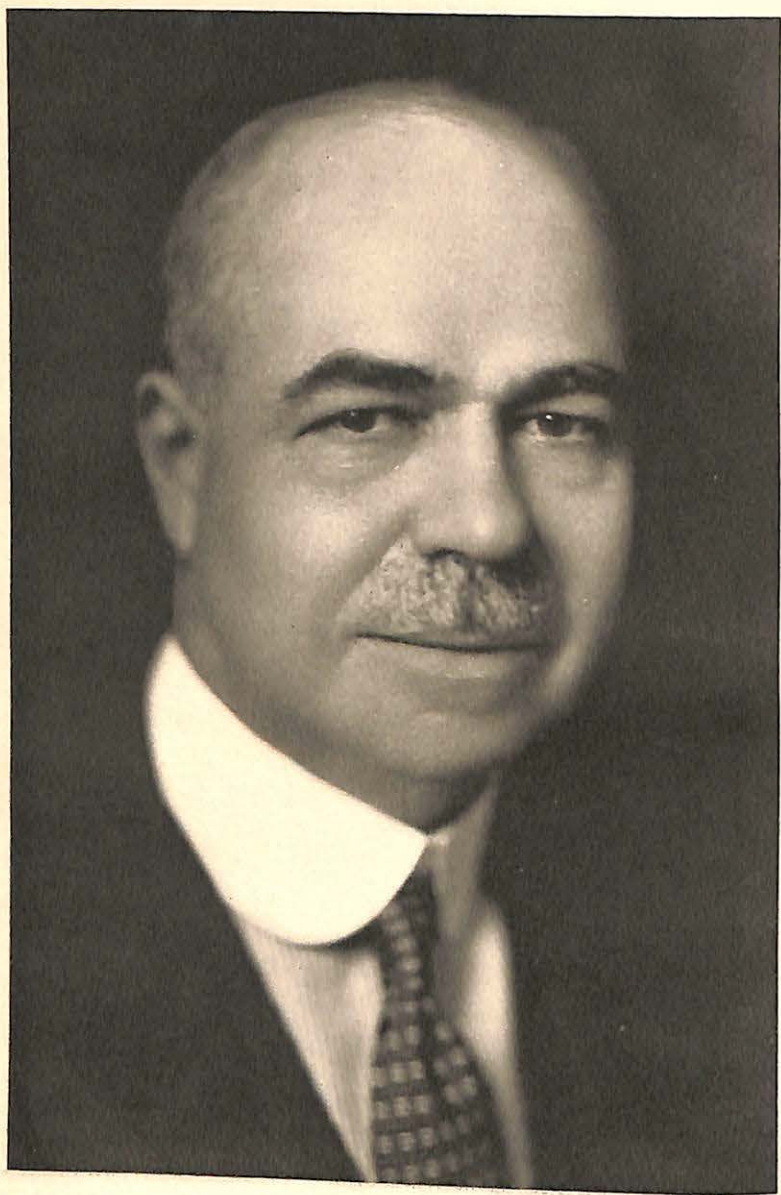


**Annals of Museum of Natural History**  
**University of Minnesota**  
1872-1939



*James F. Belle*

Annals  
of the  
Museum of Natural History

UNIVERSITY OF MINNESOTA

1872-1939



By THOMAS S. ROBERTS, M.D., Director



MINNEAPOLIS, MINNESOTA

1939

## PREFACE

In addition to the brief history of the Zoological Museum during the first forty-three years of its existence, to be found in the Introduction, this volume contains the annual or biennial reports of the Museum of Natural History which were submitted to the president regularly after 1918. All of these have been printed, either in full or in abbreviated form, in the president's reports and several have been issued separately as museum bulletins. Assembling all this scattered material thus in a single volume seemed to be the most satisfactory way of presenting an outline history of the museum and a ready source of reference.

During the first seventeen years of the museum, Professor N. H. Winchell, as director of the Geological and Natural History Survey, was curator of the museum, and the collections were largely geological, paleontological, and anthropological. During the next thirty years Professor H. F. Nachtrieb was in charge. During the last twenty years Dr. Thomas S. Roberts has been director.

The "Log" has been prepared to accentuate outstanding events in the museum's progress.

The illustrations in this volume are introduced to show the range and character of the exhibition work of the museum. Detailed descriptions of the major exhibits are given in the text. For reference to these consult the Index.

The portrait of Professor Winchell is from an original photograph that hangs in Pillsbury Hall, in the office of Dr. Emmons, who kindly permitted it to be copied for use in this connection.

## JAMES F. BELL

Mr. James F. Bell has been an active and liberal patron of the University of Minnesota Museum of Natural History since 1915. His generous and continued support has made possible the present museum and now he has contributed the major part of the sum necessary for the erection of a museum building, which will be ready for occupancy in 1939.

Mr. Bell was born in Philadelphia, Pennsylvania, on August 16, 1879, the son of James S. Bell and Sallie Montgomery O'Neil Ford Bell. He spent his boyhood in and around Philadelphia and came to Minneapolis with his parents in 1888. He is a graduate of the University of Minnesota, receiving the degree of bachelor of science in 1901. The same year he became connected with the Washburn-Crosby Milling Company, later succeeding his father as president. When the Washburn-Crosby Company became a subsidiary of General Mills, Inc., the largest merchant flour-milling company in the world, he served as its president from 1925 to 1934, and is now chairman of the board of directors. He also holds various other important business positions.

During the World War, Mr. Bell was chairman of the Milling Division of the United States Food Administration, with headquarters both in New York and Washington, and, in company with Mr. Hoover, was abroad for several months on a mission connected with the Food Administration. In recognition of his services he was given the Decoration of the Legion of Honor by France, and the Order of the Crown by Belgium.

In addition to his many exacting and time-consuming business connections, Mr. Bell has always maintained a keen and helpful interest in the cultural arts. He has been a liberal supporter of the Minneapolis Institute of Arts.

In 1939 Mr. Bell was elected a member of the Board of Regents of the University of Minnesota.

In 1936 Mr. Bell received the following testimonial from Sigma Xi:

James Ford Bell, Alumnus of the University of Minnesota, patron of arts and sciences, and citizen extraordinary of this state—for his ever active interest in the natural sciences and for his generous support given their advancement—the Minnesota Chapter of the Society of the Sigma Xi gratefully presents this testimonial of appreciation.

Mr. Bell has always been an ardent outdoor man, especially fond of hunting, including the pursuit of big game, as far afield as Alaska and Newfoundland. For some years he has been actively interested in the propagation and scientific study of wild ducks at an elaborately equipped plant on the south shore of Lake Manitoba in Canada. A natural result of this lifelong love of out-of-door things has been Mr. Bell's interest in the developing and perfecting of our Museum of Natural History.

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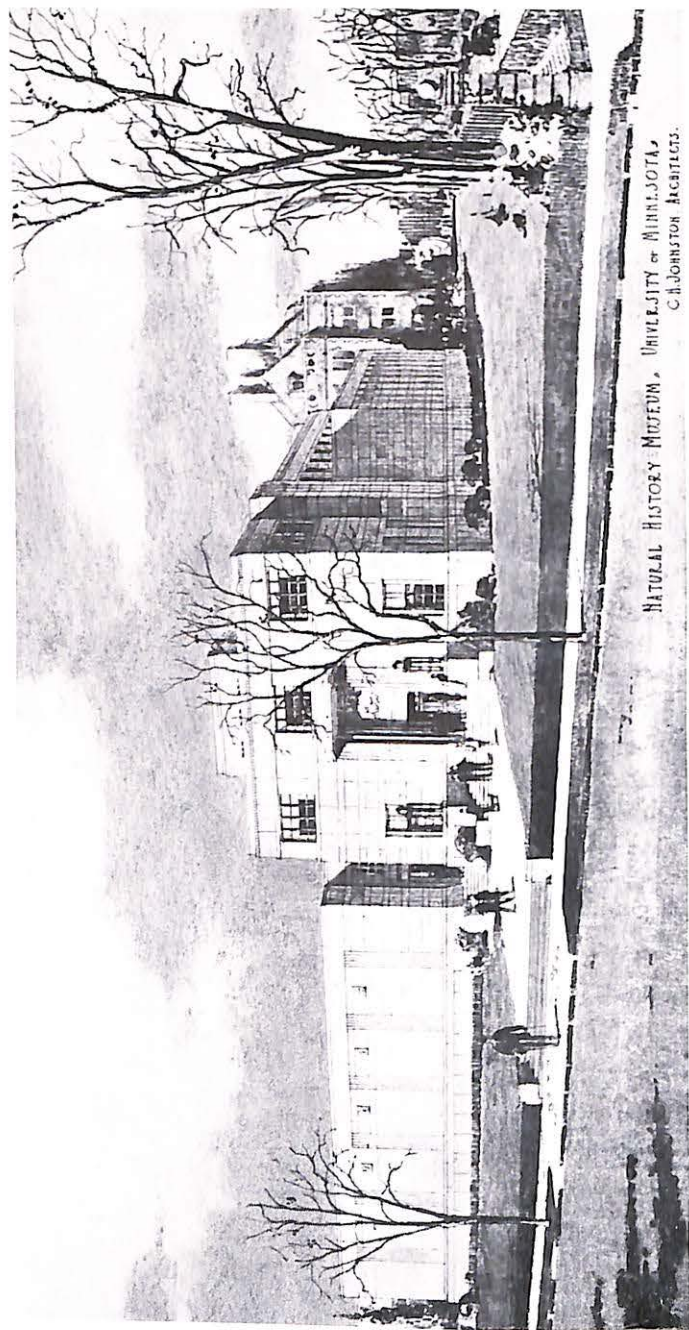
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Architect's elevation of the new Museum of Natural History. Auditorium on the left.

## INTRODUCTION

My earliest acquaintance with the Museum of Natural History of the University of Minnesota was in the fall of 1877, when I entered the University as a freshman. It was then contained in a single north room on an upper floor of the Main Building—the building later known as the "Old Main." There were a few large mammals, mounted by Ward, standing about the room, and two cases of birds mounted by C. L. Herrick, but the collection consisted mainly of geological material, as might be expected with Professor N. H. Winchell at the head. The room was full to overflowing.

The bill creating the old Geological and Natural History Survey, drawn by Dr. W. W. Folwell, was passed by the state legislature in 1872. It contained a section directing, in full detail, that a museum should be established and maintained at the University. The first three reports by Professor Winchell, the director of the survey, for 1872, 1873, and 1874 contain no special mention of a museum. But in the Fourth Report, for 1875, a separate section is devoted to a "Report of the General Museum," containing the collection of the Geological and Natural History Survey for 1875, and the question of a museum is taken up and discussed, and the section of the law relating to this function of the survey is quoted in full. The legislature is asked to appropriate \$1,000 for beginning this work. Rather surprisingly the statement is made that "Prior to the commencement of the Geological and Natural History Survey there was a nucleus of a museum already in existence in the University. This comprised a variety of objects, many from the state of Minnesota, and others from foreign localities." Of just what this collection consisted and where it was placed is not stated. It would be interesting to know.

This 1875 report states, also, that a room had been set aside in the Main and that cases were under construction. Mammals, collected in the Black Hills by the Custer Expedition, were sent to Ward, of Rochester, to be mounted and were awaiting being placed on exhibition. They consisted of two antelopes, male and female, a deer with young, an elk head, a badger, a grizzly bear with young, a weasel, and a large moose killed in eastern Otter Tail County in December, 1874. There had been purchased from Ward a large series of plaster casts of prehistoric animals ranging from man to Protozoa. These cost \$1,500 and it is interesting to see that then, as now, the generous citizens of the city contributed part of the money. The list of eighteen names contains leading business and professional men of Minneapolis.<sup>1</sup>

<sup>1</sup>The list of donors is as follows: Judge E. S. Jones, \$50; Governor John S. Pillsbury, \$150; Hon. L. Butler, \$150; Dr. H. H. Kimball, \$10; R. J. Mendenhall, \$10; Hon. E. M. Wilson, \$10; Hon. R. B. Langdon, \$50; Hon. H. T. Welles, \$50; S. C. Gale, \$25; Chute Brothers, \$10; Judge Isaac Atwater, \$15; D. S. Story, \$5; Jonathan Chase, \$100; Anthony Kelley, \$5; Wyman Elliott, \$5; Thomas Lowry, \$25; Hon. A. M. Reid, \$25; Hon. Paris Gibson, \$25.

## INTRODUCTION

Each succeeding report after 1875 contains a section devoted to the "General Museum." In 1877 reference is made to two cases of birds collected and mounted by C. L. Herrick, who was acting as assistant on the survey and was specially interested in the museum.

By the following year another room had been assigned to the museum and the geological and mineralogical specimens were moved into it, and the mounting of the *megatherium* cast—part of the Ward purchase—was begun. This left the north room free for the zoological collection. It was known as the "north" room—the other as the "south" room.

In the Ninth Report, for 1880, after brief reference to the progress of the museum a full list of zoological specimens is given. The number of each class of specimens is as follows:

Mounted specimens (mostly birds).....	147
Skins (mostly birds and small mammals).....	309
Alcoholic (marine fish and invertebrates from United States National Museum, and a few fish and reptiles from Minnesota) .....	383
Dry specimens .....	44
Total .....	883

From 1881 to 1883, inclusive, the activities of the museum seem to have centered entirely on the geological section. Mr. C. L. Herrick, who had devoted a large part of his time to the museum, left July 1, 1881, to go abroad to study at Leipzig.

An interesting item is that in 1884 the survey sent a considerable portion of the museum's exhibition collection to the New Orleans Industrial and Centennial Exposition at New Orleans, Louisiana. Besides geological, botanical, and various other exhibits, there went fifty-seven mounted mammals and birds, including the moose, deer, bears, antelopes, and larger birds. Dr. Winchell remarks that this resulted in the museum being reduced to a chaotic condition for some time. It is probable that this forth and back moving had something to do with the later poor condition of the specimens.

The material loaned to New Orleans came back in June, 1885. The two museum rooms were by this time so overcrowded that some of the cases and specimens had to be stored in the basement and in the Coliseum.

In the survey report for 1885 there is, besides the usual catalogue of geological material added to the museum, a list of accessions to the Zoological Museum. These number 715, mostly birds and mammals, many of them collected and mounted by William Howling, an East-side taxidermist of that time. One of the additions listed was an albino buffalo calf, presented by the Honorable John S. Pillsbury. Many of these specimens, including the white buffalo, are still in the present museum.

## INTRODUCTION

In the Report for 1886 Professor Winchell states, "Rooms are not large enough to accommodate any further displays. It is hoped earnestly that ere long the Museum may be removed to better quarters with ample accommodation."

This hope was realized in the summer of 1889, when the museum and "all the paraphernalia of the Survey" were moved from the Main to the new Science Hall—to be known later as Pillsbury Hall. The building was not entirely finished when the moving began, and a fire that originated in the basement of the building in December greatly delayed operations, and it was not until February, 1890, that order was finally restored.

After C. L. Herrick left he was followed by Oscar W. Oestlund, upon whom devolved the task of moving the museum from the Main Building. This was accomplished with the aid of a group of students. A considerable part of the undertaking was the taking down of the big *megatherium* cast, repairing it, and reassembling it in the new location. For several years Mr. Oestlund devoted much of his time to the museum and the original accession catalogue has many entries in his handwriting. It is still in use to-day. Others who worked in the museum at a later date were Dr. John C. Brown and Dr. Frederick W. Sardison, the latter in the geological section.

It was at this time that the Geological and Natural History Survey was divided into three lines of activity—geological, zoological, and botanical. All three activities were housed in Pillsbury Hall. The Zoological Division was assigned to Professor Henry F. Nachtrieb. The Zoological Museum was installed in a large room at the east end of the third floor where the Geological Museum is at present. Here it remained until it was removed to the Animal Biology, now known as the Zoology, Building in 1916.

Conditions did not permit of any considerable addition to the mounted collection during this period, but important additions to the study collection of birds were made. The Thomas S. Roberts collection of some 2,000 skins was donated; the Albert Lano collection of 1,565 skins was purchased in 1912; the Franklin Benner collection of 635 skins was donated; and smaller collections were received from Robert S. Williams, George R. Folds, and Dr. J. C. Hvoslef. For a time the major part of this study collection of birds was cared for in a rented room in the Handicraft Guild on Tenth Street below Nicollet Avenue. In 1915 the entire study collection was assembled in a basement room in the Institute of Anatomy on the Main campus, where it remained until the new building was ready in 1916.

The year 1917 was a critical one in the life of the museum. During the spring of that year instructions were received from the comptroller's office to abandon further efforts to construct a museum. As activities up to that time had been maintained almost entirely by

## INTRODUCTION

donations from a group of interested citizens who had been assured of continued progress with university support later, these instructions were not followed. A further subscription fund was raised and the museum continued as before.

And now the museum, as a whole, is about to be removed from its present location to a new building which will be its permanent home, provided largely through the generosity of Mr. James F. Bell. It will henceforth be known as the Minnesota Museum of Natural History in accordance with, and carrying out the instructions of, the bill passed by the legislature in 1872.

THOMAS S. ROBERTS

## Log of the Museum of Natural History, University of Minnesota

### FOR THE YEAR 1872

Bill passed by legislature establishing the Geological and Natural History Survey of the state and a museum, Professor N. H. Winchell as director.

### FOR THE YEAR 1875

Active work begun on the museum in Main Building.

### FOR THE YEAR 1889

Museum moved to Science Hall (Pillsbury Hall).

### FOR THE YEAR 1890

Survey separated into Geological, Zoological, and Botanical Divisions. H. F. Nachtrieb assumed charge of the Zoological Division including the Zoological Museum.

### FOR THE YEAR 1915

May 6—Thomas S. Roberts, M.D., appointed by the Board of Regents as associate curator of the Zoological Museum and professor of ornithology in the Department of Animal Biology, Henry F. Nachtrieb being superior officer in the museum.

July—Bird-skin collection installed in circular room in basement of Anatomy Building.

Aug. 14—Dr. Roberts' personal library moved to the University and settled in two rooms of Dr. J. E. Moore's suite in Millard Hall, as there was no room provided in Pillsbury Hall.

Oct. 5—Miss Densmore, of Red Wing, began as part-time assistant in associate curator's office.

Nov. 6—Jenness Richardson came as museum taxidermist.

### FOR THE YEAR 1916

Jan. 12—Conference in President Vincent's office about survey and museum matters. Present: President Vincent, and Professors Emmons, Clements, Nachtrieb, and Roberts. Result, no hope of getting funds for the museum from further land sales.

Feb. 3—Course in ornithology, offered by the Department of Animal Biology, taken over by the museum under Dr. Roberts. (This has continued to be given by the museum ever since.)

Feb. 23—First medium-sized cases for bird and mammal groups ordered from Brockway.

Mar. 11—New Animal Biology Building inspected by Nachtrieb and Roberts, and office rooms, bird room, etc., selected. Building in the "raw" state.

May 26—Library moved from Millard Hall and bird-study collection from Anatomy Building to new Animal Biology Building.

May 28—First motion pictures taken.

Sept. 1—Office moved from Millard Hall to new Animal Biology Building.

Sept. 19—President Vincent at Animal Biology Building to settle various details about changes in basement rooms—motion-picture room, etc.

Sept. 26—James F. Bell and Frederick G. Atkinson at museum to settle certain details about the Deer Group.

Oct. 30—Motion-picture machine installed in basement lecture-room—gift from James F. Bell.

## LOG OF MUSEUM OF NATURAL HISTORY

Oct. 30—Committee meeting in Dr. Emmons' room, Pillsbury Hall, to consider survey and museum matters. Present: Dean Johnston, and Professors Emmons, Clements, Nachtrieb, and Roberts. The museum is at present a part of the Department of Animal Biology.

### Publication

*Winter Bird Life of Minnesota (Occasional Papers No. 1)*, by Thomas S. Roberts.

### Field Work

At Cass Lake, Lake of the Woods, Heron Lake, and in Rock County.

### Groups Completed

*Large*.—Caribou Group, built in 1911, now moved from Pillsbury Hall to Animal Biology Building late in the year.

*Medium-sized*.—Chickadee; Snow Bunting and Redpoll. Work on these was mostly done in the basement of the Anatomy Building where the taxidermist's shop was located before moving to the Animal Biology Building.

## FOR THE YEAR 1917

Jan. 31—James F. Bell and Frederick G. Atkinson visited the museum to inspect work on the Deer Group.

June 4—James F. Bell at the museum.

Aug. 1—Charles A. Corwin finished the background for the Beaver Group.

Aug. 14—Two young live beavers, donated by Carlos Avery, received and placed in outside tank.

Aug. 29—Dr. E. W. Nelson, chief of the United States Biological Survey, and Dr. T. Gilbert Pearson, of the National Association of Audubon Societies, visited the museum.

Dec. 2—First Sunday afternoon museum party—invited group.

Dec. 9—Second Sunday afternoon museum party—invited group. (These parties were not a success as the building was not warm enough and they were given up.)

Dec. 28—James F. Bell at the museum.

### Field Work

In Itasca Park, collecting material for the Beaver Group.

### Groups Completed

*Large*.—White-tailed Deer and White Mountain or Dall's Sheep Groups. The background for the latter was painted in Chicago from photographs and was at first hung in one of the spaces in the upper hall, before it was decided to place the group downstairs. The room in which it was finally installed was made by cutting off part of a large room, the whole of which was intended as a taxidermist's shop.

*Medium-sized*.—Chipmunk; Red Squirrel.

## JANUARY 1, 1918 TO OCTOBER 31, 1918

Apr. 12 to May 10—Series of Friday afternoon lectures in the lower lecture-room to members of the Minneapolis Audubon Club, the university bird class, and outsiders.

June 27—Fred B. Snyder, president of the Board of Regents, visited the museum.



NEWTON HORACE WINCHELL  
Director 1872-1889

## LOG OF MUSEUM OF NATURAL HISTORY

### *Groups Completed*

*Medium-sized.*—Passenger Pigeon; Yellow Warbler. Both finished in the fall.

### OCTOBER 31, 1918 TO JUNE 30, 1919

- Dec. 9—Conference with President Burton in his office in regard to museum affairs, chiefly financial. Agreed to a budget for the museum during the next fiscal year—the first allowed for the museum, which, up to this time, had operated on funds donated by outside parties.  
Dec. 26—James F. Bell at the museum.

### *Publication*

May—*Review of the Ornithology of Minnesota*, by Thomas S. Roberts.

### *Field Work*

At Heron Lake.

### *Groups Completed*

*Large.*—Beaver.  
*Medium-sized.*—Blackburnian Warbler; Scarlet Tanager; Sparrow Hawk.

### JUNE 30, 1919 TO JUNE 30, 1920

- July 1—Museum separated from the Animal Biology Department and became an independent college of the University. First budget established for the museum.  
Sept. 1—Charles P. Phillips came as museum aid.

### *Groups Completed*

*Medium-sized.*—Double-crested Cormorant; Spotted Sandpiper.

### JUNE 30, 1920 TO JUNE 30, 1921

- Oct. 12—Louis Agassiz Fuertes painted birds in the background of the Heron Lake Group.  
Oct. 13—Dr. Frank M. Chapman and Mr. Fuertes gave an evening lecture at the museum.  
Jan., Feb., Mar.—Sunday afternoon lecture course inaugurated. Museum open Sunday afternoons for the first time.  
Apr. 20—Dr. J. C. Hvoslef's diaries presented to the museum by his widow—57 volumes.  
May 1—Charles P. Phillips left the museum.  
June 1—William Kilgore, Jr., came as curator of the museum.

### *Publication*

*Water Birds of Minnesota*, by Thomas S. Roberts.

### *Field Work*

In Itasca Park, late summer and early fall.

### JUNE 30, 1921 TO JUNE 30, 1922

- Oct. 17—Shell collection—10,000 specimens—donated by Mrs. A. W. Abbott.  
Spring—Lectures to public school classes became a considerable part of the museum's activities.  
Wild-flower painting exhibit installed in upper hall.

LOG OF MUSEUM OF NATURAL HISTORY

*Field Work*

In Isanti, Cook, Hennepin, and Ramsey counties, and Itasca Park.

*Groups Completed*

*Large.*—Heron Lake Group.

*Medium-sized.*—Kingfisher and Bank Swallow.

JUNE 30, 1922 TO JUNE 30, 1923

Feb. 28—Beebe's *Monograph of the Pheasants*, donated by Russell M. Bennett.

*Field Work*

In Isanti, Lake, Cook, Koochiching, Pine, Hennepin, and Ramsey counties.

*Groups Completed*

*Medium-sized.*—Nashville Warbler.

*Small, portable.*—Baltimore Oriole; Barn Swallow; Bobolink; Goldfinch; Kingbird; Least Flycatcher; Meadowlark; Migrant Shrike; Red-eyed Vireo; Red-headed Woodpecker; Robin; Tyrant Lizard (*Tyrannosaurus rex*); Warbling Vireo.

JUNE 30, 1923 TO JUNE 30, 1924

Dec.—R. Bruce Horsfall came from Washington to paint the background for the Bear Group.

*Field Work*

In Itasca, Koochiching, Isanti, Pipestone, Lincoln, Traverse, Grant, and Big Stone counties.

*Groups Completed*

*Medium-sized.*—Willow Thrush.

*Small, portable.*—Chipping Sparrow; Crested Flycatcher; Minnesota Blackbirds; Minnesota Sparrows; Minnesota Warblers (two cases); Parula Warbler; Savannah Sparrow; White-throated Sparrow; Yellow-throated Vireo; Plumage changes in some Minnesota birds.

JUNE 30, 1924 TO JUNE 30, 1925

Dec. 19—Upper lecture-room equipped with booth and motion-picture projector, the latter by donated funds.

*Field Work*

In Grant, Traverse, Lac qui Parle, Fillmore, and Houston counties, and North Dakota.

*Groups Completed*

*Medium-sized.*—Mourning Dove; Ring-necked Pheasant; Ruffed Grouse.

*Small, portable.*—Bluebird; Blue Jay; Brewer's Blackbird; Chestnut-sided Warbler; Cottontail Rabbit; Downy Woodpecker; Gray Squirrel, normal, white (albino), and black (melanotic) phases; Great Gray and Saw-whet Owls; Horned Lark; Humming-bird; Oven-bird; Robin; Snow-shoe Rabbit; Song Sparrow; Vesper Sparrow; winter birds (two cases).

JUNE 30, 1925 TO JUNE 30, 1926

Oct.—R. Bruce Horsfall painted the background for the Pipestone Prairie Group.

Apr. 15—Jenness Richardson resigned as preparator.

—Phillips' *A Natural History of the Ducks* presented to the museum by Franklin M. Crosby, Jr.



HENRY FRANCIS NACHTRIEB  
Director 1889-1919

## LOG OF MUSEUM OF NATURAL HISTORY

### *Field Work*

In St. Louis and Pipestone counties, and North Dakota.

### *Groups Completed*

*Large.*—Black Bear.

JUNE 30, 1926 TO JUNE 30, 1927

July 1—Walter J. Breckenridge came as museum preparator.  
Jan. 23, Feb. 6, Mar. 27—Sunday afternoon lectures sponsored by the museum given in the auditorium of Music Hall—first series.

### *Publication*

*Occasional Papers No. 2*—four radio talks.

### *Field Work*

In Isanti, Hennepin, and Ramsey counties, and on the north shore of Lake Superior.

### *Groups Completed*

*Small, portable.*—Cliff Swallow; Golden-eye; Killdeer; Snowy Owl.

JUNE 30, 1927 TO JUNE 30, 1928

Oct.—Minneapolis public schools began taking small portable groups.  
Jan. 6—Name of museum changed from Zoological Museum to Museum of Natural History.  
Jan. 20—An original double elephant folio edition of John James Audubon's *The Birds of America*—four volumes—donated to the museum by the heirs of Mr. W. O. Winston.

### *Field Work*

In Otter Tail county, Red River Valley, and on the north shore of Lake Superior.

### *Groups Completed*

*Large.*—Pipestone Prairie Group.  
*Small, portable.*—Florida Gallinule; Lesser Scaup; Pocket Gopher; Striped Gopher; Warblers; Windpipes of Swans and Cranes.

JUNE 30, 1928 TO JUNE 30, 1930

Sept. 12—Arthur H. Bulbulian came to the preparation department.  
Sept. 20—Oliver V. Jones' collection of eggs donated, containing a nest, egg, and adult of the Passenger Pigeon.  
—Sunday afternoon lectures in Music Hall discontinued after 1930.

### *Field Work*

In Cook, Pine, Itasca, Kittson, McLeod, Pipestone, Lincoln, and Goodhue counties.

### *Groups Completed*

*Medium-sized.*—Duck Hawk.  
*Small, portable.*—Baltimore Oriole; Bank Swallow; Black Tern; Buffle-head; Cedar and Bohemian Waxwings; Cooper's Hawk; Coot; Crow; Crow and Raven; Flicker; House Wren; Minnesota Moths; Monarch Butterfly; Polyphemus Moth; Polypody Fern; Rose-breasted Grosbeak; Ruddy Duck; Scarlet Tanager; Snow Goose; Sora; Spotted Sandpiper; Stegosaurus; Triceratops; Wood Duck; Yellow Warbler.

LOG OF MUSEUM OF NATURAL HISTORY

JUNE 30, 1930 TO JUNE 30, 1932

May, 1931—James F. Bell offered \$125,000 toward a new museum building if the state would duplicate the amount. This the legislature did not do and the offer was withdrawn.

June 1, 1932—Arthur H. Bulbulian resigned from the preparation department.

*Publications*

Fall, 1930—*Occasional Papers No. 3.*

June 1, 1932—*The Birds of Minnesota*, by Thomas S. Roberts.

*Field Work*

In Anoka, Pine, and St. Louis counties, north shore of Lake Superior, and across northern boundary of state to Red River Valley.

*Groups Completed*

*Medium-sized.*—Least Bittern; Sharp-tailed Grouse; Spruce Grouse.

*Small, portable.*—Barn Owl; Blue Goose; Blue-winged Teal; Canvas-back; Chickadee; Chipmunk; Deer horns (shedding and re-growth); Gray Squirrel; Herring Gull; Hooded Merganser; Humming-bird; Junco; Mallard; Phoebe; Pied-billed Grebe; Pitcher Plant; Red-tailed Hawk; Red-winged Blackbird; Shoveler; White-footed Mouse; Yellow-bellied Sapsucker.

JUNE 30, 1932 TO JUNE 30, 1934

—Original water-color paintings for *The Birds of Minnesota* placed on exhibition in wall-case on third floor.

Jan. 12, 1933—Miss Constance Everett gave twenty new cases for study collection.

Mar. 2, 1933—E. S. Stebbins' large egg collection donated.

*Publication*

Fall, 1932—*Manual for the Identification of the Birds of Minnesota and Neighboring States*, by Thomas S. Roberts.

*Field Work*

Mr. Breckenridge accompanied Dr. Robert G. Green to Hudson Bay region.

*Groups Completed*

*Medium-sized.*—Bob-white; Porcupine; Prairie Chicken (nuptial display); Striped Skunk; Woodcock; Woodchuck.

*Small, portable.*—American Merganser; Broad-winged Hawk; Brown Thrasher; carnivorous mammals' skulls; Common Tern; Humming-bird and Hawk Moth; Martin; Meadow Mouse; Muskrat; Nighthawk; Passenger Pigeon and Mourning Dove; Ruffed Grouse; Short-billed Marsh Wren; Snow-shoe Rabbit; Snowy Owl; Sparrow Hawk; Weasel; Wilson's Snipe; Woodcock.

*Special groups.*—Osprey; three beneficial Hawks.

JUNE 30, 1934 TO JUNE 30, 1936

*Publications*

Sept., 1934—*Bird Portraits in Color*, by Thomas S. Roberts.

Spring, 1936—Second edition of the *Manual for the Identification of the Birds of Minnesota and Neighboring States*, by Thomas S. Roberts.

*Field Work*

In Hennepin and Ramsey counties; in northern Minnesota, studying caribou in winter of 1934-35.



THOMAS SADLER ROBERTS  
Director 1919-

## LOG OF MUSEUM OF NATURAL HISTORY

### *Groups Completed*

*Medium-sized.*—Mink; Muskrat; Pileated Woodpecker; Screech Owl; Spotted Skunk.

*Small, portable.*—Black-banded Skink; Bull Snake; Catbird; foreign Butterflies; Fox Snake; Garter and Red-bellied Snakes; Hog-nosed Snake; Lesser Yellow-legs and Stilt Sandpiper; Minnesota Butterflies; Mole; Orchard Oriole; Pectoral and Least Sandpipers; Redstart; Salamanders; Sharp-shinned Hawk; Yellow-headed Blackbird; Yellow Warbler.

*Special groups.*—Adélie Penguin. Large case showing plumage changes, migration, adaptation (external structure) of birds, and food of certain raptorial birds.

JUNE 30, 1936 TO JUNE 30, 1938

Mar. 15, 1938—Miss Constance Everett presented a set, complete to date, of *Macrolepidoptera of the World*, 14 bound volumes.

### *Publications*

Oct. 1, 1936—Revised second edition of *The Birds of Minnesota*, by Thomas S. Roberts.

Spring, 1938—*Logbook of Minnesota Bird Life 1917-1937*, by Thomas S. Roberts.

### *Field Work*

In Traverse and Big Stone counties (photographing geese), Hennepin and Ramsey counties.

### *Groups Completed*

*Medium-sized.*—Franklin's Ground-squirrel; Goshawk; Red Fox; Snow-shoe Rabbit; Wood Duck.

*Small, portable.*—Albino Mallard and Ruddy Ducks; Banded Rattlesnake; Blue Racer; Bob-white; Chambered Nautilus; Milk-snake; Minnesota Bats; Prairie Marsh Wren; Water Snake; Wilson's Phalarope.

JUNE 30, 1938 TO JUNE 30, 1939

Nov. 1938—Excavation begun for new museum building which is being erected with funds provided by Mr. James F. Bell, supplemented by Public Works Administration.

Museum of Natural History

University of Minnesota

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ANNUAL REPORTS TO THE PRESIDENT



Fig. 1.—Group of School Children with Teacher listening to a  
Lecture before the Beaver Group

*Dr. George E. Vincent,  
61 Broadway, New York City, New York<sup>1</sup>*

February 4, 1918

MY DEAR DR. VINCENT:

In compliance with your request, that I prepare for your annual report a statement in regard to the activities of the Zoological Museum and Survey since my official connection with the work, I take pleasure in submitting the following outline sketch for the consideration of yourself and the Board of Regents, to whom it has been the custom in the past to refer survey matters.

<sup>1</sup> When this statement was submitted for President Vincent's final report he had already left the University of Minnesota, to head the Rockefeller Educational Foundation in New York City.

## ANNALS OF MUSEUM OF NATURAL HISTORY

*Preamble.*—The purpose of the Zoological Division of the Geological and Natural History Survey is to make a thorough investigation of the animal life of the state, both from the economic and the purely scientific standpoints. Such surveys have been made by many of the other states and the results are of great material and educational value to the commonwealths. This work is only in its incipiency in Minnesota. The Geological and Botanical Divisions of the survey have taken precedence and their work has reached an advanced stage. The original legislative act, creating the survey and making the Board of Regents of the University responsible for its execution, directed that the geology and botany of the state receive first consideration. It is now full time that the zoology receive the active attention that it deserves.

The Zoological Museum is the depository of the material results of the Zoological Survey. It, and the published reports of the survey activities, constitute the evidence and guarantee to the public of what is being done. The collections gathered in the museum should first and foremost represent the animal life and resources of our own state. Aside from the portions reserved for special study, these collections should be so placed that they are freely open to the entire public, and so presented that they are of the fullest educational value. In addition to its exhibits the museum should reach the whole people through lectures, loan collections, correspondence, and in all other possible ways. The Survey Bill, drawn by Dr. W. W. Folwell in 1872, specifically directed that a natural history museum be established and that it should be developed along such lines. Now, after the lapse of forty-six years, the wisdom and foresight displayed in the drafting of this bill is made the more apparent by reason of the growing recognition of the indispensable part that modern museums of all kinds play in the formal education and the enlightenment of people generally. Argument is scarcely needed as to the wisdom of carrying out the provisions of the bill. Ways and means are the only questions.

The subject of the Zoological Museum and Survey, as they exist at present, may perhaps be more clearly and tersely considered under separate heads.

### ZOOLOGICAL MUSEUM

*Former museum.*—In connection with the work of the survey a considerable zoological museum was assembled and installed, first by Professor N. H. Winchell in a room on the third floor of the old Main Building, and later by Professor H. F. Nachtrieb in Pillsbury Hall. Birds, especially, were fairly well represented and there was also a number of large mammals. Space was limited, and with the subsequent crowding that took place it was impossible to display the collection satisfactorily. The Caribou Group, presented by Mr James F. Bell, was originally placed in these contracted quarters.



Fig. 2.—Woodland Caribou Group. Presented by James F. Bell. Background by Charles A. Corwin. Constructed by Charles E. Brandler. (See page 6.)

## ANNALS OF MUSEUM OF NATURAL HISTORY

*Present museum.*—When, in the summer and fall of 1916, the transfer was made to the new quarters in the Animal Biology Building<sup>2</sup> it was found necessary to destroy much of the bird and mammal collections, as the old methods of preservation, combined with inadequate means of protection, had led to irremediable deterioration. Most of this material had served its natural lifetime. Many of the birds that had been under cover were saved and cleaned, and are in storage awaiting cases for displaying them. The serviceable portions of the Philippine Island collection, acquired from the Minnesota Academy of Natural Sciences, are also in storage. The alcoholic collection of the old museum, consisting of fish, batrachians, and reptiles, is stored in the basement. The entomological collection belonging to the survey is in Professor O. W. Oestlund's hands and needs new cases to display it properly. A considerable portion of these collections, especially the birds and small mammals, can be used, when cases are provided, as the basis of mounted synoptical displays, which have a special educational value. But in modernizing an old museum these things, stuffed and preserved in the unattractive and inadequate manner of former years, must be given a secondary place, and provisions accorded the much more realistic and artistic products of the methods of to-day.

*Habitat groups.*—A habitat group is an assemblage of plants or animals, or both, exhibited amid surroundings made to resemble as nearly as possible the natural environments under which they live. The products of the painter, the artificer and the artist-taxidermist, and real accessories collected in the field, all combine to accomplish the results. If well and skilfully done, the whole produces the same mental picture as a look into nature itself.

Thanks to the interest and generosity of a few friends, the museum has been able to make a notable beginning in this direction. There are already on exhibition in the Animal Biology Building three large groups of this description, each installed by itself in a room specially constructed for the purpose. The background canvases were painted by Mr. Charles A. Corwin of Chicago, a well-known artist in this kind of work. The groups were constructed by Mr. Charles E. Brandler of Milwaukee and are fully the equal of those in the larger eastern museums. Each represents a construction cost of about \$3,000. They are as follows:

*Woodland Caribou Group.*—Presented by Mr. James F. Bell in 1911. Formerly in Pillsbury Hall; removed to Room 20, Animal Biology Building late in 1916.

*White Mountain or Dall's Sheep Group.*—Presented by Mr. James F. Bell in the name of his father, the late Mr. James S. Bell. But recently completed and opened to the public in Room 18.

<sup>2</sup> Now known as the Zoology Building.



Fig. 3.—White Mountain or Dall's Sheep Group. Presented by James F. Bell. Background by Charles A. Corwin. Constructed by Charles E. Brandler. (See page 6.)

*White-tailed or Virginia Deer Group.*—Presented by Mr. Frederick G. Atkinson. Completed in the early summer of 1917. A beautiful group of our native deer. In Room D on the third floor.

There are also four smaller habitat groups as follows: Chickadee Group, Room 20; Snow Bunting and Redpoll Group, Room 20; Red Squirrel Group, third floor; Chipmunk Group, third floor.

The cases for these groups were presented by Mr. James F. Bell. The groups were constructed by the museum taxidermist, Mr. Jenness Richardson. The glass backgrounds are photographic enlargements, colored in oil and illuminated by diffused transmitted electric light.

Two other groups are well advanced in course of construction:

*Beaver Group.*—A large group representing a scene in Itasca Park, being installed in one of the four spaces provided for groups on the third floor. It promises to be a most attractive and instructive exhibit of one of our native animals that arouses the interest and admiration of nearly everyone. The cost is being paid out of the Donation Fund.<sup>3</sup>

*Passenger Pigeon Group.*—A smaller group that will include a genuine nest, the single egg, and a beautiful pair of this now extinct bird. The cost is being paid by Dr. Thomas S. Roberts.

A small collection of horns has been mounted on shields and hung on the walls on the third floor. Among them is a series illustrating the shedding and re-growth of the horns of our common deer.

In the absence of cases for exhibiting mounted birds, series of bird skins are being shown in flat cases on the third floor, for the instruction of the students and visitors. These include seasonal collections, species of special interest, etc.

*Study collections: Birds.*—The museum possesses a collection of between 4,000 and 5,000 bird skins. Fifteen hundred specimens representing the Lano Collection were purchased by the University several years ago and the remainder have been donated by various persons at different times and include the private collections of Thomas S. Roberts and Franklin Benner. This collection is used by teachers, students, and others, and also in connection with the annual course in ornithology offered by the Department of Animal Biology.

*Birds' eggs.*—There is a fairly representative collection of the eggs of our native birds, consisting chiefly of the private collections of Messrs. Benner and Roberts. These have been classified and arranged through the volunteer services of Mr. William Kilgore, Jr.

*Mammals.*—A beginning has been made toward a study collection of mammal skins, which is under the immediate care of Dr. C. E. Johnson, who makes use of the collection in his course in mammalogy.

<sup>3</sup> Largely by Thomas S. Roberts.

*Insects.*—As stated above, the survey collection of insects is in the care of Professor Oestlund and is used by him in the entomology courses. If suitable cases could be secured these could be satisfactorily displayed in the museum.

*Other collections.*—There is a fair collection of skeletons and alcoholic specimens, belonging partly to the museum and partly to the Department of Animal Biology, that is available for study and class purposes.

*Publications.*—During the past three years only a single publication has been issued by the Zoological Division of the survey—an illustrated pamphlet of twenty pages on the *Winter Bird Life of Minnesota*. Several short magazine articles, chiefly on birds, have appeared with credit given to the survey as the source of the material.

*Accessions.*—In addition to the groups mentioned, 261 specimens have been received by the museum from Minnesota donors. These were almost entirely birds and small mammals. The most considerable gift was 123 bird skins from Mr. Dan Smith of Excelsior. An accession catalogue has been kept, wherein every gift is described in detail and credited to the donor.

*Photography.*—(a) Negatives: During the past three years 547 negatives, dealing with natural-history subjects, have been added to a private collection of some 2,000 brought to the museum by Dr. Thomas S. Roberts.

(b) Slides: There is at this date a library of 1,002 lantern-slides, most of them hand-colored, belonging to the museum. Seven hundred and seventy-six of these constituted the private collection of Dr. Roberts and may now be considered as a part of the museum's educational resources. Of the remainder, 222 have been made from negatives taken during the past three years, two were presented by Dr. Ned L. Huff of the Botanical Department, and two by Professor J. P. Wentling of the Forestry School. These 226 slides have been carefully colored by Miss Clara K. Carney, the museum assistant.

(c) Motion-picture film: About 3,500 feet of motion-picture film have been taken during the past two years by Mr. Jenness Richardson and Dr. Roberts for the museum. This is chiefly ornithological. About 2,500 feet have been printed and are in frequent use for lecture purposes. By request, copies of certain portions have been furnished at the cost of printing to the American Museum of Natural History in New York City, the National Association of Audubon Societies, and the United States Department of Agriculture.

