to its length-breadth extensiveness rather than to any pronounced and general environmental diversity. As a matter of fact, vast tracts of remarkably uniform ecological conditions prevail, and more or less characterize the bulk of the province.

#### *Life Zones and Faunal Areas*

Some indication of the writer's present interpretation of the life zones and faunal areas in Ontario, based largely on animal distribution, may be given here in brief (see map 1). Along the north shore of Lake Erie, in extreme southern Ontario, the Carolinian fauna of the Austral life zone is fairly dominant. This fauna drops out as one proceeds northward, continuing as an important element farthest north, along the shore of Lake Huron. The Alleghanian faunal area, of the Transition life zone, overlaps the Carolinian inland from Lake Erie and gradually gains ascendancy northward, reaching its purest condition in the Lake Simcoe region but does not die out until after the Sault Ste. Marie-Lake Nipissing line is passed. In the western portion of the province, from Port Arthur to Kenora, there is a notable influence of the Assiniboian fauna of the Canadian life zone. The Canadian life zone overlaps the Transition zone across the province from Rainy River District to Lake Nipissing, the overlap being interrupted by Lake Superior. From this belt northward, however, a characteristic Algonquin fauna prevails to a line somewhere through central Patricia and southern James Bay. Hudsonian conditions probably begin locally and extend beyond this line over the coastal plain of Hudson Bay. Also, it seems probable that small areas more or less characteristically Arctic may be found locally along the exposed points and shores of Hudson Bay.



MAP 1. Life zones in Ontario.

*Changes in Avifauna*

Apart from short-period fluctuations in the population totals of our birds, there is no doubt that the avifauna of the province has changed and is continuing to change in respect to ratios and area occupied. The clearing of the land and other environmental alterations which accompany the development of agriculture and

industry are usually regarded as principal causes. To make a generalized statement, certain field birds have increased and expanded their ranges, and the numbers and distribution of certain forest forms have been curtailed or interrupted. Specific examples which illustrate the former are the Bobolink (*Dolichonyx oryzivorus*) and the Eastern Meadowlark (*Sturnella magna*) while the Pileated Woodpecker (*Ceophloeus pileatus*) and the Spruce Grouse (*Cana-chites canadensis*) are examples of the latter. A few species such as the Western Meadowlark (*Sturnella neglecta*) and the Cardinal (*Richmondena cardinalis*) are known to be comparatively recent additions to our avifauna, their advent not being caused directly by man. The Ring-necked Pheasant (*Phasianus colchicus*) and the European Partridge (*Perdix perdix*), however, are definite introductions. And then, change has been wrought by the extirpation of certain species, the Passenger Pigeon (*Ectopistes migratorius*) and the Wild Turkey (*Meleagris gallopavo*).