A new Power's motion-picture projection machine was installed in the basement lecture-room of the Biology Building in the fall of 1916. This was provided by Mr. James F. Bell and has made possible the many entertainments that have been given in the museum.

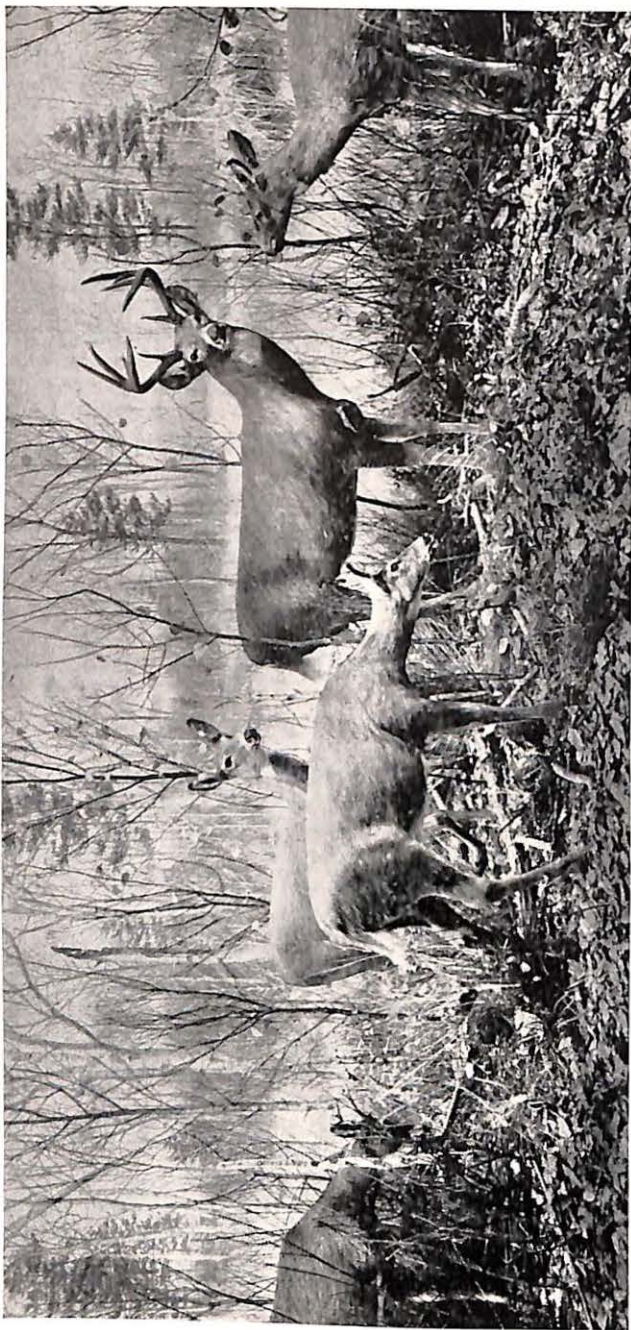


Fig. 4.—White-tailed Deer Group. Presented by Frederick G. Atkinson. Background by Charles A. Corwin. Constructed by Charles E. Brandler. (See page 8.)

## ANNALS OF MUSEUM OF NATURAL HISTORY

*Lectures.*—Forty-two lectures, under the auspices of the Zoological Museum, have been given by Dr. Roberts. Twenty-one of these were given in the museum lecture-room, six in the public schools of Minneapolis and St. Paul, one at Hutchinson, one at the Glen Lake School for Boys, one in the regular course of university scientific lectures, one at the Agricultural School auditorium, and the remainder before various clubs and societies. These were almost all on ornithological subjects and for the most part were illustrated by lantern-slides and motion-picture films. Dr. C. E. Johnson, of the Department of Animal Biology, was associated on two occasions, exhibiting the big-game films taken by him in the northern part of the state. These films are at present the property of Mr. James F. Bell and Dr. Johnson and are not controlled by the Zoological Museum.<sup>1</sup> The National Association of Audubon Societies loaned to the museum, for several months, three reels illustrating the wonderful bird life on the Florida and Gulf coasts. These were shown to several thousand children and adults in the public schools and at the museum.

*Aquarium.*—The aquarium in the basement is an especially attractive adjunct to the museum. It is under the direct control of Professor H. F. Nachtrieb and is the property of the Department of Animal Biology and not of the museum.

*Attendance.*—Considering the limited exhibits, there has been a surprising number of visitors to the museum but an accurate count has not been possible. Groups of school children, accompanied by teachers, from all grades have appeared, including even kindergarten classes. There have also been many out-of-town visitors, and everything possible has been done to make them welcome. Frequently they have been accompanied about the building and short talks have been given upon the groups and the various other features of the museum. Students from all departments of the University take great interest in the exhibits and the work in progress.

Two live beavers, living in an outside pool beside the building, have proved a great attraction to a large number of people. They were presented to the museum in August, 1917, by Mr. Carlos Avery.

*Correspondence.*—A considerable correspondence has been maintained with residents throughout the state, chiefly in regard to birds. Assistance has been rendered in the identification of specimens and the revision of lists submitted, in supplying references to literature, and in a variety of other directions. Incidentally this correspondence has brought frequent donations to the museum and a considerable fund of information in regard to the wild life of our state.

<sup>1</sup> Later these films came into the possession of the museum through the generosity of Mr. Bell.

## FIELD WORK

Only a rather limited amount of field work has been done during the past three years, as the resources at hand would not permit any extensive operations. What effort has been made has been directed largely to ornithological investigation in various parts of the state, with attention centering chiefly on photographic work and on securing material for museum groups. The work done was distributed by years as follows:

1915.—During June and July, four weeks were spent in the field, divided between Lake Mille Lacs, Isanti County, and Lake of the Woods. The bird life of these localities was investigated and much new information was obtained. Also many photographs were taken from which lantern-slides have been made for lecture purposes.

1916.—In January Mr. Richardson, who began work as museum taxidermist in November, 1915, was sent to Isanti County to obtain material for winter groups. The Chickadee and the Snow Bunting-Redpoll groups were the result. Other material then obtained has not yet been worked up. During June Mr. Richardson and Dr. Roberts spent three weeks in Rock County and at Heron Lake, Jackson County, securing specimens, photographs, and motion pictures, and studying the bird life of the localities visited. July was spent at Cass Lake studying the bird life, collecting specimens of birds and mammals, making photographs, and securing material for small habitat groups. The Red Squirrel and Chipmunk groups, with their exquisite north-woods environment, resulted. Material for several other similar groups awaits development. Assistance was rendered on this trip by Mr. Lawrence L. Lofstrom of Cambridge, Minnesota, and Mr. William Kilgore, Jr., of Minneapolis. A very complete record was made of the summer birds of the region, containing some new and interesting features in regard to the geographical distribution of our bird life.

A short trip was made in mid-July to Lake of the Woods to secure motion pictures of the Cormorants on Gull Rock, and material for a habitat group of these birds. This group still awaits construction.

1917.—After securing some excellent motion-picture films of bird life in the vicinity of Minneapolis, Mr. Richardson and Dr. Roberts went to Itasca State Park on June 16. Nine weeks in all were spent in the park during the summer and early fall, studying the remarkable beaver conditions that have developed there since the stocking of the park in 1901. The materials for the large Beaver Group, being constructed in the museum, were collected at this time. Seven beavers were secured and all the necessary accessories for the group were brought out of the park, this being made possible through the courtesy of Mr. William T. Cox and Mr. Carlos Avery. A large num-

ber of photographs and considerable motion-picture film were taken. The bird and mammal life of the park was studied carefully.

Mr. C. A. Corwin, of Chicago, was with the party for two weeks making sketches for the background of the Beaver Group. Mr. Richardson, of the museum, was in the park for a month, and Mr. William Kilgore, Jr., of Minneapolis, acted as volunteer assistant for two weeks. The outcome of this expedition was especially profitable both in collections and in interesting and instructive lecture material.

## FINANCES

No appropriations for the support of the Zoological Survey or Museum have been made of late years, and the former revenue from the sale of survey lands has now ceased. So this work is, at present, without direct financial support from the state. During the nearly three years that I have been officially connected with the survey and museum, the University, through the kind offices of President Vincent, has placed to its credit with the purchasing agent a total of \$400 to be expended in the purchase of minor equipment and office supplies. The expense of moving the Caribou Group from Pillsbury Hall to the Animal Biology Building, amounting to \$200, was paid by the University. Some necessary alterations in the rooms containing the large groups, and in the motion-picture lecture-room in the basement, were also borne by the University. The cost of constructing three large storage cases for the Lano Collection of birds was provided by the Department of Animal Biology. Other than these items, no expenditures have been made from university budgets.

The source of the money used for maintenance, construction, photography, field work, publications, postage, etc., has been private donations. To January 1, 1918, these donations have amounted in all to \$6,406.03, with several hundred dollars additional paid out for incidental and field expenses by the associate curator and not entered on the books. Direct contributions have been made by the following persons: James F. Bell, Mrs. George H. Christian, George H. Partridge, W. J. Mayo, C. H. Mayo, F. M. Prince, E. N. Osborne, George W. Porter, R. M. Bennett, R. R. Rand, A. T. Rand, John S. Pillsbury, A. F. Pillsbury, F. B. Snyder, T. B. Janney, A. S. Brooks, C. D. Velie, C. C. Bovey, H. V. Jones, E. C. Gale, Earle Brown, J. D. McMillan, C. C. Webber, H. E. Partridge, Frank W. Commons, Howard W. Commons, W. O. Winston, and T. S. Roberts. The individual donations have ranged from \$50 to \$1,100. This financial aid has been secured largely through the personal efforts of Mr. James F. Bell and Mr. George H. Partridge. The largest items of expense have been the maintenance of a museum taxidermist and a general office and museum assistant. A carefully itemized record has been kept and separate vouchers have been taken for all disbursements from this fund.

## SUGGESTIONS

May I take the liberty of making the following suggestions, which, perhaps, more than any attempt to advise, are the expression of my hopes and aspirations for the future of the work in hand.

1. Assuming that the Zoological Survey with its museum is to be accorded the right to exist and to take its place among the educational and economic forces of the state, then it is necessary that some suitable provision be made as soon as possible for its support. State money is not needed and should not be spent for the large and expensive exhibits. These can be readily secured as donations to the full extent of our capacity. What is required is a reasonable appropriation for maintenance, equipment, minor exhibits, additions to collections and lecture material, publications, and field work. It is hardly to be expected that the museum can be maintained for any considerable length of time on donations alone.

2. The Zoological Survey and Museum should not be considered as an integral part of the Department of Animal Biology, but rather, so far as its support and operation are concerned, as an independent charge of the Board of Regents. This is in accordance with the legislative act creating the survey in 1872. The museum should, however, be affiliated as closely as may be with the Animal Biology Department, as its collections and activities are a valuable adjunct to much of the work of that department.

3. If it is possible, a specific appropriation for the survey should be obtained from the legislature and maintained as a separate budget, the several divisions of the survey receiving their share according to their needs.

4. In order that better and more diversified work may be done and that there may be a fuller understanding of its position, purposes, and activities by all concerned, especially the general public, it would seem advisable that the museum should have a separate organization composed of a board of supervisors, directors, or trustees, and a designated museum staff. The board of supervisors should, of course, act under the Board of Regents. It would seem best that such a museum board should be composed largely of representative citizens of the state, who have agreed or will agree to take an interest in the affairs of the museum. The formation of such a board was authorized by the Board of Regents some time ago but no further action in the matter was ever taken. The museum staff would probably be made up largely of members of the Department of Animal Biology, but others should be eligible.

Such an organization would undoubtedly place the museum in its proper relation to the state at large, would broaden its scope, would be an appeal to the public, and would be the first step toward the great general state museum of natural history that will most certainly appear upon the campus of the University in years to come.

5. Would it not be wise for the Board of Regents to re-establish the Survey Committee that existed for so many years? It seems reasonable to believe that a small group of men could better acquaint themselves with the peculiar needs and problems of such a department than could the entire board.

6. The museum should get into closer touch with the schools of the state. Lectures constitute one way, but a better one would be through the construction of small portable groups. Almost everything can be objectively and incisively taught in this way. The Field Museum of Natural History, Chicago, through its Harris Public School Extension Department, has made a great success along this line. It can be carried out in a smaller way anywhere, and would be one of the most profitable and instructive activities in which our museum could engage.

7. Attention may be called to the fact that in any comprehensive field work that the Zoological Survey may be able to undertake, collaboration with the appropriate national bureau in Washington could be readily obtained if desired. In this way the effectiveness of appropriations would be increased at least twofold, thus permitting a much broader scope in the work planned. Also the assistance of specially trained men would be available, both in the field and in working up the collections.

Respectfully submitted,

THOMAS S. ROBERTS, *Associate Curator,*  
*Zoological Survey and Museum*



Fig. 5.—Detail from Caribou Group



Fig. 6.—Yellow Warbler Group with two-storied nest. (See page 17.)

*To the President of the University:*

SIR: I have the honor to submit to you and the Board of Regents the following report of the condition and the activities of the Museum of the Zoological Division of the Geological and Natural History Survey of Minnesota for the period from January 1 to October 31, 1918. A full report, covering the entire time of my active connection with the survey and museum to January 1, 1918, was forwarded to Dr. George E. Vincent in New York at his request, a copy of which was placed in your hands.

MUSEUM

*Exhibits.*—Work has been continued uninterruptedly by the museum taxidermist, Mr. Jenness Richardson, on the large Beaver Group being installed on the third floor of the Animal Biology Building. Mr. Rubins, of this city, has been employed to finish the background painting, which was unavoidably left incomplete by Mr. Corwin. This group is now almost ready for final assembling and will unquestionably be a remarkably attractive and valuable addition to the museum. Both because it depicts a real and novel scene in Itasca

State Park and because the beaver is an animal that historically and in itself interests so many people, this exhibit, we are sure, will attract the special attention of a large number of visitors.

The Passenger Pigeon Group, referred to in the last report, is now completed. It consists of a beautiful pair of these now extinct birds, with a genuine nest and egg, displayed in their natural surroundings. So far as can be learned this exhibit is unique of its kind.

A small group, containing a pair of Yellow Warblers and a two-storied nest, shows the manner in which this bird buries the eggs of the parasitic Cowbird. This has just been finished and is on exhibition in a special case.

*Accessions.*—No considerable donations have been received. Gifts of valuable material have been declined as there is no way of properly caring for them with the present lack of funds for providing display cases or safe storage. Mr. C. M. Loring, of Minneapolis, presented to the museum last spring a large section of bark from a redwood tree, containing many acorns imbedded there by the California Woodpecker. It is on exhibition in the bird-study room. A very large and fine specimen of beaver-cutting has recently been received from Itasca Park through the kindness of Professor John H. Wentling of the Forestry School. It will be an interesting exhibit in connection with the Beaver Group.

*Publications.*—Nothing, except occasional articles by the associate curator in periodicals, has been published as coming from the museum. A paper, entitled *A Review of the Ornithology of Minnesota*, by Thomas S. Roberts, is now ready for the printer and has been accepted for publication by the Editorial Board of the Graduate School in the Current Problem Series. It would be of great advantage to have zoological papers appear as frequently as possible as museum publications. An original plan to issue a regular bulletin has never been realized because of lack of funds to support it. Such a publication could be made an aid in the development of the museum.

*Photography.*—(a) *Negatives:* About 500 glass-plate negatives have been added to the museum collection since January 1. About fifty of these were made in the field. The remainder are from various published sources and were made by the associate curator in the course of assembling illustrative material for lecture purposes.

(b) *Slides:* Between 400 and 500 slides have been made and almost all of them have been colored by the museum assistant, Miss Clara K. Carney. These are of permanent value in the lectures given to the classes in ornithology and in illustrating public lectures.

(c) *Motion-picture film:* The associate curator has taken for the museum 1,233 feet of motion-picture film during the past summer. This is all illustrative of wild bird life and adds several new features to the reels already on hand.

*Lectures.*—A course of twelve lectures on the general subject of ornithology and four on the bird life of Minnesota were given by the associate curator during the spring months in the small lecture-room in the basement of the Animal Biology Building. These were illustrated with slides and motion pictures and were open to the general public. The attendance varied from thirty-five to seventy-five. An illustrated lecture was given before the Game Association in St. Paul and one before the Audubon Club of Minneapolis.

*Attendance.*—An increasing number of adults and school children visit the museum, rarely an afternoon passing that there are not a number of people in the building studying the exhibits. If the building could be open on holidays and Sunday afternoons there would be a large attendance even with the present limited display.

*Correspondence.*—A continuous correspondence has been maintained with a large number of people throughout the state who are interested in natural history and who appeal to the museum for information and the identification of specimens.

*Live beavers.*—The two live beavers presented to the museum by Mr. Carlos Avery, game and fish commissioner, and mentioned in the last report, are still doing well in the outdoor pool and are a never-ending source of interest and study to hundreds of school children and adults. They have grown to nearly full size and have constructed a large lodge exactly like those found in the northern wilds.

#### FIELD WORK

With the exception of occasional short trips in the vicinity of Minneapolis for photographic purposes, no field work was done during the past summer. This was in part because of the necessity of conserving funds on hand for museum maintenance.

#### FINANCES

With the exception of a small credit at the university storehouse for incidentals, the support of the museum during the present period has been, as in the past, from voluntary contribution. A monthly check for \$50 has been received from Mr. James F. Bell, and the sum of \$1,390.95 has been contributed by the associate curator toward the cost of the Beaver Group since January 1 last. A check for \$50.12 was received from Mr. Russell M. Bennett on January 9, 1918, to pay for an electric motor to be used in operating a tanning plant in process of construction in the basement of the building. One of the two large drums necessary for this plant has been donated by Mr. Franklin M. Crosby, Sr. This motor and the drum have been installed by the University at the expense of the museum fund but could not be used at present, even if needed, as the room is in use by the Department of Botany.

The Passenger Pigeon Group, referred to above, was paid for by the associate curator.

The considerable expense incident to the construction of the Beaver Group is being paid out of the museum fund, this course being considered allowable as the fund is a donated one. In the opinion of the associate curator, money provided by the state should not be used to install these large, expensive groups. Such exhibits should and can be secured as gifts from interested public-spirited citizens.

The services of a museum and office assistant have been dispensed with since July 1 when Miss Carney left to enter federal service at Washington. The only paid employee of the museum at present is the taxidermist, Mr. Richardson, who is receiving a salary of \$125 a month, but is entitled to at least \$150 that men of his ability are paid elsewhere.

The Museum Donation Fund contains, at the present date, a balance of \$706.95, deposited in the First National Bank of Minneapolis to the credit of Thos. S. Roberts, Trustee. A considerable portion of this amount will be required to finish the Beaver Group.

Following is a copy of a budget submitted through the dean of the College of Science, Literature, and the Arts, indicating the minimum amount that is needed to properly maintain and conduct the museum each year for the next two years. This amount will not provide a salary for the associate curator, nor cases for exhibiting a synoptical collection of mounted birds and mammals of the state as was planned. But since, under present crowded conditions, there is no space available for such a display this is not a requirement at this time.

#### ESTIMATE FOR ANNUAL BUDGET

Taxidermist's salary .....	\$1,800
General museum and office assistant .....	1,000
Publication, printing, etc. ....	700
Additional metal cases for storing specimens .....	300
Six display cases for installing small groups .....	500
Photography, field work, and incidental museum supplies .....	1,000
<b>Total .....</b>	<b>\$5,300</b>

This amount is needed as an annual budget for the maintenance of the Zoological Museum of the Geological and Natural History Survey of Minnesota. An amount nearly equal to this, received as donations, has been expended during the last two years.

The further development of the museum seems to be absolutely dependent upon securing a maintenance fund from the state. During the past three years, donations have been secured with the understanding that a temporary necessity existed. It will be difficult, if not impossible, to continue this means of support and it would be most unfortunate to suspend operations at this time when so much

ANNALS OF MUSEUM OF NATURAL HISTORY

has been accomplished and so much has been given in good faith by generous and disinterested friends of the University. It is suggested that any fund provided should be specified as a separate budget for the use of the Museum of the Zoological Survey, and not as an item of the budget of the Animal Biology Department of the University. The Zoological Museum is an activity of the State Zoological Survey rather than of the Department of Animal Biology.

Respectfully submitted,  
THOMAS S. ROBERTS, *Associate Curator*



Fig. 7.—Detail from Black Bear Group



Fig. 8.—Double-crested Cormorant Group. (See page 27.)

*To the President of the University:*

SIR: I have the honor to submit the following report of the condition and the activities of the Zoological Survey and Museum for the period from October 31, 1918 to June 30, 1919. My last report terminated with October 31, 1918.

MUSEUM

*Exhibits.*—The chief event since the last report has been the completion of the Itasca Park Beaver Group about April 1. With the exception of the background painting, the entire work in all its details has been done by the museum taxidermist, Mr. Jenness Richardson, some fifteen months being required for its construction. The background was painted by Mr. Charles A. Corwin of Chicago, with necessary additions and changes by Mr. H. W. Rubins of Minneapolis at the time this group was finally assembled. This group may be considered one of the best, if not the best, of its kind in this country, and has already attracted the attention and received the praise of a large number of visitors both from the city and abroad. It has been the special interest and admiration of many groups of children from the schools of the city.

ANNALS OF MUSEUM OF NATURAL HISTORY

Several small bird groups have been installed in separate cases and are on exhibition on the third floor of the building. They are designed to show the nesting habits of the smaller species of our native birds. The exhibits recently completed contain the Sparrow Hawk, Scarlet Tanager, and Blackburnian Warbler. A group nearly finished will depict the manner of nesting of the Double-crested Cormorant on Gull Rock, Lake of the Woods. The material for these groups was collected in the summer of 1917.

It is planned to construct during the coming year a large group, the size of the Beaver Group, showing the marsh and aquatic bird life of one of the most famous wild-bird resorts in our state, Heron Lake. This will make possible the display in their natural environment of a large number of birds little known to most people—even to many bird students. Also it will serve to perpetuate in lasting form another characteristic and widely known locality in Minnesota. This is one of the secondary, but by no means inconsiderable, features of these large habitat groups, in which is maintained as close an adherence as possible to reality.

*Accessions.*—Donations of material for the museum have not been numerous and have not been especially encouraged for reasons stated in the last report. Specimens have been received as follows:

Professor W. A. Riley, Farm School.....	1 Whistling Swan (in flesh)
Mr. J. A. Stillwell, Itasca Park.....	1 young beaver (in flesh)
Mr. H. J. Johnson, Le Sueur Center.....	1 albino pocket gopher (in flesh)
Mr. H. J. Jager, Owatonna.....	5 nestling Snow Geese and 1 young Black Duck (in flesh)
Miss Lulu E. Wagner, Moorhead.....	1 Ruby-throated Humming-bird (in flesh)
Mr. P. O. Fryklund, Badger.....	2 Magpies taken in Minnesota (mounted)

*Publications.*—The only publications appearing as from the museum have been several bird articles in periodicals and a small booklet entitled *A Review of the Ornithology of Minnesota* by the associate curator. The latter was issued in May, and the expense of publication was borne by the Research Committee of the Graduate School of the University. Another paper of some length on the *Water Birds of Minnesota; Past and Present* has been prepared by the associate curator and will appear shortly in the biennial report of the game and fish commissioner.

*Photography.*—Very little photographic material has been added during the last eight months. A few lantern-slides from negatives on hand and a few new negatives for lecture purposes are about all.

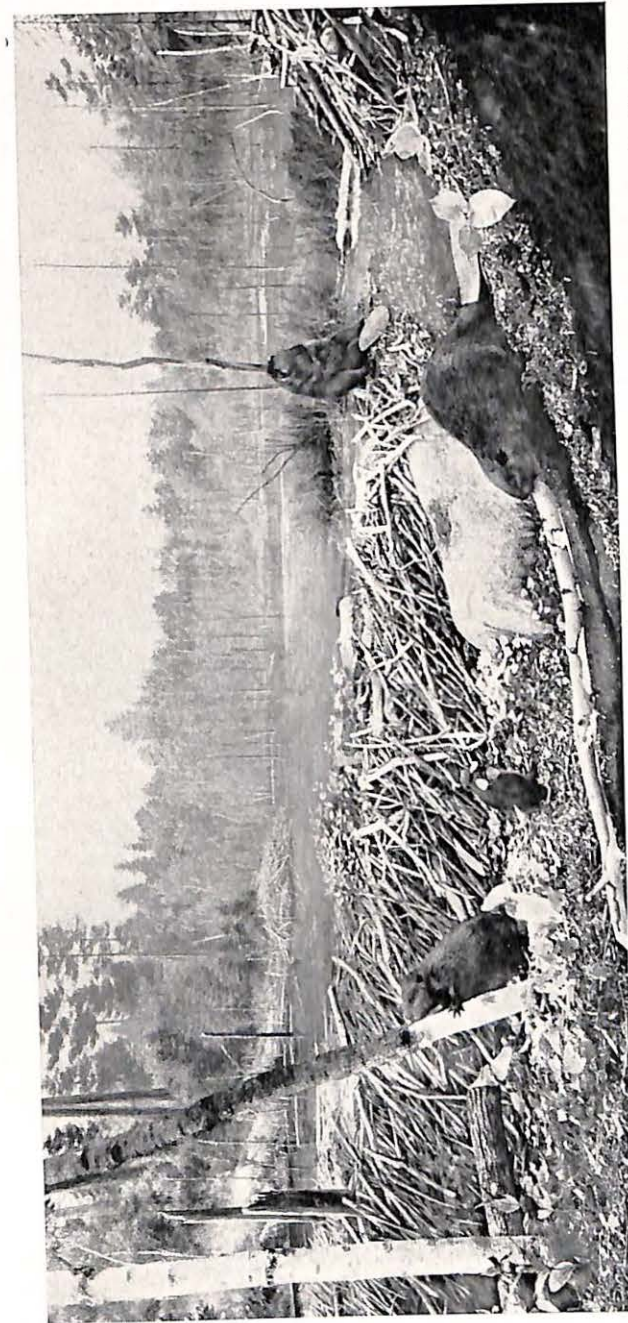


Fig 9.—Beaver Group. Background by Charles A. Corwin. Constructed by Jenness Richardson. (See pages 8, 12, 21.)

*Lectures.*—Seven illustrated bird lectures have been given in various places by the associate curator, and two field trips have been conducted with pupils from Northrop School.

*Attendance.*—The attendance at the museum has steadily increased and a considerable number of visitors from outside the city are attracted by the exhibits. Every possible attention is shown to all comers and, whenever opportunity offers, groups and individuals are accompanied through the building and the exhibits are explained. It is hoped that a plan to have the building open and warmed on holidays, and to have a competent attendant present, may be realized during the coming winter. This will attract to the museum many who cannot come under the present conditions.

*Correspondence.*—The usual correspondence with residents in various parts of the state and others in regard to natural-history matters has been conducted from the museum.

*Live beavers.*—The two live beavers are still in the outside pool by the building, are doing well, and continue to attract as much attention as formerly.

#### FIELD WORK

The only important field work done during the period covered by this report was a trip to Heron Lake to collect material for the large group referred to above. This work was done mainly in the month of June by Mr. Richardson with some assistance from the associate curator. The courteous co-operation of Mr. Avery, game and fish commissioner, was accorded us in this work. The material obtained comprised some seventy bird skins, nests and eggs, and the needed accessories, all of which were shipped to the museum and there await the beginning of construction in September.

The field work done in connection with the university class in ornithology, conducted by the associate curator, resulted as usual in securing a considerable number of records for the museum files.

#### FINANCES

As heretofore the work of the museum during the past eight months has been carried on with donated funds, aside from the sum of \$200 made available by the University as a storehouse budget. Mr. J. F. Bell has continued his generous contribution of \$50 monthly and \$842.06 was donated by the associate curator. The chief expenses have been the salary of the taxidermist—\$125 a month—and the completing of the Beaver Group. The associate curator dispensed with office help during this period. The balance remaining in the Museum Donation Fund on June 30, 1919, was \$237.31, deposited in the First and Security National Bank to the credit of Thos. S. Roberts, Trustee.

The expense of the Heron Lake Group, aside from the taxidermist's salary, has been subscribed by several business men of Minneapolis, who have already generously aided the work of the museum in the past.

The recent allotment to the Zoological Survey and Museum by the University of the sum of \$5,500 for maintenance and salaries during the coming year is of importance in more ways than one. It puts the work for the first time on an official basis, keeps faith with the men who have supported the museum up to the present time, and relieves numerous trying embarrassments.

Respectfully submitted,

THOMAS S. ROBERTS, *Associate Curator*



Fig 10.—Detail from Pipestone Prairie Group



Fig. 11.—Spotted Sandpiper Group. (See page 27.)

*To the President of the University:*

SIR: I have the honor to submit the following report of the condition and activities of the Zoological Survey and Museum for the year ending June 30, 1920. July 1 the status of the museum was established as a separate college of the University, responsible directly to the president and the Board of Regents, which has simplified and facilitated the work of the museum.

On September 1, Mr. Charles P. Phillips of Minneapolis, a former student in the University, began work as museum assistant. His duties are to help with the office routine, to assist in lecture work and with the university class in ornithology, and to look after a portion of the detail in the general conduct of the museum.

MUSEUM

*Exhibits.*—The museum taxidermist, Mr. Jenness Richardson, has been employed most of the time since last September on the Heron Lake Bird Group mentioned in my last report. This has proved to be more of an undertaking than was expected, largely because of the considerable amount of waxwork required to represent properly the marsh vegetation. Mrs. Richardson has rendered much assistance in the making of this waxwork. The background is being painted by Mr. H. W. Rubins of Minneapolis. When this painting, which is over thirty-two feet in length, is completed the foreground will be quickly assembled and it is expected that the group will be ready for exhi-

bition to the public some time in the fall. The case for this group is an entirely new departure in our museum and follows in the main a design adopted in recent years by the American Museum of Natural History in New York City, the California Academy of Sciences, and elsewhere. The construction, except the front, is of iron and cement with vaulted roof, and the painting is executed directly on the prepared surface of the cement. It is expected that this style of case will add greatly to the effectiveness of the group, as the reflections, from the considerable amount of water surface necessary, prohibited the use of the usual flat, undecorated ceiling.<sup>1</sup>

The Double-crested Cormorant Group was completed and placed on exhibition December last. It accurately represents a nesting scene on Gull or Cormorant Rock, Lake of the Woods. A beautiful little group, showing a pair of Spotted Sandpipers and their nest and eggs amid the natural surroundings, was assembled by the taxidermist during the year. The exquisite waxwork in this group was made by Mrs. Richardson. Seasonal exhibitions of bird skins have been displayed in flat cases in the upper museum hall, and these have been supplemented by a selection of the nests and eggs of some of our native birds. On exhibition on the same floor is a very attractive and valuable collection of the plumes of the Lesser and Black Birds of Paradise, the Egret, and the Goura Pigeon, prepared for millinery purposes. These were donated to the museum through the kind offices of Mr. T. Gilbert Pearson, secretary of the National Association of Audubon Societies, and formed part of a large illegal importation confiscated by the revenue collector at the port of New York.

During the winter there was placed on permanent exhibition, in swinging wall frames, a collection of water-color paintings of Minnesota birds that has long been the property of the survey. It was hoped when these paintings were executed by a Japanese artist, Kako Morita, that they could be reproduced for the benefit of our bird students, but thus far the way has not been opened. This display, augmented by a selection of reproductions of paintings by Louis A. Fuertes, has been studied and much appreciated by many local students of our birds.

Throughout the spring months a wild-flower table, showing the commoner species in bloom in the vicinity of Minneapolis, was maintained in the museum for the instruction of visitors and students. It attracted considerable attention and it is planned to continue it.

In the upper hall was hung a large map of Minnesota on which was indicated, as reports came in, the presence and distribution of winter-visitant birds, and another on which was shown the arrival in the spring of several well-known species.

<sup>1</sup> This type of construction proved to have serious drawbacks and it was discontinued after this group. The American Museum in New York City has, of late years, also abandoned it in favor of canvas or heavy linen pasted on the background.

No plans have been made for the construction of a large habitat group during the coming year, as the present cost of erecting cases and of all materials required is so high that it scarcely seems reasonable to ask for donations of money on the scale that would be required. But material has been collected for making interesting additions to the public exhibits on a less elaborate and costly basis.

*Accessions.*—The donations of specimens to the collection of the museum during the past year have been considerable, but they have gone for the most part into the study collections. They are as follows:

## BY GIFT

Mr. Walter Gantenbein, Diamond Bluff, Wis. ....	1 Groove-billed Ani (mounted)
Mrs. W. E. Albee, Minneapolis .....	1 Orchard Oriole's nest
Mr. Paul A. Brooks, Minneapolis .....	6 sunfish, 2 black bass, 1 catfish (alive for aquarium)
Mr. J. M. Eheim, Hutchinson .....	1 Red-tailed Hawk (in flesh)
Mrs. A. S. Brooks, Minneapolis .....	1 Ruby-throated Humming-bird's nest
Dr. G. H. Luedtke, Fairmont .....	1 White-winged Scoter (in flesh)
Mr. Bernard Bailey, Elk River .....	342 bird skins and 60 sets of birds' eggs
Mr. Alfred Peterson, Pipestone .....	1 Clark's Nutcracker (skin)
Dr. Thomas S. Roberts, Minneapolis .....	109 mammal skins (collection of Bern- ard Bailey); 1 Parasitic Jaeger (mounted)
Mr. Thaddeus Surber, St. Paul .....	7 mammal skins
Mr. Dan Smith, Excelsior .....	1 Long-billed Dowitcher (skin) and 1 Black-crowned Night Heron (skin)
Dr. Charles E. Johnson, University of Kansas .....	30 bird skins collected in Minnesota
Prof. R. N. Chapman, University of Min- nesota .....	20 bird skins collected in Minnesota
Mr. Carlos Avery, St. Paul .....	9 Ducks (in flesh)
Mr. William L. Wolford, Minneapolis .....	26 Humming-bird skins and 12 skins of South American birds
National Association of Audubon Soci- eties, through the secretary, Mr. T. Gilbert Pearson, New York .....	A collection of plumes of Birds of Paradise, Egret, and Gouara
Mr. James F. Bell, Minneapolis .....	2 "dancing" mice (alive) and 3 reels of motion pictures of big game, camp scenes, etc., taken in northern Minnesota by Dr. C. E. Johnson

*Publications.*—The principal publication issued during the year was a pamphlet of thirty-five pages, illustrated with half-tones, on the *Water Birds of Minnesota; Past and Present*. This was prepared by the director<sup>2</sup> from the files of the museum and was published by Mr. Carlos Avery, game and fish commissioner of Minnesota, in his

<sup>2</sup> With the separation of the museum from the Animal Biology Department, as a special college of the University, the title of Dr. Roberts as head of the museum was changed to "Director."

*Biennial Report* for the period ending July 31, 1918. Five hundred copies with a special cover were procured at the expense of the museum and distributed as a museum publication.

A check list of the birds of Minnesota, arranged for recording migration and nesting data, was issued by the museum in February and has been widely distributed to correspondents who, for some time, have been asking for such a list. It has also served an especially useful purpose in the collection of data in regard to the birds of the state from numerous bird students who are in communication with the museum. Copies of the bird-life or faunal map that formed the frontispiece of the *Review of the Ornithology of Minnesota*, published last year, have been printed separately and circulated in a similar manner.

It is hoped that it may be possible during the coming years to issue a series of papers on natural-history subjects for the benefit of the steadily increasing number of nature students in the state.

*Photography.*—About 700 feet of positive from negative motion-picture film made in 1918 have been printed and added to the museum's reels used for lecture purposes. During the month of June, 1920, several hundred feet of new negative were taken by Mr. Richardson and the director in the vicinity of Minneapolis. This is chiefly bird-life and associated subjects. A small number of negatives of natural-history subjects has been added to the museum's collection.

An important addition to the lecture resources is the generous gift by Mr. James F. Bell of the three reels of motion pictures of big-game animals, camp scenes, natural scenery, etc., taken in the wilds of northern Minnesota by Dr. Charles E. Johnson several years ago and heretofore the personal property of Messrs. Bell and Johnson. These are remarkable pictures from several points of view, and are in constant demand for the entertainment of gatherings of sportsmen and nature lovers. The museum is very fortunate to possess them and very grateful to Mr. Bell for this additional evidence of his continued interest in its welfare.

*Co-operation.*—Mr. J. V. Ankeny of the School of Agriculture has been permitted to have, for use in his extension work, a considerable number of slides made from the museum's collection of negatives.

A set of slides, illustrating the bird life of Minnesota, has been assembled in a suitable shipping case and has been sent on request to two high schools in the state—at Hutchinson and Montevideo. This small beginning is expected to expand into a valuable feature of the educational work of the museum. Reels of motion pictures have on several occasions been loaned to Mr. Carlos Avery, game and fish commissioner, to illustrate lectures in various parts of the state, and also on one occasion to Mr. H. J. Jager for use at Owatonna. But generally it is not considered desirable to loan films, as they are liable to serious and expensive damage in the hands of inexperienced

persons. Motion pictures of bird life were shown on April 24 in connection with an exhibition of Maeterlinck's *Blue Bird* given by the Kindergarten Association of the city at the East Lake Street Theater to 1,200 school children. The collection of the museum is constantly in use in teaching the university class in ornithology, and the series of skins are at all times open to the inspection of school teachers and other accredited persons who make application to the director.

The museum lecture-room with its full projection equipment has been used at various times by other departments of the University. It is necessary, however, to exercise some supervision over such use in order to protect the instruments. The lantern and the motion-picture projector are not the property of the University.

*Lectures.*—Thirty-seven illustrated lectures have been given during the year, chiefly by the director—on two or three occasions by Mr. Phillips, museum assistant. Nine of these lectures have been given outside of the museum—one at Cokato and one at Brainerd—the others in the museum lecture-room in the basement of the Animal Biology Building. The majority have been to groups of public-school children accompanied by their teachers, and have invariably been followed by a trip through the museum, with talks on the principal exhibits. The average attendance at the museum lectures has been thirty-five, with a maximum of seventy. The capacity of the room is eighty-four. Outside audiences have numbered as high as 500. Including the 1,200 children who attended the Kindergarten Association exhibition mentioned above, it is estimated that at least 3,667 children and adults have received instruction in natural-history subjects directly through the museum's lecture equipment.

On April 6 Mr. William L. Finley of Portland, Oregon, one of the best-known wild-life photographers and lecturers in the United States, gave a lecture, illustrated with remarkable motion pictures, in the museum lecture-room to an invited audience of about eighty persons. A reception and inspection of the exhibits followed.

*Attendance.*—There has been a very considerable increase in the attendance during the past year. Much of the time of the museum assistant, Mr. Phillips, has been spent in showing groups of visitors through the museum and explaining the exhibits. School children, especially, are in evidence, and many are the compositions that are written afterwards descriptive of these trips. The building is still closed on Sundays and holidays, which greatly lessens the attendance and its educational value to the general public.

*Correspondence.*—Hundreds of inquiries in regard to the natural history of the state and other topics have been answered from the office of the director. The services of a stenographer will soon be required if this important work is to be carried on satisfactorily.

A vigorous attempt was made during the fall and winter to locate as many as possible of the nature students throughout the state and

to affiliate them with the field work of the museum. This met with a fairly satisfactory response, but there is still much to be accomplished in this direction. Large areas of the state are yet without representation. Blanks to be filled in, addressed post-cards, and special inquiries were sent to all who signified a willingness to assist in an effort to obtain information in regard to distribution, migration, and winter visitants, in a survey of the bird life of the state. The returns were even better than expected, and many new and valuable records were obtained for our files. As far as possible this information was displayed on large state maps, hung in one of the museum halls, for the benefit of all interested. Similar maps were also maintained in conspicuous places in Brainerd, Moorhead, Red Wing, and elsewhere, through the co-operation of interested correspondents to whom we furnished the data. Much valuable assistance was rendered in this work by Mr. Carlos Avery, game and fish commissioner, who prepared blanks at our suggestion and organized his wardens as field observers.

A general summary of the winter-visitant records has been prepared by Mr. Phillips for publication in the quarterly bulletin of the game and fish commissioner.

*Live beavers.*—The two live beavers, presented to the museum nearly three years ago by Mr. Carlos Avery, are still flourishing in the outside pool. They are now fully grown and receive much attention from school children and other visitors.

#### FIELD WORK

No field work, other than the taking of motion pictures by the museum staff, has been done during the past year.

The field trips in connection with the university class in ornithology, conducted by the director, resulted in the usual accumulation of data for our files.

#### FINANCES

*University Museum Maintenance Budget.*—A maintenance fund, received this year from the University for the first time, has been expended largely in making much-needed permanent improvements and additions to the museum equipment. The preparation department, under the direction of Mr. Jenness Richardson, has been hampered heretofore by the lack of safe and adequate facilities for storing work, either finished or in course of construction; by the absence of tanks, sinks, etc., for handling skins; and by the want of various tools, supplies, etc. These have been provided and with a few minor additions the department will be well equipped for any kind of work.

The bird-study room has been provided with an iron balcony for half of its length, to secure additional space for storing, in accessible manner, the collection of bird skins, which now numbers between

6,000 and 7,000. Additional Cambridge metallic cabinets of the standard museum pattern have been purchased, and now the entire collection of bird and mammal skins and birds' nests and eggs, which has been in large part boxed and stored in various places in the building, is available for examination and study. The labeling, cataloguing, and indexing of this material is in progress.

In addition to the above, a five-foot metal Multiplex wall-display fixture, small cases for exhibition purposes, motion-picture film and printing same, special student work in the museum, and the ordinary minor running expenses have been paid out of the budget allowed. Certain technicalities prevented charging the cases for the Cormorant and Sparrow Hawk groups to the budget, and these were paid for by the director.

*Museum Donation Fund.*—Mr. James F. Bell has continued his monthly contribution of \$50 throughout the year, which for the present is being added to the Heron Lake Bird Group Fund. In addition the following amounts have been received to be applied to the cost of the Heron Lake Group:

Mr. R. M. Bennett.....	\$500.00
Mr. W. O. Winston.....	500.00
Mr. James F. Bell.....	500.00
Mr. C. D. Velie.....	250.00
Mrs. Louise Koon Velie.....	250.00
Mr. F. A. Chamberlain.....	100.00
Total.....	\$2,100.00
Mr. Bell's monthly contribution of \$50.....	600.00
Total.....	\$2,700.00
Additional contributions:	
Mr. F. W. Commons.....	50.00
Minneapolis Lodge No. 19, A. F. A. M.....	25.00
Total.....	\$2,775.00

This money has been deposited in the First National Bank of Minneapolis to the credit of Thos. S. Roberts, Trustee, and the construction expenses of the Heron Lake Group to date have been paid from it. The balance on hand June 30, 1920, is \$917.31.

#### COMMENTS

On the whole, the year has been one of marked progress for the museum along the lines originally laid out. It is hoped that its value as a live and worth-while educational asset to the University, and through it to the general public, is being established and more and more recognized. More adequate accommodation will have to be provided in the near future, as the museum has already reached the limit of its growth in its present quarters. Valuable and important dona-

tions of material have had to be declined because of the impossibility of properly caring for or displaying them.

The services of a special caretaker or service man are needed to keep the exhibits and rooms in proper condition for the reception of visitors. This work now falls on the janitors of the Animal Biology Building, who are hardly able to cope satisfactorily with the situation.

Attention is again called to the great desirability of keeping the building open and heated, when required, on holidays and Sunday afternoons.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*



Fig. 12.—Detail from Beaver Group



Fig. 13.—Section of Heron Lake Group. (See pages 25, 35, 48.)

To the President of the University:

SIR: I have the honor to submit the following report of the condition and activities of the Zoological Survey and Museum for the year ending June 30, 1921.

#### MUSEUM

The work of the museum has proceeded along the same general lines as heretofore with, however, a marked increase in the lecture service given to school children and the general public so that this feature has, during the past year, outstripped other activities. A conservative estimate, based on the seating capacities of the various auditoriums in which lectures have been given, shows that nearly 7,000 persons have been reached directly in this way. These lectures were all illustrated with motion pictures or slides, chiefly from our own library. A series of Sunday afternoon lectures, given at the museum during the months of January, February, and March, proved very popular and drew audiences that considerably exceeded in some instances the seating capacity of both lecture-rooms combined.

A large part of the time of both the director and his assistant has been devoted to selecting, preparing, and assembling the new lecture material obtained during the year; to meeting the various

engagements for lectures at and away from the museum; and in accompanying the constantly increasing groups of visitors and explaining the exhibits.

In November, the director attended the annual meeting of the American Ornithologists' Union in Washington and took part in the program in the National Museum on November 10, giving a talk entitled *Some Common Birds in Motion Pictures*, presenting reels belonging to the museum. One sequel of this was a request from the Massachusetts Audubon Society for the loan of the films for its spring lecture course in Boston. This was granted. The films were shown to a large audience on April 2 in Symphony Hall, and Mr. Winthrop Packard, secretary of the society, on returning the films expressed himself as follows: "I want to thank you for the great treat which your pictures gave our audience. The Itasca Park film, especially, it seems to me, is admirable—one of the best and most interesting bird films I have seen." This was coupled with an inquiry as to whether the society might be permitted to have a copy made from the negative of the Itasca film. It seemed best to hold this request in abeyance for the present.

Mr. Charles P. Phillips, who had served as museum assistant since September 1, 1919, resigned on May 1, 1921. Mr. William Kilgore, Jr., was appointed in his place and began his duties in the museum on June 1, 1921, with the title "curator." Mr. Jenness Richardson has continued as museum taxidermist and has been reappointed for the ensuing year. Several students have been employed from time to time on an hourly basis to assist in labeling and arranging the study collections.

*Exhibits.*—Work on the large Heron Lake Bird Group has continued throughout the year. It was found impossible to complete it in the time expected, as the magnitude of the task with Mr. Richardson working alone proved much greater than anticipated. However, it is now in the final stage. Mr. H. W. Rubins of this city, has finished painting the background which is a beautiful and artistic picture some thirty-two feet in length by twelve feet in height, with a vaulted sky effect. Mr. Louis Agassiz Fuertes of Ithaca, New York, an artist who is renowned for his bird portraiture, kindly came to Minneapolis in October at the solicitation of the director and painted sixty birds into the background, which will not only add greatly to the beauty and effectiveness of the group but will impart to it a special and historic value in the future. Mr. Fuertes' paintings take first rank among bird artists, and the museum is fortunate in possessing a fine example of his work. Dr. Frank M. Chapman, the Nestor of modern bird groups in America, accompanied Mr. Fuertes and very kindly volunteered much valuable advice.

Mr. Richardson's time being almost entirely occupied with the

Heron Lake Group, no exhibits of any note have been added to the museum during the year.

The winter-visitant bird map and the spring wild-flower table have been maintained as last year, the latter with the very considerable assistance of Dr. Huff and others of the Department of Botany.

*Study collections.*—As will be seen by the list of donated material, some additions have been made to the study collections of birds and mammals, kept in Room 315 on the third floor. These collections are for the use of students both in and out of the University who are specially interested in such subjects and who know how to handle the specimens without injuring them. The birds at present number about 7,000, and the mammals 325. The birds of the state are well represented, but the mammal collection is very deficient and an effort will be made as soon as possible to make it representative of the species found in Minnesota. The collections have been consulted constantly throughout the year by students and teachers, and the bird skins are used in teaching the class in ornithology, though for close study in the latter connection a separate series has been prepared to avoid as far as possible the injury that would result to the main collection from untrained handling.

*Accessions.*—

BY GIFT

Chicago, St. Paul, Minneapolis and Omaha Railroad .....	1 White Pelican (in flesh)
Mr. J. O. Ewing, Minneapolis .....	1 Baldpate Duck (in flesh)
Minnesota Game and Fish Commission .....	1 male Ring-necked Pheasant, 2 Golden-eyed Ducks, 1 Spruce Partridge (in flesh); several lots of live fish for aquarium
Mr. Paul A. Brooks, Minneapolis .....	7 live fish for aquarium
Mr. Lawrence E. King, Minneapolis .....	2 cottontail rabbits with "horns" (in flesh)
Mr. Ernest Kennedy, Minneapolis .....	1 Parakeet (in flesh)
Mr. Alfred Peterson, Pipestone .....	8 Horned Larks and 2 Brewer's Blackbirds (in flesh)
Mr. Bernard Bailey, Elk River .....	1 Sharp-shinned Hawk, 1 Solitary Vireo, and 1 Tennessee Warbler (skins)
Mr. W. O. Winston, Minneapolis .....	Mounted group of 3 Bobwhites in glass case
Mr. John Jaeger, Minneapolis .....	1 Sapsucker (in flesh)
Mrs. J. C. Hvoslef, Lanesboro .....	57 manuscript volumes of diaries and records by Dr. J. C. Hvoslef, covering the period from 1881 to 1918, inclusive
Dr. Arthur C. Strachauer, Minneapolis .....	1 adult and 3 young flying squirrels
Mr. H. J. Jager, Owatonna .....	1 Sharp-shinned Hawk (in flesh)
Mr. Burton W. Thayer, Minneapolis .....	20 mammal skins with skulls, 3 bird skins, 1 beaver skull, and 1 coyote skull
Mr. Jenness Richardson, Minneapolis .....	2 live lamprey eels, 3 live rattlesnakes, 19 negatives, and several photographs

American Museum of Natural History, New York City .....	16 large photographs illustrative of the museum and its activities
Mr. Sewall D. Andrews, Minneapolis .....	1 barrel fine plaster of Paris
Mr. Sumner W. Matteson, Milwaukee .....	5 photographs of Gulls feeding
Mr. Charles C. Bovey, Minneapolis .....	1 large mounted photograph of California Gulls feeding
Mr. S. C. Swanson, Cannon Falls .....	6 photographs of birds
Mr. J. M. Eheim, Hutchinson .....	4 photographs of birds

BY PURCHASE (MUSEUM DONATION FUND)

Mr. Fred Barker of Parker's Prairie .....	37 mammal skins
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The mammal skins presented by Mr. Thayer were collected by him in and about Itasca Park and are of interest as we have but little material of this kind from that region. They are as follows: 1 skunk, 1 Franklin's ground-squirrel, 3 red squirrels, 1 gray chipmunk, 3 long-tailed chipmunks, 2 striped gophers, 1 woodchuck, 1 jumping mouse, 2 white-footed mice, 1 Loring's gapper mouse, 1 deer mouse, 1 bat (*Myotis l. lucifugus*), 3 Minnesota varying hares.

A gift of more than ordinary importance and to which special recognition should be accorded is the journals and notebooks of the late Dr. J. C. Hvoslef who practiced medicine at Lanesboro, Fillmore County, from 1876 to 1920. Dr. Hvoslef was a well-trained and careful student of natural history, giving particular attention to ornithology and botany, and during his long residence at Lanesboro kept a continuous, detailed diary in which he carefully recorded all his observations with accompanying meteorological data. There are fifty-four volumes of diaries and three additional general notebooks. Dr. Hvoslef died October 11, 1920, at the age of eighty-one years, and the following spring Mrs. Hvoslef very generously presented to the museum in complete form this life work of her husband, recognizing that it most appropriately belonged to the state to which it pertained. There is contained within the volumes a mine of natural-history lore which will increase in value as the years pass. No part of it has ever been published but from its pages were taken the bird-migration records that Dr. Hvoslef sent to the United States Biological Survey at Washington over a series of years and concerning which Wells W. Cooke, in one of the survey bulletins, stated that the information from Lanesboro was the most complete and satisfactory that he had received from any source. The museum is fortunate indeed to possess these journals and is deeply grateful to Mrs. Hvoslef for the gift. A number of years ago Dr. Hvoslef donated his collection of birds—numbering some 400—to the museum and they form a part of the study collection. There is also in our files a considerable series of letters from Dr. Hvoslef relating almost entirely to the bird life of southeastern Minnesota. The earliest of them date back nearly thirty years and were received by the writer of this report during a long correspondence acquaintance with the doctor.

*Publications.*—No special publications have been issued the past year other than several articles which were prepared by the director from museum data and appeared in various journals. Four hundred copies of the last museum report were separately printed with special cover and full-page half-tone illustrations of the four large groups, with explanatory text. These, together with many copies of former publications, have been widely distributed. A considerable number of group illustrations were printed separately and are being presented in sets to interested visitors. The *Review of the Ornithology of Minnesota*, issued in 1919, has been circulated by the university library with the exception of about seventy-five copies which have been sent out gratis from the museum. The edition of the paper on the *Water Birds of Minnesota; Past and Present* is nearly exhausted. The *Check List of Minnesota Birds* is in constant demand and incidentally has served to bring to the museum during the past year a larger number of well-arranged reports on the bird life of the state than has ever before been received.

An article prepared by Mr. Phillips, giving a summary of the winter bird conditions in Minnesota for the season 1919-20 and based on information received from the correspondents of the museum, was published in *Fins, Feathers and Fur* for June, 1920 (No. 22).

*Photography.*—More attention than ever has been given during the year to securing motion-picture films for the lecture work of the museum, as this feature at present, whether wholly desirable or not, takes precedence of all others in attracting and holding audiences—adults as well as children. A rather wider range of subjects than heretofore has been included. The resulting reels have added greatly to the interest and popularity of this part of our educational work. Special credit is due Mr. Phillips for much painstaking work and thought in assembling the pictures in a satisfactory manner.

During the year nearly 10,000 feet of negative have been taken by the director and Mr. Richardson. A little less than one-half of this has been printed, assembled, provided with appropriate titles, and placed in service. With this addition we have now twelve original reels, all dealing with natural-history subjects, presented under the general caption *Outdoor Studies in Minnesota*. Several pieces of especially desirable and interesting film have been added to our reels through the courtesy of Mr. Carlos Avery, state game and fish commissioner, who permitted the museum to have prints made from negative belonging to the commission.

There is in reserve a considerable amount of negative film that has not been printed, either because it closely duplicates negative already printed, is not needed at present, or is second-class. There is much unavoidable duplication and waste in taking wild-life pictures. The only road to ultimate success is to keep at it, take what offers, and then select the best. One of the foremost men engaged in

this kind of work in this country stated that his shrinkage was eighty per cent, which accounted for the unusual perfection of his films. A fifty per cent loss may be considered entirely reasonable.

Both of the motion-picture cameras in use by the staff during the past year were much out of repair, which caused great annoyance and loss both in film and results. As it has been found impossible to get these cameras repaired satisfactorily a new outfit has been obtained without cost to the University and is in use this year.

Two hundred new negatives have been added to the museum's series during the year. One hundred twenty-five new lantern-slides have been made, including a set illustrating the food habits of certain of our common birds.

*Co-operation.*—Every effort has been made to give the children of our public and private schools, scout organizations, and other groups of children, the service that, in the opinion of the director, is the most important part of our work. The education of the children of to-day along broad nature-study lines will result, in generations to come, in greatly increased numbers of intelligent and efficient conservationists of our natural resources. This will be an important advance over present conditions. The response from the public schools has been quite general and many groups of children, accompanied by their teachers, have come to the museum. The lecture-room being small, only selected classes can be accommodated. However, one fortunate feature results from these small groups, as after each lecture the children can be taken through the museum in a body and the exhibits explained to them in a brief talk.

The State Game and Fish Commission has been granted the use of several of our motion-picture reels on a number of occasions to illustrate talks before sportsmen's organizations in various parts of the state. In return Mr. Avery has granted us many favors and has cordially co-operated in the work of the museum in every way possible.

Sets of bird slides have been loaned to Mr. Frank Gillis of Anoka, and Mr. L. F. Kruse of Red Wing. In each instance they were used to illustrate talks to several audiences, chiefly school children.

The lower lecture-room and equipment have been used on a number of occasions by others than the museum staff. The Minneapolis Mycological Society has been granted permission to hold its monthly meetings there under the presidency of Dr. Stakman.

At the invitation of Dr. Sigerfoos four illustrated lectures on bird migration were given during the spring to sections of the first-year zoology class.

The course in ornithology, offered by the Department of Animal Biology, was conducted by the director of the museum during the winter and spring quarters. The collections of the museum and its library of slides and films are invaluable aids in this work.

*Lectures.*—The most important feature of the lecture work of the museum for the year was a series of thirteen popular lectures offered to the faculty and students of the University and to the general public on Sunday afternoons during the months of January, February, and March. The lectures were given in the main auditorium on the third floor of the Animal Biology Building at three-thirty o'clock. They were illustrated with lantern-slides and, when possible, with motion pictures appropriate to the subject. The motion pictures were shown in the lower lecture-room after the formal lecture, until the attendance so greatly exceeded the capacity of the upper room that it became necessary to install a second projector, after which both rooms were in operation at the same time. In the main, the films shown were those belonging to the museum, but Mr. Avery and Mr. Cox kindly supplied films and slides of their own for their lectures. To supplement his lecture Dr. Stakman secured an especially interesting and instructive film from the Bureau of Plant Industry at Washington. The University Department of Visual Instruction provided several reels, and three reels were obtained from the Community Motion Picture Bureau of New York City. Slides to illustrate their lectures were also provided by Dr. Emmons, Dr. Stakman, Dr. Chapman, and Dr. Huff. Dr. Sigerfoos illustrated his lecture by means of a microscope attachment to the lantern, thus projecting on the screen living examples of the minute animal and plant inhabitants of our ponds. The lecture by Dr. Lund was accompanied by a series of sixty-seven beautiful slides generously loaned for the occasion by the American Museum of Natural History, New York City, through the kind offices of Dr. G. Clyde Fisher, associate curator of the Department of Public Instruction of that institution. A considerable part of this series had been specially made and was here shown for the first time. We wish to express here our appreciation of the American Museum's courteous and kindly co-operation on this as well as on other occasions.

During the lecture course the museum was open to the public Sunday afternoons for the first time and from the start the attendance was unexpectedly large. It was estimated that at least 3,000 visited the museum and attended the lectures, and this without any notices appearing in the public press. This display of interest in the exhibits and activities of the museum would seem to indicate that as soon as it is possible it would be well worth while to have the building open regularly on Sunday and holiday afternoons.

The program of this first course of lectures should form a part of this report, if for no other reason than to express to those who so generously gave of their time and effort the thanks and recognition that are due them. Without exception each man met the invitation with a cordial and ready acceptance and gave to his subject the preparation and thought that insured the success of the course.

## PROGRAM OF SUNDAY LECTURES

- January 2—The Winter Bird Life of Minnesota, by D. Lange, principal of the St. Paul Mechanic Arts High School.
- January 9—The Geology of the Minnesota Iron Ores, by W. H. Emmons, professor of geology and head of the Department of Geology, University of Minnesota.
- January 16—The Work of the State Game and Fish Commissioner, by Carlos Avery, game and fish commissioner of Minnesota.
- January 23—The Story of the Wheat Rust, by E. C. Stakman, professor of plant pathology and head of the Division of Plant Pathology, College of Agriculture, Forestry, and Home Economics, University of Minnesota.
- January 30—Animal Pets and Their Relation to Health, by W. A. Riley, professor of entomology and chief of the Division of Entomology and Economic Zoology, College of Agriculture, Forestry, and Home Economics, University of Minnesota.
- February 6—Some Minnesota Butterflies and Moths and the Mystery of Their Double Lives, by Royal N. Chapman, assistant professor of animal biology and assistant entomologist, Agricultural Experiment Station, University of Minnesota.
- February 13—The Work of the Chief State Forester, by William T. Cox, chief forester of Minnesota.
- February 20—The Mysteries of Pond Life, by C. P. Sigerfoos, professor of zoology, University of Minnesota.
- February 27—The Indians of Minnesota; Past and Present, by Albert E. Jenks, professor of anthropology, University of Minnesota.
- March 6—Itasca State Park and Its Wild Life, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.
- March 13—Living Lanterns of Fireflies and Other Animals, by E. J. Lund, associate professor of animal biology, University of Minnesota.
- March 20—Our Spring Flowers, by N. L. Huff, assistant professor of botany, University of Minnesota.
- March 27—The Home-Coming of Our Birds, by D. Lange, principal of the St. Paul Mechanic Arts High School.

Thirty-one illustrated lectures have been given by the director at the museum, chiefly to groups of school children. Fifteen other lectures have been given in response to invitations in Minneapolis and St. Paul. Including the Sunday lectures, the total attendance for the year was 6,860—nearly double that of last year.

During the time that Dr. F. M. Chapman and Mr. Louis A. Fuertes were here in the interest of the Heron Lake Group they kindly consented to talk before an invited audience at the museum on the evening of October 13. Dr. Chapman gave an account, accompanied by a series of beautiful slides, of his travels and explorations in South America. Mr. Fuertes described and gave imitations of the songs and calls of some of our common birds.

*Attendance.*—Under existing conditions there is no way even approximately to estimate the number of transient visitors to the museum, but that there is a steady increase is clearly evident. Saturdays, especially, always bring a considerable number of school children. Each new quarterly influx of university students is always followed by interested groups before the principal exhibits.

*Correspondence.*—An increasing number of inquiries for information on a great variety of topics comes to the museum and is taken care of by the director as far as possible. These inquiries range from a request for a suitable milk formula for feeding baby beavers to questions that call for considerable search of our files and for lengthy replies.

The regular correspondents of the museum throughout the state have shown an active interest in sending natural-history notes, particularly lists and migration records of birds, and in this latter connection our files will soon contain sufficient material to justify the publication of a report on the migratory movements of Minnesota birds. Mr. Carlos Avery, game and fish commissioner, has courteously continued to assist in the collection of such data by furnishing us with all reports received from his wardens.

*Aquarium.*—The aquarium, on the basement floor, attracts a great deal of attention but it has been found difficult to keep the tanks in good condition and the fish healthy. The work falls on one of the janitors of the building and more time is required than he can properly give to it. After restocking the tanks in the fall, it is hoped that it may be possible to secure the part-time service of someone, perhaps a student, to make this feature a greater success than it has been.

*Live beavers.*—One of the two beavers that have lived in the pool beside the building since August, 1917, disappeared about October 1 last. Whether it escaped or was stolen has never been determined. The one remaining is in good condition and continues to attract much attention.

#### FIELD WORK

Since the last report no field work has been done by the museum except the taking of motion pictures and the collecting of material for several small groups to be constructed during the coming year.

The detailed study of the fauna of Minnesota, in any one of its several branches, is still in its infancy both as to the scientific and economic aspects. Here and there bits of good work have been done with some approach to completeness, but a general zoological survey under modern requirements and with the assistance of trained men is still to be undertaken. It is of great practical importance to the state that this work should be done as soon as possible. In co-operation with the United States Biological Survey at Washington, our neighboring state of Wisconsin is at present engaged in a thorough study of its vertebrate fauna. The survey, through its chief, Dr. E. W. Nelson, has expressed a willingness to render the same aid to Minnesota whenever it is ready with the needed funds. The Minnesota Game and Fish Commission was empowered by the last legislature to make zoological investigations and is actively at work

collecting data in connection with its regular duties. It has recently published an important bulletin on the fishes of the state, prepared by its efficient field agent, Mr. Thaddeus Surber. It is hoped that the museum may be permitted to engage in intensive field work and so take its proper place in these activities and at the same time enrich its collections. Now that the working equipment of the museum has been brought to a fairly satisfactory condition, a portion of the present maintenance fund might well be expended in this way.

During the spring and early summer of 1920 motion pictures of some of our common birds were obtained in the vicinity of Minneapolis by Mr. Richardson and Dr. Roberts. Later the director went to Itasca Park and spent the remainder of the summer and early fall, devoting most of his time to securing films of birds, mammals, and general views illustrative of the scenery and wild life of that interesting region. From a portion of that material an "animated map" was prepared by Rath, Mills, and Bell of St. Paul, which, under the title *A Little Journey about Itasca Park*, is used to introduce a three-reel lecture on the park, the other reels showing some of the mammals and birds. The increasing popularity of the park as a summer resort gives to the subject a special interest.

Considerable additional negative film has been obtained the present spring but is as yet unprinted.

#### FINANCES

*University Museum Maintenance Budget.*—The maintenance fund received from the University the past year has been expended largely in adding to the permanent equipment of the museum, the largest item being a considerable increase in the lecture facilities—reels of motion pictures, negatives, slides, etc. A new screen has been installed in the lower lecture-room and the motion-picture projector has recently been changed from an arc light to an incandescent bulb light, thus greatly facilitating the ease and convenience of operation. We are no longer dependent upon the direct current supplied by the dynamo in the Anatomy Building.

Metal filing cabinets have been obtained, to insure the safety and proper care of the films.

The small-group cases in the upper hall, which have been scattered on tables, have been assembled in a more attractive and permanent manner and a system of adequate lighting, devised by the museum taxidermist, Mr. Richardson, has been put in place and is in satisfactory operation.

Certain sums have been set aside from the general maintenance fund as a miscellaneous salary fund to pay several students who have been employed from time to time working on the study collections.

ANNALS OF MUSEUM OF NATURAL HISTORY

*Museum Donation Fund.*—Mr. James F. Bell has generously continued his monthly contribution of \$50 throughout the year. Two checks for \$25 each have been received as "courtesy fees," for lectures given outside of the museum.

Mr. James F. Bell's monthly contribution of \$50 .....	\$600.00
Phi Psi Fraternity, "courtesy fee" .....	25.00
Woman's Club of Minneapolis, "courtesy fee" .....	25.00
Total .....	\$650.00

The Museum Donation Fund, which is deposited in the First National Bank to the credit of Thos. S. Roberts, Trustee, has been almost entirely exhausted the past year in paying the cost of constructing the Heron Lake Group, for which purpose most of the money was subscribed. Balance in the bank June 30, 1921, \$122.38.

Since the establishment of this fund in 1916, through the generosity of a number of business men interested in the museum project, there has been received a total of \$11,904.10. A very considerable part of this sum was expended during the early years of the museum, when there was no budget supplied by the University, in paying for the initial equipment and general maintenance, including salaries of taxidermist and office assistant.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*



Fig. 14.—Detail from White-tailed Deer Group

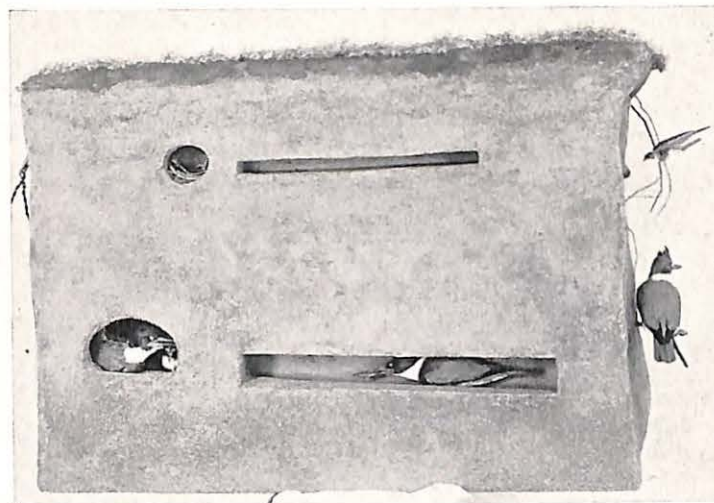


Fig 15.—Nesting burrows of the Belted Kingfisher and Bank Swallow.  
A wall group inclosed in a glass case. (See page 48.)

*To the President of the University:*

SIR: I have the honor to submit the following report of the condition and activities of the Zoological Survey and Museum for the year ending June 30, 1922.

There has been a gratifying increase during the past year in the interest shown by the general public, and especially by the schools of Minneapolis and St. Paul, in the museum exhibits and the illustrated lectures offered. The University also is awakening to the educational and cultural opportunities presented. At the beginning of each quarter the habitat groups receive much attention from the new students, many of whom spend considerable time in careful study of the contents of the cases.

With the exception of the Sunday afternoon lectures, no regular schedule has been followed but, both at the museum and outside, lectures have been given by special arrangement. In the case of the public schools this plan has not been entirely satisfactory, giving rise occasionally to confusion and conflict. An effort will be made to establish some systematic plan during the coming year. Toward spring the requests from the public schools became numerous and insistent and a large part of the time of the director and his assistant, Mr. William Kilgore, Jr., was devoted to this work. During some weeks nearly every afternoon, and occasionally morning hours also, found groups of grade and high school pupils, with attending teachers

and parents, filling the lecture-room and listening afterwards to talks before the various exhibits. Even kindergarten and first- and second-grade children were brought by their teachers and seemed to find pleasure and interest in what they saw and heard, if the response and attention they showed truly indicated their reactions. However, the best results are attained of course with the older children. It has been a real pleasure and satisfaction to come into contact in this special field with all these bright and eager young folk. All do not profit equally, but a considerable number receive enduring impressions and we feel that this is, perhaps, the most worth-while activity in which the museum is engaged at present. Cultivating a love of nature and stimulating powers of observation pave the way for much pleasure and profit in years to come, and impressionable childhood is about the only period of life when this can be accomplished with anything like lasting effect. Most of the teachers are very earnest and self-sacrificing in this work and are quick to co-operate with the museum. In some instances the classes come prepared in advance and provided with paper and pencil to take notes. Essays, discussions, and letters follow at the schools and a number of the letters are forwarded to the museum. In this way the teachers guard against these expeditions being mere pleasure parties.

An analysis of the list of lectures shows that the number of children who came to the museum during the past year reaches an approximate total of 2,158. These children came from twenty-three Minneapolis and five St. Paul schools, St. Paul sending 285 pupils. In Minneapolis, lectures were given at the Hiawatha and Rosedale schools with an attendance of 800. Such lectures to large gatherings at schools are not as satisfactory as talks to smaller groups at the museum where the opportunity to view the exhibits is a valuable additional feature. Lectures were also given at the museum to classes from the Anoka High, Edina, and Crystal Bay schools, and at St. Thomas Academy, St. Paul. Invitations were accepted to give talks and show motion pictures at several general rallies of both Boy and Girl Scouts and at a gathering of 700 boys belonging to the boys' clubs of the Young Men's Christian Association at the Blue Mouse Theater on May 6, the total attendance aggregating 1,615. A lecture was given at Stillwater under the auspices of the Primrose Club on May 5, and two lectures at Fairmont, Martin County, on May 12 under the auspices of the Martin County Game, Fish, and Bird Protective Association. The afternoon lecture at Fairmont was attended by 700 school children assembled in the principal theater. On December 17 the director gave an illustrated lecture at the Chicago Art Institute before an audience composed of the Illinois Audubon Society and affiliated organizations. A visit was made at that time to the Milwaukee Public Museum and much valuable information was obtained in regard to the policies being pursued at that fine institu-

tion. In November the director attended the annual meeting of the American Ornithologists' Union in Philadelphia, and presented two reels of motion pictures with an accompanying lecture before an audience at the Philadelphia Academy of Natural Sciences. In July both the director and the curator attended the annual convention of the Minnesota Game Protective League at Gull Lake, near Brainerd, and gave an outdoor evening motion-picture show to an audience composed in part of Indians. It was interesting to note that the response of the considerable number of Indian children present was quite equal to that of the most enthusiastic of the Minneapolis school children. An illustrated lecture on Itasca Park and its wild life was given in the Mayo Clinic Building at Rochester on September 23 in response to an invitation from the Sigma Xi Chapter and the University Alumni Club. A considerable number of lectures were given to churches, clubs, societies, and various groups of adults, chiefly in Minneapolis. Other invitations from places both in and out of the state were received but had to be declined as the work of the museum was pressing during the spring months.

The Sunday afternoon lecture course was given again this year during January, February, and March, and attracted audiences beyond the seating capacity of the upper lecture-room so that the basement room had to be used for the overflow nearly every afternoon. The total attendance was estimated at 2,950.

A summary of all the audiences reached by the lecture work of the museum for the year gives an aggregate attendance of 11,829, of which 6,272 were children of school age. This is a very great increase over last year and the outlook is for a steady growth along this line. Practically all of the lectures were illustrated with motion pictures of wild life, as slides do not seem to meet the requirements of the present generation. However, for actual teaching purposes slides are unquestionably superior to motion pictures, but the demand is for something more realistic and appealing.

In the latter part of May, Mr. Jenness Richardson, the museum taxidermist, was sent to the Field Museum of Natural History in Chicago and the Milwaukee Public Museum to inspect the work being done there, but more especially to acquaint himself with the methods of construction of the small portable exhibits which the Field Museum has been making in large numbers during the last few weeks under the N. W. Harris Public School Extension Fund. These groups are built in standard sizes and the contents are so securely installed that they can be easily and safely transported to schools and libraries and even shipped a distance if desired, where they can be seen and studied at leisure by many who could not readily come to the museum. The Field Museum, through the generous gift of Mr. Harris, who was the pioneer in this work and plan, has met with such success that other cities are now adopting the idea. It has long been the hope of the

director that the university museum might enter upon this line of work and recently a small beginning has been made. Mr. S. C. Simms, director of the Harris Extension, very kindly sent to us a sample case and, with this as a model, six of these small cases are under construction. By next winter we hope to have a sufficient number completed to demonstrate the practicability and value of the plan. The expense of the work thus far has been charged to the museum budget, but as it grows it is hoped that financial assistance can be obtained from persons interested in this phase of school work. It is capable of indefinite expansion as industrial and historical, as well as strictly natural-history, subjects can be thus graphically presented.

*Exhibits.*—The chief event of the year in this connection has been the completion of the large Heron Lake Bird Group, which was opened to the public on December 15, 1921, just before the beginning of the Sunday afternoon lectures. It became at once the center of attraction in the museum and has received high praise from competent judges. It represents a section of a quill-reed swamp at Heron Lake, Jackson County. This particular subject was selected in order to represent the common bird life of a typical marsh which, not being easily accessible, is comparatively little known even among bird students. The group contains some eighty birds belonging to twenty-two species. The time of the year is June, which permits the introduction of many nests with eggs and young. The designing and executing of the foreground and the mounting of the birds is the work of the museum taxidermist, Mr. Jenness Richardson, while the very considerable amount of vegetation necessary to render the setting realistic was very skillfully and accurately reproduced in wax by Mrs. Richardson with the assistance and supervision of Mr. Richardson. The background was painted by Mr. H. W. Rubins of Minneapolis. Sixty birds in the background were painted by Mr. Louis Agassiz Fuyertes, of Ithaca, New York, and add greatly to the beauty and effectiveness of the picture.

The dimensions of the group are: width twenty feet, six inches; depth, nine feet, six inches; height, nine feet. Lighting: direct inside electric, the lights being enclosed in a separate ventilated compartment to avoid heating the interior of the case.

The group is the gift of Mr. J. F. Bell, Mr. W. O. Winston, Mr. R. M. Bennett, Mr. and Mrs. C. D. Velie, and Mr. F. A. Chamberlain. A very good account of this group, accompanied by a half-tone illustration from a photograph taken by Mr. Richardson, appeared in the *Minnesota Alumni Weekly* for May 18, 1922 (Vol. 21, page 480).

Another smaller group, showing the burrowing nesting-habits of the Kingfisher and Bank Swallow, was completed during the winter, and hangs on the wall at the north end of the upper hall. This group measures four feet, three inches in width, three feet in height, and

fifteen inches in depth. The materials were collected and the group constructed by Mr. Richardson, the cost being charged to the museum budget.

A collection of water-color paintings of wild flowers, made by Miss Agnes B. Williams,<sup>1</sup> of Bucks County, Pennsylvania, and Miss Mary Emma Roberts, of Minneapolis, has been installed in swinging wall-frames in the upper hall and has received much attention.

*Study collections.*—The labeling and systematic arranging of the study collection of bird skins, numbering nearly 7,000, has been completed. Mr. Burton W. Thayer, a senior student in the Division of Forestry, has been employed on this work during his spare time for over a year. Considerable work in labeling the egg collection and certain mounted exhibits has also been done by another forestry student, Mr. Orcutt W. Frost. A medical student, Miss Agnes Williams, has been engaged in preparing a mounted collection of photographs from the negatives belonging to the museum, which will serve as a card index to these negatives and the library of slides.

Bird skins to the number of thirty-two, and ninety-nine mammal skins have been added to the study collections during the year, chiefly by gifts from various persons, as shown in the list of accessions.

These collections—chiefly the bird collection—continue to provide the opportunity for critical examinations by students, both in and out of the University, who are allowed free access to the cases. A card catalogue index greatly facilitates the work of these students.

The expansion and proper arrangement of the collections necessitated more room and twelve new Cambridge metal cabinets were purchased during the year.

*Accessions.*—The list below shows the sources of the various additions to the museum's collections during the past year. In the case of donations, due acknowledgment has been made in each instance.

Special mention should be made of the extensive and valuable collection of shells donated to the museum by Mrs. A. W. Abbott, of Minneapolis. This comprises some 10,000 specimens representing 1,118 species, 1,000 of which are named and systematically arranged in trays in metal cabinets provided for the purpose by the museum. The shells are all in fine condition and some species are represented by considerable series of specimens. A large part of the collection consists of land shells. It represents fifteen years of work by Mrs. Abbott and has been assembled by personal collection, purchase, and exchange with well-known conchologists in this and other lands. The museum was fortunate in receiving such a gift and is very grateful to the donor. In recognition of her generosity and because of her offer to continue to care for and develop the collection, Mrs. Abbott was appointed honorary curator of shells by the Board of Regents.

<sup>1</sup> Now Mrs. Thomas S. Roberts.

## ANNALS OF MUSEUM OF NATURAL HISTORY

## BY GIFT

Mrs. A. W. Abbott, Minneapolis.....	10,000 shells, mostly land shells, comprising 1,000 named and 118 unnamed species
Mr. Bernard Bailey, Elk River.....	14 birds (skins) collected in Minnesota, 97 small mammals (skins), 26 skulls of small mammals
Mrs. Florence Merriam Bailey, Washington, D.C.....	1 photograph of downy Red-breasted Merganser, taken at Burntside Lake, Minnesota
Mr. Horace W. Bivins, Billings, Montana	1 Sage Grouse (skin)
Mr. C. C. Bovey, Minneapolis.....	8 photographs of wild-life subjects from Rocky Mountain region
Mr. Harry Branigan, Itasca State Park	1 young mink (in flesh)
Mr. J. W. Bryant, Minneapolis.....	1 Barred Owl (in flesh)
Misses Virginia and Lumarie Cheyney, St. Paul.....	2 shed deer horns, partly eaten
Mr. George H. Childs, Minneapolis.....	1 gila monster (alive)
Mrs. John Crosby, Minneapolis.....	1 Barred Owl (in flesh)
Mr. J. M. Eheim, Hutchinson.....	11 photographs of birds
Miss Florence Englund, Minneapolis.....	1 Yellow Rail (in flesh)
Mr. H. W. Gleason, Boston, Massachusetts	3 photographs
Dr. H. M. Guilford, Minneapolis.....	1 Kirtland's Warbler (skin) collected at Minneapolis May 13, 1892. Only record for state
Mr. and Mrs. E. W. D. Holway, Minneapolis	2 Humming-birds (skins) from Ecuador, South America
Dr. N. L. Huff, Minneapolis.....	9 photographs of birds
Mr. H. J. Jager, Owatonna.....	2 birds (in flesh)
Mr. E. S. MacGowan, Minneapolis.....	3 photographs of birds
Minnesota Game and Fish Commission.....	3 birds (in flesh), 1 young beaver (in flesh), 7 brown trout (alive)
Minnesota State Forestry Board.....	2 buffalo bones dug up in a marsh in western Minnesota
Mr. S. J. Monsos, Minneapolis.....	1 small alligator (alive)
Mr. Frank Nute, Park Rapids.....	2 Rusty Blackbirds (in flesh), 1 albino
Mr. Alfred Peterson, Pipestone.....	1 Rock Wren (skin) collected in Minnesota, 1 Ruddy Turnstone (alive)
Mr. A. G. Ruggles, Farm School.....	1 nest and 4 eggs of Brown Thrasher
Mr. B. J. Shaver, St. Paul.....	1 Franklin's Gull (in flesh)
Mr. Dan Smith, Frazee.....	1 albino Red-winged Blackbird (skin)
Dr. Boyd Williams, Minneapolis.....	1 snapping turtle (alive)
Mr. Donald Winston, Minneapolis.....	18 colored illustrations of groups in Museum of California Academy of Science

## BY MUSEUM FIELD WORK

Several lots of fish and water insects, collected at Itasca State Park.  
1 Bell's Vireo and nest. Bird made into skin for study collection.

## BY PURCHASE

Museum Donation Fund.....	1 albino Sharp-tailed Grouse (mounted), 1 nine-banded armadillo (mounted)
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## ANNALS OF MUSEUM OF NATURAL HISTORY

*Publications.*—No new publication has been issued this year. Many copies of the *Check List of Minnesota Birds*, and various bulletins and pamphlets obtained from the Department of Agriculture at Washington and the National Association of Audubon Societies, have been sent out in answer to requests. As last year, 500 copies of the museum report to the president were issued separately with a title page and illustrations of four of the smaller groups in the museum. These have been widely distributed among those who received the last report.

There is a constant demand for a fuller and more comprehensive publication on the birds of the state than is available at present, and it is hoped that time may be found during the coming year to prepare a bulletin that will in some measure meet this need. The cost is a serious consideration, as such a publication should be illustrated as fully as possible. Also, the lecture work of the museum bids fair to develop to such an extent that it will consume about all the time and energy of the present staff to care for it properly.

Six articles, based on the field work and correspondence of the museum, have been published by the director during the past year in *Bird-Lore*, the official organ of the National Association of Audubon Societies.

*Photography.*—Very few negatives or lantern-slides have been added to the collection during the year, as attention was directed chiefly to securing new motion-picture films. During the spring and early summer considerable negative was made in the vicinity of Minneapolis, and after August 1 the work was continued in Itasca Park until the middle of September.

A total of 7,041 feet of negative were taken, only 2,583 feet have thus far been printed, the remainder being duplicates, or subjects held in reserve until further supplemental material of a similar character can be obtained. Some especially interesting pictures were secured and these have been incorporated with our former reels or made the basis of new ones.

During the fall and early winter an arrangement was entered into with Dr. R. B. Harvey of the University Farm, by which the museum assumed the expense of certain microphotographic motion-picture work that Dr. Harvey was doing, dealing with the life histories and activities of various minute organisms. The result was an interesting and instructive, but highly scientific, reel that is the property of the museum and which is available for class work and general circulation where demonstrations of this kind are needed.

*Co-operation.*—By far the most important co-operative work of the museum at present is its contact with the public schools, which has been fully referred to elsewhere in this report.

The museum is indebted to the Department of Public Education of the American Museum of Natural History, New York City, for the

loan of a set of slides in connection with Dr. Stauffer's Sunday lecture; also to the director of the same institution, Dr. F. A. Lucas, for a set of full-sized working plans of their exhibition cases, which were followed in making two similar cases for our museum. In return the American Museum was permitted to have between 300 and 400 feet of positive made from portions of our recent motion-picture negative.

Special thanks and appreciation are due to Mr. S. C. Simms, director of the Harris Extension at the Field Museum, and to Dr. S. A. Barrett, director of the Milwaukee Public Museum, and to the taxidermists of the latter institution, Mr. Shrosbee and Mr. Stoddard, for the opportunity afforded Mr. Richardson for admission to the workrooms of those museums and for many courtesies shown during his recent visit.

The Massachusetts Audubon Society again requested the loan of two reels of bird pictures for their spring meetings in Symphony Hall, Boston, and these were sent. In return for which there was sent to us a two-reel dramatization of Longfellow's "Birds of Killingworth," which was used at the Sunday afternoon lecture on January 1.

The Minnesota Game and Fish Commission has had the use on a number of occasions of the "big game" motion pictures belonging to the museum, and in return Mr. Avery, the commissioner, has granted numerous favors to us and in every way shown a sympathetic and helpful spirit toward our work. The "big game" pictures were also loaned to several local clubs and to the Watonwan Game and Fish Club, St. James, Minnesota, for their annual meeting on February 17. These reels are of special interest to sportsmen and it was decided early in the year to accede to the numerous requests for them. A new set of positives will have to be made before long.

Sets of slides have been loaned to Mr. Frank Gillis of Anoka, to Mr. L. F. Kruse of Red Wing, and both slides and specimens to Miss Tillisch of Minneapolis, for use in lectures to school children and teachers.

Some assistance has been rendered the St. Paul Institute in naming its collection of birds.

The Minneapolis Mycological Society has continued to use the lower lecture-room for its meetings as the projection apparatus furnishes opportunity to present illustrated papers. Mr. Kilgore has on numerous occasions put on motion pictures and slides for various departments of the University. The museum is always very glad to assist and to use its equipment for such purposes. The identification of specimens of various kinds, submitted by residents of the state, is a service gladly rendered by the museum. The course in ornithology continues to be given by the director, and our collections are freely used and are indispensable in this connection.

The director was elected secretary, and the curator, Mr. Kilgore, was appointed executive secretary, of the Hennepin County Sports-

men's Club for the year 1922, and such assistance as can be given the organization, which has for its chief object the conservation of wild life, will be duly rendered.

*Sunday afternoon lectures.*—The museum was open to the public from two to five o'clock each Sunday afternoon during the months of January, February and March, and an illustrated lecture on some natural-history subject was given. Much interest was displayed by the large audiences, and the repeated success of this second venture would seem to indicate that it will be worth while to make this lecture course an annual event. The program of the lectures is appended, as it seems proper that it should be made a matter of record.

## PROGRAM OF SUNDAY LECTURES

- January 1—Our Birds As Winter Tourists, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.  
 January 8—Methods of Wild Life Conservation, by Carlos Avery, game and fish commissioner of Minnesota.  
 January 15—"Who's Who" in a Fresh Water Pond, by Royal N. Chapman, assistant professor of animal biology and assistant entomologist, Agricultural Experiment Station, University of Minnesota.  
 January 22—The Fight of the Plant against Disease, by R. B. Harvey, associate professor of plant pathology and botany, University of Minnesota.  
 January 29—How Insects Taste, Smell, Feed, and See, by D. E. Minnich, assistant professor of animal biology, University of Minnesota.  
 February 5—A Popular Talk on the Natural History of the Blood. Illustrated by motion pictures showing the circulation of the blood, by Hal Downey, professor of histology, University of Minnesota.  
 February 12—Ancient Land and Fresh Water Animals of North America, by C. R. Stauffer, professor of geology, University of Minnesota.  
 February 19—Mysteries of the Bee World, by Francis Jager, professor of bee culture and chief of the Division of Bee Culture, University of Minnesota.  
 February 26—How Insects Aid in the Fertilization of Flowers, by C. D. Rosendahl, professor of botany, University of Minnesota.  
 March 5—The Wild Peoples of the Philippines, by A. E. Jenks, professor of anthropology, chairman of the Department of Anthropology, and director of the Americanization Training Course, University of Minnesota.  
 March 12—Our Friends and Foes among the Mushrooms, by E. C. Stakman, professor of plant pathology and botany, University of Minnesota.  
 March 19—How Plants Travel, by N. L. Huff, assistant professor of botany, University of Minnesota.  
 March 26—The Feeding Habits of Some of Our Common Birds, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.