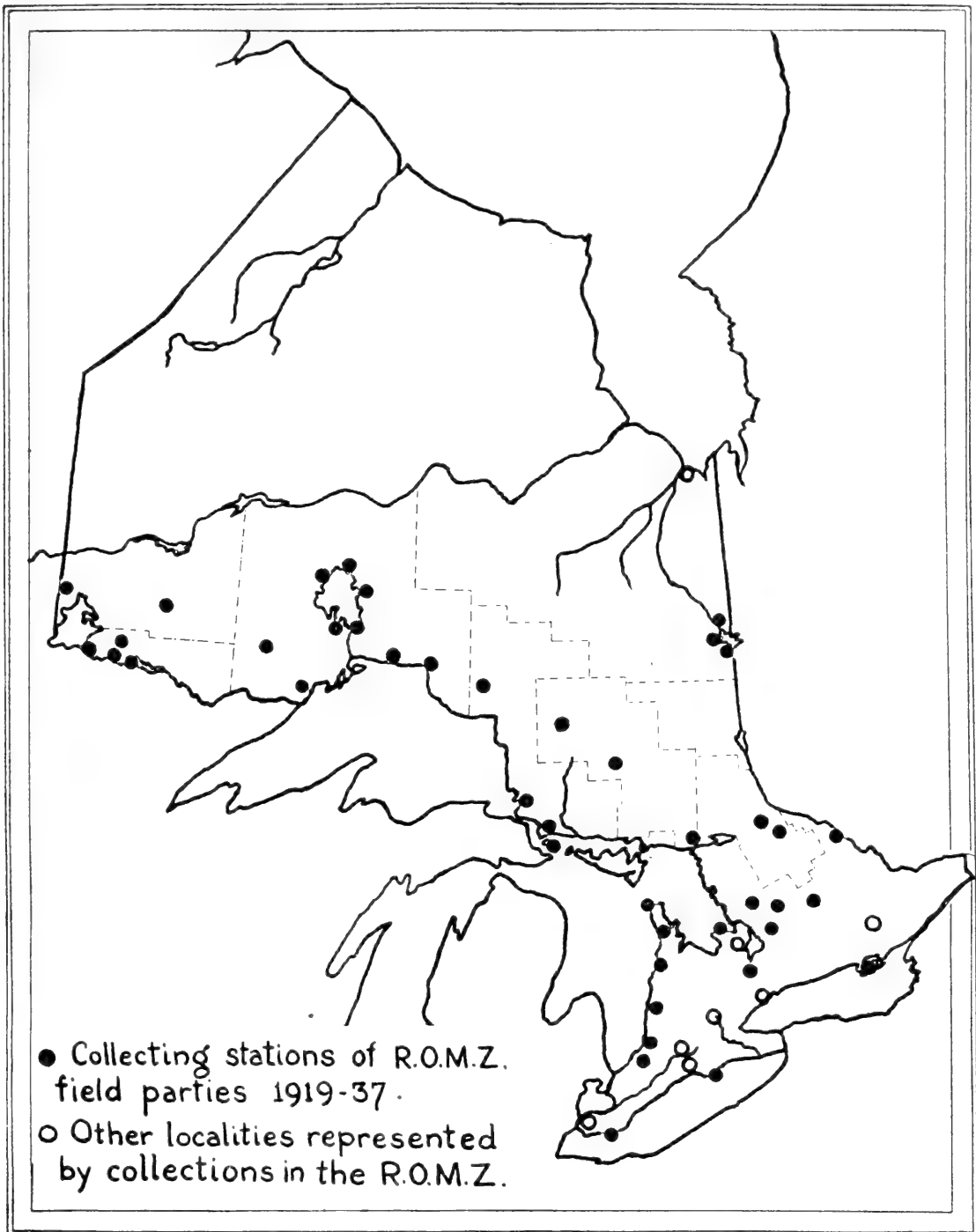
The most remarkable novelty in the matter of our changing avifauna is the Starling. During a running survey made in the summer of 1935, nearly sixteen hundred miles were traversed in southern Ontario. The Starling was found to be the third most evenly distributed and numerous bird. The Song Sparrow and Robin exceeded it. South of Lake Simcoe, the Starling exceeded all other species, both in point of numbers and in regular distribution. This has come about in approximately sixteen years!

#### *An Analysis of Ontario's Avifauna*

To turn to a brief analysis of Ontario's avifauna, it may be remarked that a complete list of Ontario birds cannot be compiled with certainty, but there are about 342+ species, residents and transients, which occur or have occurred in our area. A total of two hundred and forty-seven species, based for the most part on actual records, appears to be a fairly exact estimate of the summer resident or breeding species. Of this total, four species are exotics which have been introduced and have become established. Of the two hundred and forty-three native species, continental or wide-ranging forms constitute 28%. The more characteristically boreal birds make up 35%. Species which reach the northern periphery of their range in Ontario and represent southern elements constitute 27%. Western forms to the extent of 10% reach and penetrate into the province most pronouncedly in the region west of Lake Superior. Western forms do occur as a minor element in the north, in the south-central (vicinity of Sault Ste. Marie) and in the extreme south (counties bordering on Lake St. Clair and Lake Erie).

*Field Work by the R.O.M.Z.*

Although contributions to our knowledge of Ontario birds began nearly two centuries ago and, strangely enough, dealt with



MAP 2. Distribution of the Museum's Ontario collections.

the far north, which is still difficult of access, vast areas are still unsurveyed. Only a few years ago, it was estimated that 90% of the published literature on Ontario birds pertained to the southern

10% of the provincial area. Although this situation is improving rapidly and field work is well in advance of publication, extensive areas have yet to be investigated.

Some idea of this Museum's contribution to this work may be gained by a brief review of its field activity during the past eighteen years (see map 2). Particular attention has been given to summer resident or breeding birds of the province. These are the forms which can be regarded more strictly as Ontario birds. They are the birds tied to our area during the most important period of the year, the period of reproduction.

Prior to 1923, the Museum made casual observations on birds in several areas: in 1919, on the north branch of the Muskoka river, Muskoka District; 1920 at Point Pelee, Essex County; 1922 in northern Algonquin Park.