*Attendance.*—The average daily attendance at the museum is not large, owing to its situation at some distance from the main city, but it is steadily increasing. A much larger number of visitors would undoubtedly be a serious interference with laboratory work and the lectures to students that are constantly going on in the building and which must, of course, receive first consideration. This is an argument in support of previous suggestions that Sunday and holiday afternoons are the best time for the public to be given admission to the building, and indications are that such a plan would lead to greatly in-

creased attendance. The museum has never received any special advertising in the general press and most of those who come simply drop in because they have happened to hear about it. Where such valuable exhibits have been provided through the generosity of citizens this is hardly fair recognition.

*Correspondence.*—Much information in regard to the natural history of the state has been received from the regular correspondents of the museum and has been added to our files for future reference and use in publications. Hundreds of letters have been written in answering the numerous inquiries received.

*Aquarium.*—It has been found impossible to continue the aquarium exhibit which has been of so much interest heretofore, as apparently most fish will not live for any length of time in our present city water. We are not entirely satisfied as to the exact cause but, without definite data, have thought that perhaps the amount of chlorine gas in the water varied at different times and occasionally reached the limit of fish tolerance, as the fish might live for a time and then all die at once. German carp survive. Of late the goldfish have been dying off. The aquarium was well stocked with native fish last year but in the fall there came a day when all died within a few hours, though many of them had been in the tanks for months. Other places where chlorine treatment of the city water is in use have had the same trouble. It is a disappointment as the aquarium is a very popular feature of the museum, but unless some other water supply can be had there is no use in restocking the tanks.

*Live beaver.*—The live beaver continues to thrive in the outside pool and still receives much attention.

#### FIELD WORK

Mr. Richardson of the museum is in Isanti County at present collecting specimens and material for the small school-groups which it is intended to construct during the coming year. He will spend a month in this field work.

Mr. Eugene W. Surber, son of Mr. Thaddeus Surber of the State Game and Fish Commission, has been engaged to collect for the museum mammals and birds in the northeastern portion of the state and is at present at work along the north shore of Lake Superior in Cook County. He is expected to remain in the field through July and August. Mr. Thaddeus Surber is engaged in a survey of the streams of that region and, with the consent of Mr. Avery, is assisting his son in the work that he is doing for the museum. Information received indicates that they have already made some interesting discoveries.

The director and Mr. Kilgore were in the field much of the time last summer taking motion pictures in the vicinity of Minneapolis and in Itasca Park. This work has been continued this spring.

The spring field trips of the class in ornithology, made under the guidance of the director, result in many records that are transferred to our museum files. The seventh year of this class work has just been completed.

#### FINANCES

*University Museum Maintenance Budget.*—The principal items for which this fund has been expended during the past year are: motion-picture negative and cost of developing and printing same (the largest item); twelve metal cabinets for study collections; two large exhibition cases for mounted collections; one twin exhibition case for medium-sized group; six small cases for school-groups; two cabinet files and mounting-board for photographic index to negatives and slides, and printing photographs for same; two files for card index to study collections; waxwork for Nashville Warbler Group; separate publication of museum report with half-tone illustrations. This is mostly in the nature of permanent equipment.

*Museum Donation Fund.*—Mr. James F. Bell has generously continued his monthly contribution of \$50 with permission, since the completion of the Heron Lake Group, to use the money as the director may think best. Lecture fees amounting to \$127.50 have been received during the year and this amount has been added to this fund.

Mr. James F. Bell's monthly contribution of \$50 .....	\$600.00
Hennepin Avenue Methodist Church .....	7.50
Primrose Club of Stillwater .....	20.00
Martin County Game, Fish, and Bird Protective Association .....	100.00
Total .....	\$727.50

Balance in First National Bank of Minneapolis, June 30, 1922, to credit of Thos. S. Roberts, Trustee, \$438.68.

In addition to paying the cost of particular groups for which special amounts are contributed, this fund is expended in taking care of various expenses that are most conveniently and speedily settled in this manner. It permits the director an independence of action that is sometimes very desirable. The expenses of Mr. Richardson's trip to the museums of Chicago and Milwaukee were cared for in this way.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*



Fig. 16.—Lesser Scaup Duck or Blue-bill. Portable Group.

*To the President of the University:*

SIR: I have the honor to submit the following report of the condition and activities of the Zoological Survey and Museum for the year ending June 30, 1923.

#### MUSEUM

The museum, during the year just closed, has continued to function along the same lines as heretofore with, however, the addition of a new feature, which it is hoped and believed will in time become one of its most important activities. This is the active inauguration of a long contemplated plan for constructing small portable groups, with full descriptive labels, for loaning to schools, libraries, and similar educational institutions. Last year's report called attention to what other museums are doing along this line and to the preparation that had been made for beginning this work here. Thirteen cases of this special type have been completed and hung in the upper hall and five others are in course of construction. They are attracting much attention and several persons interested in the work of the museum have generously offered to provide the money necessary

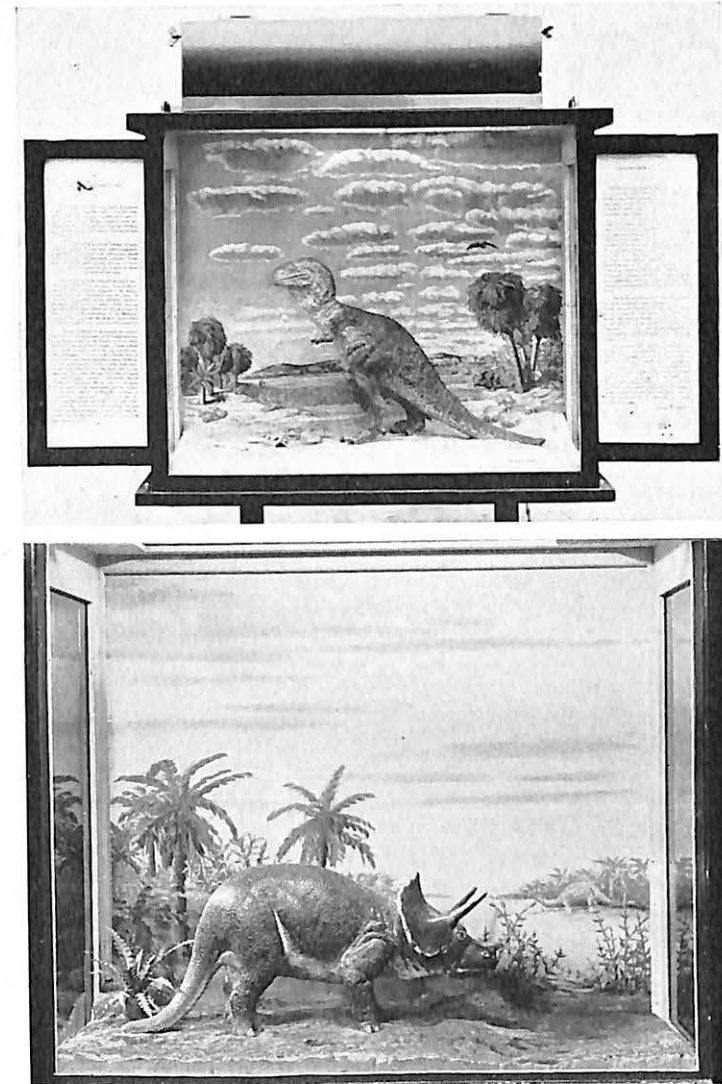


Fig. 17.—Above, *Tyrannosaurus rex* or King of the Tyrant Lizards  
Fig. 18.—Below, *Triceratops*.

(Both are small models in portable cases.)

for the further development of the undertaking.<sup>1</sup> Thus far the expense has been charged in large part to the museum budget. None of the groups has yet been loaned, as for several reasons it is thought best to complete a considerable number before beginning their distribution. With a single exception the groups thus far built contain birds, but in the near future other subjects, such as mammals, insects, shells, etc., will be introduced. The single exception referred to is a small model of one of the huge extinct reptiles that in ancient times inhabited the interior of this continent—the king of the tyrant lizards (*Tyrannosaurus rex*). It is on a scale of one inch to a foot and was made by Mr. George H. Childs of the Animal Biology Department. With its painted background, also done by Mr. Childs, depicting the probable environment of the period in which such monsters lived, it has received very favorable comment from persons competent to judge.

Mr. Richardson, the museum taxidermist, is constructing the small-group series, following along the lines worked out at the Field and Milwaukee museums. A special type of taxidermy is required in order that the groups shall be durable and safe for transportation. The work is being done in Mr. Richardson's usual skillful and thorough fashion so that these small exhibits are well up to the high standard of the other work in the museum. The rather limited amount of waxwork required is being done by Mrs. Richardson after a method especially devised by her husband. This promises to secure a high degree of permanency in the cases, which must be handled and exposed under varied conditions. It is expected that such cases will thus withstand all reasonable usage.

The bird groups already completed and on exhibition contain the following species, accompanied in most instances by the nest and eggs or young: Robin, Baltimore Oriole, Barn Swallow, Migrant Shrike, Kingbird, Least Flycatcher, Red-eyed Vireo, Warbling Vireo, Goldfinch, Meadowlark, Bobolink, and Red-headed Woodpecker.

A very considerable part of Mr. Richardson's time during the past year has been devoted to the initial work on a large Black Bear Group that is being constructed in one of the two remaining spaces in the upper hall. This is to be another gift from that devoted and generous friend of the museum, Mr. James F. Bell, and it promises to be one of our finest exhibits. The case is completed and most of the foreground framework is in place. The setting is to be a midsummer scene in a wild, rock-bound gorge of one of the rivers on the north shore of Lake Superior. The very considerable amount of waxwork vegetation that will be required is being made by Mrs. Richardson and

<sup>1</sup> While this report was in course of preparation a contribution of \$1,000 was placed, unsolicited, in the hands of the director by Mrs. George C. Christian, of Minneapolis, for use in this special connection.

is about two-thirds completed. The final assembling of this group will not take place until some time next winter.

The most important activity of the museum continues to be its service to schools and the general public through illustrated lectures, mostly on natural-history subjects. The number of schools served and the total attendance on all lectures was somewhat less than last year, but the decrease was not great and was probably not because of any waning interest in the museum and its work. Thirty-four lectures, illustrated with motion pictures, were given to groups of school children coming from eighteen Minneapolis and three St. Paul schools. The total number of children included in these audiences was 4,806. Except in four instances the children, accompanied by teachers, came to the museum where they had the additional advantage of seeing the exhibits and listening to descriptive talks by Mr. Kilgore or the director. Four lectures to large gatherings were given in the auditoriums of three Minneapolis schools, and the Edina school sent one group and the Northrop school two groups to the museum during the year. This work is unfortunately crowded in late spring and early June, and it is sometimes difficult to arrange a schedule, as we wish as far as possible to avoid serious interference with the zoology classes attending lectures and laboratories in the building. Only about twenty per cent of the schools of the city have thus far sought this service. With the introduction of a regular nature-study course in the public schools the coming year it seems probable that we shall be called upon even more frequently, and in that event some sort of schedule running throughout the school year will have to be arranged.

On November 18, 1922, a lecture with motion pictures was given to an audience of 1,000 in one of the motion-picture houses of Superior, Wisconsin, under the auspices of the Kindergarten Association of that city. Part of the expense was paid and a donation of \$50 was made by the association. On the evening of November 22, 1922, an illustrated lecture was given before the Teachers' Institute of Anoka County in one of the churches of Anoka. Responding to the request of Mr. Lyle James, a former student in the ornithology class and now a teacher of biology in the high school of Little Falls, Minnesota, a lecture and several reels of motion pictures were presented to a mixed audience in a motion-picture hall of that town on the evening of May 1, 1923. The proceeds went toward establishing a museum in the Little Falls High School.

From October 22 to 29, 1922, the director, accompanied by Mr. Kilgore, was absent attending the session of the American Ornithologists' Union in Chicago. The meetings were held in the new Field Museum of Natural History, and on October 25 a lecture, illustrated with two reels of motion pictures taken last summer, was given by the director in the lecture-room of the Field Museum before an audience of 800.

It was gratifying to the museum authorities, and I hope to the University as a whole, to find favorable comment of our Beaver Group, the work of Mr. Jenness Richardson, in an article in *Scribner's Magazine* for July, 1922, entitled "Masterpieces of American Taxidermy." The author of this article was Dr. William T. Hornaday, director of the New York Zoological Park. An illustration of the group was included. Dr. Hornaday is a competent judge and this article called attention in no uncertain terms to the exceptional character of the exhibits in our infant museum.

*Exhibits.*—In addition to the thirteen small groups already mentioned, a larger group known as the "Nashville Warbler Group" has been completed, except for the background, and placed in the Dall's Sheep Group room. A pair of Nashville Warblers are posed about their nest and eggs, sunk in the side of a large sphagnum moss hummock from Itasca Park. A special feature of this exhibit is the beautiful wax reproductions of characteristic northern plants, made by Mrs. Richardson, including exquisite examples of the rare ram's-head lady's-slipper and the one-flowered *Moneses*. The perfect botanical accessories, made possible by the skill of the Richardsons, add greatly to the value and beauty of these groups. This exhibit is installed in one-half of a twin case, similar to others in the museum, and the group to be placed in the other compartment is finished and ready to be assembled as soon as the backgrounds are completed. This second group will be a Willow Thrush or Veery family amid an assemblage of plants, conspicuous among which will be a beautiful reproduction of the large showy lady's-slipper. We shall soon have enough of these accurately made wax models of our native plants to furnish the botanists with material for study and demonstration in their teaching. Materials for a number of other small groups are on hand and several of these are nearing completion.

The two large exhibition cases, made by Paulle after plans kindly furnished by the American Museum of Natural History, New York City, have been placed in the upper hall and filled with mounted birds saved from the old Pillsbury Hall collection. They number 108 and are all Minnesota species. Though many of them are not in perfect condition they fill, for the present, a lack that some visitors to the museum seemed to feel.

*Study collections.*—The cataloguing and indexing of the study collection of bird skins have been completed and the collection is now in excellent shape and readily accessible to all students who may wish to use it. A similar catalogue of the mammal skins is in course of preparation. Mr. Kilgore, curator, and Mr. Orcutt W. Frost, a forestry student, have co-operated in this work.

Eighty-seven bird skins and 134 mammal skins have been added during the year. The larger part of the birds collected were for small-group purposes and are not included here.

*Accessions.*—The following statement shows the nature and source of the additions to the collections of the museum during the past year.

Mr. Russell M. Bennett of Minneapolis very generously presented a set of William Beebe's recently completed work in four volumes entitled *A Monograph of the Pheasants*. It is a magnificent and authoritative work beautifully illustrated by the foremost bird artists of the world. It was transferred to the University General Library and will be deposited in the Animal Biology departmental library as requested by Mr. Bennett.

## BY GIFT

Mr. H. J. Jager, Owatonna.....	2 young Snow Geese (in flesh)
Mr. W. B. Boardman, Minneapolis.....	Photograph of Great Blue Herons' nests
Mr. Elmer B. Hause, St. Paul.....	A young Bald Eagle (in flesh)
Dr. L. A. Nippert, Minneapolis.....	1 albino red squirrel (in flesh)
Dr. H. H. Knight, University Farm.....	1 Hawk Owl (in flesh)
Mr. A. S. Lundberg, Minneapolis.....	1 Great Horned Owl (in flesh)
Mr. Frank Blair, State Game Farm, Mound.....	1 Saw-whet Owl, 1 Red-tailed Hawk, 2 Harlan's Hawks, 1 Krider's Hawk, 1 Barn Owl, wing and tail of Red-shouldered Hawk (all in flesh)
Mr. Hovey Clarke, Minneapolis.....	1 Pileated Woodpecker (in flesh)
Mr. Thaddeus Surber, St. Paul.....	1 Raven (in flesh)
Mr. Bernard Bailey, Elk River.....	19 bird skins
Mr. Russell M. Bennett, Minneapolis.....	1 set (4 volumes) Beebe's <i>Monograph of the Pheasants</i>
Mr. L. M. Reinholdson, Sandstone.....	1 pair of interlocked deer horns found near Sandstone
Metropolitan National Bank of Minneapolis.....	1 buffalo head (mounted)
Mr. Lester R. Badger, Minneapolis.....	1 nest of Olive-backed Thrush, collected in Itasca County

## BY MUSEUM FIELD WORK

Mr. Jenness Richardson, collector.....	137 bird skins, 34 nestlings, nests, eggs, and accessories for small groups; 1 adult black bear
Mr. Eugene Surber, collector.....	59 bird skins and 134 mammal skins collected in Lake and Cook counties

## BY PURCHASE

Museum Donation Fund.....	2 black bear cubs (alive)
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*Publications.*—No important publication has been issued during the past year. A *Daily Field Checking List* of Minnesota birds, with space for additional nature notes to facilitate the recording of observations and to secure greater accuracy, was published in May and has been distributed among the correspondents of the museum. These lists are of small, convenient size and will be preserved in card-catalogue form when returned. Copies of former publications, especially

the *Check List* and *Migration Blank*, continue to be sent out in response to frequent applications. The director continues to prepare from the records of the museum bimonthly reports on seasonal natural-history conditions for publication in *Bird-Lore*, the official organ of the National Association of Audubon Societies.

*Photography.*—The effort to secure additional motion pictures for lecture purposes was unfortunately limited to the vicinity of the Twin Cities, as circumstances made it impossible for the director to go far afield last summer. So only about 3,500 feet of new negative were secured, but, rather unexpectedly, this comprised some of the best material we have. A reel of 1,000 feet was assembled under the title *Wayside Natural History* and proved to have a greater appeal to the older children than anything we have thus far presented.

Fifty-six negatives and a similar number of lantern-slides have been added to the collection. The preparation of the mounted-photograph index has been progressing rather slowly because of the pressure of other work. For this purpose 1,541 prints have been made from our negatives.

*Co-operation.*—The museum desires to assist in every way possible all earnest educational work and has endeavored to meet all requests along such lines. It has not been possible, however, to respond to all calls coming from a distance. It has not been considered a duty of the museum to provide mere entertainment by showing its motion pictures. The service rendered the schools, already referred to, is, we feel, the best outside work done by the museum.

Heretofore the director has not thought it best to make a general practice of loaning the motion-picture reels belonging to the museum as they were in almost constant use here and were liable to come back considerably damaged. The past year several exceptions have been made, the most notable being the loan of ten reels, one or two at a time over a period of several weeks, to the Field Museum of Chicago for use in connection with that institution's spring course of lectures to school children. Besides feeling some pride in being able to render such a service to a leading institution, we were thus enabled to reciprocate for favors shown us on several occasions in the past.

For the third time the Massachusetts Audubon Society appealed to us to assist in their annual course of lectures in Boston and a reel of pictures was loaned to them.

In May three reels were sent to Dr. William C. Herman of Cincinnati, Ohio, for use in the public schools of that city. A rental charge was made in this instance and hereafter a fee of \$5 a day will be charged for each reel while in use when reels are sent out of the state, except when reciprocating with other museums or organizations.

Locally reels have been loaned as follows:

September 15, 1922.	Lion's Club, Duluth.
September 19, 1922.	St. Paul Medical Society.
October 30, 1922.	State Teachers College, St. Cloud.
November 4, 1922.	Boy Scouts, Minneapolis.
December 27, 1922.	Boy Scouts at Y. M. C. A., Minneapolis.
December 29, 1922.	Northwestern National Life Insurance Co., Minneapolis.
January 19, 1923.	Dr. Harvey, lecture at Blooming Prairie, Minnesota.
February 14, 1923.	A. N. Wilcox, Scottish Rites Temple, Minneapolis.
March 12, 1923.	Boy Scouts, Minneapolis.

Sets of lantern-slides have been loaned in several instances to illustrate school and other lectures.

Mr. Kilgore has been called upon many times during the year to put on motion-picture reels for various departments of the University and this service has been willingly and gladly rendered. The museum stands ready at any time and in any way within its power to co-operate with any department of the University. The Powers projector in the lower lecture-room cannot safely be moved from its place, but the museum has a small portable projector which is in general use when the regular motion-picture room is not available.

We are again indebted to the Department of Public Education of the American Museum of Natural History, New York City, for the loan of a set of slides to illustrate Dr. Minnich's Sunday afternoon lecture.

The course in ornithology, offered by the Department of Animal Biology, was given for the eighth consecutive year by the director, with the assistance this year of Mr. Kilgore. Our study collection of birds is invaluable in this connection and it has been found possible to make free use of it without serious damage to the skins.

*Sunday afternoon lectures.*—The third series of Sunday afternoon lectures, twelve in number, was given during the months of January, February, and March, in the upper lecture-room. The museum was open to the public on these occasions from two to five o'clock. The total attendance at the lectures was 2,240, an average of 190. This figure is less than last year but there are now more Sunday afternoon attractions offered in the city. Another reason for the diminished attendance is that the lecture-room is too small, and with a large audience it is impossible to ventilate it properly, which discouraged many from continued attendance. Perhaps the most potent reason was that very few motion pictures were shown, instead of at every lecture as heretofore. This was because the small projector had to be used and with the usual crowded condition of the room some apprehension began to be felt lest something should go wrong. Plans were once made for building a booth in the rear of the room but it would have encroached so much on the already limited space that it was abandoned.

The program of the course as given is appended. Special thanks are due to the men who so willingly gave of their time and effort to prepare and deliver these lectures.

## PROGRAM OF SUNDAY LECTURES

- January 7—Some Curious and Beautiful Birds of the World, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.
- January 14—The Glaciers and Flords of Alaska, by W. S. Cooper, assistant professor of botany, University of Minnesota.
- January 21—A Journey along the Milky Way, by F. P. Leavenworth, professor of astronomy and head of the Department of Astronomy, University of Minnesota.
- January 28—Methods of Conserving and Propagating Fish in Minnesota, by Carlos Avery, game and fish commissioner of Minnesota.
- February 4—Minnesota versus Insect Enemies; How the Fight Is Waged, by A. G. Ruggles, Minnesota state entomologist and professor of economic entomology, University of Minnesota.
- February 11—The Forests of Minnesota; Past, Present, and Future, by C. O. Rosendahl, professor of botany, University of Minnesota.
- February 18—How Minnesota's Wild Creatures Spend the Winter, by Royal N. Chapman, assistant professor of animal biology and assistant entomologist, Agricultural Experiment Station, University of Minnesota.
- February 25—Sea-Side Biological Stations and What Is Done There, by E. J. Lund, associate professor of animal biology, University of Minnesota.
- March 4—Known Facts about Primitive Man, by A. E. Jenks, professor of anthropology, chairman of the Department of Anthropology and director of the Americanization Training Course, University of Minnesota.
- March 11—Seven Wonders of the Plant World, by N. L. Huff, assistant professor of botany, University of Minnesota.
- March 18—A Talk about Ants, by D. E. Minnich, assistant professor of animal biology, University of Minnesota.
- March 25—The Bird, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.

*Attendance.*—The number of visitors to the museum has continued about the same as last year. Situated as we are at a distance from the center of the city a large daily attendance cannot be expected. For the greater part of the year the museum is closed Sundays and holidays, just when most people are free to come. This is particularly unfortunate for it would not be wise, while the museum is situated where it is, to encourage a large week-day attendance by advertising, as this would seriously interfere with the class work that is going on almost all of the time in the building. Hundreds of university students give much attention to the exhibits and constitute an important part of those who make use of the museum.

*Aquarium.*—The aquarium has remained almost empty the past year as it has been found nearly impossible to keep fish alive and healthy with the present water supply.

*Correspondence.*—The correspondence of the museum continues to grow and many inquiries are answered and much information is given out in this way in regard to the natural history of the state.

*Live beaver.*—One of the two live beavers, that formerly lived in the pool beside the building, is still there and continues to attract much attention.

## FIELD WORK

At the time the last report was submitted, Mr. Richardson was in Isanti County collecting specimens for the museum. He returned early in July, 1922, with a considerable amount of material, which has been largely incorporated in the small groups that have been constructed during the year. During the latter part of May and early June this year, Mr. Richardson returned to the same locality and obtained a new lot of birds and accessories for continuing this same small-group series.

From August 8 to August 31 last year Mr. Richardson, with Mrs. Richardson as assistant, was in the vicinity of Beaver Bay on the north shore of Lake Superior securing the necessary materials for the foreground of Mr. Bell's Bear Group. From September 26 until the middle of October he was in the country south of International Falls looking for bears for this group. He secured a medium-sized male specimen, the skin and skeleton of which are in the mammal collection. He will return to the same locality in July of this year to continue the effort to get proper specimens for the group. Two small cub bears were purchased in September last from Mr. A. L. Powers, of International Falls, and the skins and skeletons are in the collection awaiting possible use in the group. The expense of these several field trips and the purchase price of the cubs was charged to the Bear Group Fund.

Mr. Eugene Surber returned late in August from the collecting-trip in Lake and Cook counties, mentioned in the last report. He secured a small collection of birds and a larger number of mammals for the study collections. An important part of the returns from this expedition was the very complete and carefully prepared report submitted by Mr. Thaddeus Surber, field naturalist for the Minnesota Game and Fish Commission. Annotated lists of the birds, mammals, fish, and certain of the aquatic plants were included, besides a good description of the physical features and a detailed original map of the region worked over. Credit may be given here for similar valuable reports received from Mr. Surber in the past, on the birds of Pine County, the Root River Valley, and the Lake Shetek region. These reports were based on observations made during field work for the Game and Fish Commission. Mr. Surber is a competent and painstaking field naturalist and has shown a generous interest in the work of the museum ever since his connection with the commission.

During June, July, and August, 1922, Mr. Kilgore and the director spent considerable time in the field in Hennepin and Ramsey counties taking motion pictures of birds and other natural-history subjects.

ANNALS OF MUSEUM OF NATURAL HISTORY

In the latter part of August, 1922, the director and Mr. Kilgore made a brief inspection trip to the Pine County Game Refuge.

FINANCES

*University Museum Maintenance Budget.*—This fund was reduced during the year from \$2,700 to \$2,100 because of \$600 transferred to salary accounts. The chief items for which it was expended, outside of the ordinary running cost of maintenance, were: motion-picture negative film and the cost of developing and printing same; twelve small-group cases; waxwork accessories for small groups and the Veery and Nashville Warbler groups; photographic work for index; making negatives and slides, and enlargements for small-group backgrounds; printing 5,000 copies of the *Field Checking List*; and additional tools and equipment for the taxidermist's shop.

*Museum Donation Fund.*—Mr. James F. Bell has kindly continued his monthly contribution of \$50. One lecture fee of \$50 was received, and also \$30 for rental of films, which amounts have been deposited to the credit of this fund. Up to June 30, 1923, \$1,300 had been received from Mr. Bell toward the cost of constructing the Black Bear Group. A special account is being kept against this "Bear Group Fund."

Mr. James F. Bell's monthly contribution of \$50.....	\$ 600.00
Superior, Wisconsin, Kindergarten Association.....	50.00
Rental of films, Dr. William C. Herman.....	30.00
Mr. James F. Bell, account of Bear Group.....	1,300.00
Total .....	\$1,980.00

Balance in First National Bank of Minneapolis June 30, 1923, to credit of Thos. S. Roberts, Trustee, was \$187.66. An overdraft of \$410.39 on the Bear Group fund was paid from the general Donation Fund. This amount will be returned later, so the balance June 30 to the credit of the Donation Fund should have been \$598.05. Certain items of expense in connection with small groups, student work at the museum, supplies that cannot be had readily on requisition or must be had quickly, etc., are paid from this fund, so it will be seen that it is handled as a convenient auxiliary to the University Museum Maintenance Budget. The small Dinosaur Group, which involved considerable expense, was paid for entirely from this fund.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*

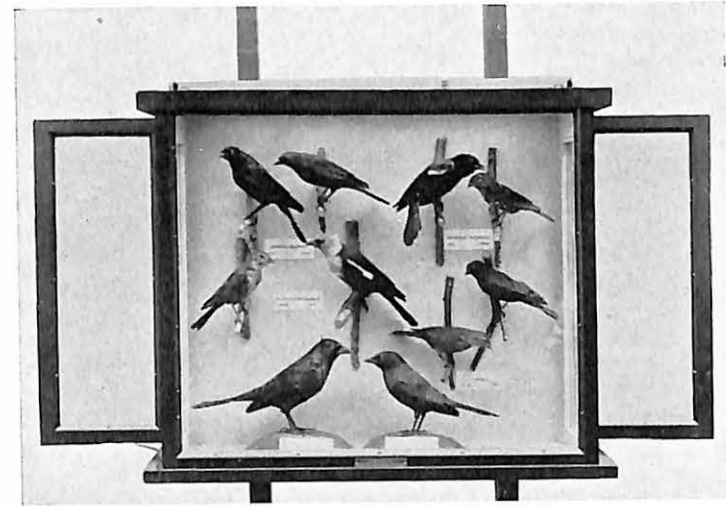


Fig. 19.—Minnesota Blackbirds. Portable Group.

*To the President of the University:*

SIR: I have the honor to submit the following report of the condition and activities of the Zoological Survey and Museum for the year ending June 30, 1924.

MUSEUM

The general condition of the museum during the year just closed has been marked by a steady advance in exhibits, study collections, equipment, and the accumulation of data in regard to the natural resources of the state, as detailed under various headings below. But the demand for lectures, both at the museum and outside, and the attendance upon the Sunday afternoon lecture course have not been as great as formerly. The largely increased number of lectures and entertainments offered by other institutions and our rather inadequate facilities for taking care of large audiences have perhaps accounted in part for this decline. However, this falling-off has not been discouraging, and in fact the present work along this line is more nearly commensurate with the time that the director and curator can give to it without neglecting other activities.

In all, seventy-seven lectures were given under the auspices of the museum with a total attendance of 6,870. Thirteen of these were Sunday afternoon lectures, two of which were given by the director. Of the other sixty-four, twelve were given away from the museum and fifty-two at the museum. Twelve of the latter were to adult

audiences and forty to groups of children divided as follows: public school groups, twenty-eight; Boy Scouts, five; Four Square Boys, one; Girl Scouts, five; Campfire Girls, one. Mr. Kilgore, the curator, has taken a considerable part in the lecture work the past year, having given fourteen of the lectures, several to outside audiences. He has also devoted much time to showing visitors through the museum and explaining the exhibits.

Eleven small school-groups have been added to the thirteen previously finished and these have been placed on exhibition as fast as completed. Cases and material are on hand for ten or twelve more groups of this style. All of the eleven groups constructed the past year contain birds, as follows: White-throated Sparrow, Savannah Sparrow, Chipping Sparrow, Crested Flycatcher, Yellow-throated Vireo, and Parula Warbler, each with nest and eggs or young, colored background, and accessories; a case containing a number of common birds mounted on natural perches, and selected and arranged to show the great difference in plumage that sometimes exists between the male and the female; a case containing male and female of the various species of Blackbirds found in Minnesota; two cases containing Minnesota Warblers; and a case of Minnesota Sparrows. These last five cases, with the birds synoptically arranged, are of special value to amateur bird students, as they afford an opportunity to examine and compare closely related species, and the male and female when they differ. It is our purpose to continue the construction of these synoptical exhibits of Minnesota birds as far as it is practicable within the limitations of these small cases. It is also the intention to include, in this small-group series, exhibits containing insects, flowers, and mammals. Materials for several small mammal-groups are on hand.

Several applications have already been received for the loan of these small groups, but with a single exception they have not yet been sent out, as the details connected with their circulation and shipment have not been arranged. They are at present serving a very useful purpose in the general museum where they seemingly attract as much attention as the larger exhibits.

In the construction of the school groups Mrs. Richardson has assisted her husband, the museum taxidermist, to a considerable extent, not only making the needed waxwork but mounting many of the birds and attending to the details of the final assembling.

Much of Mr. Richardson's time during the year has been devoted to the construction of the large Black Bear Group, which is nearing completion. Mr. R. Bruce Horsfall, of Portland, Oregon, came to the museum in December to paint the large background. It is a very satisfactory and beautiful picture of a scene on the north shore of Lake Superior and is a good example of Mr. Horsfall's work along this line.

On January 1 last, Mr. Kilgore was appointed, by the Minneapolis

Boy Scout Organization, official examiner for merit badges awarded for proficiency in bird study. Up to June 30, forty-eight such examinations were held at the museum. Under the administration of Mr. Kilgore these examinations have been standardized and the qualifications required of applicants have been raised to a worth-while level.

More field work than usual has been done the past year, all within the limits of the state. This is a necessary adjunct to the museum if its material collections and information files are to be augmented and kept up to date. Considerable motion-picture film and numerous photographs for lecture work were secured on these trips. Details are presented under separate headings below.

During the year the museum was visited at different times by Dr. Roy Chapman Andrews, noted explorer and scientist, and Mr. James J. Clark, assistant director and chief of preparation section, both of the American Museum of Natural History, New York City, and after careful inspection they commented favorably upon the progress made and especially on the exceptional excellence of the exhibits.

*Exhibits.*—No large group has been completed the past year, but the work on the Bear Group has been advanced to such a point that its completion in the near future is assured.

Besides the eleven small groups listed above, a medium-sized group, similar to others in the museum, has been completed. It contains the nest and eggs and a pair of Willow Thrushes or Veeries placed in the natural setting of a northern alder swamp which this bird inhabits so commonly. The background is a transparent, colored, enlarged photograph mounted on glass and shows the characteristic environment. The coloring was done by Mrs. Richardson. In the foreground is a beautiful wax reproduction of the large showy lady's-slipper (*Cypripedium reginae*), one of the finest of the flower pieces among the many that the Richardsons have produced. This group fills the second compartment of a double case with the Nashville Warbler and is at present in the Dall's Sheep Group room on the basement floor.

A donation of \$1,000 was received from Mrs. George C. Christian, of Minneapolis, to be expended for the school-group work. From this fund twelve new cases, made in the university shops, have been secured, several of which are already filled and displayed on the walls of the museum.

*Study collections.*—The catalogue of the mammal skins has been completed, the work being finished by Mr. Orcutt Frost during the past spring. This collection is now available to students interested in this branch of natural history.

One hundred and eighty-eight bird skins and fifty mammal skins have been added to the collection during the past year, a number of which will be used in the construction of small groups.

The study collections are in frequent use by visitors, and the bird collection, now numbering 6,895 specimens exclusive of the series used for class work, is the indispensable practical basis of the course in ornithology given annually by the director.

**Accessions.**—The following statement shows the nature and source of the additions to the museum during the past year. Special mention should be made of a fine pair of Passenger Pigeons received from Mr. C. D. Velie. As this bird, formerly abundant in Minnesota, is now extinct everywhere, specimens are very desirable and of increasing value.

Mr. William L. and Mrs. Irene Finley of Jennings Lodge, Oregon, generously presented to the museum 200 feet of motion-picture positive of the Barn Owl and its young, which will be interesting and entertaining in the lectures to school children.

The bird and mammal skins credited to the Minnesota Game and Fish Commission were collected by Mr. Thaddeus Surber and his son along the north shore of Lake Superior, and among the mammal skins is one species new to the state. Mr. Surber has ever shown a generous interest in our work.

## BY GIFT

Dr. L. C. Bacon, St. Paul.....	9 bird skins and 1 horned toad
Mr. Russell H. Bennett, Minneapolis.....	1 Resplendent Trogon (skin)
Mr. William T. Cox, St. Paul.....	1 photograph of Great Gray Owl
Mr. George H. Childs, Minneapolis.....	2 box turtles (alive)
Mrs. Edward C. Chatfield, Minneapolis.....	1 book, <i>The Bird</i>
Mr. and Mrs. Frank W. Commons, Crystal Bay.....	2 White-throated Sparrows and 1 Harris's Sparrow (in flesh); a section of tree with stored acorns, showing work of California Woodpecker
Mr. J. M. Eheim, Hutchinson.....	1 Golden Eagle and 1 white leghorn chicken (in flesh)
Extension Division, University of Minnesota.....	111 lantern-slides (33 mounted, 78 unmounted)
Mr. William L. and Mrs. Irene Finley, Jennings Lodge Oregon.....	200 feet of positive moving-picture film of Barn Owl
Mr. P. O. Fryklund, Roseau.....	1 Pileated Woodpecker, 1 Great Gray Owl, 2 least weasels, and 6 wolf pups (in flesh)
Mr. F. W. Galland, Minneapolis.....	1 Pine Grosbeak (in flesh)
Dr. N. L. Huff, Minneapolis.....	18 photographs and 2 colored lantern-slides
Mr. H. J. Jager, Owatonna.....	1 Cackling and 1 Blue Goose (in flesh)
Mrs. Simon Kruse, Minneapolis.....	Small collection of shells
Mr. B. R. Lewis, Stillwater.....	1 Rose-breasted Grosbeak (in flesh)
Mr. E. J. Lund, Minneapolis.....	3 lantern-slides
Miss Mary L. Mills, Preston.....	1 bird photograph
Minnesota Game and Fish Commission, St. Paul.....	3 bird and 17 mammal skins
Dr. C. O. Rosendahl, St. Paul.....	3 lantern-slides

Mr. R. C. Smith, Minneapolis.....	1 Least Bittern (alive)
Mr. W. H. Smock, Minneapolis.....	2 black squirrels (in flesh)
Mr. Alfred Peterson, Pipestone.....	3 Stilt Sandpipers and 1 Black-bellied Plover (in flesh)
Mr. C. D. Velie, Minneapolis.....	2 Passenger Pigeons and 1 Wood Duck (mounted)
Mr. L. J. Holtzman, Minneapolis.....	1 pair of greater kudu horns

## BY MUSEUM FIELD WORK

Mr. Jenness Richardson, collector.....	146 bird skins, 15 small mammal skins, 8 large mammal skins (black bear), photographs, nests and eggs, molds, color studies, and accessories for groups
Dr. Roberts and Mr. Kilgore, collectors.....	13 bird skins, 3 nests, 18 eggs

**Publications.**—No publication, except an illustrated reprint of the annual report, has been issued directly from the museum the past year. The bimonthly articles by the director, prepared largely from the museum's current natural-history records, have been continued in "The Season" department of *Bird-Lore*.

**Photography.**—About 1,800 feet of motion-picture positive have been printed from negative taken in the summer of 1923, and some 1,200 feet of new negative were made in June, 1924. The latter has not yet been printed. All this film deals with natural-history subjects, mostly birds, and is for use in lecture work. Some 500 feet, or about half a reel, illustrates the subject of bird-banding, which is now, under the supervision of the United States Biological Survey at Washington, receiving so much attention throughout the United States and Canada. This picture was made in large part on the grounds of Mr. and Mrs. Frank W. Commons at Lake Minnetonka and thanks are due them for their kind and patient co-operation in the undertaking. Another half-reel calls attention to the value and attractions of a properly constructed drinking and bathing place for birds in city as well as country grounds. The fact that birds of value to man will assemble in large numbers about such a place, even in a city yard, is clearly shown. The picture was made in the flower garden of Dr. N. L. Huff in southeast Minneapolis.

Fifty-two negatives and 158 lantern-slides have been added during the year. Of the slides, 111 were received from the University Extension Department, being transferred because they deal with nature subjects more directly within the scope of the museum's work.

A new cabinet for filing the collection of negatives has been added to the office equipment. The total number of negatives thus made available for ready reference is 3,469. The card-catalogue index of mounted prints from these negatives, together with a large number of other photographs and pictures, has been completed and serves a useful purpose in various ways.

**Co-operation.**—The lectures for public school children and other groups of children, both at the museum and outside, have continued

to be an important feature of the work. Various societies, churches, and organizations of adults have applied for illustrated lectures and in most cases these have been given. When held at the museum in the evening, as occasionally happens, the building is open and lighted for the inspection of the visitors.

A series of bird skins was loaned to the Carnegie Museum, Pittsburgh, for use in the study of the distribution of certain species.

Acknowledgment and thanks are due the Department of Public Education of the American Museum of Natural History, New York City, for the loan of a set of slides to illustrate the lecture on "Spider-Lore" by Dr. W. A. Riley on Sunday afternoon, February 3, 1924.

The museum has been called upon frequently during the year to make use of its equipment in projecting motion pictures and slides for other departments of the University. This service has been rendered by Mr. Kilgore, usually in the lecture-rooms of the Animal Biology Building.

The course in ornithology, offered by the Department of Animal Biology was given by the director for the ninth consecutive year, using the collections of the museum for the laboratory and lecture work. Mr. Kilgore rendered much assistance this year and the field trips of the spring quarter were largely under his direction. Never before has the class had such a successful series of outings, identifying and studying in the field no less than 142 species of birds. The average, heretofore, has been about 100.

Motion-picture reels and sets of slides have been loaned by the museum as shown in the following statement:

#### LANTERN-SLIDES AND MOTION-PICTURE REELS LOANED

- September 14—Dr. R. B. Harvey, 1 reel, Society of Illuminating Engineers, Lake George, New York.  
 September 14—Mr. James F. Bell, 3 reels.  
 November 3—Mrs. C. A. Donaldson, 40 slides, Tourist Club, Minneapolis.  
 January 15—Mr. Carlos Avery, 35 slides, lecture at Hutchinson, Minnesota.  
 January 18—Dr. V. W. Jackson, 2 reels, Manitoba Agricultural College, Winnipeg, Canada.  
 February 6—Hennepin County Sportsmen's Club, 2 reels, annual dinner.  
 February 15—Fathers and Sons, Joyce Memorial Church, Minneapolis, 2 reels; annual dinner.  
 February 19—Dr. R. B. Harvey, 1 reel, Farmers' Short Course, University School of Agriculture.  
 March 7—Watsonwan Fish and Game Club, St. James, Minnesota, 3 reels, annual dinner.  
 March 18—Dr. R. B. Harvey, 1 reel, Wild Flower Preservation Society.  
 March 18—Mr. Carlos Avery, 12 slides, lecture in Boston, Massachusetts.  
 April 10—Miss Mary Tillisch, 25 slides, Miss Wood's Kindergarten School class, Minneapolis.  
 April 10—Dr. R. B. Harvey, 1 reel, St. Paul Park Board.  
 April 11—Miss Agnes Williams, 37 slides, High School, Renville, Minnesota.  
 April 17—Miss Harriet J. Wall, 36 slides, High School, Mahanomen, Minnesota.  
 April 25—Miss Agnes Williams, 50 slides, High School, Renville, Minnesota.  
 April 26—Dr. R. B. Harvey, 1 reel, St. Paul Garden Club.

April 26—Mr. Mel Nyman, 3 reels, Izaak Walton League.

May 1—Mr. L. G. James, 40 slides; High School, Little Falls, Minnesota.

May 23—Miss Elizabeth Lagaard, 40 slides, Denfeld High School, Duluth, Minnesota.

*Sunday afternoon lectures.*—The Sunday afternoon course of lectures was offered to the general public at the museum for the fourth year. They were held as usual in the upper lecture-room during the months of January, February, and March at three-thirty, the museum being open on these occasions from two to five o'clock. The total attendance at the thirteen lectures was 1,675, an average of 129 each lecture. The attendance has decreased considerably since the overcrowding of the first two years. This has been largely in the lessened number of children, undoubtedly because of the fact that few motion pictures have been shown the last two years. The attendance is still as large as the room can accommodate comfortably and has been generally satisfactory to the lecturers.

Thanks are due to the men, all but one members of the university faculty, who so generously gave of their time and effort to make these lectures a success. The course this year was a varied one, covering a rather wide range of topics as will be seen by the program given below:

#### PROGRAM OF SUNDAY LECTURES

- January 6—"Shams and Humbugs" in Nature, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.  
 January 13—Rambles beside the Pacific, by W. S. Cooper, assistant professor of botany, University of Minnesota.  
 January 20—Organic Evolution, by Dwight E. Minnich, assistant professor of animal biology, University of Minnesota.  
 January 27—Pasteur and Human Welfare, by Charles P. Sigerfoos, professor of zoology, University of Minnesota.  
 February 3—Spider-Lore, by William A. Riley, professor of entomology and economic zoology and chief of the Division of Entomology and Economic Zoology, University of Minnesota.  
 February 10—The Animal Life on the Sand-Dunes of Minnesota, by Royal N. Chapman, associate professor of animal biology, University of Minnesota.  
 February 17—Drainage and Its Effect on Wild Life, by Carlos Avery, former game and fish commissioner of Minnesota.  
 February 24—Personality of a Protozoan, by Elmer J. Lund, associate professor of animal biology, University of Minnesota.  
 March 2—An American Zoo of Other Days, by Clinton R. Stauffer, professor of geology, University of Minnesota.  
 March 9—Forests and Human Life, by Raphael Zon, chief of Lake States Forest Experiment Station.  
 March 16—Nectar-Bearing Flowers, by N. L. Huff, assistant professor of botany, University of Minnesota.  
 March 23—Origin, Nature, and Transmission of Sound. Photographing Sound Waves, by Henry A. Erikson, professor of physics and chairman of the Department of Physics, University of Minnesota.  
 March 30—Bird-Banding: History, Object, Methods, and Results, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.

*Attendance.*—The number of visitors to the museum has increased somewhat over previous years, but there is no way of determining

even approximately the total attendance. The building is open all day every week day and there are nearly always groups of people in the halls viewing the exhibits. On some days the upper hall is well filled and on such occasions, and at any time when requested, Mr. Kilgore or the director accompanies the visitors to explain the exhibits. On the afternoon of "Mother's Day," May 10, the building was full from noon to six o'clock and motion pictures were shown in the lower lecture-room by Mr. Kilgore to a group of those present at the time.

*Correspondence.*—The correspondence of the museum has been greater the past year than ever before, and a large amount of information bearing on the natural history of the state has been obtained in this way. A number of correspondents have been reporting regularly from the localities where they live and our files are now becoming a valuable record of the wild life of the state, especially as to the distribution and migration of birds.

*Live beaver.*—The remaining one of the two beaver "kittens" donated to the museum by Mr. Carlos Avery several years ago was wantonly killed last fall in the pond where it had lived so long, by a boy of the neighborhood. Thus closed tragically a never-ending source of interest and entertainment to hundreds of people, adults as well as children. No further attempt will be made to keep live animals in connection with the museum as the cost and difficulties are too great.

#### FIELD WORK

From June 20 to July 6, 1923, Mr. Kilgore and the director were at Island Lake, Itasca County, taking motion pictures and studying the birds of that northern locality, the special object of the trip being to locate, if possible, the little-known nest of the Evening Grosbeak, which had been discovered to be a summer resident of that part of the state. Being unsuccessful in the latter quest, Mr. Kilgore, accompanied by Dr. N. L. Huff, returned to the same place on July 14 and continued the search until July 23 without definite result, although it was proven without doubt that the birds were breeding somewhere in that densely wooded, trackless waste.

August 31 to September 4, inclusive, the director and Mr. Kilgore went by automobile to Pipestone and Lincoln counties in southwestern Minnesota to investigate briefly the water-bird conditions in that part of the state. A summary of the results of this and the Itasca County trip was embodied in the *Bird-Lore* articles.

July 25 to September 19, 1923, Mr. Richardson was in the northern part of the state, south of International Falls, collecting bears for the James F. Bell Black Bear Group. In this he was entirely successful. The expense of this expedition was borne by the special Bear Group Fund. The country in which this bear hunt was staged is almost without roads and trails and it would have been difficult, if

not impossible, to bring it to a successful issue had it not been for the kind assistance rendered by the Backus and Brooks Company and the Virginia and Rainy Lake Company, both of which generously and freely extended all the facilities of their railroads, camps, and general equipment throughout the region. A letter from Mr. William T. Cox, state forester, to the rangers was also of service. Acknowledgment of, and thanks for, the considerable help thus given is hereby gratefully rendered.

June 18, 1924, Mr. Kilgore, Dr. Huff, and the director left Minneapolis by automobile to make a general survey of the present wild-life conditions along the western border of the state, especially in the Lake Traverse, Big Stone Lake, and Coteau regions. They were still absent June 30 at the close of the period covered by this report, and reference to the results of the trip will be deferred until later.

#### FINANCES

*University Museum Maintenance Budget.*—This fund for the past year was \$2,100. The principal items for which it was expended were motion-picture film, developing and printing same; the making of negatives, slides, and enlargements for backgrounds; a cabinet file for negatives; expense of field trips; printing separate museum report; office stationery and filing blanks; and waxwork for groups.

*Museum Small-group Fund.*—A donation of \$1,000 was received from Mrs. George C. Christian for use in constructing small groups for loaning to schools, libraries, etc. This was deposited to the credit of Thos. S. Roberts, Trustee, in the Minneapolis Trust Company. Twelve new cases were purchased and several groups completed during the year with the aid of this fund. There remained on June 30 a balance of \$308.04.

*Museum Donation Fund.*—Mr. James F. Bell has continued his monthly contribution of \$50. In addition to this there has been received from Mr. Bell during the year \$3,500 on the account of the Black Bear Group.

The sale of a discarded museum specimen, originally paid for by Mr. Bell, netted \$75 and the amount was credited to this fund.

Mr. James F. Bell's monthly contribution .....	\$ 600.00
Sale of discarded Dall's sheep .....	75.00
Mr. James F. Bell, account of Bear Group .....	3,500.00
<b>Total</b> .....	<b>\$4,175.00</b>

Balance in First National Bank to credit of Thos. S. Roberts, Trustee, on June 30, 1924, \$1,266.50, of which \$701.85 is to the credit of the Bear Group and \$564.65 to general Donation Fund.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*

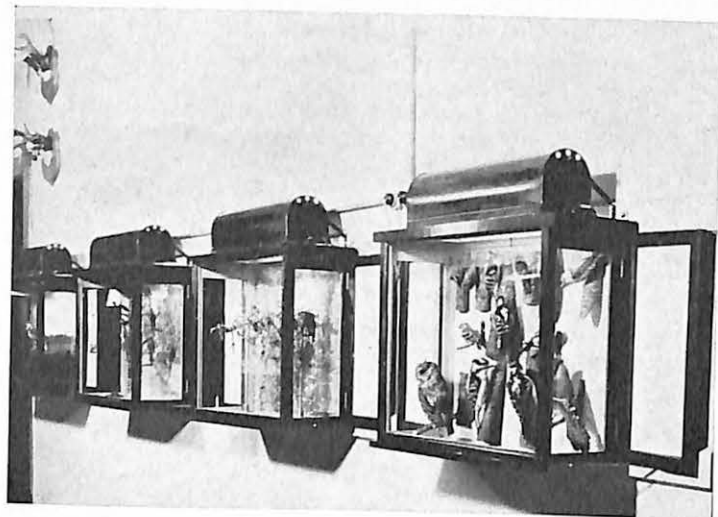


Fig. 20.—Showing manner of hanging and lighting small portable groups. (See pages 47, 56, 58, 112-14.)

To the President of the University:

SIR: I have the honor to submit the following report of the condition and activities of the Zoological Museum for the year ending June 30, 1925.

#### MUSEUM

The museum, at the close of the year just ended, is in a materially improved and healthy condition. The exhibits have been considerably increased, the active educational work has been carried on as heretofore, and an increasing amount of new information in regard to the natural history of the state has been accumulated and placed on record in the files. There has been evidence of a growing interest both by the university personnel and the general public.

A natural-history museum of to-day, developed and functioning along the best modern ideals, is a vastly different thing from the old-style, passive institutions, some of which, strange to say, are still in existence. The Association of American Museums and the administrators of the larger and more progressive museums are in recent years making an earnest effort to dispel from the minds of people the still prevalent conception of a museum as either an accumulation of odd, startling, often abnormal objects, or a collection of dry-as-dust, unattractive specimens with an appeal only to the curiosity seeker or the closet student. It has been recently stated that "The primary

object of a great . . . museum is to bring to those who cannot explore or travel, who cannot go far beyond their immediate environment, the whole world of nature" (*Report of American Museum of Natural History*). Our museum is not yet a great museum, but an endeavor is being made to model it after the best, that it may eventually form a worthy nucleus of the greater institution that must in time appear on the campus as an essential educational center, offering the basic, real knowledge to which books are only supplemental. Museums to-day are rapidly becoming the great centers from which is dispensed a satisfying, fundamental knowledge that can be had nowhere else and in no other way except by turning to Mother Nature herself, which is not generally practicable. Also, the finest exhibits of to-day have an esthetic appeal akin to that of the best displays in our art galleries. Thus a refining and moral stimulus must be accorded to the best examples of the present-day natural-history museum.

A much-needed addition to the lecture-hall on the upper floor, used chiefly by the classes in zoology but also for the Sunday lectures, was provided last December. This room has been without a projection booth but this was built and fully equipped during the past winter. Two-thirds of the expense was charged to the museum budget, the remainder to the College of Science, Literature, and the Arts. Funds for the purchase of a new motion-picture projector for the room were generously donated by Mr. W. O. Winston, Mr. J. F. Bell, and Mr. C. C. Bovey. This provides the building with two lecture-rooms fully equipped for the projection of films or slides. The lecturers in general zoology have thus been able to present to their classes illustrative material of special value and interest not possible under the old conditions. It has also made it possible to illustrate the Sunday afternoon lectures in a manner much appreciated by the large audiences.

Through a special lighting system, devised by Mr. Richardson, the small groups on the walls in the upper and lower halls have been rendered much more attractive and effective. Although the cost of making and installing these lights was considerable, the greatly improved conditions are well worth the outlay.

In the latter part of last August Mr. and Mrs. E. L. King, of Winona, generously proposed that they collect material for the museum while on a projected hunting expedition into East Africa. The proposal was considered by the officers of the University and the museum and was accepted with provisos. Mr. King was provided with the necessary commission from the University to secure such specimens as could be properly cared for, and these were indicated on a list prepared and submitted to him. The expedition sailed in the latter part of September and returned to Winona about June 1. A large and varied collection of specimens was secured, a selection from

which is to be donated to the museum. The collection had not arrived in this country at the time of the close of this report.<sup>1</sup>

Reference has been made above to the educational and esthetic value of the museum. A more sordid and material view presents itself as the result of a cost-price inventory of its property, made recently. This shows that the actual money value of the exhibits and collections, as an asset of the University, stands to-day at between \$75,000 and \$100,000. This has grown up during the past few years from a start of practically nothing except the Caribou Group, which was moved over from Pillsbury Hall at the beginning of the new departure. This growth has been accomplished not only by the appropriations made by the University but to an even greater extent by large donations made by a considerable number of interested citizens, among whom it is but fair to name personally Mr. James F. Bell, whose generous and repeated contributions have made possible the museum as it exists to-day.

*Attendance.*—There is at present no way to determine even the approximate number of visitors coming to the museum from day to day, but it is safe to say that there has been a marked increase in the daily attendance throughout the last year. There are many out-of-town visitors, and on special occasions a considerable number of those on the campus come to the building to inspect the museum. On Mother's Day and Father's Day during the past year the students brought their parents and friends in such numbers that the halls were well filled all day. During the meeting of the Minnesota State Medical Society, which was held at the University this year, the museum was listed among the "exhibits," and many members of the society inspected the groups. The Central Interurban Clinical Club met at the University on April 18, and the museum was featured on its program, a lecture illustrated with motion pictures being included among the attractions offered. More people than usual came to the museum on Sunday afternoons during January, February, and March, when the building was open from two to five o'clock, simply to inspect the exhibits without attending the lectures.

*Exhibits.*—The large Black Bear Group was not completed during the past year, as much of Mr. Richardson's time was diverted to other work, but it is now in the final stages of construction and will be finished in the near future.

Seventeen small groups in the portable loan-series have been completed since the last report and form an attractive exhibit on the walls of the upper and lower halls. These are mostly bird groups but several contain small mammals. Where appropriate, the groups have been provided with enlarged photographic, colored backgrounds, which add greatly to their beauty and effectiveness. The backgrounds are mostly from photographs taken for the purpose by Mr. Richard-

<sup>1</sup> See page 91 for final outcome.

son, but several are from negatives made by the director many years ago. The coloring has been done by Mrs. Richardson, who, under the supervision of her husband, is also responsible for the construction of the groups containing birds. The expense of this work was provided by funds donated for the purpose by Mrs. George Chase Christian. Full explanatory labels have been prepared by the director and Mr. Kilgore and printed in the University Printing Department, and add greatly to the educational value of the exhibits.

Following is a list of the subjects shown in these new groups: Vesper Sparrow, Oven-bird, Brewer's Blackbird, Song Sparrow, Great Gray and Saw-whet Owls, Horned Lark, Ruby-throated Humming-bird, Robin, Blue Jay, Chestnut-sided Warbler, Bluebird, Downy Woodpecker, Cottontail Rabbit with young, Snow-shoe Rabbit, a group containing normal, black (melanotic), and white (albino) Gray Squirrels, and two groups containing winter birds. All except five of these groups contain colored backgrounds and natural accessories including nests and eggs or young.

In addition to these seventeen smaller groups three larger ones have been finished, showing, respectively, a Ruffed Grouse with her newly hatched chicks, a pair of Mourning Doves with nest and young, and a Ring-necked Pheasant. The first two are installed in a twin case and are at present displayed in the Dall's Sheep Group room on the basement floor. The backgrounds are enlarged photographic transparencies made and colored by the Haynes Studio of St. Paul. The original negatives were taken by Mr. Richardson for this special purpose. A feature of these exhibits is the beautiful waxwork reproductions of plants and flowers appropriate to the surroundings. The stemless lady's-slipper in the Grouse Group and the wild cranesbill in the Dove Group are worthy of special mention. They were made by Mrs. Richardson, as were all the other plants in the two groups. The cost of constructing these three exhibits was paid out of the Museum Donation Fund, provided by Mr. James F. Bell.

The effectiveness of the small groups has been greatly enhanced by the special lighting device previously referred to as the invention of Mr. Richardson. The aluminum reflectors required for this purpose were made in the university shops and have proved entirely satisfactory. The installation of the system called for considerable electric wiring in the upper and lower halls, which was done under the direction of Mr. E. A. Lieck, foreman-electrician of the University.

The cases for all of the above groups were made in the university shops under the direction of Mr. E. J. Hemple, foreman-carpenter; and Mr. David Crowther, superintendent of the central repair shops, has constructed certain specially designed metal supports used in the arrangement of some of the exhibits.

*Lectures.*—The lecture work of the museum may be summarized as follows: seventy-six lectures were given under the auspices of the

museum, with a total attendance of 8,090. Of this number thirteen were Sunday afternoon lectures with an attendance of 3,135. Of the remaining sixty-three, forty-six were given at the museum and seventeen outside. Only nine of the sixty-three were to audiences composed chiefly of adults, fifty-four being to students or children mostly from the public schools of Minneapolis and St. Paul. Out-of-door talks, illustrated with specimens from the museum, were given at the St. Paul Girl Scout camp at Marine and at the Minneapolis Girl Scout camp at Bloomington. Illustrated lectures were given at the Owatonna High School and at the Waseca High School on April 30 and May 1, respectively, and on May 1 a talk with motion pictures was given at the State Public School at Owatonna. On the invitations of Dr. Sigerfoos and Dr. Ringoen three lectures on bird migration were given to the first-year zoology class.

Nine of the lectures at the museum were given by Mr. Kilgore, the others, except eleven on Sunday afternoons, by the director. The lectures have dealt entirely with natural-history subjects and have been illustrated with motion pictures, slides, or material from the collections of the museum. In the case of those held at the museum they have, with few exceptions, been supplemented by an inspection of the exhibits and talks by Mr. Kilgore and the director.

*Sunday afternoon lectures.*—The fifth annual Sunday afternoon lecture course was given during January, February, and March. The attendance usually exceeded the capacity of the hall and on several occasions overflow lectures were given by the director or Miss Tillisch in the lower room. These audiences were composed largely of school children, with a few parents and teachers. With the exception of notices in the university publications, and the sending out of several hundred printed programs, there was no advertising of the course as it would be impossible to care for the large number of people who would unquestionably seek admission if attention were called to it in the public press. As it was, many of those who came this year had to content themselves with inspecting the museum, the main lecture-room often being crowded to the doors at an early hour. This is good evidence of the appreciation on the part of the general public of scientific offerings of this kind and is gratifying to those concerned in an enterprise that was at first considered as an experiment. All of the lectures were illustrated with lantern-slides and motion pictures, and frequently films from the collection of the museum were shown at the end of the hour. Special thanks are due to two well-known citizens of Minneapolis, Mr. E. C. Gale and Mr. W. C. Edgar, not connected with the University, but who kindly consented to fill places on the program and presented subjects of historical and literary character, which were much appreciated by capacity audiences. The other lecturers were all members of the university faculty, who gave willingly

and freely of their time and effort, and to whom appreciative thanks are tendered.

The following transcript of the program of the Sunday lectures will show the nature of the subjects presented and the names of those who took part:

## PROGRAM OF SUNDAY LECTURES

- January 4—The Winter Bird Life of Minnesota, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.  
 January 11—Pictures of Minnesota before the Days of Photography, by Edward C. Gale.  
 January 18—Life and Work of Charles Darwin, by Charles P. Sigerfoos, professor of zoology, University of Minnesota.  
 January 25—Spinners and Weavers of the Insect World, by William A. Riley, professor of entomology and economic zoology and chief of the Division of Entomology and Economic Zoology, University of Minnesota.  
 February 1—In Hawaiian Waters, by Royal N. Chapman, associate professor of animal biology, University of Minnesota.  
 February 8—Among Hawaiian Plants, by J. Arthur Harris, professor of botany and head of the Department of Botany, University of Minnesota.  
 February 15—The Forest As a Plant Community, by Raphael Zon, chief of the Lake States Forest Experiment Station.  
 February 22—Some Spineless Denizens of the Sea, by Dwight E. Minnich, assistant professor of animal biology, University of Minnesota.  
 March 1—The River Jordan: Adventures of a City Man in the Country, by William C. Edgar, former editor of *The Bellman* and *The Northwestern Miller*.  
 March 8—Birds of Other Lands in Motion Pictures, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.  
 March 15—Men of the Old Stone Age, by Charles A. Erdmann, professor of anatomy, University of Minnesota.  
 March 22—Wild Flowers; Where They Grow and Why, by N. L. Huff, assistant professor of botany, University of Minnesota.  
 March 29—Bird-Banding; History, Object, Methods, and Results, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.

*Study collections.*—Fifty-one birds, five mammals, and a few nests and eggs have been added to the study collections during the past year. A considerable number of specimens, collected during June in North Dakota by Mr. Richardson (still in the field), will have to be credited next year. The collections are open to all who know how to handle the specimens and many avail themselves of the opportunity throughout the year. The specimens are now fully catalogued and indexed and there is no trouble in finding anything that is wanted.

*Accessions.*—The following list shows the nature and source of gifts of material that have been received by the museum during the past year, exclusive of the formal groups mentioned elsewhere. The donors have all received personally the thanks of the museum, but it may here be added that all such expressions of interest in our welfare and material development are fully appreciated.

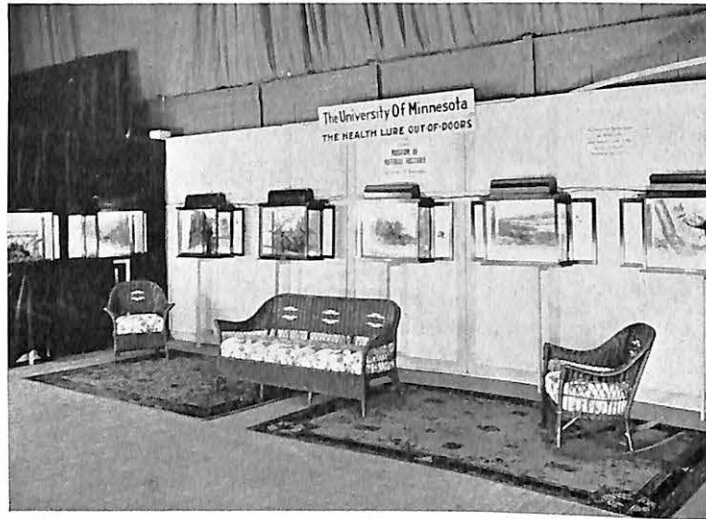
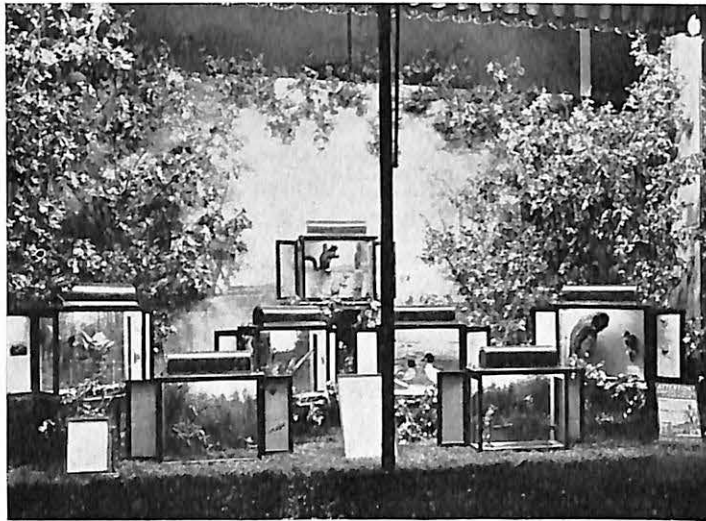


Fig. 21.—Above. Portable groups loaned to Izaak Walton League for window display, November, 1927

Fig. 22.—Below. Groups loaned to National Health Association, Minneapolis Auditorium, October, 1922

## BY GIFT

Mr. Frank Blair, Mound .....	1 Rough-legged Hawk and 1 long-tailed weasel (in flesh)
Dr. Chester M. Carlaw, Minneapolis .....	1 big brown bat (in flesh)
Mr. and Mrs. Frank W. Commons, Crystal Bay .....	1 White-crowned Sparrow (in flesh)
Mrs. Frances S. Davidson, Minneapolis .....	1 nest and 4 eggs of Wilson's Phalarope
Mr. P. O. Fryklund, Roseau .....	1 Saw-whet Owl and 1 Shrew (in flesh), 1 Red-tailed Hawk (mounted)
Mr. J. E. Grimes, Minneapolis .....	1 Mallard-Pintail Duck, hybrid (in flesh)
Mr. G. E. Harrison, Crystal Falls, Michigan .....	1 flying squirrel (in flesh)
Dr. N. L. Huff, Minneapolis .....	4 lantern-slides and 4 prints
Mr. Luth Yaeger, Minneapolis .....	1 Short-eared Owl (in flesh)
Mr. H. J. Jager, Owatonna .....	1 Blue Goose, 1 Brant, and 6 young Snow Geese (all in flesh)
Mr. Paul V. Jaqua, Long Lake .....	1 nest and 5 eggs of Migrant Shrike
Dr. G. H. Luedtke, Fairmont .....	2 photographs
Mrs. F. D. Patterson, South St. Paul .....	1 Turkey Vulture (alive)
Miss Florence Sargent, Minneapolis .....	1 Prairie Chicken (in flesh)
Mr. John Schuster, Dalton .....	2 cottontail rabbits (in flesh)
Mr. E. W. Stafford, St. Paul .....	1 Florida Gallinule (in flesh)
Dr. Arthur C. Strachauer, Minneapolis .....	1 Bluebird's nest and 4 eggs
Mr. T. Surber, St. Paul .....	1 Coot, partial albino (in flesh)
Mr. Burton Thayer, St. Anthony Park .....	1 short-tailed shrew and 1 Bittern (in flesh)
Miss Margaret Wentling, St. Paul .....	1 nest of Ruby-throated Hummingbird
Mrs. C. E. Bloomberg, Minneapolis .....	1 Indigo Bunting (in flesh)
Mrs. J. C. Hvoslef, Lanesboro .....	A small collection of birds' eggs by the late Dr. J. C. Hvoslef; a beaver-cutting collected by Dr. Hvoslef on the Root River below Lanesboro in 1877

## BY MUSEUM FIELD WORK

Mr. Jenness Richardson, collector .....	32 bird skins, 2 small mammal skins
Thomas S. Roberts and William Kilgore, collectors .....	1 nest of Wood Thrush containing 6 Cowbird's eggs and 2 Wood Thrush's eggs, and 1 nest of Cliff Swallow

*Co-operation.*—It is the policy and the wish of the museum to co-operate with all other departments of the University that can be aided in any way without seriously disarranging equipment, and also to meet the requests of outside institutions and organizations. This outside work by the staff of the museum comes properly under this heading, and in addition to this the following statement of museum material loaned will show to what extent the educational resources of the museum have been shared with others during the past year.

Six portable bird groups have been loaned during the year to the Northrop Collegiate School and two to the St. Paul Public

Library, this being the initial movement in the circulation of these exhibits. Three of the small groups, provided with appropriate labels calling attention to the museum, were exhibited in the window of the Wells-Dickey Company on a busy downtown thoroughfare in Minneapolis, where they were seen and examined by a large number of people. Arrangements for loaning the groups to the public schools have not yet been completed.

A series of thirty-two bird skins was loaned to the Carnegie Museum, Pittsburgh, Pennsylvania.

The Minnesota State Forestry Department was allowed to have slides made from a number of our negatives for use in their school lectures.

Mr. Kilgore, at the request of the lecturers, has put on sets of slides nine times and motion-picture films twenty-three times for the first-year zoology classes.

Our motion-picture projectors have been used frequently, with the aid of Mr. Kilgore, for reviewing and testing films belonging to other departments of the University.

Motion-picture reels have been loaned to the Field Museum, Chicago; Massachusetts Audubon Society, Boston; Inland Bird Banding Society, Nashville, Tennessee; Waukegan High School, Waukegan, Illinois; and several times to the Minnesota Chapter of the Izaak Walton League.

Mr. Kilgore has continued his services to the Minneapolis Boy Scout organization as examiner for the bird-study badge. Thirty-seven boys have been examined during the year. The boys come to the museum by appointment, present their papers and lists, and are put through a practical test in the bird-study room.

*Photography.*—Seven hundred and forty feet of motion-picture positive have been printed from negative taken last year. No new motion-picture negative has been taken the past year. Over 200 still negatives have been added, 187 of which have been filed and indexed, bringing the indexed collection up to 3,656. One hundred and fourteen lantern-slides have been added. This collection now numbers over 2,000. It is indexed and the slides are readily accessible for use at any time. A great variety of subjects are covered and many of the slides are colored.

Mention may be made here of a mounted collection of photographs and other illustrations referred to in a former report. These files now contain a classified and indexed collection numbering 3,624 pictures, which can be consulted and made use of by anyone interested. The pictures are chiefly birds, mammals, flowers, Minnesota landscapes, etc. It also furnishes a print-index to the slide and negative collections.

*Publications.*—Other than the regular bimonthly seasonal report, gleaned from the museum records and furnished to each issue

of *Bird-Lore*, there have been no publications issued by the museum. The separate issue of the annual report to the president has been postponed for the last two years on account of lack of funds. Absolutely necessary museum equipment has absorbed the appropriations available.

*Correspondence.*—This feature of the museum work is steadily increasing and occupies a considerable part of the time of both the director and the curator. In addition to answering a large number of inquiries covering a wide range of subjects, all the important information contained in letters and lists (the latter on blanks furnished by the museum) is transcribed and filed in its appropriate place in our natural-history record files. This entails much careful labor which cannot be left to an inexperienced person, but it is the only way in which this information can be permanently preserved and made readily available when needed for reference or in the preparation of articles. During the year the great accumulation of bird records, running back over forty years and containing about all that is known in regard to the ornithology of Minnesota, has been transferred from an old, obsolete filing system to a new, indexed, steel filing case in which the material relating to each species is assembled in a single large expanding envelope. All of these valuable records are here reasonably safe and can be consulted and added to without effort and loss of time.

Certain correspondents of the museum have rendered such long-continued and painstaking service in the collecting of data relating to the natural history of the state, that it seems fitting and courteous that their work should receive recognition by name in this connection, especially as they might appropriately be considered volunteer field agents or associates of the museum. They are as follows:

Mr. Bernard Bailey, Elk River; Mr. Lester Badger, Mr. and Mrs. Frank W. Commons, Mrs. A. E. Cook, Mrs. Frances S. Davidson, Dr. L. O. Dart, Mrs. C. F. Keyes, Miss Margaret E. Morse, Mr. E. D. Swedenborg, Miss Mary Tillisch, and Mrs. Judson L. Wicks, all of Minneapolis; Mr. A. C. Rosenwinkel, Mr. Thaddeus Surber, and Mr. Burton W. Thayer, all of St. Paul; Mr. M. E. Chamberlain, Montevideo; Mrs. J. A. Campbell, Ivanhoe; Miss Mabel Densmore, Red Wing; Mr. J. M. Eheim, Hutchinson; Mr. and Mrs. Orcutt W. Frost, Cloquet; Mr. P. O. Fryklund, Roseau; Mr. Frank Gillis and Mrs. Roy Hodson, Anoka; Miss Olga Lakela and Dr. G. H. Luedtke, Fairmont; Mr. L. L. Lofstrom, Cambridge; Miss Mary Mills, Preston; Mr. O. J. Murie, Moorhead; Mr. Alfred Peterson, Pipestone; Miss Rose Smith, Winona; Mr. S. C. Swanson, Cannon Falls; Mrs. J. A. Thabes, Brainerd; Miss Almira Torgerson, Fosston; and Mrs. Phelps Wyman, Milwaukee, formerly of Minneapolis. The members of the Minneapolis Audubon Society, collectively and individually, have generously contributed all their bird records for our files. There are a number of

other correspondents not on the above list who have recently tendered their assistance and who are sending in occasional contributions.

*Publicity.*—A museum designed for the general public, and the development, if not existence, of which is in large part the result of private donations of money and material, should be advertised in all legitimate ways in order to make it known and to attract the attention that justifies the effort expended upon it. There is little excuse for such an institution unless it be well patronized. The need and appreciation have been well demonstrated on a large scale in other cities. That such a need and appreciation exist also in a community like this goes without saying. Such is the argument of certain large donors to our museum, who feel that we have been rather apathetic in not calling wide-spread attention to the museum. This is undoubtedly true, but the management has hesitated under the present conditions to adopt a policy of greater publicity through the public press for the reason that a considerable influx of visitors on week-days would seriously interfere with the regular class activities that occupy so much of the building. Such a plan of advertising cannot be adopted until the museum is housed in a separate building where it can be conducted along its own special and peculiar lines. It should have a service department of its own and be free to open its doors at all times, and especially on the days and occasions when the greatest number of people are at liberty to visit its halls. This is perhaps the strongest argument in favor of separate, independent quarters for the museum. Let us hope that in some way this may be accomplished in the not too distant future.

During the past year both Minneapolis and St. Paul newspapers have, of their own volition, published illustrated articles describing the museum, and both the *Alumni Weekly* and the *University Chats* have devoted considerable space to the exhibits. But still it is not widely known and, strange to say, there are many on the campus who express surprise when they happen accidentally to wander into the building.

*Visitors of note.*—Among numerous visitors to the museum during the past year may be mentioned the following: Dr. E. E. Hellmayer, Field Museum, Chicago; Mr. O. F. Fuehrer, Carnegie Museum, Pittsburgh; Professor J. W. Stack, Agricultural College, Michigan; Mr. H. C. Oberholser, United States Biological Survey, Washington; Mr. Ashley Hine, Field Museum, Chicago; Dr. G. Clyde Fisher, American Museum of Natural History, New York City; Dr. and Mrs. Charles H. Mayo, Rochester, Minnesota; Mr. Francis M. Uhler, United States Biological Survey.

Mr. Fuehrer and Mr. Hine are members of the preparation departments of the museums with which they are connected, and spent

some time at our museum studying the work and methods of Mr. Richardson, which are attracting attention throughout the country.

Mr. Uhler is connected with the Economic Division of the Biological Survey at Washington, under Mr. McAtee, and had been assigned to a study of the food habits of certain water birds in Minnesota and North Dakota. He spent a day at the museum making excerpts from our records, and all possible assistance was given him in making plans for the field work in this state.

*Course in ornithology.*—For the tenth consecutive year the director gave the six-month course in bird study offered by the Department of Animal Biology. Mr. Kilgore assisted to a considerable extent in the laboratory work of the winter quarter and was indispensable in the field work in the spring. Perhaps it may be permitted to offer the suggestion that this course be given under the auspices of the museum instead of the Department of Animal Biology, as the instruction is given entirely by the staff of the museum and the materials used are from the museum collections. As the Animal Biology Department and the museum are now entirely distinct it seems only right that the museum should receive full credit for the work.

#### FIELD WORK

Through an oversight, mention of the following field work was omitted from the last report. Mr. Richardson was in the field in Isanti County on March 28, 1924, and from May 4 to 24 and again from June 5 to 25, 1924, collecting for the museum material to be used largely in the small groups. Specimens and accessories for the Ruffed Grouse and Dove groups were also secured at this time. In all, 146 bird skins, fifteen mammal skins, a number of nests and eggs, photographs, and accessories for most of the twenty groups constructed during the past year were obtained on these trips.

At the close of the last fiscal year the director, Mr. Kilgore, and Dr. Huff of the Department of Botany, were in the west central part of the state making a survey of the wild-life conditions in the prairie regions. The work centered in Grant and Lac qui Parle counties, but several others were included in the investigation, chiefly those bordering on or close to the western boundary of the state. About 1,000 miles were covered in the itinerary, the trip being made in the director's automobile. Much information of value in the museum records, about 1,800 feet of motion-picture negative including good studies of the Burrowing Owl and Marbled Godwit, over 100 photographs, and a small number of specimens were secured. An account of this trip was published in one of the *Bird-Lore* articles.

June 20 to 23, inclusive, of the present year, the director and Mr. Kilgore made a brief trip by automobile to the Root River Valley in

Fillmore County to make a preliminary inspection in view of future bird work in that region. On June 4, 1925, Mr. Richardson, accompanied by Mrs. Richardson as assistant, left for the Turtle Lake country in North Dakota to collect material for a large bird group illustrative of the western "coteau" region of Minnesota. This is to be another gift to the museum by Mr. James F. Bell. The Richardsons are still absent at this time and the results of the trip will have to be included in the next report.

## FINANCES

*University Museum Maintenance Budget.*—The budget for maintenance and supplies, allowed by the University for the past year, was \$2,500. This was expended very largely for additional equipment and improvements that are in the nature of permanent assets. Some of the principal items are as follows: over two-thirds of the expense of the construction of a projection booth in the upper lecture-room; twelve small-group cases and one large twin case; wiring in upper and lower halls for lighting small cases; reflectors for lighting small cases; printing labels for small cases, including reserve stock; developing and printing motion-picture film; making negatives and slides for lecture work; making enlargements for group backgrounds; additional equipment in taxidermist's shop; one four-drawer fire-proof steel filing case with jackets and guide cards for filing museum records; two lantern-slide files; one steel card-index file; lecture programs, stationery, and general incidentals from the storehouse required in conducting the office and shop work. The field trips have been comparatively inexpensive as a considerable part of the outlay has been provided from other sources.

*Museum Small-group Fund.*—A second donation of \$1,000 was received during the year from Mrs. George Chase Christian, of Minneapolis, for continuing the construction of the portable school-groups, which have proved so satisfactory as museum exhibits as well as a loan feature. This important project could not have been developed to the present extent had it not been for the interest and generosity of Mrs. Christian.

On June 30, 1925, the unexpended balance in the Minneapolis Trust Company to the credit of this fund was \$302.03. The account is in the name of Thos. S. Roberts, Trustee.

*Museum Donation Fund.*—On July 1, 1924, Mr. James F. Bell increased his monthly contribution from \$50 to \$75. This regular and now long-continued monthly check from Mr. Bell has aided greatly in conducting the incidental affairs of the museum, as the director is at liberty to expend the money as he thinks best.

## STATEMENT OF MONEY RECEIVED

Mr. J. F. Bell, monthly contribution of \$75 .....	\$900.00
Mr. W. O. Winston, for motion-picture projector .....	300.00
Mr. J. F. Bell, for motion-picture projector .....	150.00
Mr. C. C. Bovey, for motion-picture projector .....	100.00
Sale of photograph to <i>Nature Magazine</i> .....	2.00
Total .....	\$1,452.00

Balance in the First National Bank of Minneapolis to credit of Thos. S. Roberts, Trustee, on June 30, 1925, \$417.45.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*



Fig. 23.—Detail from Red Fox Group



Fig. 24.—The big Great Gray and the tiny Saw-whet Owls.  
Portable Group.

To the President of the University:

SIR: I have the honor to present the following report of the condition and activities of the Zoological Museum for the year ending June 30, 1926.

#### MUSEUM

The museum has continued to develop satisfactorily during the past year. The daily attendance has been greater than ever before but there is still no way of determining even approximately the number of visitors except on special occasions when the building is not otherwise used. The two or three entrances to the building, open from morning to night on week-days, and the large numbers of students coming and going constantly make impracticable the installing of any registration device. The requests for lectures have increased considerably and during the spring months, especially, large groups of school children have been at the museum every available day. More detailed information in regard to the scope and character of this important work will be found farther on in this report.

A sixth large habitat group was completed and opened to the public in December last. It shows a family of black bears, two adults and three cubs, displayed in characteristic attitudes and surroundings in a rocky gorge on the north shore of Lake Superior. This group is another gift from Mr. James F. Bell. It was constructed by Mr. Jenness Richardson and his wife according to a general plan proposed by Mr. Bell. The background was painted by Mr. R. Bruce Horsfall.

No small groups were built during the past year as the entire time of the taxidermist and his wife was devoted to the completion of the Bear Group and the beginning of another large group, which is to show the characteristic fauna and flora of the coteau region of western Minnesota. The model and some of the plant reproductions for the latter were already completed when, on April 15, Mr. Richardson resigned. The museum was without a taxidermist from April 15 to July 1. On the latter date Mr. Walter J. Breckenridge, a recent graduate of the University of Iowa and with two years' experience under Dr. Homer R. Dill in the Zoological Museum of that institution, came to fill the position. He was appointed as museum preparator, his regular term of service beginning July 1, 1926.

Reference was made in the last report to an expedition to East Africa by Mr. and Mrs. E. L. King of Winona, Minnesota, who proposed securing specimens for the museum. A half-dozen large bird skins were received from them last fall, but these were in such condition that our taxidermist felt it inadvisable to mount them and they were returned to Mr. King.

*Exhibits.*—As previously stated, no additional small groups have been built during the past year but there is on hand material for the construction of ten or twelve such exhibits as soon as opportunity presents itself for taking up this work again. Twelve new cases of this type were made in the university cabinet shop the past year and are immediately available.

A more detailed description of the Black Bear Group, the major addition to the museum during the past three years, may be of interest here. The group was proposed, planned, and financed by Mr. James F. Bell, whose gift of \$5,000 for the purpose made possible its construction. It is about the same size as the other large groups in the museum (twenty and a half by nine and a half by nine feet) and stands next to the Beaver Group in the upper hall. It is lighted by inside, direct electric lights enclosed in a separate compartment according to the plan that has been found so satisfactory in the Heron Lake Group. The time of year chosen is late summer when the wild berries, of which bears are so fond, are at their best. The locality selected is on the north shore of Lake Superior and the scene is an adaptation from conditions found at Beaver River near Beaver Bay, and well represents the rugged character of that region. The background painting by Horsfall spans the upper end of a rock-walled gorge in which the chief action is placed, and provides a beautiful outlook upon the wild and varied country beyond with the "Saw-tooth Mountains" in the distance. A rapid, foam-flecked stream, broken by numerous tiny falls, flows from a spruce swamp in the picture down into the foreground, encircling the base of one of the perpendicular cliffs. In this deep gorge, so characteristic of the streams of the north shore just before they enter Lake Superior,



Fig. 25.—Black Bear Group. Presented by James F. Bell, Background by R. Bruce Horsfall. Constructed by Jenness Richardson. (See pages 58, 65, 68, 74, 90-93.)

## ANNALS OF MUSEUM OF NATURAL HISTORY

are displayed the main features of the group. Of the two old bears, one is sitting quietly watching the antics of two of her three cubs, while the second adult is standing beside the stream holding under his wet foot a large trout, recently caught. A third cub is perched on a projecting rock above, peering curiously down at the performance. One of the old bears and one of the cubs are dark brown in color while the others are all pure black, thus showing the two color phases of our black bear. The three cubs, two black and one brown, were together when collected by Mr. Richardson and presumably belonged to the same family, which is an added interest in the grouping. Rising through the foreground are the lower portions of the trunks of a large white pine and two white cedars (*Arbor vitae*). The season being August, most of the shrubs and plants shown are in fruit. These include two species of raspberry, the blueberry, bearberry, red-osier dogwood, bunchberry, swamp fly-honeysuckle, clintonia, and strawberry. Besides these are polypody ferns in the crevices of the rocks, *Linnaea* vines on the ground, willows along the stream, and various other minor plants scattered about, with an exquisite cluster of harebells in full bloom on one of the close-by rocky ledges. All these plants and shrubs are wax reproductions beautifully and accurately made by Mrs. Richardson. A thick bed of reindeer "moss" or lichen provides an interesting playground mat for the two wrestling cubs. This group has attracted much attention and is one of the most striking and instructive exhibits in the museum. It is entirely the work of Mr. and Mrs. Jenness Richardson, who not only constructed the group but collected all the specimens and accessories and made the necessary studies and photographs in northern Minnesota.