In 1923, the Museum undertook to carry on a survey as a systematic programme, the exact place and duration of field work to be adjusted each year according to the funds available. A survey of the Lake Nipigon region was conducted during 1923 and completed the following summer. In 1925, work was continued, at Lake Abitibi. In 1926, a survey of King Township was prosecuted. During the summer of the following two years, 1927 and 1928, Long Point, Norfolk County, was the scene of a survey. In 1929, an expedition worked the western portion of Rainy River District. The following summer, 1930, work was conducted in both Prince Edward and Bruce counties. In 1931, the region of Sault Ste. Marie, Algoma District, was investigated.

After a lapse of three years, during which little field work was done, expeditions were resumed in 1935, when a party covered approximately sixteen hundred miles of southern Ontario as a running survey. In 1936, work was carried on between Schreiber and Amyot on the north-east shore of Lake Superior. In 1937, field work was conducted in two sections, one party working between Ingolf (on the Manitoba-Ontario boundary) and Fort William, and the other party between Chapleau and the French river.

These surveys have greatly enlarged our knowledge of birds in Ontario, and through them, approximately 5,000 specimens have been added to the Museum's study collection. Further work is contemplated. With the development of provincial ornithology will come the basis for broader studies.

THE MUSEUM'S BIRD COLLECTION  
*(with an account of early Ontario Ornithology)*

By J. L. BAILLIE

*Early Ornithologists and Collections*

Although the earliest recorded observations on Ontario birds were those made by Samuel de Champlain (Macnamara, 1926) on the north shore of Lake Ontario in September, 1615, no important contribution to Ontario ornithology was made until 1768. During that year, Andrew Graham, Governor of the Hudson's Bay Company's post at Severn River on Hudson Bay, submitted (Preble, 1902) a number of birds to the Royal Society (England), collected by him along Ontario's sea-coast. The importance of Graham's work can be estimated when we consider that from this collection were described the Eskimo Curlew (from Fort Albany), the Great Gray Owl, the White-crowned Sparrow, the Blackpoll Warbler and the Hudsonian Chickadee (from Severn River), none of which had previously been brought to the attention of the scientific world.

Humphrey Martin, Governor of Fort Albany on James Bay (1775?-1782?), sent to England several hundred specimens of "animals and plants" collected in the vicinity of the Fort, at the request of his Company, but nothing further is known of his work or whether or not any birds were included in his collection.

T. Hutchins, who succeeded Martin as Governor of Fort Albany, made even more extensive collections at Hudson Bay and his manuscript journals (235 pages of which are devoted to birds) written about 1782 and entitled "Observations on Hudson's Bay" are still in the library of the Company, unpublished. They contain descriptions of the habits and occurrence of birds noted during his twenty-five years' residence at Albany and Severn (particularly at the mouth of the Severn River).

Following Hutchins came Charles Fothergill (1782-1840), whose manuscript on the birds of the north shore of Lake Ontario contains carefully-written descriptions of 117 species of birds, with copious notes on their occurrence and abundance. Fothergill, whose residence in southern Ontario extended from 1817 to the time of his death in 1840, may well be regarded as the first individual to deal particularly and fully with Ontario birds. His jour-



nal, dealing with Upper Canada birds, is still in the possession of one of his great-grandsons, Major G. A. MacGillivray, of Oshawa, Ontario.

The next Ontario ornithologist of note was William Pope (1811-1902), who, during his residence near Port Ryerse, Norfolk County, painted pictures of 162 species of native birds. These paintings, as well as a typewritten copy of one of his journals (covering the period from 1834 to 1843), are now in the Public Reference Library, Toronto. Many of his paintings compare favourably with our best modern depictions of birds, and they are of particular interest by reason of their early date. By far the best of Pope's paintings (59 species) were done between 1834 and 1847. These are bound in one volume in the Reference Library. The others, framed in the John Ross Robertson Historical Room in the Library, illustrate 149 species. These are for the most part dated from 1859 to 1875 and are distinctly inferior to his earlier efforts.

Although Graham, Hutchins, Fothergill and Pope were the pioneers of Ontario ornithology, none of them published any account of their observations or collections. Graham's collections were described by Forster (1772); Hutchins' manuscript has been extensively quoted by Latham (1781-5), Pennant (1784-5), Swainson and Richardson (1831), and Thompson (1890); Fothergill's journal has been reported on by Black (1934) and a catalogue of Pope's paintings has been published by the Toronto Public Library (1917).