For some time it has been a wish of the director to build another large bird group as a companion piece to the Heron Lake or Marsh Group. On presenting the plan to Mr. Bell he, with his usual generosity, readily agreed to finance the project and so, on completion of the Bear Group, the preliminary detail work was begun. It is to present an association of bird and plant life characteristic of the elevated prairie region in southwestern Minnesota called by Nicollet "the coteaux" when he explored that country in 1838. Such a group will permit showing birds and plants found normally only in the western part of our state. In point of time the group is to represent conditions some one hundred or more years ago, so as to allow the introducing of features that have disappeared since the permanent advent of man. The exact locality selected for reproduction is the pipestone quarry in Pipestone County, famous in history, legend, and poetry for its association with the Indian tribes of the past, who resorted to this place to obtain the red stone ("catlinite") of which they made their peace pipes. Longfellow has made the place known to every school child of to-day by introducing a description of it into his poem *Hia-*

*watha*, and both Catlin and Nicollet visited it and wrote lengthy accounts of its physical features and legendary lore. With all these facts and traditions as a special appeal it seemed a fitting subject for the background of this prairie group, as it lies on the very edge of the particular region to be depicted. So last fall—early in October—Mr. R. Bruce Horsfall came from Washington and we went to Pipestone and spent four days making studies and sketches for the proposed background picture. On our return Mr. Horsfall completed a painting some thirty-three feet wide and nearly twelve feet high, which shows the valley where the pipestone was dug by the Indians and the red, rocky cliff overhanging it on the east with the wide prairie stretching away in the distance. A herd of buffalo is streaming down through a break in the cliff to drink at a small lake, which is continued into the foreground. It is an appealing and interesting picture and is in itself alone a valuable and attractive addition to the museum. It is mounted in the completed framework of the case, awaiting the installation of the foreground. In June and July of the past year Mr. and Mrs. Richardson were sent to Turtle Lake in North Dakota to secure the birds required for this group, as some of the species are now very rare or extinct in Minnesota. They brought back most of the birds and some of the plants needed. The remaining species have been, or will be, obtained in the state. Work on the group was suspended for a time after the resignation of Mr. Richardson in April, but on the coming of Mr. Breckenridge, July 1, it was resumed and will be carried along as speedily as possible. The undertaking as planned is a very considerable one and will require at the best many months for its completion.

The museum now contains a total of sixty-two groups, distributed according to size as follows: large habitat groups, six; medium-sized groups with transparent colored backgrounds, eight; small portable groups, forty-one; miscellaneous, including the Passenger Pigeon and Cormorant Groups, seven. In addition to these there are on display several cases of mounted Minnesota birds.

The new bird group under construction fills the last space for large exhibits. A considerable number of small portable groups can still be accommodated on the walls of the upper and basement floors and nearly all available space has recently been prepared for hanging and lighting such groups as completed. All groups in the museum are now adequately lighted, which adds much to their value and attractiveness. With the moving of the Department of Botany to their new building during the coming year we have been promised by Dr. Riley a large room on the second floor, which will provide space for expansion for some time to come, so far as medium-sized and small groups are concerned. This is all very well under the circumstances but, as will be seen, it scatters the museum throughout the building in a way that is not at all desirable for various evident

reasons. The completion of the present building and the allotment therein of adequate space would be the next best thing to a special museum building.

*Lectures.*—The full number of lectures that have been given under the auspices of the museum during the past year is 114, with a total attendance of 11,923. This compares very favorably with seventy-six lectures and an attendance of 8,090 the year before.

All but sixteen of the lectures were given at the museum—fifty-two of them to groups of public school children, forty-six from Minneapolis and six from St. Paul. Thirty-six Minneapolis schools were represented and four from St. Paul, certain ones sending two or more groups at different times. Included in this list are four illustrated talks given to parents and teachers associations at as many different schools. Other requests of the same kind could not be complied with as the buildings were not equipped with suitable projecting facilities and the Minneapolis School Board has very wisely prohibited the use of inflammable films in portable projectors in the buildings. This objection will be overcome in the future as we have had duplicate copies of some of our films made on non-inflammable stock.

Four lectures were given to Boy Scout groups, one to a Young Men's Christian Association group, and one to a group of Campfire Girls.

At the request of Miss Jennie Hall, supervisor of nature study in the Minneapolis public schools, illustrated evening lectures at the museum were given on three occasions in her University Extension Course for Teachers.

On March 11, Dr. Robert Cushman Murphy of the American Museum of Natural History, New York City, who was in the city for an address before the Dinner Club, kindly consented to show some of his remarkable films and give a talk on the bird life of the west coast of South America to a large group of school children, who had assembled at the museum for a talk by the director.

All these lectures to groups at the museum are illustrated with motion pictures, lantern-slides having largely lost their interest to such gatherings. Following the introductory illustrated talk the groups, if numbering more than twenty-five, are divided into two sections, Mr. Kilgore taking one section and the director the other. They are then piloted through the museum and a brief explanation is given before each exhibit with some account of the life history of the animals and birds shown, allowing also an opportunity for questions which, especially in the case of the younger children, are not few in number. Thus Mr. Kilgore, besides putting on the films, takes an active part in nearly all this lecture work.

*Sunday afternoon lectures.*—The sixth annual course of Sunday afternoon lectures at the museum was given as usual during January, February, and March, with a total attendance of 3,400. As there were

thirteen Sundays this was an average attendance of about 260. The actual number varied from 135 to 405, depending largely upon the weather, as the museum is at a considerable distance from the homes of most of these visitors. The usual attendance was much in excess of the seating capacity of the two rooms combined, but the museum has now reached a stage of development where it provides sufficient attraction to newcomers aside from the lectures. The museum was open on these days from two to five p.m. The lectures were at three-thirty, usually occupying about an hour.

An additional course of regularly scheduled talks was given this year for the first time in the lower room, beginning at the same time as the more formal lectures upstairs which were designed primarily for adults. These talks in the basement room were given by Miss Mary Tillisch of Miss Wood's Kindergarten Teachers' School and were intended for the younger children, but it turned out that many adults, when they found the upper room filled, came downstairs and joined the children with apparent interest and profit. Both series of lectures were well illustrated with slides and motion pictures. The subjects of Miss Tillisch's talks were as follows:

January	3	Christmas-tree Land
January	10	How the Winter Birds Earn Their Living
January	17	The Hunter of the Night
January	24	Skyland
January	31	Nature's Story-Book
February	7	The Ground Gleaners; the Farmer's Friends
February	14	The Animal That Chops Wood
February	21	Why the Trees Wake Up
February	28	Spring's Orchestra
March	14	How the Insects Get Their Spring Suits
March	21	Housekeeping in Bird-Land
March	28	Spring's Call to the Flowers

Three of the lectures in the regular series were given by persons not connected with the University—Miss Jennie Hall, supervisor of nature study in the Minneapolis public schools; Mrs. Grace Wiley, curator of the Minnesota Academy of Sciences; and Mr. Frank M. Warren of Minneapolis. Mr. Warren illustrated his lecture with slides and motion pictures taken by himself at Isle Royale. Special thanks are due these lecturers for their kind and generous participation. The remainder of the series was filled by members of the university faculty, all of whom have taken part before, and their continued interest and self-sacrificing loyalty to the museum are much appreciated by those who are entrusted with its immediate care.

Appended is a copy of the regular program that was circulated in advance to call attention to the lecture course.

## PROGRAM OF SUNDAY LECTURES

January 3—Our Birds and Their Insect Food, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.

- January 10—Nature Study in Our Public Schools, by Miss Jennie Hall, supervisor of nature study in the Minneapolis public schools.
- January 17—Evidences of Prehistoric Man in Europe; a Recent Survey, by A. E. Jenks, professor and chairman of the Department of Anthropology, University of Minnesota.
- January 24—The Wild Life of Isle Royale, by Frank M. Warren of Minneapolis.
- January 31—Bacteriophages and Their Relation to Disease Germs, by Robert G. Green, assistant professor of bacteriology, University of Minnesota.
- February 7—An Illustrated Talk on Minnesota Reptiles, by Mrs. Grace Wiley, curator of the museum of the Minnesota Academy of Sciences, Public Library, Minneapolis.
- February 14—How Forests Feed the Clouds, by Raphael Zon, professor-director, Lake States Forest Experiment Station, United States Department of Agriculture, and Cloquet Forest Experiment Station, University of Minnesota.
- February 21—The History and Habits of the Termites or White Ants, by Dwight E. Minnich, associate professor of animal biology, University of Minnesota.
- February 28—Water Babies, by Charles P. Sigerfoos, professor of zoology, University of Minnesota.
- March 7—Eight Days on the Desert, by William S. Cooper, assistant professor of botany, University of Minnesota.
- March 14—Origin of Minnesota Plant Life, by C. O. Rosendahl, professor of botany, University of Minnesota.
- March 21—The Native Orchids of Minnesota, by N. L. Huff, assistant professor of botany, University of Minnesota.
- March 28—Rambles of a Bird Lover in Minnesota, by Thomas S. Roberts, director of the Zoological Museum, University of Minnesota.

*Accessions.*—Mr. Franklin M. Crosby, Jr., presented the beautifully illustrated four-volume work by Dr. John C. Phillips entitled *A Natural History of the Ducks*. As this was given directly to the museum it has been retained in the museum library, where it is in frequent use.

## BY GIFT

Mr. Lester R. Badger, Minneapolis .....	1 Ruddy Turnstone (in flesh)
Mr. C. H. Bennett, Pipestone .....	1 buffalo skull
Mr. Bernard Bailey, Elk River .....	1 Cooper's Hawk (skin)
Mr. H. L. Bond, Lakefield .....	1 Grasshopper Sparrow and 1 Savannah Sparrow (in flesh)
Mr. Nathan Butler, Minneapolis .....	1 mountain lion (skin)
Mr. F. M. Crosby, Jr., Minneapolis .....	1 set (4 vols.) Phillips' <i>A Natural History of the Ducks</i>
Miss Elizabeth Foss, Minneapolis .....	1 pair of small deer horns
Mr. P. O. Fryklund, Roseau .....	1 Golden Eagle, 2 Great Horned Owls, and 1 wild cat (all in flesh)
Mrs. J. L. Gleason, Minneapolis .....	1 Parakeet (in flesh)
Mr. J. E. Grimes, Minneapolis .....	1 albino Scaup Duck (in flesh)
Mrs. Roy Hodson, Anoka .....	Several Owl pellets
Dr. N. L. Huff, Minneapolis .....	3 photographs and 1 big brown bat
Mr. Clarence S. Jung, Chicago .....	1 Scaup Duck (in flesh)
Dr. G. H. Luedtke, Fairmont .....	1 albino House Sparrow (alive)
Mr. B. R. Lewis, Stillwater .....	1 Cardinal (in flesh)
Minnesota Game and Fish Department .....	Large number of fish of various species for aquarium
Dr. D. E. Minnich, Minneapolis .....	3 Blanding's turtles (alive)
Mr. C. E. Peterson, Jr., Madison .....	2 photographs

## ANNALS OF MUSEUM OF NATURAL HISTORY

Mr. George Ranerhoril, Fulda .....	1 partial albino Bronzed Grackle (in flesh)
Dr. Thomas S. Roberts, Minneapolis .....	2 Starlings (skins)
Mr. Burton W. Thayer, St. Paul .....	2 Goshawks (skins)

## BY MUSEUM FIELD WORK

Mr. Jenness Richardson, collector .....	140 bird skins, 23 nests, 116 eggs, photographs, color studies, molds, and accessories for groups
Dr. Roberts, Mr. Kilgore, and Mr. Breckenridge, collectors .....	6 bird skins, 2 eggs, photographs, motion pictures and accessories for groups

## BY PURCHASE

Museum Donation Fund .....	91 bird skins from Mr. Bernard Bailey 29 feet of positive motion-picture film of Pelicans from Dr. W. L. Finley
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*Study collections.*—There have been added the past year 112 bird skins and three mammal skins. Of the 140 bird skins, twenty-three nests, and 116 eggs, collected in North Dakota for the prairie bird group, a considerable number will be added to the study collection after those to be mounted in the group have been selected. Among the mammal skins there is a fine large mountain lion pelt, collected some years ago in Washington and presented by Mr. Nathan Butler of Minneapolis, and a wild cat taken recently in northern Minnesota and presented by Mr. P. O. Fryklund of Roseau. Both of these can be mounted for exhibition some time in the future.

There has been in the possession of the museum for many years a miscellaneous lot of discarded material obtained from the long-ago Menage Scientific Expedition to the Philippines. Most of the mammal material is beyond reclaiming, but at various times during the last two years a few skins, including five water-buffaloes, fourteen monkeys, and two small deer, have been selected, cleaned, tanned, and placed in the mammal storage case. They have not been catalogued as the exact data have been lost, but they may be of use some day and it seems best to save them in as good condition as possible.

*Co-operation.*—The museum has continued its policy of loaning its material and rendering assistance in various ways, both at home and abroad, to the extent of its resources and ability.

The long list of lectures provided for the children of the public schools and other educational institutions will speak for its service in that direction.

There have been loaned during the year nineteen sets of slides, thirty-two reels of motion pictures, and four sets of bird skins. A number of these have been supplied to former students of the ornithology class who are teaching in rural high schools and combining nature study with general science and biology courses.

## ANNALS OF MUSEUM OF NATURAL HISTORY

The Minnesota Forestry Service and the United States Forestry Service have each been supplied with a few negatives for making lantern-slides.

Dr. W. L. Finley of Portland, Oregon, was permitted to have a print made from some of our motion-picture negative, and in exchange we received a print from certain negative of his which we wanted for lecture purposes.

Mr. Kilgore, the museum curator, has continued his connection with the Boy Scouts and during the year has examined fifty-five boys for bird-study merit badges. He has also been recently appointed bird-study examiner for the Girl Scouts and has examined five applicants.

Mr. Kilgore was elected president of the Minneapolis Audubon Society during the year and has been serving in that capacity—a well-deserved honor.

Motion pictures have been run by Mr. Kilgore for other departments of the University thirty-four times (fifty-seven reels), and slides have been shown once.

Four radio talks over WCCO in the university radio service were given by the director during the late winter and spring months on subjects dealing with the bird life of Minnesota.

*Photography.*—During the year there have been added in this department 471 lantern-slides, 138 negatives, 301 prints, and ten bromide enlargements, the latter to be used as backgrounds for small groups. Three hundred and two feet of new motion-picture negative have been taken and developed, and 3,695 feet of positive print have been made, mostly from old negative, with 601 feet of positive title. This large amount of reprinting is because of the fact that we have had made two duplicate prints of each of the two reels that are most in demand, so that we can loan them without robbing ourselves during the spring months when they are in almost constant use at the museum.

For about a month during the winter Miss Mabel Densmore, of Red Wing, was employed at the museum labeling and cataloguing negatives, slides, and prints to keep the collections up to date and make them readily accessible for immediate use.

*Publications.*—The regular bimonthly seasonal report of nature happenings in Minnesota was prepared from the museum files by the director and forwarded to each issue of *Bird-Lore*, the official publication of the National Association of Audubon Societies.

Two delayed museum reports, illustrated with half-tones of groups, were published during the year, one for the year ending June 30, 1923, and the other for the year ending June 30, 1924. These were widely circulated among the museums of the world and among interested individuals. They bring returns by way of exchange from a number of other museums even as far distant as Australia. The

issue of the first report for the year ending June 30, 1920, is now practically exhausted, only a half-dozen or so copies remaining.

Five thousand copies of a three-leaved folder containing one page of text and five illustrations of museum exhibits were printed in February, primarily for distribution at the Izaak Walton League convention but they have since been widely circulated.

*Correspondence.*—The usual correspondence, numbering many hundreds of letters, has been kept up during the year in answering inquiries on a great variety of subjects as well as in securing in this way much information in regard to the natural history of the state for our files. It falls to the lot of the director to personally write all these letters.

*Publicity.*—No special attempt has been made to advertise the museum in the daily press, for reasons given in the last report. However, from time to time brief notices and illustrated articles have appeared in the papers of the Twin Cities, usually without previous knowledge of the museum authorities. The university publications have very kindly followed the activities of the museum and have given them adequate notice whenever occasion arose.

From February 6 to 13, inclusive, the Minneapolis Chapter of the Izaak Walton League held a convention with various exhibits in connection with the Automobile Show in the Overland Building in the Midway district. The league offered a booth to the museum and, in association with the Minneapolis Audubon Society, the offer was accepted and the space was occupied during the week. The museum displayed five of its small portable groups, and about 4,000 copies of the three-leaved folder referred to above were distributed from the booth. This was done because it seemed a good opportunity to spread a knowledge of the museum outside of the Twin Cities. Thanks are due to the members of the Audubon Society who took charge of the booth and looked after the interests of the museum as well as those of the society.

*Visitors of note.*—During the year the following visitors of special interest have inspected the museum: Dr. William Beebe of the New York Zoological Society; Dr. Robert Cushman Murphy of the American Museum of Natural History, New York City; Mr. Vernon Bailey of the United States Biological Survey, Washington; Dr. W. L. Finley of Portland, Oregon; Mr. F. L. Jaques of the American Museum of Natural History, New York City; Mr. J. Friesser and Mr. H. C. Holling of the Field Museum, Chicago; Mr. A. M. Collins, hunter-naturalist, of Philadelphia; and Mr. R. Bruce Horsfall, artist of *Nature Magazine*, Washington, D.C.

*Course in ornithology.*—For the eleventh consecutive year the course in ornithology, offered by the Department of Animal Biology, was given by the director, with the assistance of Mr. Kilgore. The class during the winter quarter contained eleven students, and ten

in the spring quarter. The students who have taken these courses in the past are loyal friends of the museum and have rendered assistance in various ways, and in return we supply them with illustrative material to be used in connection with their work as teachers.

Thanks are due Miss Mary Tillisch and Mrs. Frances S. Davidson for faithful assistance in transporting the class afield during the spring quarter, which is devoted to outside work.

*Aquarium.*—Last fall Dr. W. A. Riley, head of the Department of Animal Biology, transferred the care and upkeep of the aquarium to the museum. The aquarium was in rather poor condition and the fish that had been placed in it from time to time had for various reasons not done well. So it was entirely cleaned out and disinfected, the old gravel was replaced by new, and an iron framework with metal-mesh covers was placed over the entire series of tanks. The latter addition was necessary to prevent the fish from jumping out, which had been one source of trouble in the past. Through the kindness of Mr. James F. Gould and Mr. Thaddeus Surber, of the State Game and Fish Department, the tanks were stocked in September with a large assortment of native fish. Mr. Eugene Surber, son of Mr. Thaddeus Surber and a student in the University, was engaged to care for the aquarium throughout the winter and spring months. Even after all the preparation had been made, considerable difficulty was encountered in keeping the fish alive and healthy. But by restocking occasionally and treating the water (from the city mains) with chemicals to counteract the injurious effect of the chlorine, the tanks were maintained in fair condition during the period when the greatest number of people come to the museum. We wish to thank the personnel of the State Health Department Laboratory, located on the campus, for much help in solving some of our difficulties.

The aquarium furnishes an exhibit of special appeal to almost everyone, young and old, and so long as we can have the co-operation of the State Game and Fish Department it seems worth while making the effort to maintain it.

#### FIELD WORK

Mr. and Mrs. Richardson returned July 12 from a collecting trip to the Turtle Lake region in North Dakota where they had gone on June 4 to secure material for the Coteau Bird Group which is now under construction. A summary of the specimens obtained is given in the list of accessions.

On July 7 the director and Mr. Kilgore went to Burntside Lake, in St. Louis County, and spent the two weeks that Mr. Kilgore remained in making a survey of bird conditions in the vicinity.

June 17 to 28, inclusive, the director, Mr. Kilgore, and Mr. W. J.

ANNALS OF MUSEUM OF NATURAL HISTORY

Breckenridge, the new museum preparator, made a trip to Pipestone and vicinity in the interests of the new bird group. A re-examination of the locality and the securing of additional photographs and specimens were the chief results of the trip, supplemented, however, by the usual general survey of the natural-history conditions of the region.

FINANCES

*University Museum Maintenance Budget.*—The allowance from the University for maintenance and equipment for the past year was \$2,500. The principal items for which this was expended were as follows: printing two museum reports, 5,000 illustrated folders, lecture programs, index cards, motion-picture title cards, etc.; constructing twelve museum cases; racks and wiring for hanging and lighting small groups; iron frames and covers for aquarium tanks; platform and seat in front of Bear Group; making lantern-slides, prints, negatives, and enlargements; developing and printing motion pictures; and field work. The expense of the field work in North Dakota was not charged to the university budget.

*Museum-aid Budget.*—This was a new allowance by the University to aid in securing special assistance. The amount was \$300, but this had to be increased during the year by transferring \$150 from the regular budget, as the original amount was not sufficient to cover the expense of caring for the aquarium and employing the extra help that was needed from time to time in the museum.

*Museum Small-group Fund.*—As no small groups were constructed during the year this fund was not drawn upon. There remained on June 30, 1926, a balance of \$307.93 in the Minneapolis Trust Company to the credit of Thos. S. Roberts, Trustee.

*Museum Donation Fund.*—Mr. James F. Bell has continued his monthly contribution of \$75.

STATEMENT OF MONEY RECEIVED

Mr. James F. Bell, monthly check of \$75.....	\$ 900.00
Mr. James F. Bell, for new bird group.....	500.00
Mr. James F. Bell, for new bird group.....	1,500.00
Rent of films, Sioux City Academy of Sciences and Letters.....	15.00
Total .....	\$2,915.00

Balance on June 30, 1926, in First National Bank of Minneapolis to credit of Thos. S. Roberts, Trustee, \$296.78.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*

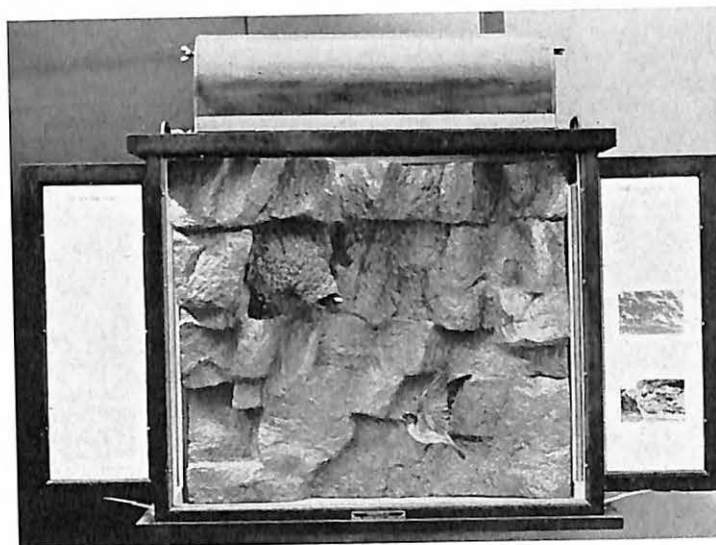


Fig. 26.—Cliff or Eave Swallow. Portable Group.

To the President of the University:

SIR: I have the honor to submit the following report of the condition and activities of the Zoological Survey and Museum for the year ending June 30, 1927.

MUSEUM

The year just closed has been one of increased prosperity. Considerable additions to its material resources have been completed and there has been a marked increase in attendance and a gratifying development, on the part of the general public, in interest in the museum. The number of visitors from the Twin Cities and surrounding country is steadily growing, and the museum is becoming well and favorably known abroad. As will be seen by the figures given under the heading "Attendance," the Sunday afternoon open-hours brought to the museum nearly double the number in any previous year—only a little short of 1,000 the last Sunday, which filled to overflowing the rather limited space on the two floors—and this without the attraction of regular lectures as heretofore. The three formal lectures, given this year in the auditorium of the Music Building, were so well attended that each Sunday a large number were unable to gain admission.

The general lecture work of the staff, both at the museum and outside to school children, Boy Scouts, Young Men's Christian Asso-

ciation groups, teachers, and various clubs and other organizations, has remained about the same as last year and, indeed, is about as full a schedule as the present staff can attend to properly.

*Change of name.*—For some time past there has been under consideration the question of changing the name of the museum from "The Zoological Museum" to "The Museum of Natural History of the University of Minnesota." There are various reasons why the latter name would be better than the present one. It would be better understood by the non-scientific world and would convey a more definite idea; the word "zoological" is cumbersome and forbidding and not easily handled by the average person; the museum is not now strictly zoological and will become less and less so as time goes on; most museums of the kind are designated museums of natural history; since the name "Department of Zoology" has recently been substituted for the former "Department of Animal Biology" no little confusion has resulted in various ways and it would be better for the museum to have a more distinctive title. If such a change meets with the approval of yourself and the Board of Regents it is hoped that official action will be taken at an early date, sanctioning the above new designation and recognition of the museum as an independent college of the University.

*Exhibits.*—No large exhibit has been completed during the past year but Mr. Breckenridge, the preparator, has devoted most of his time to work on the new large bird group, to be known as the Coteau or Pipestone Bird Group, and it is now, at the close of the year, nearly ready to be assembled. The making of the accessories of this group, chiefly flowers and plants of the western prairies, has been a considerable task—110,000 separate blades of grass have been made to insure a satisfactory representation of prairie conditions in the foreground. These have been made of colored sheet-pyralin especially prepared for us by the du Pont Viscoloid Company of Arlington, New Jersey. A machine which cuts, tapers, and grooves each blade with a single movement was designed by Mr. Breckenridge and constructed by Mr. David Crowther of the University Central Shop. It worked perfectly and made possible the carrying out of this detail. Also, 9,000 leaves were cut with stencils and assembled in sprays for the construction of the buffalo-berry bush, which is a feature of the group. The buffalo-berry is not a native of Minnesota and was probably introduced, purposely or accidentally, into the Pipestone area by visiting Indians from farther west. Several helpers were employed from time to time to assist Mr. Breckenridge in the more routine parts of this work. Miss Mabel Densmore of Red Wing, Miss Marian Ruthenberg of the Elsie Horton Studios, and Mr. Adolph C. Johnson, a recent graduate of the University, have been employed at various times in the preparation shop in connection with this special work.

Four small groups of the standard portable school size have been completed by Mr. Breckenridge. They contain, respectively, a winter scene on the north shore of Lake Superior with a pair of Golden-eyed Ducks in the foreground; a pair of Killdeers with nest and eggs; a pair of Cliff Swallows with their peculiar mud nest attached to a rocky background; and a Snowy Owl amid a wintry scene. Material is on hand for a large number of these smaller groups and after completion of the large bird group Mr. Breckenridge's time will be devoted entirely to this work, as, unfortunately, we have no space for the construction of any more major groups at present. A large room on the second floor has been kindly placed at our disposal by Dr. Riley and here we shall be able to display a considerable number of these lesser-sized groups.

The public schools of Minneapolis are to begin taking our portable groups the coming fall. Mr. W. F. Webster, superintendent of schools, visited the museum recently and arrangements have been perfected for inaugurating this loaning program, which has been under consideration for some time. Fifteen of the schools are being equipped for the proper hanging and lighting of the groups as a beginning on a limited scale. The public schools are to take care of the transportation.

Considerable time has been devoted during the year to writing suitable labels for the groups and other exhibits. These have been printed and installed, and now the museum is fully provided with descriptive and explanatory matter. This is no small task and requires much careful study.

*Study collections.*—About 125 bird skins and a considerable number of birds' eggs have been added to the study collections during the year. Besides the regular bird class and a considerable number of individual students, a group of public school teachers under the direction of Miss Tillisch has been using these collections in connection with a course in nature study given under the auspices of the Extension Division. Both mammal and bird skins have been loaned to a few accredited persons during the year for use either in teaching or personal study.

*Accessions.*—The list below will show in detail the accessions to the museum and the sources from which obtained. Mention may be made of the following items: Dr. H. M. Guilford, formerly of Minneapolis and now of Madison, Wisconsin, presented 101 bird skins and a large number of eggs collected by him in Hennepin County many years ago; Mr. J. D. Figgins, director of the Colorado Museum of Natural History, generously donated two mounted Long-billed Curlews for the new large bird group.

## BY GIFT

Mr. Bernard Bailey, Elk River .....	1 Least Sandpiper (skin)
Mr. Frank Blair, Mound .....	1 Red-tailed Hawk and 1 Goshawk (in flesh)

## ANNALS OF MUSEUM OF NATURAL HISTORY

Major Allan Brooks, Okanagan Landing, British Columbia .....	2 Evening Grosbeaks (skins)
Masters Lucian H. and Winthrop L. Brown, Lake Minnetonka.....	7 soft-shelled turtles and 2 painted turtles (alive)
Miss Lois Carlton, Dodge Center.....	1 Nelson's Sparrow (in flesh)
Mrs. Collins, Minneapolis.....	1 Loon (in flesh)
Mr. and Mrs. Frank W. Commons, Cryst- tal Bay.....	1 Broad-winged Hawk, 1 White- winged Crossbill, and 2 Juncos (all in flesh)
Dr. L. O. Dart, Minneapolis.....	1 shark's skull
Colorado Museum of Natural History, Denver, by courtesy of the director, Mr. J. D. Figgins .....	2 Long-billed Curlews (mounted)
Dr. H. M. Guilford, Madison, Wis.....	101 bird skins and a collection of birds' eggs
Dr. J. Arthur Harris, St. Paul.....	1 Roseate Spoonbill (skin)
Miss Mathilda L. Krefting, Worthington	4 photographs
Mr. Dietrich Lange, St. Paul.....	6 photographs
Dr. Alfred Lewy, Chicago.....	1 Scaup Duck (skin)
Mr. R. C. Lewis, Stillwater.....	1 Pileated Woodpecker (in flesh)
Mr. Frank H. Nutter, Minneapolis.....	2 red squirrels (in flesh)
Rev. P. B. Peabody, Wamego, Kan.....	52 birds' eggs and 11 nests
Mr. C. M. Roberts, Minneapolis.....	1 Snowy Owl (in flesh)
Minnesota Game and Fish Department ...	Large number of fish of various spe- cies for aquarium
Mr. G. W. Swedenborg, Minneapolis.....	2 photographs
Mr. Thaddeus Surber, St. Paul.....	1 wolf skull and 1 photograph
Mr. Stephen H. Withey, Crookston.....	1 Raven (mounted)
Mr. Donald Winston, Minneapolis.....	Section of petrified tree

## BY MUSEUM FIELD WORK

Mr. W. J. Breckenridge, collector.....	77 bird skins, 24 nests and eggs, photo- graphs, color studies, molds, and accessories for groups
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## BY PURCHASE

Museum Donation Fund.....	1 Whooping Crane (for bird group)
University Museum Maintenance Budget	24 lantern-slides (later transferred to the Department of Zoology)

*Publications.*—*Occasional Papers No. 2*, containing four radio talks given during the spring of 1926 by the director, was issued during the year. All four papers dealt with ornithological subjects with special reference to Minnesota. Copies were sent to nearly 200 persons who requested the publication of the lectures, and many others have been distributed to correspondents and bird students.

The usual articles entitled "The Season," prepared from the files of the museum, have been published every two months in *Bird-Lore*, the official organ of the National Association of Audubon Societies.

*Photography.*—One hundred and twenty-six negatives, 123 slides, and four enlargements from small negatives have been added to the photographic library during the year. Two hundred and forty-eight

## ANNALS OF MUSEUM OF NATURAL HISTORY

prints have been made and mounted in the print collection, which serves as an auxiliary index to the negative and slide collection. One hundred and eleven feet of motion-picture negative were taken, developed, and printed. Four hundred and sixty slides were colored by Miss Jackson of the Haynes Studios, St. Paul, to be used largely in making up duplicate loan sets.

Miss Mabel Densmore, of Red Wing, again spent some time in cataloging and indexing the photographic collection, so that it is fully up to date and accessible for all purposes.

*Co-operation.*—The two-quarter course in ornithology, offered by the Department of Zoology, was given by the museum staff for the twelfth consecutive year. The class was full again this year. Special thanks are once more due Mrs. F. S. Davidson and Miss Mary Tillisch for valuable aid in the field work.

Assistance has been rendered in various ways to other departments of the University. The many lectures to school children and other groups form a considerable and important part of the co-operative work of the museum.

Mr. Kilgore has continued to serve as examiner in bird-study for the Boy and Girl Scouts and has examined thirty-six boys and six girls for merit badges.

A radio talk, in the Izaak Walton League program over station WCCO, was given by Mr. Kilgore on December 14 on the subject "Out-of-door Literature." Two talks were given by the director—the first, October 26, on the "Distribution and Migration of Ducks" at the request of the Izaak Walton League, and the second on "Vanished Mammals of Minnesota," on February 28 in the university program. The latter was the opening lecture in a series on the "Mammals of Minnesota," the subsequent lectures being prepared and broadcast by Mr. Thaddeus Surber of the Minnesota Game and Fish Department. These papers reviewed rather fully the mammals of our state and were carefully written with a view to publication, as there is nothing very recent in print on the subject.

Sets of slides, motion-picture reels, and specimens have been loaned on forty-one occasions. The slides and reels were in some cases shown a number of times and were viewed by a total of over 8,000 persons.

Portable groups were loaned to Northrop Collegiate School, to the Boy Scouts, to the Minneapolis Chapter of the Izaak Walton League for exhibition at the convention of the League of Minnesota Municipalities, and on one or two occasions for window displays in the city.

*Lectures.*—The full list of lectures given under the auspices of the museum during the past year numbers 123, of which all but sixteen were given by the director or Mr. Kilgore. The total attendance was a little over 12,000. Forty-six lectures to children of the Minneapolis

public schools have been given, most of them at the museum, a few in the auditoriums of the schools. The combined attendance was 5,815. Thirty-nine schools were represented, several repeating one or more times. The list is as follows:

*High schools.*—Central, South, Washburn, and West.

*Junior high schools.*—Franklin, Lincoln, and Seward.

*Grade schools.*—Adams, Clara Barton, Blaine, Bryant, Calhoun, Clay, Cleveland, Cooper, Corcoran, Douglas, Emerson, Robert Fulton, Grant, Harrison, Hawthorne, Holland, Johnson, Kenwood, Lake Harriet, Loring, Lyndale, Miles Standish, Monroe, Morris Park, Peabody, Pierce, Pillsbury, Sheridan, Sumner, Tuttle, Washington, and Webster.

Four classes came from St. Paul schools and others from outlying places as distant as Faribault, Goodhue, and Stillwater. Boy and Girl Scouts, Young Men's Christian Association boys, classes of children from private schools, and various groups of adults have been met at the museum or elsewhere and provided with illustrated lectures on request.

Last spring the Young Men's Christian Association camp leaders organized a course in nature study and the museum joined with members of other departments of the University in instruction and devoted two evenings at the museum to lectures on birds and study of the collections. Miss Jennie Hall, supervisor of nature study in the public schools, and Miss Mary Tillisch of Miss Wood's Kindergarten Teachers Training School, brought their classes to the museum for lectures and inspection of the exhibits. Several parents and teachers associations were provided with evening entertainments. Mr. Kilgore lectured before the Civitan Club, the Milwaukee City Club (at Milwaukee), the Women's Welfare League of St. Paul at the St. Paul City Club, and the Swedish Tabernacle and First Baptist Church clubs. Mr. Breckenridge has rendered assistance in lecturing to school groups in the museum.

On July 22 Mr. Kilgore and the director visited the St. Paul Young Men's Christian Association Boys' Camp on the St. Croix River below Hudson, Wisconsin, and gave an illustrated talk on bird study to the seventy-two boys and their directors.

Early in August the director and Mr. Kilgore spent several days at McGregor, Iowa, attending the annual session of the American School of Wild-Life Protection. The director gave two illustrated lectures, and a third by request was descriptive of the work of the museum. Mr. Kilgore directed several field parties in connection with the course in bird study.

*Sunday afternoon lectures.*—For the seventh consecutive year the museum was open Sunday afternoons from two to five o'clock during January, February, and March. Heretofore a formal lecture for each Sunday was offered, usually given by a member of the

university faculty. This year a departure from this plan was tried as an experiment. Only three formal lectures were announced and outside speakers were secured. These lectures were given in the auditorium of the Music Building, which was kindly placed at our disposal for the purpose. The seating capacity of the hall is about 650 and it was crowded to the doors and even on the stage at each lecture, while many who came could not gain admittance. The total of the three audiences was at least 2,250. This was a gratifying demonstration of the interest that can be aroused in good scientific lectures, popularly presented. The speakers and the titles of their lectures are as follows:

#### PROGRAM OF SUNDAY LECTURES

January 23—The Story of the Glacial Period or Ice Age, by A. O. Thomas of the Department of Geology, University of Iowa.

February 6—Seeing Stars, by Edwin B. Frost, director of Yerkes Observatory and professor of astrophysics, University of Chicago.

March 27—Wild-Life Outposts, by William L. Finley, lecturer, and director of wild-life conservation, American Nature Association.

Lectures, intended for the large number of children who came regularly, were given every Sunday at the museum, mostly by Miss Tillisch. They were fully illustrated with motion pictures and slides and were well attended, the total estimated number being 1,300.

Aside from the *Minnesota Daily* and one city daily, very little newspaper publicity could be secured. Posters were distributed freely in the Twin Cities and neighboring towns, and the increased knowledge of the museum, spread in this way, was reflected in an augmented attendance throughout the year. A brief radio talk, descriptive of the museum and its activities, was given by the director in January through the courtesy of the University Radio Department.

*Attendance.*—It is impossible to keep a record of the daily attendance, but whereas not long ago the university students were chiefly in evidence, now outside visitors in steadily increasing numbers are to be seen in the halls. An exact tally count was kept of the attendance on the thirteen Sunday afternoons in January, February, and March, and it totaled 5,172. On the same afternoons that the Music Building auditorium contained capacity audiences, the halls of the museum were crowded with other visitors who had come to see the exhibits. It is a reasonable estimate that the museum in its various activities now reaches directly 20,000 people annually without taking account of the very considerable number who daily visit the exhibits throughout the year. It would seem that all the effort and expenditure of the last few years are bearing fruit and being justified.

*Visitors of note.*—Mention may be made of the following persons who visited the museum during the past year as guests or to inspect the exhibits critically: Dr. Witmer Stone, curator of the

Museum of the Philadelphia Academy of Sciences; Captain Donald McMillan, arctic explorer; Mr. Vernon Bailey of the United States Biological Survey; Dr. E. B. Frost of Yerkes Observatory; Dr. A. O. Thomas of the Geological Department, University of Iowa; Dr. Homer Dill, director of the Museum of the University of Iowa; Dr. W. L. Finley, lecturer, Jennings Lodge, Oregon; Mr. Frank Tose, chief taxidermist of the Museum of the California Academy of Sciences; Mr. Ashley Hine, bird taxidermist of the Field Museum of Natural History, Chicago.

*Correspondence.*—The usual volume of correspondence has been taken care of in the office of the director, the subject-matter ranging from how to organize a course in bird study, or information in regard to the natural history of the state, to how to get rid of mites on pet canaries!

*Aquarium.*—The aquarium has been maintained in fair condition throughout the year with Mr. Eugene Surber as caretaker. As usual there has been considerable loss and no little difficulty in keeping the fish free from disease, but with occasional restocking through the courtesy of the State Game and Fish Department the tanks have been kept well enough supplied with native fish to be interesting. The aquarium is a very special and never-ending attraction to the children and only a little less so to adults.

#### FIELD WORK

Work in the field this year has been largely confined to collecting material for small school-groups and medium-sized groups to be constructed the coming winter after the large bird group is completed. In the course of this collecting much information in regard to the natural history of the state has been obtained for our files.

From January 29 to February 24, and again from April 12 to 18, Mr. Breckenridge was on the north shore of Lake Superior collecting and making a winter and early spring survey of conditions in the interests of the museum. From April 26 to June 3 he spent much time in the field in the vicinity of Minneapolis and secured much-needed material. From June 8 to 18 Mr. Kilgore, Mr. Breckenridge, and the director were in Isanti County collecting specimens and studying the special faunal conditions of that locality, which is on the border line between the *Transition* and *Canadian Faunae*.

The specimens obtained on these various expeditions are listed under *Accessions*. Full written reports of the observations made have been placed in our files for future use. While on the north shore Mr. Breckenridge collected a species of Gull not before taken in the state.

#### FINANCES

*University Museum Maintenance Budget.*—This amount for the past year was \$2,700, an increase of \$200 over last year. The principal items for which it has been expended are as follows: photography, developing and printing negatives, making enlargements for backgrounds, developing and printing motion-picture negative; coloring 460 lantern-slides; taxidermist's supplies, including a machine for cutting celluloid grass and a projecting instrument for studying motion-picture negative; stationery and other office supplies; printing and framing labels for groups; miscellaneous printing; Sunday lecture fees and expenses; publishing *Occasional Papers No. 2* (1,500 copies); constructing a large storeroom in the sub-basement; building twenty-four small and six twin medium-sized cases for groups; and field expenses. In order to meet this rather unusual outlay it was necessary to transfer \$500 from the Museum-aid Budget to this fund.

*Museum-aid Budget.*—This was \$1,200 for the past year. Considerable extra service was required in the museum during the past year and it was paid from this fund, which was also drawn upon to the extent of \$500 to help out the regular budget.

*Museum Small-group Fund.*—A balance of \$307.93 was carried over in this fund from last year. This has been augmented by a contribution of \$100 monthly since November, 1926, received from Mr. E. Floyd Allen of Minneapolis. Mr. Allen's generous contribution was offered by him without solicitation and the thanks of the museum and the University are extended to him for this kind assistance in the portable school-group work. He intends to continue this monthly contribution for the present.

There remained a balance in this fund on June 30, 1926, of \$972.21, in the Minneapolis Trust Company in the name of Thos. S. Roberts, Trustee.

*Museum Donation Fund.*—Mr. James F. Bell has continued his contribution of \$75 monthly throughout the year, amounting to \$900. Various minor expenditures and the supplies for the Coteau Bird Group have been paid from this fund. There remained a balance of \$633.96 on June 30, 1927, in the First National Bank of Minneapolis in the name of Thos. S. Roberts, Trustee.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*

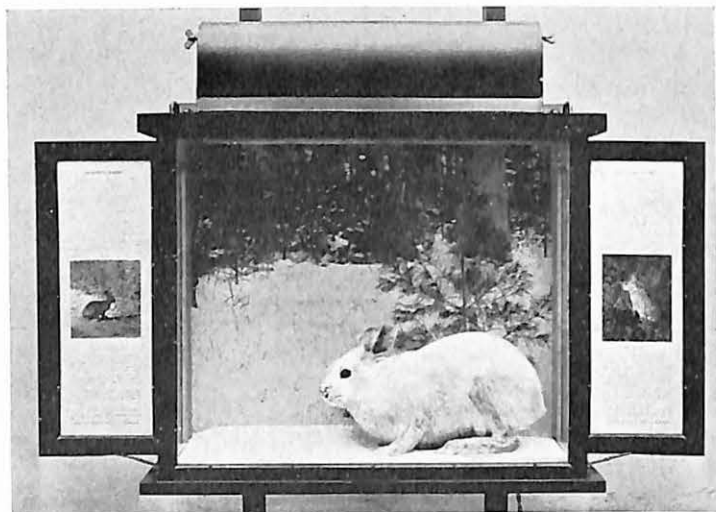


Fig. 27.—Snow-shoe Rabbit. Winter coat. Portable Group.

*To the President of the University:*

SIR: I have the honor to submit the following report of the condition and activities of the Museum of Natural History for the year ending June 30, 1928.

#### MUSEUM

During the past year the museum has actively maintained the same lines of work as in recent years with the addition of one important new outside contact, preparation for which has been in progress for some time. This is the loaning of small portable groups to the public schools, which brings the museum to a large number of pupils who might not otherwise have the opportunity to inspect the exhibits. Only a comparatively small beginning was made as but fifteen groups were put into circulation this year, but it is the beginning of a long-planned project which it is hoped will expand to considerable proportions in the years to come. The co-operation of the Minneapolis Board of Education was all that could be desired. The museum loaned the groups and the reflectors, and the board equipped fifteen buildings with hanging devices and electrical connections patterned after those in the museum, which insured the exhibits being safely and effectively displayed. Late in October one of the large school trucks called for the cases, which were enclosed separately in substantial shipping containers. They were delivered, one to each of the fifteen schools selected, and every two weeks thereafter the entire series was moved ahead one building, so that at the

end of thirty weeks each school had had the entire fifteen exhibits. This was done so carefully and methodically by the two men in charge of the truck that no injury of any consequence was done to the cases or their contents, and the whole plan worked smoothly and satisfactorily. Miss Jennie Hall, supervisor of nature study in the public schools, entered cordially and enthusiastically into the scheme and planned and superintended the working-out of the details in the schools. Only grade schools received the exhibits this year. The response from the teachers and pupils was most gratifying, and many letters were received telling of the pleasure and interest as each new group made its appearance. Examples of these letters may be of interest as showing the reaction to this work and as a justification of the rather considerable expense and labor involved. The first is from the principal of the Washington School:

Your museum exhibit has given much joy to our children at the Washington School. The little people have enjoyed singing songs about our present Rabbit exhibit and happily gather about the case to take just one more look at him. It has stimulated much interest in the field of Nature Work so that children have brought in their own specimens from home as well as stories and poems.