The first attempt to write a list of the birds of Ontario was in 1822 (37 species), followed by lists in 1851 (72 species), 1859 (145 species), 1867 (271 species), 1886 (296 species), 1893 (322 species), 1894 (309 species), 1900 (300 species) and 1905 (315 species), compiled successively by Gourlay, Smith, Cottle, Hincks, McIlwraith, Fleming and Nash (Baillie and Harrington, 1936).

#### *The R.O.M.Z. Collection of Birds*

In 1835, Fothergill, who was a member of the Legislative Assembly (1825-9) during his residence in Upper Canada, proposed the establishment of a museum of natural history at Toronto, and succeeded in procuring a grant of land from the government for the purpose. Fothergill accumulated a large collection of stuffed birds for this proposed museum but these, together with most of his journals, were destroyed by fire shortly after his death in 1840.

The Royal Ontario Museum of Zoology collection of birds is in some respects an outgrowth from the Biological Museum of the University of Toronto. The earliest serious attempt to bring together a bird collection at the University was made in 1853 by Rev.



William Hincks, first professor of Natural History (1853-71), just thirteen years following Fothergill's death.

The control of the Biological Museum was officially taken over by the Senate of the University on August 11, 1856, and the bird collection developed by Hincks and his successors, Professor H. A. Nicholson (who occupied the chair, 1871-74) and Professor Ramsay Wright (1874-1912). It contained 783 birds in 1865 (Hincks' inventory), 1190 birds in 1870, 3,547 birds in April, 1909 (according to an inventory made by the late J. B. Williams, cataloguer of the Museum, 1906-1916) and approximately 5,000 birds on October 16, 1913, when the Royal Ontario Museum of Zoology was established.

The new museum enlarged the scope for building a research collection of birds and the Biological Museum's collection served as the nucleus. A list of the major sub-collections contained in this early collection is appended to this paper (table 1), but it here suffices to say that it contained important lots from Dr. J. H. Garnier, the British Museum, J. H. Ames and the Biological Society of Ontario, acquired between 1891 and 1912.

Following the transfer of the Biological Museum collection in 1913, the next considerable acquisitions were made in 1922 and 1924, when the J. E. Keays and the C. B. Garrett collections of bird-skins, totalling more than 2,300 specimens, were acquired.

In 1933, two notable collections were added,—the collection of the Ontario Provincial Museum (founded in 1853) and a generic collection. The former was presented by the Ontario government and the latter purchased with funds bequeathed by the late Colonel Reuben Wells Leonard, formerly a trustee of the Royal Ontario Museum. These two lots contained nearly 2,700 birds and were world-wide in representation.

Staff collecting (which has added more than 5,000 specimens to the collection since 1919), the increasing number of acquisitions and the development of ornithological work in the Museum brought the total collection in 1933 up to 21,500 specimens (Peters, 1933) and in 1935 necessitated the establishment of a Division of Birds, with curatorial supervision.

Since then the collection has grown to 28,892 specimens (December, 1937), a total exceeded in Canada only by the Fleming collection at Toronto (which housed 33,000 specimens in 1933) and perhaps by the collection of the National Museum of Canada (Peters, 1933) at Ottawa (25,000 specimens in 1933).

The growth of the collection is indicated by the following inventories, taken at various times since the Museum was established in 1913:

1913.....	5,000 specimens
1923.....	7,500 specimens
1929.....	14,271 specimens
1933.....	21,500 specimens
1935.....	24,185 specimens
1937.....	28,892 specimens

The geographical representation of the bird collection is as follows, in approximate numbers: North America, 23,000; South America, 1,900; Asia, 1,600; Europe, 1,000; Africa, 700 and Australia, 400. Of the North American series, which approximates 80 per cent. of the total collection, the major representation is as follows: Ontario, 15,000; British Columbia, 1,700; Manitoba, 1,100; Alberta, 400; California, 400; Utah, 400; Alaska, 250 and Michigan, 200.

All of the 27 avian orders are represented in the collection, 160 of the 166 families, 1,655 genera and 3,305 species. About two thousand of the birds (1,050 species) are mounted and on exhibition. Included in the collection is a small number of alcoholic specimens and a quantity of dry skeletal material. There is also a collection of approximately 2,800 sets of eggs and nests.

The collection is arranged according to Wetmore's classification (1934) with the genera and species arranged in accordance with Peters (as far as published, 1931-7) and Sharpe's (1899-1909) lists. The research collection is housed in 92 specially-designed metal-covered cabinets of three sizes, as described by Snyder (1935), in a Bird Room (see accompanying illustration) of 1,850 square feet, especially provided for the purpose in the new fire-proof Museum building, officially opened on October 12, 1933.



View of the Museum's bird room, 1935.

TABLE 1.—Principal Collections of Birds in the R.O.M.Z.

Date acquired	Number of birds	From whom	Description
1913 (Oct.)...	5,000	Biological Museum, Univ. of Toronto	Containing ten major lots as follows, with the date of their receipt: Prior to 1870—about 300 old mounted birds 1891 (Feb.)—104 specimens from Paris Museum 1891 (Oct.)—612 specimens from Dr. J. H. Garnier 1895 (Nov.)—108 skins from Malabar coast, India, from Wm. Boulton 1901 (Oct.)—1,619 specimens from British Museum (Natural History) 1904 (Apr.)—114 Ontario skins from R. T. Anderson 1904 (Nov.)—166 mounted Ontario birds from Lady Gzowski 1911 (Mar.)—546 specimens from J. H. Ames, mostly from Ontario but including 86 skins from British Guiana 1911 (Apr.)—113 mounted Ontario birds from Rev. John Doel 1912 (Jan.)—1,047 Ontario skins from Biological Society of Ontario, including lots from J. Edmonds (390), Dr. W. Brodie (159), W. Metcalfe (141), W. G. A. Brodie (109) and G. E. Atkinson (101).
1914-23.....	736	James Goldie	Skins, including about 200 humming birds
1916 (May) ..	240	F. Norman Beattie	Skins from Guelph, Ont., and Vancouver, B.C.
1916-37.....	172	Toronto Parks Department	Captive birds
1918-37.....	74	Paul Hahn	Including 50 Passenger Pigeons
1919-37.....	5,366	R.O.M.Z. staff	Skins, mostly from Ontario, secured during the Museum's avifaunal survey of the province
1922 (Apr.) ..	1,307	J. E. Keays	Skins, mostly from Middlesex County, Ontario
1923-37.....	668	A. A. Wood	Skins, mostly from Middlesex County, Ontario
1924 (Apr.) ..	1,082	C. B. Garrett	Skins, from Alberta and British Columbia
1924 (May) ..	284	Hubert H. Brown	Skins, mostly from Toronto, Ontario
1924-5.....	181	H. S. Osler	Skins from Anglo-Egyptian Sudan

TABLE 1.—Continued

Date acquired	Number of birds	From whom	Description
1924-5	522	Royal Canadian Institute	Mostly from Toronto, Ontario
1924-37.....	125	Robt. V. Lindsay	Mostly from Frontenac County, Ontario
1924-37.....	206	J. A. Munro	Skins, mostly from British Columbia
1925 (Nov.)..	90	J. A. Varley	Skins, mostly from Toronto, Ontario
1925-37.....	175	Holton B. Haugh	Skins, mostly from Barrie, Ontario
1925-37.....	177	J. H. Fleming	Including 96 hummingbirds
1926 (Feb.)..	220	John Boyd	Skins from southern Ontario
1926 (Mar.)..	133	Major E. H. Pooler	Skins from Ramandrug, India
1926-33.....	809	John Maughan, Jr.	Skins from Toronto, Ontario, and mounted foreign birds
1926-37.....	605	Alfred Kay	Skins from Port Sydney, Ontario
1927-29.....	307	Kenneth Racey	Skins from British Columbia
1928-37.....	207	Dr. C. H. Douglas Clarke	Skins from southern Ontario
1928-37.....	126	Dr. W. Ellis Hurlburt	Captive birds (exotics)
1928-37.....	250	Jack Miner	From Kingsville, Ontario, including 163 hawks and owls
1929-37.....	312	Dr. W. E. Saunders	Casualties from Long Point, Ontario, lighthouse
1929-37.....	682	Clifford E. Hope	Skins, mostly from York and Peel Counties, Ontario
1930 (Mar.)..	145	Dr. W. D. Strong	Skins, mostly from California
1930 (May) ..	481	Dr. A. Brooker Klugh	Skins, mostly from Essex, Wellington and Bruce Counties, Ontario
1930 (June) ..	479	A. Gow Estate	Skins, mostly from Windsor, Ontario
1930-3.....	59	Rev. C. L. W. Bailey	Skins from Lake Harbour, Baffin Island, N.W.T.
1931-7.....	112	Herbert H. Southam	Skins from southern Ontario
1931-7.....	489	Sam Waller	From Lake St. Martin, Manitoba
1931-7.....	383	Arthur C. Twomey	Skins, mostly from Churchill, Man.
1932 (Aug.) ..	450	W. G. A. Lambe	Skins, mostly from southern Ontario
1932-3.....	596	Dr. J. E. H. Kelso	Skins, from British Columbia (397), and Hants, England (199)
1932-7.....	497	Albert C. Lloyd	Skins, mostly (405) from Utah
1932-7.....	57	Reginald V. Whelan	From Cochrane District, Ont.
1933 (June) ..	1,392	Ontario Provincial Museum	Built up through the efforts of C. W. Nash and J. Maughan, Jr., mostly from Toronto but containing 175 skins from Moosonee, Ont., collected by Sam Waller
1933 (Sept.)..	1,345	Col. Reuben Wells Leonard Estate	A generic collection of skins, purchased from W. F. H. Rosenberg
1933-7.....	136	W. Herbert Lunn	Mostly from Prince Edward County, Ontario