We are very grateful to you for these lovely exhibits. May I express the appreciation of all the teachers also? The boys and girls have been so interested that they wish to thank you in their own childlike manner so I am enclosing a letter from each room, thinking that you, too, would enjoy the original forms.

The second is from a teacher in the sixth grade of the Irving School:

I am joining the boys and girls in extending to you my thanks for the nature exhibits which come to us every two weeks. I wish you might see the enthusiasm with which they are welcomed by the children of the Irving School. I am sure you would be somewhat repaid for your effort in getting these splendid and helpful cases to us. It is next to having nature at first hand.

A third is from the principal of the Calhoun School:

The Calhoun School has so thoroughly enjoyed the wonderful bird exhibits, which you were so kind as to send to us, that the children wish to express to you their appreciation.

A large number of letters were received from the children, all of which it would be interesting to put on record did space permit, but one or two will have to suffice. From the 4A and 5B pupils in Clay School:

We thank you for sending the Rabbit Group to Clay School. Six children in Miss Schenck's room had never seen Cottontail Rabbits before.

From Room 104, 5B, Calhoun School:

We are very glad to have this opportunity to see the birds so closely. We have been studying about the Orioles, Song Sparrows, and the Goldfinch. Your exhibits have been helping us very much in answering questions about the colors, size, food, nests, eggs, and homes of these different birds.

ANNALS OF MUSEUM OF NATURAL HISTORY

And this from a youngster in 1A, Washington School:

We like our Bunny Snowshoe,  
And our Snowy Owl, too.  
We thank you—we do.

From the president and secretary of the Irving School Audubon Society:

We are sending you a letter to tell you how fortunate we consider ourselves in getting the specimen cases for nature study. We enjoy them so much. We use them for reading lessons, also, in this way: first we make a list of questions which we spend the week looking up. Then on Friday we write the answers. From these our teacher collects the most interesting parts and makes a reading lesson out of them. We are now beginning to wonder what our next case is to be, but we will be very happy to receive any case for we take much pleasure in them and are writing this to show our gratitude.

Numerous comments were made, even by the children, on the electric lighting of the groups, which, so far as we know, has never been attempted in any other city where this method of visual education is being carried on.

Printed descriptive text designed for adults and older children accompanied each group. Some, at least, of the teachers cleverly rearranged this matter in simpler form and prepared questions suited to the age of the pupils, which brought out more clearly the salient points in the text. Samples kindly sent to us may serve as guides in the future preparation of labels for the use of young children. Aside from the instruction in nature study, many of these exhibits are so artistically worked out that they possess the esthetic and cultural qualities of a fine picture.

The cases were returned to the museum in June in generally good condition. It is expected that a larger number will be put into circulation next winter, as many of the teachers not included this time are hoping to receive them hereafter.

In regard to the proposed change of name of the museum, referred to in the last report, the following letter received from President Coffman under date of January 6, 1928, announced that the proposed change had been made effective:

MY DEAR DR. ROBERTS:

I am happy to inform you that the Board of Regents at its meeting to-day voted unanimously to change the name of the Zoological Museum to Museum of Natural History of the University of Minnesota . . . .

*Exhibits.*—The large group, known as the Pipestone Prairie Group and described in previous reports, was completed and opened to the public in October. It has received high praise from competent judges and is generally considered to be the most attractive, instructive, and technically perfect group in the museum. It is the gift of Mr. James F. Bell. It was constructed by Mr. W. J. Breckenridge, the present museum preparator, although considerable of the material

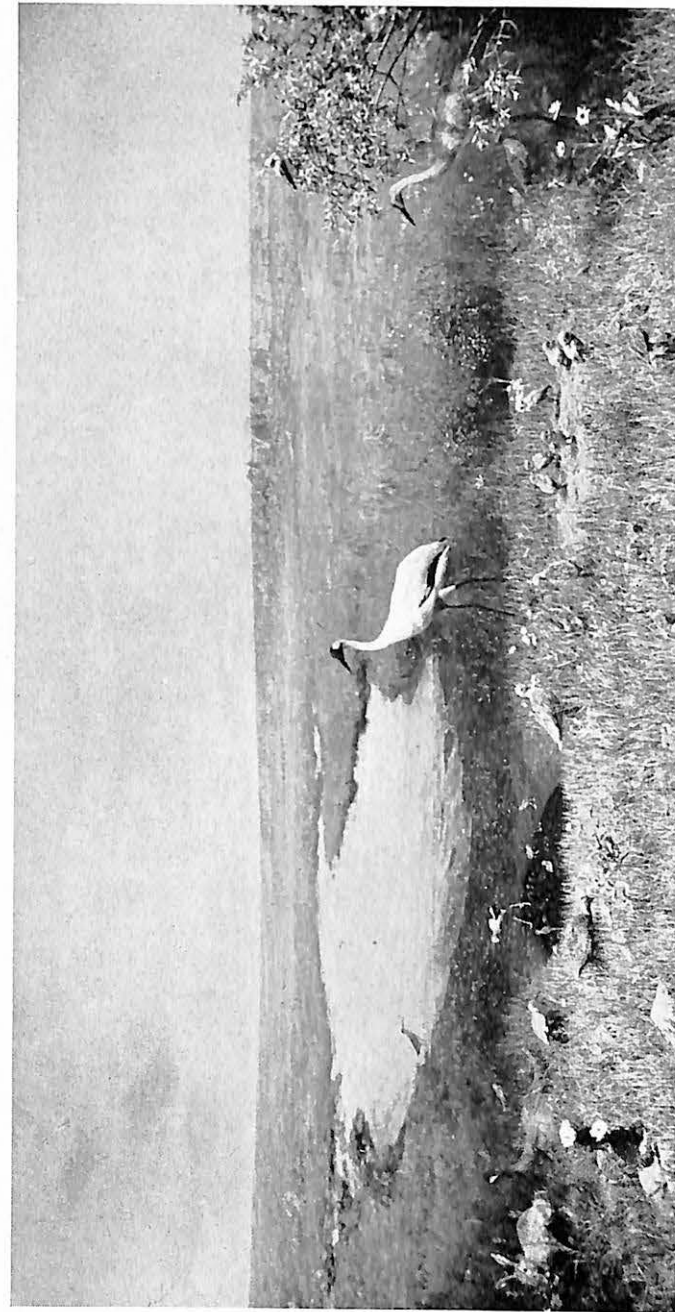


Fig. 28.—Pipestone Prairie Group. Presented by James F. Bell. Background by R. Bruce Horsfall. Constructed by W. J. Breckenridge. (See pages 93-94, 104, 114-16.)

was collected in North Dakota by Mr. and Mrs. Jenness Richardson before they severed their connection with the museum. The setting and general scheme of the group, as a prairie association of plants and animals with the famous red-pipestone quarries as a background, was an idea of the director. The foreground arrangement or model was largely designed by Mr. Richardson but underwent various minor modifications by Mr. Breckenridge in the course of construction. The background was painted by Mr. R. Bruce Horsfall of Washington. This exhibit was written up very fully by Mr. Thomas E. Steward, director of the University News Service, in an illustrated article in *Minnesota Chats* for December, 1927. This article attracted much attention to the group and the following unsolicited letter from Mr. W. R. Morton, superintendent of the Robbinsdale public schools, is presented as an example of the appreciative reception that this exhibit has received from discriminating observers. The letter was addressed to Mr. Steward and was dated January 5, 1928:

MY DEAR SIR:

As an alumnus I wish to congratulate you upon the splendid description of the fauna and flora exhibition in the Zoological Museum, which recently appeared in *Minnesota Chats*. The exhibit to which I refer is that of the region of Pipestone. I read very carefully every sentence of your description and was very much pleased with the way you have brought out the historical facts.

I was so interested in the work that I immediately went over to see the exhibit and was very much pleased with what had been done. There is a tremendous amount of detail connected with this setting, which most people do not appreciate. I am taking this special interest because I was raised in Pipestone and graduated from the High School there and every foot of this ground is familiar to me. I do not see how the fauna and flora of southern Minnesota could have been placed to better advantage than with the Pipestone Falls in the background. It is a piece of splendid work. It surely brought back to me many of my boyhood experiences and I could not help but be moved at seeing the birds, animals and flowers which were so familiar to me in the days of childhood.

The fact that there are no buildings or marks of civilization in the picture lends dignity and grandeur to the scene. The Three Maidens, the long ledge of rock, the Buffalo winding over the precipice, the empty prairie to the south where now stands the city of Pipestone with five thousand inhabitants, are all magnificent. The picture is just as it was when Indians visited it in the early half of the past century. The unusual amount of detail in mounting the different birds and making the flowers and grass reflects great credit upon the artist. One who is familiar with the animals and flowers of early Minnesota cannot help but be impressed with this splendid service rendered to the memory of early historical days.

In addition to the large Pipestone Prairie Group, six small portable groups were completed during the past year. These are as follows: Florida Gallinule; Warblers among apple blossoms; Lesser Scaup, male and female; Striped Gopher; Pocket Gopher; and a group showing the windpipes of the Trumpeter and Whistling Swans and the Whooping and Sandhill Cranes.

*Study collections.*—Two hundred and seventy-seven bird skins and thirty-four mammal skins have been added to the study col-

lections during the year. A number of other specimens secured are retained especially for group work and not included here. These collections are in frequent use for study and reference by students both within and without the University.

*Accessions.*—An item of exceptional interest and value is a set of the double elephant folio edition of Audubon's *Birds of America*. This was presented to the museum by the heirs of Mr. William Overton Winston with the following letter of transmittal:

Minneapolis, Minnesota  
January Twentieth, 1928

Zoological Museum  
University of Minnesota  
Minneapolis, Minnesota

DEAR SIR:

Because of the special interest of William Overton Winston in the Zoological Museum of the University of Minnesota, as well as because of his lifelong friendship for its Director, Dr. Thomas S. Roberts, we, the family of Mr. Winston, in his memory, present to the Zoological Museum of the University of Minnesota, this set of the Double Elephant Folio Edition of the works of John James Audubon, with the request that it be retained in the Museum as a special exhibit.

Very sincerely yours,

FRANCISCA S. WINSTON  
CHARLES W. WHITAKER      WILLIAM O. WINSTON, JR.  
DONALD WINSTON              FREDERICK S. WINSTON

The four volumes are complete in every detail, in perfect condition, and are contained in a specially constructed mahogany cabinet built with a tilting top for convenience in viewing the ponderous books. For the present the cabinet containing the books has been installed in a railed-off area in a room on the second floor of the Zoology Building, where it is safe and where the volumes can be easily and conveniently shown to visitors. The University as well as the museum is very grateful to the Winston family for this generous and rare gift.

Special mention should also be made of several other items. Mrs. Oscar B. Warren, widow of Mr. Oscar Bird Warren, who for many years was a student of natural history, kindly donated a collection of bird skins, pamphlets, and separates on nature subjects, and seven rare negatives depicting the nesting of the Canada Jay, the property of her husband who died in Minneapolis, September 15, 1921.

Mr. P. O. Fryklund, of Roseau, presented the skins of an adult and nestling Goshawk and a set of three eggs, all taken in northern Minnesota and constituting the first substantiated record of this northern species breeding in this state.

The following list shows in detail the accessions that have been made to the museum during the past year and the sources from

which they have been received. Letters of acknowledgement and thanks have been sent to Mr. Fryklund and the following donors:

## BY GIFT

Mr. James F. Bell, Minneapolis .....	1 partial albino Baldpate Duck, 1 Blue Goose, 2 Snow Geese (all in flesh)
Mrs. W. A. Benitt, Hudson, Wis. ....	1 Ruby-throated Humming-bird (in flesh)
Mr. W. H. Boone, Minneapolis .....	1 American Scoter Duck (in flesh)
Mr. Hovey C. Clarke, Minneapolis .....	1 Golden-eyed Duck (in flesh)
Miss C. C. Crosby, Minneapolis .....	1 Canvas-back Duck (in flesh)
Mr. John Durand, St. Paul .....	1 Screech Owl (in flesh)
Mr. G. R. B. Elliott, St. Paul .....	1 Hoatzin (skin)
Mr. P. O. Fryklund, Roseau .....	1 adult Goshawk, 1 young Goshawk (skin) and 1 set of 3 Goshawk eggs
Dr. Robert G. Green, Minneapolis .....	1 Canada lynx (in flesh)
Mr. J. E. Grimes, Minneapolis .....	6 Redhead Ducks, 1 Pintail Duck, 2 Marbled Godwits, 1 Reddish Egret (all salted skins)
Miss Gwendolen M. Larson, Agate, N. D.	1 Snowy Owl (in flesh)
Mr. J. L. Montgomery, Minneapolis .....	1 Sora Rail (alive)
Mr. D. N. Morison, St. Paul .....	1 Resplendent Trogon (skin)
Mr. Alfred Peterson, Pipestone .....	2 Semipalmated Sandpipers (in flesh)
Mr. C. E. Richards, Minneapolis .....	1 Woodcock (in flesh)
Minnesota Game and Fish Department ..	3 lots of live fish for aquarium
Mrs. M. F. Staudenmoir, Pipestone .....	2 samples of rock from Pipestone quarries
Mr. Thaddeus Surber, St. Paul .....	27 small mammals (skins)
Mr. B. W. Thayer, St. Paul .....	1 gray squirrel (skin)
Mr. F. M. Uhler, Washington, D.C. ....	3 photographs
Mrs. O. B. Warren, Minneapolis .....	82 bird skins, 1 red squirrel (skin); 1 card with mounted horned toad, tarantula, and trap-door spider; 71 pamphlets and separates pertaining to natural history; 7 4x5 negatives of Canada Jay
Mrs. W. O. Winston and family, Minneapolis .....	1 set of the John James Audubon 4-volume double elephant folio edition of the <i>Birds of America</i> , with cabinet and display table

## BY EXCHANGE

Major Allan Brooks, Okanagan Landing, British Columbia .....	1 Northwest Crow, 1 Black-headed Jay, 1 Short-billed Gull, 4 Evening Grosbeaks (var. brooksi), 2 Barrow's Golden-eyed Ducks
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## BY MUSEUM FIELD WORK

Material collected by museum staff .....	165 bird skins, 4 nests, 11 eggs, 5 small mammal skins, 500 feet of motion pictures, photographs, color studies, and accessories for small groups
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*Publications.*—The only publications have been the six articles in *Bird-Lore* entitled "The Season; Minnesota Region" and based on information in the files of the museum; and a reissue of the *Daily Checking List*, supplied to bird students throughout the state to facilitate recording bird observations. These lists are in great demand and many hundreds are sent annually to applicants without charge.

*Photography.*—One hundred and ninety-two negatives, 234 prints, and sixty-four slides have been added to the collection during the year. Of motion-picture film, 733 feet were taken and developed and 435 feet were printed.

The museum added to its photographic equipment this year a new Bell and Howell Eyemo motion-picture camera with six-inch lens, tripod, and other accessories.

*Co-operation.*—Besides the groups loaned to the Minneapolis public schools, already referred to, portable groups have also been loaned to the Minneapolis Chapter of the Izaak Walton League, to Macalester College, and to Northrop Collegiate School. Lantern-slides in full sets and small lots, and motion-picture reels, have been loaned to various institutions, societies, and teachers, both within and without the city. Return cards show that over 5,000 adults and children viewed these slides and films. Skins and mounted birds have been loaned in several instances.

Mr. Kilgore has examined thirty-eight Boy Scouts and four Girl Scouts for bird-study badges during the year.

Mr. Breckenridge has given instruction in the making of museum specimens to several persons from other institutions.

On April 12 Mr. Kilgore gave an illustrated lecture to the Chisholm Branch of the Izaak Walton League at Chisholm with 125 in attendance, and on the following day gave a lecture with motion pictures to the junior and senior high school classes in the Chisholm High School, with 1,000 present.

The course in ornithology, offered by the Zoology Department, was conducted as usual by the museum staff. For important assistance in field work thanks are due Mrs. Frances S. Davidson and Mrs. E. P. Stacy.

The museum has gladly placed its facilities at the disposal of other departments of the University when requested.

*Lectures.*—The illustrated lectures and museum tours for groups of children from the public schools have continued as heretofore. Thirty-seven such groups have come from the Minneapolis schools and ten from St. Paul. Four additional lectures have been given in the auditoriums of Minneapolis schools with the attendance very much larger than is possible at the museum, but this way of presenting natural history is by no means as satisfactory as to small groups at the museum.

Four groups came from outside schools—Faribault, Stillwater,

White Bear, and Hammond, Wisconsin. Lectures were given to two private school groups, two Young Men's Christian Association groups, three Boy Scout groups, one Girl Scout group, two classes from Miss Wood's Kindergarten Teachers School, one to Miss Hall's University Extension teachers class, three to parents and teachers associations at as many different schools, and eighteen to various organizations both at the museum and outside. Including the Sunday lectures at the museum and at the Music Hall, a total of 103 illustrated lectures was given under the auspices of the museum with an aggregate attendance of 9,969. With the exception of about fifteen, all these lectures have been given by Mr. Kilgore as he has taken almost the entire charge of the school work during the past year. On a few occasions Mrs. Robert G. Green has rendered voluntary assistance in caring for large groups of children at the museum.

*Sunday afternoon lectures.*—Three free Sunday afternoon lectures were given under the auspices of the museum in the auditorium of the Music Hall. The attendance exceeded the capacity of the hall, totaling 2,125. The lecturers and subjects were as follows:

#### PROGRAM OF SUNDAY LECTURES

- January 22—Flowers in Their Relation to Insects, by Dr. A. H. Reginald Buller, professor of botany in the University of Manitoba, Winnipeg, Canada, and president of the Royal Society of Canada.
- February 12—Nature and Man in Abyssinia, by Dr. Wilfred H. Osgood, curator of the Department of Zoology at the Field Museum of Natural History, Chicago, Illinois.
- March 25—Camera Hunting on the Roof of the Rockies, by Dr. William L. Finley of the American Nature Association, Washington, D.C.

The museum was open to the public on Sunday afternoons in January, February, and March from two to five o'clock as in the past. Illustrated lectures for children were given in the lower lecture-room by Mr. Kilgore on twelve Sundays with a total attendance of 1,230. On three Sundays illustrated lectures for adults were given in the upper lecture-room by Mr. Kilgore, Dr. Sigerfoos, and Mr. Breckenridge. The total attendance at the museum on the thirteen Sundays, exclusive of the lectures in the Music Hall, was 3,871. The largest attendance—586—was on March 25; the smallest—twenty-two—on January 1, New Year's Day.

*Attendance.*—The daily attendance has continued to increase steadily as the museum has become better known. Assistance has been rendered by members of the staff to visiting groups and individuals from abroad whenever possible. As long as the museum remains scattered through the Zoology Building, as at present, there can be no way of even estimating the actual number of visitors except on special occasions, but perhaps a conservative figure of fifty a day, in addition to the students, would give some idea of the number viewing the exhibits throughout the year.

*Visitors of note.*—The museum has been visited and inspected more or less critically during the past year by the following well-known persons from outside the state: Dr. William Beebe, author, lecturer, and honorary curator of birds, New York Zoological Society; Dr. H. C. Bumpus, consulting director of the Buffalo Museum of Science; Mr. Howard Cleaves, lecturer; Dr. A. R. Crook, chief of the Illinois State Museum; Mr. Cyrus Edwin Dallin, sculptor, Arlington, Massachusetts; Dr. William L. Finley, American Nature Association, Washington, and author and lecturer, Jennings Lodge, Oregon; Dr. C. R. Keyes, Cornell College and Iowa Historical Society; Dr. Gregory Mathews, ornithologist and author, England; Dr. Wilfred H. Osgood, curator of the Department of Zoology, Field Museum of Natural History, Chicago, Illinois; and six members of the Mid-west Museum Conference.

*Correspondence.*—A considerable correspondence is taken care of each year by the director, most of it relating to natural-history subjects. The files are thus enriched annually by a steadily increasing volume of information about the wild life of the state. This work entails the added labor of transcribing the information contained in letters, record sheets, and lists sent in. Assistance has been rendered here by Miss Densmore, of Red Wing, and Mr. Kilgore.

Mention may be made in this connection that Miss Densmore was employed at the museum for three or four months during the past winter in going over the ornithological files and condensing the vast number of records and notes with a view to possible publication.

*Aquarium.*—The aquarium has been maintained in fair condition throughout the year with the generous help of the Minnesota Game and Fish Department. Mr. George M. Ruggles, a teaching assistant in the Department of Zoology, has been employed as caretaker. As in the past much difficulty has been encountered in keeping fish alive and healthy, presumably because of the varying amounts of chlorine in our city water, with which the tanks are supplied.

#### FIELD WORK

From September 28 to October 10 Mr. Breckenridge was at Ten Mile Lake in Otter Tail County with the main purpose of collecting Ducks for museum groups. From October 4 to 10 the director and Mr. Kilgore joined him and a good series of specimens was secured, including a number of other species besides Ducks. It was through the courtesy and co-operation of Messrs. J. F. Bell, F. M. Crosby, C. C. Bovey, W. H. Bovey, and C. D. Velie, members of a gun club leasing grounds at Prohosky's Camp, that the privilege was granted of occupying quarters and shooting at this favored spot.

Mr. Breckenridge was on the north shore of Lake Superior from May 14 to 21 with the purpose of locating, if possible, nesting-places of the Duck Hawk, getting information about the fast-disappearing

Canada Spruce Grouse, and making a study of bird conditions along the shore at that time of year. In the first of these efforts he succeeded beyond expectations and also secured much-needed data about other species and a small series of interesting water-birds.

From June 6 to 30, inclusive, the director, Mr. Kilgore, and Mr. Breckenridge made an extensive trip by automobile to the northern part of the state in the interests of the museum. The itinerary, with numerous side trips, covered nearly 2,400 miles, entirely within the boundaries of Minnesota. Most of the time was spent in the Red River Valley collecting specimens and gathering information in regard to the present-day wild-life conditions. The museum collections have contained very few specimens from that part of the state, which is of special interest faunally. Also there was very little definite knowledge of the summer bird life of that section within the last quarter-century. In spite of some bad weather the results of the trip were entirely satisfactory. The final week was spent on the north shore of Lake Superior collecting materials for a Duck Hawk Group, which undertaking was successful largely because of Mr. Breckenridge's energetic survey of this difficult coast in May last. The Duck Hawk is the American representative of the famous European Peregrine Falcon, which was the central figure in the once-renowned royal sport of falconry. It is not a common bird in Minnesota, and along the north shore it nests on the narrow ledges of the highest vertical cliffs bordering the lake. The specimens and photographs needed were obtained only by some rather hazardous rope descents made by Mr. Breckenridge. This group, when completed, will be one of the specially interesting exhibits in the museum.

Many still photographs and considerable fine motion-picture film were made during these expeditions. Aside from the bird and mammal films there is a series of motion pictures showing the special scenic features along the north shore including a number of the best waterfalls. These pictures were taken by Mr. Breckenridge in May when conditions were most favorable.

#### FINANCES

*University Museum Maintenance Budget.*—The \$2,700, appropriated by the University for supplies and current expenses, was expended largely for the following items: photographic supplies including developing, printing, making slides, etc.; Sunday lecture fees and attendant expenses (a considerable item); a new typewriter; shipping cases for portable groups; fifty aluminum reflectors for lighting small groups; viewing-platform for Pipestone Prairie Group; wiring twelve new medium-sized exhibition cases; field expenses; and miscellaneous construction and operating expenses including office supplies, printing, etc.

*Museum-aid Budget.*—This was \$800 for the past year. It has



Fig. 29.—Duck Hawk Group. (See page 122.)

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been used to pay expenses of maintaining the aquarium and for extra clerical work in the museum.

*Museum Small-group Fund.*—Mr. E. Floyd Allen has contributed \$1,100 during the year for this purpose. The remaining balance of Mrs. George C. Christian's previous contributions has taken care of most of the expenditure since Mr. Allen began contributing in 1926, and there remained to the credit of this fund in the First Minneapolis Trust Company on June 30, 1928, the sum of \$1,874.18, deposited in the name of Thos. S. Roberts, Trustee. Mr. Allen has kindly consented that the money contributed by him may be used for any purpose that will, in the judgment of the director, advance the material interests of the museum. The purchase of specimens for the study collections was specially indicated.

*Museum Donation Fund.*—Mr. James F. Bell's monthly contribution of \$75 has been received throughout the year, amounting to \$900. After the initial sum of \$1,500, given by Mr. Bell for the Pipestone Prairie Group, the further cost of construction was paid from this Museum Donation Fund, amounting in all to nearly \$3,000. There remained in the First National Bank of Minneapolis on June 30, 1928, a balance of \$223.50 to the credit of this fund in the name of Thos. S. Roberts, Trustee.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*

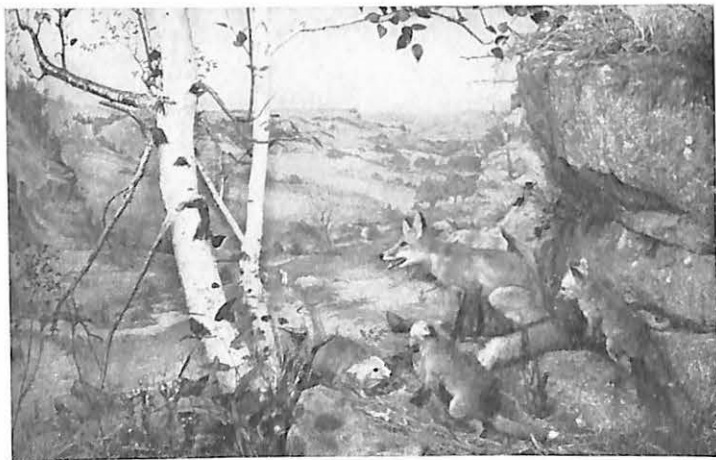


Fig. 30.—Red Fox Group. Constructed by W. J. Breckenridge.



Fig. 31.—Striped Gopher or 13-lined Spermophile. Portable Group.

*To the President of the University:*

SIR: I have the honor to submit the following report of the condition and activities of the Museum of Natural History for the biennial period ending June 30, 1930.

### MUSEUM

The museum during the past two years has continued to function actively as heretofore except that it has not been possible to construct additional major groups, as the last space for such exhibits was filled with the completion of the Pipestone Prairie Group in October, 1927. However, the museum in its present well-filled, though not crowded, condition presents an attractive appearance and serves to fulfill satisfactorily the purposes for which it was created.

Construction of the small, standard-sized loan cases has been continued though, through lack of room, it is not possible to display all of them. The surplus is away from the museum for the greater part of the year and the others form attractive wall-exhibits wherever there is space to hang and light them. Field work within the state in the interests of the museum has occupied much of the time of Mr. Breckenridge, and in order to keep the shop work going it was thought

best to employ another preparator. Mr. Arthur H. Bulbulian came from the University of Iowa on September 12, 1928, and has been working under Mr. Breckenridge's supervision since that date, chiefly on a half-time schedule. Mr. Bulbulian is a skillful technician and has proved to be a valuable addition to the staff. He is not on the university pay-roll, his salary being paid from funds supplied by Mr. E. F. Allen.

Much of the time of the director and part of the time of Mr. Breckenridge when not in the field have been devoted to the preparation of an illustrated work on *The Birds of Minnesota*, which will be published by the University Press for the museum. The money to defray in large part the expense of publication has been generously donated by a group of interested persons and is in the hands of the university comptroller. It is expected that the work will be ready for distribution some time next winter.

The museum was open every Sunday during January, February, and March from two to five o'clock, and both the formal lectures at the Music Hall and lectures to children and adults at the museum have been maintained as in the past.

In view of the fact that the general attendance is steadily increasing, that the school work is about all the present staff can care for properly, and that a knowledge of the existence and character of the museum is spreading and bringing more and more contacts with organizations and individuals, it is felt by those in charge of the museum that it is becoming an important educational factor, not only in the University but throughout Minnesota and to some extent, at least, beyond the confines of the state.

*Exhibits.*—Twenty-six school-groups and one medium-sized group have been added during the period covered by this report. The medium-sized group contains an adult Duck Hawk with nest, eggs, and background view of the north shore of Lake Superior at the "Palisades." The small school-groups are as follows: Coot with nest and eggs, Crow and Raven, Crow with nest and eggs, Pintail Duck, Wood Duck, Ruddy Duck, Buffle-head, Snow Goose, Sora Rail with nest and eggs, Spotted Sandpiper with nest and eggs, Black Tern with nest and eggs, Cooper's Hawk with nest and eggs, Bank Swallow with nesting-site, Flicker with nest and young, Yellow Warbler with nest and eggs, Rose-breasted Grosbeak with nest and eggs, Scarlet Tanager with nest and eggs, Baltimore Oriole with nest, House Wren with nest and eggs, Cedar and Bohemian Waxwings, a model of Triceratops, a model of Stegosaurus, the life cycle of the polypody fern, the life history of the polyphemus moth, the life history of the monarch butterfly, and a selection of Minnesota moths. All these groups, except the last one, have colored backgrounds. Several other groups, both small and medium-sized, are nearing completion.

## Accessions, 1928-29

Special mention should be made of a valuable donation by Mr. Oliver V. Jones of Minneapolis. This gift contained a beautiful male of the now extinct Passenger Pigeon, with nest and egg collected at Minneapolis during the last days of this bird; also some 1,055 eggs, fifty-three nests, and twenty-three skins of other birds. All of the specimens are in excellent condition with full data, which make them a very valuable addition to the collection.

Also mention should be made of a gift from the United States Biological Survey, of an assortment of confiscated plumages, including Birds of Paradise, Egrets, etc.

## BY GIFT

Dr. William P. Abbott, Duluth .....	1 Snow Goose, 4 Blue Geese, 1 Oldsquaw Duck (all in flesh)
United States Biological Survey .....	5 Birds of Paradise; backs of 11 American Egrets, 2 Snowy Egrets, 1 Little Blue Heron, 1 Louisiana Heron, and 1 Great Blue Heron; 25 plumes (black), 10 plumes (white), and 10 other colored plumes. (All confiscated plumage)
Mr. Charles Evans, Minneapolis .....	1 three-storied nest of Yellow Warbler
Mr. E. H. Forbush, Boston, Mass. ....	1 half-tone cut of young Burrowing Owls
Miss Margaret Hill, Minneapolis .....	1 Robin and 1 Oven-bird (in flesh)
Dr. N. L. Huff, Minneapolis .....	1 female Connecticut Warbler with nest and 4 eggs (bird in flesh) and 1 Song Sparrow (in flesh)
Mr. H. J. Jager, Owatonna .....	1 young Snow Goose (in flesh)
Miss Eleanor B. Jilson, St. Paul .....	1 male Connecticut Warbler (in flesh)
Mr. Oliver V. Jones, Minneapolis .....	A collection of bird skins, nests, and eggs, including a beautiful skin, a nest, and egg of the now extinct Passenger Pigeon. Collection contained 1,055 eggs, 53 nests, and 23 bird skins
Mr. R. F. Jones, Minneapolis .....	1 Cassowary (in flesh)
Mrs. E. H. King, Dassel .....	1 adult and 2 young hoary bats
Mr. D. Lange, St. Paul .....	1 Cardinal (in flesh)
Dr. Elmer Langevin, Crookston .....	1 set of 13 Prairie Chicken eggs
Dr. R. B. Loucks, Minneapolis .....	2 porcupines (alive)
North Carolina State Museum, Raleigh, N. C. ....	6 photographs of sperm whale
Mr. Alfred Peterson, Pipestone .....	1 albino Screech Owl (in flesh) and 1 nest of Warbling Vireo
Minnesota Game and Fish Department ..	1 Whistling Swan (skin) and 2 separate lots of fish (alive for aquarium)
Mr. B. J. Shaver, United States Game Warden, St. Paul .....	5 Mallards and 1 Pintail (in flesh)
Mr. M. W. Smith, Minneapolis .....	1 partial-albino Green-winged Teal (in flesh)

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Mr. Gustav Swanson, Minneapolis.....	1 Phoebe and 2 Red-winged Black-birds (skins)
Mr. D. R. Thompson, Northome.....	1 Evening Grosbeak (in flesh)
Mr. H. Waters, Minneapolis.....	1 Snowy Owl (alive)

BY MUSEUM FIELD WORK

Collected by museum staff.....	68 bird skins, 8 nests, 28 eggs, 23 small mammal skins, 375 feet of motion pictures, photographs, color studies, and accessories for small groups
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BY PURCHASE (MUSEUM DONATION FUND)

Mr. Anthony Prohosky, Dalton.....	1 gold-colored buffalo-fish (alive)
Mr. Marion W. Cooper, St. Paul.....	1 Osprey (in flesh)
Mr. P. O. Fryklund, Roseau.....	5 Great Horned Owls, 1 Great Gray Owl, 1 Hawk Owl, 2 Short-eared Owls, 1 Sharp-shinned Hawk, and 4 least weasels (all skins)

Accessions, 1929-30

BY GIFT

Dr. William P. Abbott, Duluth.....	1 Surf Scoter, 2 American Scoters, 3 Old-squaw Ducks (all in flesh)
Mr. L. L. Cahlander, Excelsior.....	2 black rats (in flesh)
Dr. William de la Barre, Minneapolis.....	1 American Golden-eyed Duck (salted skin)
Mr. J. M. Eheim, Hutchinson.....	1 Great Gray Owl, 2 Sparrow Hawks, 2 Red-tailed Hawks, 1 Cooper's Hawk, 1 albino Dove, 1 Virginia Rail, 1 Scarlet Tanager, 1 Yellow-bellied Sapsucker (all skins)
Miss Elizabeth H. Foss, Minneapolis.....	1 large shell from Bermuda
Mr. P. O. Fryklund, Roseau.....	1 Arctic Three-toed Woodpecker (in flesh)
Dr. Robert G. Green, Minneapolis.....	1 adult red fox (in flesh), 3 young red foxes (alive)
Mr. Sheridan Greig, Danbury, Wis.....	1 Herring Gull (in flesh)
Mr. H. J. Jager, Owatonna.....	1 Blue Goose and 1 Canada Goose (in flesh)
Mr. George Kerstan, Minneapolis.....	1 Least Bittern (in flesh)
Dr. T. G. Lee, Minneapolis.....	13 small mammal skins from Pacific Coast
Mr. Stanley Liljegren, Scandia.....	1 flying squirrel (in flesh)
Dr. G. H. Luedtke, Fairmont.....	1 Hungarian Partridge (in flesh)
Minnesota Game and Fish Department.....	1 Snowy Owl (in flesh), 1 set of caribou horns, 1 lot of fish (alive, for aquarium)
Mr. Arthur G. Ruggles, St. Paul.....	1 albino gray squirrel (in flesh)
Mr. B. J. Shaver, United States Game Warden, St. Paul.....	14 Wood Ducks (in flesh)
Mr. E. D. Swedenborg, Minneapolis.....	1 Blackburnian Warbler, 1 Black and White Warbler, 1 Golden-winged Warbler (all in flesh)
Mr. Gustav Swanson, Minneapolis.....	3 Red-winged Blackbirds and 1 Yellow-billed Cuckoo (skins)
Mr. A. C. Tilden, Hill City.....	1 star-nosed mole (in flesh)
Mr. A. N. Wilcox, Minneapolis.....	1 Wood Duck (in flesh)

ANNALS OF MUSEUM OF NATURAL HISTORY

BY PURCHASE (MUSEUM DONATION FUND)

Mr. P. O. Fryklund, Roseau.....	2 Sharp-tailed Grouse, 4 Hawk Owls, 1 Red-tailed Hawk, 1 Greater Scaup Duck, 1 Glaucous Gull (all skins)
Mr. Sheridan Greig, Danbury, Wis.....	1 Whistling Swan (in flesh)
Mr. James S. Harris, Backus.....	1 Golden Eagle (in flesh)

BY EXCHANGE

1 Hudsonian Godwit, 1 Cairns's Warbler, 1 Carolina Junco, 1 Orchard Oriole (all skins)
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BY MUSEUM FIELD WORK

Collected by museum staff.....	49 bird skins, 1 nest, 8 eggs, 690 feet of motion-picture negative, 63 photographs, color studies, and accessories for small groups
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*Publications.*—The following papers have been published by members of the museum staff during the past two years:

Six articles have been prepared each year by the director from the museum records and have appeared in "The Season" department of *Bird-Lore*.

Mr. Kilgore and Mr. Breckenridge collaborated in the preparation of two short articles on the finding, in Minnesota in 1929, of the rare nests of Nelson's Sparrow and the Connecticut Warbler. These were published in *The Auk* (46:548 and 46:551-52, 1929).

An illustrated article by Mr. Breckenridge on "The Booming of the Prairie Chicken" was also published in *The Auk* (46:540-43, 1929). Other papers by Mr. Breckenridge were "Actions of the Pocket Gopher," in the *Journal of Mammalogy* (10:336-39, 1929, illustrated); "Two Notable Minnesota Duck Records," in the *Wilson Bulletin* (42:59, 1930); "Imitating Water in Groups," in the *Museum News* (7:7, 1929, No. 2); and, in collaboration with Mr. A. H. Bulbulian, "Notes on the Reproduction of Cattails and Coarse Sedges," in the *Museum News* (7:9-12, 1930, No. 19, illustrated). Mr. Breckenridge also wrote an illustrated article of thirteen pages entitled "Suggestions on the Construction of School Extension Groups," as one of a series of technical papers written by museum preparators throughout the country. This was issued by the museum in 1929 in the form of a mimeographed bulletin and was distributed to museums and interested individuals. This series of publications is an effort to bring about better co-operation and a better understanding among the technical workers in the museums of the United States and Canada. In the past, museums have worked largely alone without knowing what others were doing, chiefly because preparators were not willing to communicate their methods for general use.

No. 3 of the museum *Occasional Papers* series is in page proof and should be ready for distribution in June. It will have a colored plate as frontispiece, eight half-page half-tones, and articles by Mr.

Kilgore, Mr. Breckenridge, and the director, based on the field work of the museum.

A book on the mammals of Minnesota has been written by Mr. Thaddeus Surber during the past year under the auspices of the museum, with an introductory chapter by the museum director. The manuscript has been delivered to the University Press for publication as soon as possible. There is a present demand for a book of this kind.

*Photography.*—During the two-year period there have been made and printed 881 negatives; twenty-five lantern-slides; 1,268 feet of motion-picture negative taken and developed and 897 feet printed. Among the motion pictures are several notable scenes—the courting of the Pinnated Grouse or Prairie Chicken, the still more remarkable courting of the Sharp-tailed Grouse, drumming of the Ruffed Grouse, and a pair of Sandhill Cranes at their nest—all the work of Mr. Breckenridge.

*Co-operation.*—Museum material has been loaned as follows:

1928-29	
Small groups to Minneapolis public schools .....	30
Small groups to N.E.A. Convention .....	7
Small groups to Minneapolis School of Arts .....	6
Small groups to Northrop Collegiate School .....	12
1929-30	
Small groups to Minneapolis public schools .....	31
Small group to Minneapolis School of Arts .....	1
Small groups to Northrop Collegiate School .....	8
Small groups to American Health Association .....	16
Small groups to miscellaneous .....	6
<b>Total</b> .....	<b>117</b>
Lantern-slides loaned in 1928-29 .....	721
Lantern-slides loaned in 1929-30 .....	462
<b>Total</b> .....	<b>1,183</b>
Motion-picture reels loaned in 1928-29 .....	19
Motion-picture reels loaned in 1929-30 .....	13
<b>Total</b> .....	<b>23</b>
Museum specimens loaned in 1928-29 .....	33
Museum specimens loaned in 1929-30 .....	45
<b>Total</b> .....	<b>78</b>

From duplicate and uncatalogued material fifty bird skins and 184 birds' eggs were donated to the Northrop Collegiate School for class work; and at the request of Miss Olga Lakela, a graduate of the University and now teaching in the North Dakota State Teachers College at Minot, 206 birds' eggs, representing fifty-two species, were presented to that institution for their study collections.

Mr. Breckenridge and Mr. Bulbulian, of the museum's preparation department, during the two years made seven sets of models for the Wheat Rust Prevention Association at the request of Dr. Stakman and his associates; two small groups, similar to our school-groups, for the Metropolitan Drainage Commission; and Mr. Bulbulian's technical skill has been in demand by the Departments of Anatomy, Zoology, etc., for the repair of numerous models. This work has not been done on museum time.

The use of the lower lecture-room and projection equipment has been granted on various occasions to the Minneapolis Mycological Society, Minnesota Bird Club, and other similar organizations. On September 10, 1928, the American Fisheries Society, meeting in Minneapolis, held one of its sessions at the museum, and on the evening of May 7, 1930, the Hennepin County Sportsmen's Association was invited to meet in the upper lecture-hall.

Mr. Kilgore has continued to act as examiner in bird-study for the Boy and Girl Scouts and during the two years has examined at the museum 116 Boy Scouts and five Girl Scouts for the bird-study merit badge. He also gave, at the request of the organization, an evening course of seven lectures and laboratory demonstrations to a class of fourteen Boy Scout leaders, and a number of museum lectures were given to Boy Scout groups.

*Lectures.*—The following list shows the total number of lectures, with the attendance, that were given during the past two years:

Lectures to school-groups at the museum, 1928-29 .....	52	
Lectures to school-groups at the museum, 1929-30 .....	65	
<b>Total</b> .....		<b>117</b>
Total of other lectures given by staff, 1928-29 .....	86	
Total of other lectures given by staff, 1929-30 .....	124	
<b>Total</b> .....		<b>210</b>
<b>Total of all lectures during the two years</b> .....		<b>327</b>
Total attendance at all lectures given by staff, 1928-29 .....	6,856	
Total attendance at all lectures given by staff, 1929-30 .....	8,659	
<b>Total</b> .....		<b>15,515</b>

With but few exceptions the lectures during this two-year period have been given by Mr. Kilgore. He has also given a number of lectures out of the city, as will be seen under the heading "Outside Activities of the Staff."

*Sunday afternoon lectures.*—The formal Sunday afternoon course of three lectures was given each winter in the auditorium of the Music Building. The total attendance for the six afternoons was 3,825, an average of 638 for each lecture. The following is the program for the two courses:

## ANNALS OF MUSEUM OF NATURAL HISTORY

### PROGRAM OF SUNDAY LECTURES

#### 1929

- January 13—Extinct Animals of North America, by Professor Elmer S. Riggs, associate curator of paleontology, Field Museum of Natural History, Chicago.  
February 3—Kindred of the Wild, by Dr. William L. Finley, director of wild life conservation, American Nature Association.  
March 10—Through Africa with Roosevelt, by Mr. Edmund Heller, director, Milwaukee Zoological Gardens.