TABLE 1.—*Continued*

Date acquired	Number of birds	From whom	Description
1933-7.....	118	R. J. Gill	Captive birds (exotics)
1934-7.....	58	J. B. Robinson	Captive pheasants
1935 (Oct.)...	90	William Owen	Skins, mostly from Toronto, Ont.
1935 (Nov.)...	128	Euphemia Summers	Skins, mostly from Toronto, Ont.
1935-6.....	100	Jean Bodaly	Skins from Angola
1935-7.....	58	Major Allan Brooks	Skins from British Columbia. Major Brooks was also instrumental in obtaining the Strong and Kelso collections (1930-3)
1936 (Sept.)...	232	J. F. S. Fletcher	Skins from Yakutat, Alaska
1936-7.....	135	O. D. Boggs	Skins from Peru and Ecuador
1936-7.....	45	R. G. Ferguson	From Moosonee, Ontario

TABLE 2.—Principal Collections of Birds' Eggs in the R.O.M.Z.

Date acquired	Number of sets	From whom	Description
1913 (Oct.)...	200	Dr. C. K. Clarke	Acquired by the Biological Museum in 1911. Mainly from Frontenac Co., Ontario
1923 (Mar.)...	431	A. A. Wood	Mostly from Middlesex Co., Ontario
1925 (Jan.)...	168	John L. Jackson	Mostly from Toronto, Ontario
1930 (June)...	650	Edwin Beaupre	Mostly from Kingston, Ontario
1936 (Sept.)...	285	F. W. Warwick	Mostly from eastern Canada
1936-7.....	106	O. D. Boggs	Mostly from Peru and Ecuador
1937 (Feb.)...	272	H. V. McIntyre	Mostly from Toronto, Ontario
1937 (May)...	136	Rev. C. J. Young	Mostly from southern Ontario

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This series contains reports of Museum studies, including faunal surveys. Except where otherwise stated the price is twenty-five cents a copy.

1. Faunal Survey of the Lake Nipigon Region, Ontario, by J. R. Dymond, L. L. Snyder and E. B. S. Logier. 58 pages.
2. A Faunal Survey of the Lake Abitibi Region, Ontario, by the staff of the Royal Ontario Museum of Zoology. 46 pages.
3. A Faunal Investigation of King Township, York County, Ontario, by L. L. Snyder and E. B. S. Logier. 42 pages (out of print).
4. A Faunal Investigation of Long Point and Vicinity, Norfolk County, Ontario, by L. L. Snyder and E. B. S. Logier. 120 pages (out of print).
5. Some Account of the Amphibians and Reptiles of British Columbia, by E. B. S. Logier. 26 pages (out of print).
6. A Study of the Sharp-tailed Grouse, by L. L. Snyder. 66 pages.
7. The Passenger Pigeon in Ontario, by Margaret H. Mitchell. Records of the history of the now extinct wild pigeon (*Ectopistes migratorius*) in Ontario. Paper, \$1.00. Cloth, \$1.50.
8. The Distribution of Breeding Birds in Ontario, by James L. Baillie, Jr., and Paul Harrington. 134 pages.
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12. Ontario and its avifauna, by L. L. Snyder, and The museum's bird collection, by J. L. Baillie. 14 pages.