#### 1930

- January 26—June on the Labrador Coast, by Dr. A. A. Allen, professor of ornithology, Cornell University, Ithaca, New York.  
February 23—Prehistoric Man in America, by Mr. Barnum Brown, curator of paleontology, American Museum of Natural History, New York City.  
March 30—Our Place in the Milky Way Galaxy, by Dr. G. Clyde Fisher, curator of the Departments of Astronomy and Visual Education, American Museum of Natural History, New York City.

*Attendance.*—The daily attendance is steadily increasing, but under existing conditions there is no way of even approximating the number. A tally count is made of the attendance on the open Sundays in January, February, and March. The total for the two years was 5,189, not as large as when the museum was first open on Sundays, but at present each Sunday brings a group of new visitors which was not the case when a regular course of lectures was given in the museum. At that time about the same people came each Sunday, and after the first visit or two they showed little interest in the exhibits, while at present those who come are intent upon these displays. There is but little duplication of the attendance at the museum and the lectures in Music Hall, so that the total Sunday attendance for the six months was about 9,000.

*Outside activities of the staff.*—The director and Mr. Breckenridge attended the annual meeting of the American Ornithologists' Union at Charleston, South Carolina, in November, 1928, and took part in the program. Following the meeting, museums in Washington, Philadelphia, New York City, and Chicago were visited, and the public exhibits and preparation departments were inspected. In October, 1929, the director attended the meeting of the American Ornithologists' Union in Philadelphia.

Mr. Kilgore has given lectures at the county graduation exercises of the rural schools of Cottonwood County at Windom, July 25, 1928; before the Milwaukee City Club at Milwaukee, February 7, 1929; to the Sioux City Bird Club at Sioux City, Iowa, on May 10, 1929; and to the Stillwater High School Science Club at Stillwater, October 8, 1929.

*Visitors of note.*—Special mention may be made of visits to the museum by the following persons whose comments on the exhibits were of more than passing interest: Dr. E. J. Foyles, director, Museum of Natural History, Rochester, New York; Dr. William L. Fin-

## ANNALS OF MUSEUM OF NATURAL HISTORY.

ley, director of wild-life conservation, American Nature Association, Washington, D.C.; Dr. C. L. Hubbs, Museum of Zoology, Ann Arbor, Michigan; Mr. Ashley Hine, Field Museum of Natural History, Chicago; Mr. Edmund Heller, director, Milwaukee Zoological Gardens, Milwaukee, Wisconsin; Mr. and Mrs. F. L. Jaques, American Museum of Natural History, New York City; Mr. E. R. Kalmbach, United States Biological Survey, Washington, D.C.; Professor Elmer S. Riggs, Field Museum of Natural History, Chicago; Mr. Ray C. Steele, director, Upper Mississippi River Wild Life Refuge; Mr. Herbert L. Stoddard, United States Biological Survey; Mr. Frank Tose, California Academy of Sciences, San Francisco; a group of foreign editors; Mr. Hoyes Lloyd, president, International Association of Game, Fish and Conservation Commissioners, and supervisor of wild-life protection, Department of the Interior, Canada; Mr. F. C. Lincoln, United States Biological Survey; Mr. W. E. Clyde Todd, Carnegie Museum, Pittsburgh; Dr. A. A. Allen, professor of ornithology, Cornell University, Ithaca, New York; Mr. Barnum Brown, American Museum of Natural History, New York City; Dr. G. Clyde Fisher, American Museum of Natural History, New York City; Dr. H. C. Oberholser, senior biologist, and Mr. W. C. Henderson, associate chief, United States Biological Survey.

*Aquarium.*—Thanks to the generous co-operation of the Minnesota Game and Fish Department the aquarium has been kept well supplied with native fish during the colder months. It is always an especially attractive feature to the groups of school children. During the summer months the tanks have been drained and allowed to dry out as this seemed to lessen somewhat the parasitic white fungus which is one of the worst enemies of fish confined in aquaria.

### FIELD WORK

Considerable field work within the limits of the state was done during the last two years in the interests of the museum's collections and natural-history files. The principal expedition in 1928 was in the month of June of that year and was referred to in the last report. In the latter part of July, 1928, Mr. Breckenridge accompanied Mr. Thaddeus Surber, of the State Game and Fish Department, to the interior of Cook County in the Lake Superior region.

During the latter half of April, 1929, Mr. Breckenridge was in McLeod County studying the duck and shore-bird migrations, and on May 15, 1929, left for Pipestone and Lincoln counties in the southwestern corner of the state. From there he worked northward along the Minnesota-Dakota line to the Canadian boundary. He was joined in Kittson County on June 12 by Mr. Kilgore and Mr. Surber, and together they studied wild-life conditions in the northwestern counties of the state. Returning, Mr. Kilgore and Mr. Breckenridge went eastward to central Itasca County to make a brief examination of cer-

tain localities, reaching Minneapolis July 1. During July and August, 1929, several short trips were made by Mr. Breckenridge and other members of the staff to Itasca, McLeod, and adjoining counties, and to Lake Pepin.

From April 18 to May 1, and again from May 16 to 19, 1930, Mr. Breckenridge was in Pine County collecting specimens and taking motion pictures of the Ruffed and Sharp-tailed Grouse and the Sandhill Crane. The results of the motion-picture work were most striking and satisfactory. So far as we know the remarkable courting "dances" of the Sharp-tailed Grouse have never been filmed before. In the middle of May a short trip was made by Mr. Breckenridge, accompanied by Mr. Gustav Swanson, to the north shore of Lake Superior for the purpose of obtaining certain materials needed to complete the Duck Hawk Group. An illustrated bulletin, to be known as *Occasional Papers No. 3*, is about ready for distribution, and will contain some of the important results of this field work.

#### FINANCES

*University Museum Maintenance Budget.*—The \$2,700 annual appropriation by the University for supplies and current expenses has been largely expended for the following items: three steel filing cases, two drawer card files, thirty-nine shipping cases for school-groups, forty-eight portable school-cases, a colored plate for *Occasional Papers No. 3* and printing, typewriter stand, lecture fees for the two Sunday afternoon courses, developing and printing 881 negatives, developing 1,268 feet of motion-picture negative, printing 897 feet of motion-picture positive, photographic supplies, miscellaneous office supplies, expenses of field work for the two years, and repair and construction work done by the university shops. The Museum-aid Budget was exhausted during the last year and \$500 was transferred from the Maintenance Budget.

*Museum-aid Budget.*—The annual appropriation was \$800. It was used to pay for additional office help on an hourly basis and for the care of the aquarium. During the past year so much extra clerical service was required in the preparing and transcribing of manuscripts, answering an increasing correspondence, and keeping up the files, that this fund was exhausted early in the spring and a transfer of \$500 was made from the Maintenance Budget.

*Museum Small-group Fund.*—Mr. E. Floyd Allen has continued to send throughout the two years a monthly check for \$100, making \$2,400 from July 1, 1928 to July 1, 1930. This fund has been used in paying the salary of Mr. Bulbulian (on an hourly basis), who is working in the shop as an assistant to Mr. Breckenridge; in the purchase of museum specimens and also materials needed in the construction of the school-groups; and, with the consent of Mr. Allen, in paying for some of the original paintings to be reproduced in *The Birds of*

*Minnesota.* A donation of \$200 from Mr. Joseph R. Kingman, to be used for the latter purpose, was deposited in this fund and has been expended as directed by the donor.

There remained to the credit of this fund in the First Minnesota Trust Company on June 30, 1930, the sum of \$678.54, deposited in the name of Thos. S. Roberts, Trustee.

*Museum Donation Fund.*—Mr. James F. Bell's monthly contribution of \$75, amounting to \$1,800, has been received regularly throughout the two years. This fund is used to take care of current museum expenses, supplemental to the regular University Museum Maintenance Budget, and is especially useful in emergencies when prompt action is required. At present it is being drawn upon occasionally to assist in paying for the originals of the illustrations for *The Birds of Minnesota*.

There remained in the First National Bank of Minneapolis on June 30, 1930, a balance of \$659.55 to the credit of this fund in the name of Thos. S. Roberts, Trustee.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*



Fig. 32.—Detail from Striped Gopher Group



Fig. 33.—Golden-eyed Ducks. Winter scene on Lake Superior.  
Portable Group.

To the President of the University:

SIR: I have the honor to submit the following report of the condition and activities of the Museum of Natural History for the biennial period ending June 30, 1932.

#### MUSEUM

The material improvement in the museum during the last two years has consisted largely in the addition of small portable loan exhibits, and a considerable number of specimens to the study collections, chiefly birds and mammals. Several medium-sized groups have also been constructed but there will be no opportunity to add to the series of large habitat groups until more commodious quarters are provided. This is unfortunate as the materials and funds for desirable exhibits could be obtained at present if they could be accommodated.

The number (103) of finished portable school-groups now far exceeds the facilities for displaying them and the surplus has to be stored when not in circulation. These small groups, when exhibited on the walls and lighted with a special device, are as attractive and fully as instructive as the larger groups.

The donations to the museum and the material collected during field trips are shown in the list on pages 138-40.

The week-day attendance at the museum has continued to show a gradual increase, and on Sunday afternoons in January, February, and March, when the museum is open to the general public, it has increased greatly. This Sunday afternoon increase was brought about by advertisements placed in the Minneapolis and St. Paul street-cars—twice during 1931 and once in 1932. On one Sunday afternoon (February 22, 1931) 1,570 people came to the museum. This was far in excess of the number that could be properly cared for in our present quarters. Three or four hundred visitors in an afternoon are about all that can be comfortably and profitably accommodated on the two floors and in the two lecture-rooms. The total attendance for the twenty-six open Sundays in 1931 and 1932 was 14,681, an average of about 564 for each Sunday. But for some reason not evident the attendance in 1931 was nearly three times greater than in 1932.

The formal Sunday afternoon lecture course, given in Music Hall, was discontinued after 1930. It proved to be a heavy burden on the Museum Maintenance Budget from which the expense was paid, and although the lectures were popular and well attended they failed to advertise the museum as had been hoped. Such courses of lectures attracted practically the same group of people each time, while advertising the museum in the street-cars, which was done at much less expense, brought a large and constantly varied attendance, which spread a knowledge of the existence of the museum where it was most desirable, and this was at once reflected in an increased week-day attendance. With a museum building, having an adequate lecture-hall, both objects could be attained and all classes could be invited to avail themselves of the opportunities offered by a museum intended for the general public.

The general lecture work has continued as heretofore. Thousands of school children, in groups, accompanied by their teachers, come to the museum by appointment, are given a lecture illustrated by motion pictures, and are then piloted through the museum with an explanatory talk before each exhibit. This work is now carried on almost entirely by Mr. Kilgore, the curator. Mr. Breckenridge has taken an active part in lectures to special groups. The director, being otherwise occupied, has done but little lecturing during the past two years. The total number of lectures for the two-year period was 196, with an attendance of 12,291.

The director has devoted a large part of his time to the preparation of the work, *The Birds of Minnesota*, recently issued by the University Press and the museum. It is based largely on information contained in the files of the museum and on the museum's study collection of birds.

Mention should perhaps be made of a futile attempt to secure a museum building during the last biennium. Mr. James F. Bell made a formal offer to the Board of Regents of \$125,000 to be used in the construction of a museum building, provided the state legislature would appropriate a like amount. This the legislature failed to do and in May, 1931, the project fell through, Mr. Bell withdrawing his offer when the legislature adjourned without making the appropriation.

*Exhibits.*—Twenty-one portable school-groups and three medium-sized groups have been constructed during this period. These contain the following subjects. Medium-sized groups—Least Bittern, adults and young in nest; Canada Spruce Grouse, male and female, the male in full nuptial display; Sharp-tailed Grouse, female, nest and eggs. These groups are all provided with colored transparent backgrounds enlarged from photographs. Small groups—Blue-winged Teal, nest and eggs; Pied-billed Grebe, nest and eggs; Junco, male, female, nest and eggs; Red-tailed Hawk; Herring Gull, nest and eggs; Red-winged Blackbird, male, female, nest and eggs; Yellow-bellied Sapsucker, male, female, nest and eggs; Mallard Duck, male and female; Shoveler, male and female; Canvas-back, male and female; Hooded Merganser, male and female; Blue Goose; Barn Owl; Black-capped Chickadee, adults and nest; Ruby-throated Humming-bird, male, female, nest and eggs; Phoebe, adults, nest and eggs; Gray Squirrel; models showing shedding and re-growth of horns, and the seasonal changes in color of pelage, in White-tailed Deer; Chipmunk; White-footed or Deer Mouse; pitcher plant (*Sarracenia*) with associated bog plants. With two exceptions these small groups are provided with backgrounds consisting of colored enlarged photographs and in the foregrounds are wax reproductions of flowers and associated vegetation.

*Accessions.*—The following special gifts have been received and placed on exhibition: a mounted tarpon from President Coffman; eighteen mounted fish, mostly marine, from Mrs. C. D. Velie; a very fine American bison or buffalo head from Mr. Cavour S. Langdon; and, as an indefinite loan, a magnificent musk-ox head from Mr. F. J. Ward.

The following list will show in detail the accessions that have been made to the museum during the last two years by gift and by purchase. In addition to these, seventy-two mammal skins and 282 bird skins have been added to the study collections by field work.

## BY GIFT

Dr. William P. Abbott, Duluth.....	1 Surf Scoter, 1 Iceland Gull, which is first record for Minnesota (salted skins)
Mr. Franklin Benner, Minneapolis.....	80 books, pamphlets, and magazines pertaining to natural history

Mrs. C. H. Bigelow, St. Paul.....	2 Regent Honey-eaters and 2 Bee-eaters (skins)
Mr. A. M. Bull, Rockford.....	1 Whistling Swan (in flesh)
Dr. F. K. Butters, Minneapolis.....	1 Red-headed Woodpecker (in flesh)
Mr. William Carlson, Wayzata.....	1 Ring-necked Pheasant (in flesh)
Mr. F. B. Chute, Minneapolis.....	1 Double-crested Cormorant (in flesh)
Dr. L. D. Coffman, Minneapolis.....	1 tarpon (mounted)
Mr. H. W. Converse, Pipestone.....	1 Harlan's Hawk (in flesh)
Mr. M. W. Cooper, Madelia.....	1 Red-shouldered Hawk (in flesh)
Miss Gertrude Drohan, Minneapolis.....	1 Black-billed Cuckoo (in flesh)
Dr. William de la Barre, Minneapolis.....	1 Barn Owl and 1 Barred Owl (in flesh)
Messrs. Charles Evans, Minneapolis and Alden Risser, St. Paul.....	1 Wilson's Phalarope (in flesh)
Miss Constance Everett, Waseca.....	1 Red-tailed Hawk (in flesh)
Mr. William Everett, Minneapolis.....	1 Ruddy Duck (in flesh)
Mr. S. E. Fellows, Pipestone.....	1 Sparrow Hawk (in flesh)
Dr. L. A. Fried, St. Paul.....	1 Mourning Warbler (in flesh)
Mr. C. H. Galbraith, Minneapolis.....	1 partial albino Blackbird (in flesh)
Mr. W. B. Grobe, Minneapolis.....	1 Whistling Swan (in flesh)
Dr. Alfred O. Gross, Brunswick, Maine.....	5 8x10 photographs of Heath Hen and Prairie Chicken
Dr. W. R. Hiller, Minneapolis.....	1 Sora Rail (in flesh)
Mr. H. J. Jager, Owatonna.....	3 Blue Geese and 2 Snow Geese (in flesh)
Mr. William Jellison, Minneapolis.....	1 lynx skull and 1 black bear skull (prepared) and 1 pair of mountain goat horns
Mr. J. C. Jones, St. Paul.....	1 Swamp Sparrow (skin) and 1 Vesper Sparrow (in flesh)
Mr. C. S. Jung, Milwaukee, Mr. E. R. Ford and Dr. Alfred Lewy, Chicago.....	1 nest and 5 eggs of Nashville Warbler
Mr. E. J. Kaufman, Appleton.....	1 partial albino Ring-necked Pheasant (in flesh)
Mr. Cavour Langdon, Minneapolis.....	1 bison head (mounted)
Mr. Charles F. Myhervold, Minneapolis.....	1 House Sparrow (in flesh)
Mr. Percival Narveson, Spring Grove.....	1 Starling (in flesh), first record for Minnesota
Northern States Power Co., Minneapolis.....	1 Pileated Woodpecker (in flesh), 2 sections of pole with Pileated Woodpecker nesting-cavity, and 2 photographs
Mr. Alfred Peterson, Pipestone.....	1 Snowy Owl and 1 Great Horned Owl (alive), 1 Prairie Falcon (skin), 1 Pigeon Hawk (skin), 1 Duck Hawk (skin), 2 Rough-legged Hawks and 4 Red-tailed Hawks (in flesh), and 1 albino Blackbird (in flesh)
Mrs. C. E. Peterson, Madison, Minn.....	1 Migrant Shrike (in flesh)
Dr. A. R. Ringoen, St. Paul.....	1 Cedar Waxwing (in flesh)
Messrs. Alden Risser, St. Paul, Gustav Swanson, Minneapolis, and J. R. Dobie, Springfield, Ill. ....	1 Piping Plover, 1 Hooded Merganser, 1 Blue-gray Gnatcatcher (all in flesh)

## ANNALS OF MUSEUM OF NATURAL HISTORY

Mr. Alden Risser, St. Paul.....	1 Sora Rail (skin), 1 Hooded Merganser, 1 Red-bellied Woodpecker, 1 Booby, 1 Least Tern, 2 Skimmers, 1 Snowy Plover, and 1 American Bittern (all in flesh), and 1 Hermit Warbler (in flesh) taken at Cambridge, Minnesota, first state record
Minnesota Game and Fish Department...	6 Whistling Swans, 3 White Pelicans, 1 Short-eared Owl (all in flesh), 75 live fish
Dr. A. C. Strachauer, Minneapolis.....	1 nest of Chimney Swift
Mr. Thaddeus Surber, St. Paul.....	1 Dovekie (in flesh), first record for Minnesota
Mr. E. D. Swedenborg, Minneapolis.....	1 nest and egg of Brown Creeper, 1 nest and 8 eggs of Golden-crowned Kinglet
Mr. Gustav Swanson, Minneapolis.....	2 Hooded Mergansers, 1 Red-tailed Hawk, 1 Rough-legged Hawk (all in flesh)
Mr. S. B. Swenson, Minneapolis.....	1 Prairie Chicken (in flesh)
Mrs. C. D. Velie, Minneapolis.....	2 tarpon, 3 yellow-tail, 1 sailfish, 1 mackerel, 1 steel-head trout, 1 brook trout, 1 albicore, 3 bonefish, 1 flying-fish, 1 barracuda, 1 dolphin (all mounted)
Mrs. Grace Wiley, Minneapolis.....	1 Saw-whet Owl (in flesh)
Mr. Howard Williams, Minneapolis.....	1 Red-tailed Hawk (in flesh)
Mrs. E. O. Wilson, Montevideo.....	1 Gray-cheeked Thrush (in flesh)
Mr. S. H. Withey, Crookston.....	2 Spruce Grouse (mounted)

## BY PURCHASE (MUSEUM DONATION FUND)

Mr. Dan Smith, Frazee.....	63 small mammal skins
Mr. Fred Barker, Parker's Prairie.....	1 Golden-eyed Duck (skin)
Mr. P. O. Fryklund, Roseau.....	2 Great Horned Owls (skins)
Mr. John Linklater, Ely.....	1 Spruce Grouse

## BY LOAN

Mr. F. J. Ward, St. Paul.....	1 musk-ox head (mounted)
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*Publications.*—The major publication was a two-volume, quarto work by the director, entitled *The Birds of Minnesota*, illustrated with ninety-two color-plates and over 600 text figures and half-tones. It was issued by the University Press with the added signature of the Museum of Natural History. The seven-color offset plates were made and the work printed and bound by the McGill Lithograph Company of Minneapolis. Five thousand copies were printed. Its publication was made possible by the donation of \$32,500 by a group of Minneapolis citizens. The total cost was in the neighborhood of \$60,000, the additional amount being made up from various sources including part of the proceeds of the sale. An agreement between the Board of Regents and donors contained a clause establishing a Thomas S. Roberts Trust in perpetuity to consist of the final proceeds of the sale of the book and any part thereof, the interest from such trust fund to be used primarily as a publication budget for the museum.

## ANNALS OF MUSEUM OF NATURAL HISTORY

The director continued throughout the two years to contribute an article every two months to "The Season" department of *Bird-Lore*.

Mr. Surber's *Mammals of Minnesota* with introduction by Thomas S. Roberts, referred to in a previous report, was published during this period by the Minnesota Game and Fish Department instead of by the University Press as originally planned.

A bulletin of forty pages entitled *Occasional Papers No. 3*, which was referred to in the last report as in course of preparation, was issued and distributed in the late summer and fall of 1930. It contained four ornithological papers by members of the staff, based on research work done under the auspices of the museum. It was illustrated with one colored plate and numerous half-tones.

New issues of the field checking-list and migration blank, revised to correspond with the new 1931 American Ornithologists' Union *Check-List of North American Birds*, have been prepared and published. These are furnished gratis to correspondents of the museum, to teachers, and to bird students generally.

*Photography.*—During the two-year period 1,280 feet of motion-picture negative have been made and developed, and 2,037 feet of positive have been printed, mostly of wild birds including the important series showing the nuptial display of the Canada Spruce Grouse. One hundred and sixty-five negatives and 345 prints have been made and added to the collection and also twenty lantern-slides from old and new negatives and from motion-picture film.

*Co-operation.*—Grouped here are such activities as the school lectures both at the museum and outside, lectures to various organizations and special groups, loans of portable school-cases, slides, motion-picture reels, specimens, etc., and assistance rendered to Boy and Girl Scout organizations and to other departments of the University.

Museum material has been loaned as follows, including sixty portable groups which are in circulation in the Minneapolis schools from October to June each year:

Small portable groups, 1930-31.....	70
Small portable groups, 1931-32.....	153
Total.....	223
Lantern-slides, 1930-31.....	467
Lantern-slides, 1931-32.....	452
Total.....	919
Motion-picture reels, 1930-31.....	15
Motion-picture reels, 1931-32.....	14
Total.....	29
Museum specimens, 1930-31.....	32
Museum specimens, 1931-32.....	19
Total.....	51

Mr. Breckenridge, under the direction of Dr. Gortner, prepared a series of mounted specimens for the Division of Biochemistry, illustrating nutritional experiments on rats, pigeons, etc. He has also rendered minor incidental service to other departments from time to time.

Mr. Bulbulian was employed for much of the summer of 1931 in repairing models for the Department of Zoology and in preparing specimens for a biological exhibit under its auspices.

After more than three years partial-time, special service with the museum Mr. Bulbulian left the staff June 1, 1932, to accept a position at the Mayo Clinic in connection with the preparation of an exhibit for the Century of Progress Exposition at Chicago in 1933.

Mr. Kilgore has examined seventy-two Boy Scouts for the bird-study merit badge.

The use of the lower lecture-room with projection equipment has been granted on numerous occasions to various organizations. The Minnesota Bird Club has continued to hold its meetings in the museum and has been allowed free use of the collections.

#### Lectures.—

To school groups, June 30, 1930 to July 1, 1932.....	114
Other lectures .....	82
<b>Total .....</b>	<b>196</b>
<b>Total attendance at these lectures.....</b>	<b>12,291</b>

*Outside activities of the staff.*—The director and Mr. Breckenridge attended the annual meeting of the American Ornithologists' Union in Salem, Massachusetts, in October, 1930, and again in Detroit, Michigan, in October, 1931. At each meeting Mr. Breckenridge presented papers illustrated with slides and motion pictures—on the last occasion in the new natural-history building at the University of Michigan, Ann Arbor.

Mr. Kilgore has given lectures before the Masonic White Shrine in St. Paul, the Izaak Walton League and High School at Chisholm, twice at the Highland Park Golf Club for the St. Paul Park Board, and at the St. Louis Park High School.

Mr. Breckenridge has lectured before the Duluth branch of the Izaak Walton League at Duluth, the Capital City Sportsmen's Club at St. Paul, and the Minnesota Game Protective League at Worthington.

Mr. Kilgore and Mr. Breckenridge have also filled various other lecture engagements away from the museum.

The director gave an illustrated lecture before the Wabasha County Medical Association at Lake City on July 9, 1931, and several other lectures to local organizations, but most of his time during the past two years has been devoted to the writing of a work on the birds of Minnesota.

Miss Mabel Densmore of Red Wing, who has practically been a special member of the staff during the past two years, was occupied almost entirely in assisting the director in the preparation of the bird book.

*Visitors of note.*—The following persons, representing other organizations or institutions, were at the museum during the past two years and inspected the exhibits: Dr. Alfred O. Gross, Bowdoin College, Brunswick, Maine; Mr. Carlos Avery, American Game Association, New York; Mr. George M. Sutton, Cornell University, Ithaca, New York; Mr. C. J. Albrecht, Field Museum of Natural History, Chicago; Dr. Henry T. Bailey, Cleveland, Ohio; Minnesota legislative group (fifty); Dr. George E. Vincent, former president of the University of Minnesota; Dr. William L. Finley, *Nature Magazine*, Washington, D.C.; Mr. Vernon Bailey, United States Biological Survey, Washington, D.C.; Mr. W. C. Henderson, assistant chief of the United States Biological Survey; Dr. G. Clyde Fisher, American Museum of Natural History, New York City.

*Aquarium.*—The aquarium has been stocked with native fish each September through the courtesy of the State Game and Fish Department and has furnished an instructive exhibit throughout the winter. The tanks are drained and allowed to dry out during the summer.

#### FIELD WORK

From July 14 to 24, 1930, Messrs. Kilgore and Breckenridge and the director were in the upper Red River Valley seeking special information in regard to certain birds and mammals. In October of that year Mr. Breckenridge made a short trip to the Pine County region on the St. Croix River to study the old and young Sandhill Cranes that still dwell there. A month later he accompanied Mr. W. A. Weber, then of the Field Museum, on a collecting trip in Pine County. April 5 to 10 Mr. Breckenridge was again in the Pine County region attempting to film the spring dance of the Cranes, in which he was only partly successful. May 4 to 22, 1931, he was in northern St. Louis County studying and filming the nuptial display of the Canada Spruce Grouse, securing a series of remarkable and unique motion pictures. Much of the information and many of the pictures secured on these trips were incorporated in *The Birds of Minnesota*.

On June 15, 1931, Mr. Breckenridge left by automobile for British Columbia, returning August 15. A number of desirable western species of birds were collected for the museum, and while at Okanagan Landing, British Columbia, the home of Major Allan Brooks, the noted bird and mammal artist, Mr. Breckenridge was generously permitted to study Major Brooks' methods of bird portraiture. The museum, as well as Mr. Breckenridge, has profited by this opportunity.

The final days of December, 1931, were spent by Mr. Breckenridge in company with Mr. and Mrs. Walter A. Weber on the north shore

of Lake Superior collecting specimens. Again on April 9, 1932, he was on the Lake Superior shore and collected a Harlequin Duck, the first and only authentic record of this northern species for the state.

On June 13, 1932, Mr. Gustav Swanson of the Department of Zoology left for the Rainy Lake and Rainy River region to spend the summer collecting for the museum specimens and information in that comparatively little-known part of the state.

Considerable field work has been carried on during the last two years within a radius of seventy-five miles of Minneapolis and this has resulted in the acquisition not only of specimens of birds, mammals, reptiles, batrachians, etc., but some interesting photographs and films also have been secured. Among the latter is a complete series of motion pictures of the nesting activities of the Woodcock. A part of Mr. Breckenridge's time since early this spring has been devoted to making an intensive study of the life conditions on a selected square-mile of diversified wild land in southern Anoka County. Some interesting results were obtained, which will be embodied in a thesis to be presented by Mr. Breckenridge for a Master's degree in the near future. In connection with this work a careful study was made of the nesting and feeding habits of the Marsh Hawk, a bird about the economic status of which there has been much controversy.

#### FINANCES

*University Museum Maintenance Budget.*—The \$2,700 annual appropriation by the University for supplies and current expenses was largely expended in the following manner: twelve portable school-cases, twenty-four shipping cases, twenty reflectors for groups, storage cabinet and field collecting chest for taxidermist, desk for use in the preparation studio, chairs for classroom, street-car advertising, printing of museum labels, printing *Occasional Papers No. 3* with cost of illustrations, stationery, and incidentals. A large item was the use of \$1,585 from this budget to assist in paying for the originals of the color-plates in the bird book. The total cost of these original paintings, which are now the property of the University, approximated the sum of \$9,000.

The Museum-aid Budget proved to be inadequate for the large amount of clerical work and assistance required in preparing the manuscript of the bird book and several transfers were made from the Maintenance Budget, amounting to \$1,529.25 in all for the two years.

*Museum-aid Budget.*—The amount appropriated by the University each year was \$800. For reasons stated above this proved to be insufficient to meet the exceptional demands, and sums totaling \$1,529.25 were transferred from the Maintenance Budget to this budget. Such action will probably not be necessary in the future.

The care of the aquarium and special office assistance are among the items usually taken care of by this budget.

*Museum Small-group Fund.*—This fund was originally formed to contain contributions from Mrs. George C. Christian and later from Mr. E. F. Allen, to be used in the construction of the small portable school-groups. Mrs. Christian's contributions consisted of \$1,000 in 1923 and a similar amount in 1924. Mr. Allen began sending a monthly check of \$100 in November, 1926, and continued without interruption until January, 1931, his gifts amounting in all to \$4,800. On the latter date Mr. Allen discontinued his contribution. On May 1, 1931, the balance, \$264.62, in what has been known as the Museum Donation Fund, carried in the First National Bank, was transferred to this fund in the First Minneapolis Trust Company. Both balances were small and it seemed unnecessary to carry two trustee funds on which it was likely that monthly bank penalties would have to be paid. Also the First Minneapolis Trust Company allowed a small rate of interest on deposit. This combined fund may be known hereafter as the "Museum Donation Fund." The balance to the credit of this fund in the First Minneapolis Trust Company, carried in the name of Thos. S. Roberts, Trustee, was \$373.15 on July 1, 1932.

*Museum Donation Fund.*—As stated above, this fund, carried for many years in the First National Bank was closed out on May 1, 1931, and the balance, \$264.62, was transferred to the First Minneapolis Trust Company.

Mr. James F. Bell continued his monthly gift of \$75 throughout the last two years, amounting to \$1,800 for the biennium.

With the permission of the donors, both of these funds were drawn upon extensively in paying for the originals of the color-plates in *The Birds of Minnesota*. Checks for \$100 each were received from Mr. W. H. Bovey and Mr. J. R. Kingman to be applied to the same purpose.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*

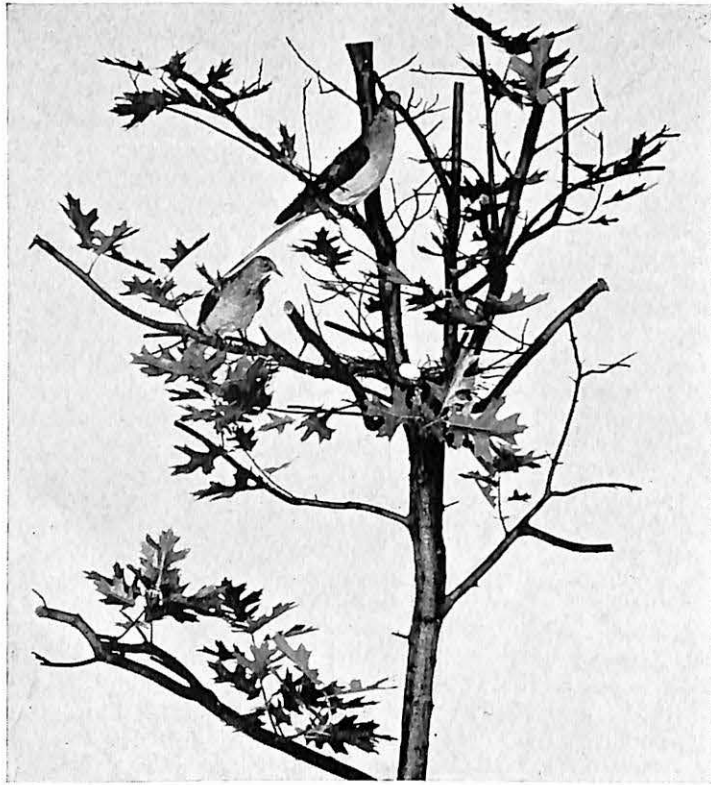


Fig. 34.—Passenger Pigeon Group. (See pages 8, 17.)

To the President of the University:

SIR: I have the honor to submit the following report of the condition and the activities of the Museum of Natural History for the biennial period ending June 30, 1934.

#### MUSEUM

The material growth of the museum during the past two years has been satisfactory and all that could be expected in the limited accommodation available. Through the courtesy of Dr. Minnich, head of the Department of Zoology, additional space for the display of medium-sized and small groups has been granted to the museum. The walls of the main entrance hallway on the first floor of the building have been lined throughout with small, artificially lighted groups,

which present an attractive and pleasing effect to visitors on entering the front door. One of the long, narrow rooms on the third floor, used heretofore for miscellaneous purposes, was placed at the disposal of the museum and made possible the installation, under very favorable conditions, of a considerable series of medium-sized groups. The ninety-two original water-color paintings, from which the illustrations for *The Birds of Minnesota* were made, have been handsomely mounted and labeled and placed on the third floor in a specially lighted multiplex floor-case where they form a most pleasing and valuable exhibit. These paintings will have an increasing interest and value as time goes on.

The staff has continued the general lecture work to school children and other groups both in and out of the museum. This work has been carried on largely by Mr. Kilgore and Mr. Breckenridge. A résumé, showing the extent and character of these activities, will be found in a later section of this report. As heretofore the general public has been invited to the museum on Sunday afternoons in January, February, and March, with a gratifying response. The hundreds of people who come show a keen interest in the exhibits, which, though not numerous, are well up to the standards of larger museums.

*Attendance.*—The week-day attendance continues to increase and is as large as is desirable in a building where lecture and laboratory work are in progress much of the time. No record of the actual attendance can be obtained under present conditions. The Sunday afternoon attendance is usually equal to the capacity of the halls. The total for the two years was 11,221—an average of 449 for each Sunday. The largest for any one day was 805. Illustrated lectures were given each Sunday by a member of the staff.

*Exhibits.*—No large habitat groups have been constructed because of lack of adequate room. Six medium-sized groups, with plant accessories and colored transparent backgrounds, have been completed and placed on exhibition. They contain the Striped Skunk, Porcupine, Woodchuck, Prairie Chicken in full nuptial display, Woodcock with nest and eggs, and Bob-white with nest and eggs. Nineteen portable groups each provided, where appropriate, with colored background and wax reproductions of flowers and plants, have been added to the loan series. They contain the Nighthawk with eggs, Short-billed Marsh Wren with nest and eggs, Wilson's Snipe, Humming-bird and Hawk Moth, Passenger Pigeon and Mourning Dove, Woodcock, Brown Thrasher, Martin, Ruffed Grouse, Sparrow Hawk, Broad-winged Hawk, Snowy Owl, Common Tern with nest and eggs, American Merganser, Muskrat, Meadow-mouse, Snow-shoe Rabbit, Weasel, and skulls of several carnivorous mammals. Two non-portable groups, showing the Osprey or Fish Hawk and three of the beneficial Hawks, have been installed on the third floor in the ends of large habitat group cases.

ANNALS OF MUSEUM OF NATURAL HISTORY

*Accessions.*—The following list shows the sources of a considerable amount of material that has been added to the museum, chiefly by donation. Special mention should be made of a large collection of birds' eggs generously presented by the late Mr. E. S. Stebbins of Minneapolis. It contained 838 sets with a total of 3,354 eggs. The collection was in excellent condition with full data and added many new things to the museum's series. Mr. Stebbins had spent a lifetime assembling it and we greatly appreciated the gift.

In addition to the list below a number of bird skins have been purchased for the study collection and a considerable amount of material has been obtained on various field trips by Mr. Breckenridge, including birds, mammals, reptiles, amphibians, and accessories used in the construction of groups.

BY GIFT

Dr. William P. Abbott, Duluth .....	1 albino Scaup Duck (in flesh)
Mr. W. H. Aborn, Hawley .....	2 mounted photographs of birds' eggs
Mr. Harry Adams, Minneapolis .....	1 Western Red-tailed Hawk and 1 Green-winged Teal (in flesh)
Mr. Sam Anderson, Hutchinson .....	2 Emperor Geese, 1 young Snow Goose, 1 Barnacle Goose (all in flesh)
Mr. O. P. Bailey, Minneapolis .....	2 large starfish and a collection of 300 shells
Mr. James F. Bell, Minneapolis .....	1 skull of Alaskan bear
Mr. Franklin Benner, Minneapolis .....	Several bound books and a number of odd magazines and pamphlets pertaining to ornithology
Mr. C. E. Callender, Minneapolis .....	1 Warbler (in flesh)
Dr. R. W. Dawson, St. Paul .....	1 mole (in flesh)
Miss Constance Everett, Waseca .....	20 steel cases for study collection
Mr. H. B. Finch, Minneapolis .....	1 Greater Scaup Duck (in flesh)
Mr. P. O. Fryklund, Roseau .....	2 Willow Ptarmigans (skins)
Mr. James A. Galbraith, Minneapolis .....	3 photographs of birds and a Dove's nest with 4 eggs
Mr. Forest K. Geerkin, Minneapolis .....	1 kangaroo skin (from the Adelaide Museum of Australia)
Mr. F. L. Gilland, Minneapolis .....	3 hoary bats (in flesh)
Mr. H. Glander, Minneapolis .....	1 cottontail rabbit (in flesh)
Dr. Robert G. Green, Minneapolis .....	1 Willow Ptarmigan (in flesh)
Dr. W. R. Hiller, Robbinsdale .....	1 short-tailed shrew (in flesh)
Mr. H. J. Jager, Owatonna .....	1 Cackling Goose, 4 Snow Geese, 3 Blue Geese, 1 White-fronted Goose, 2 Bean Geese
Mr. E. E. Jardine, St. Paul .....	1 cottontail rabbit (in flesh)
Mr. J. C. Jones, St. Paul .....	1 Bluebird, 1 Red-bellied Woodpecker, 1 Myrtle Warbler, 1 Magpie, 1 Lapland Longspur, 1 Hudsonian Godwit, 1 Black-bellied Plover, 1 Yellow-headed Blackbird, 1 Sparrow Hawk, 1 Nelson's Sparrow, 1 Savannah Sparrow, 1 American Pipit (all skins) and 1 set of 17 eggs of American Merganser

ANNALS OF MUSEUM OF NATURAL HISTORY

Mr. Edward P. Kehoe, Minneapolis .....	1 Pileated Woodpecker (in flesh)
Mr. Carl A. Lindberg, Chisago City .....	1 star-nosed mole (in flesh)
Dr. G. H. Luedtke, Fairmont .....	1 White Mallard and 1 albino Killdeer (in flesh)
Dr. E. P. Lyon, Minneapolis .....	1 fox-snake (alive)
Mr. E. S. Macgowan, Minneapolis .....	5 photographs
Dr. D. E. Minnich, Minneapolis .....	1 Bob-white and 1 Flicker (in flesh)
Mr. H. E. Partridge, Minneapolis .....	4 books
Rev. P. B. Peabody, New Richmond, Wis. ....	8 lantern-slides
Mr. Alfred Peterson, Pipestone .....	1 Rough-legged Hawk, 1 Swainson's Hawk, 5 Red-tailed Hawks, 1 Pomarine Jaeger, 2 Prairie Falcons (all in flesh)
Mrs. C. E. Peterson, Madison .....	2 Arctic Towhees (first records for Minnesota), 1 Hungarian Partridge, 1 Gray-cheeked Thrush, 1 Coot, 1 Western Meadowlark, 1 Crested Flycatcher, 1 Ruby-throated Hummingbird, 1 Mourning Dove (all in flesh)
Mr. C. B. Reif, Minneapolis .....	1 Prairie Chicken (in flesh)
Mr. Alden Risser, St. Paul, and Mr. Charles Evans, Minneapolis .....	1 young Wilson's Phalarope (skin)
Mr. Alden Risser, St. Paul, and Mr. Gustav Swanson, Minneapolis .....	1 Knot (in flesh)
L. K. Stein Company, Minneapolis .....	1 gecko (alive)
Mr. J. S. Taylor, St. Paul .....	1 Black-billed Cuckoo (in flesh)
Mrs. W. S. Telford, Duluth .....	3 Pine Grosbeaks (in flesh)
Mrs. Rollo Wells, Minneapolis .....	1 egg and nest of Winter Wren
Mr. William Wilber, St. Peter .....	1 Richardson's Owl (in flesh)
Minnesota Game and Fish Department .....	1 albino Ruffed Grouse and 1 hybrid Black Duck (in flesh), 2 lots of live fish for aquarium
Mr. E. S. Stebbins, Minneapolis .....	A collection of 3,354 birds' eggs (838 sets)
Mr. Herbert L. Stoddard, Beachton, Ga. ....	1 Wild Turkey (salted skin)
Mrs. Gertrude Hale Strachauer, Minneapolis .....	1 Brown Thrasher's nest
Mr. Harry Swanson, Minneapolis .....	1 cottontail rabbit (in flesh)
Mr. E. D. Swedenborg and Dr. C. A. Prosser, Minneapolis .....	1 nest and 4 eggs of Black-throated Blue Warbler, and 1 egg of Purple Finch
Mr. E. D. Swedenborg, Minneapolis .....	1 nest and 4 eggs of Black and White Warbler, and 1 nest with 2 eggs of Magnolia Warbler and 2 of Cowbird

BY PURCHASE (MUSEUM DONATION FUND)

14 small mammal skins, 51 bird skins, and 67 birds' eggs, for study collections

BY FIELD WORK

198 small mammals and 86 birds for study collections; several photographic studies, and various accessories for medium- and small-sized groups.

*Study collections.*—The most important and valuable recent addition was Mr. Stebbins' large collection of birds' eggs, which has already been mentioned. Bird skins to the number of 216, and 215

mammal skins with skulls, have been added by purchase, gift, and field work.

The entire study collections of birds, birds' eggs and nests, and mammals have been moved to a large well-lighted room (204) on the second floor where they can be used under much-improved conditions. The bird collection has been entirely rearranged and indexed according to the most recent classification. These changes were made possible by the generous donation by Miss Constance Everett of Waseca, on January 12, 1933, of twenty large, steel-jacketed cases costing \$1,000. Miss Everett was a member of the 1933 bird class and the gift was made in memory of her father, the late Mr. E. A. Everett, who was greatly interested in the ornithological work of the museum.

With the active co-operation of Dr. Samuel Eddy, of the Zoology Department, a good beginning has been made toward collections of reptiles, amphibians, fish, shells, and skeletons.

The museum's study collections are freely accessible to all well-accredited students who know how to handle such material and who appreciate the limitations of such privileges.

*Publications.*—In the fall of 1932 the keys and descriptions in the second volume of the large work on Minnesota birds were issued separately, with certain additions and a special index, under the title *A Manual for the Identification of the Birds of Minnesota and Neighboring States*. The director has also written the text for an edition of the colored plates from *The Birds of Minnesota*, which the University Press will issue September 1, 1934. This will make a handy single volume with one page of generalized text for each plate. The bimonthly contribution to *Bird-Lore*, of an article on Minnesota seasonal ornithology, has been continued by the director.

*Photography.*—One thousand three hundred and sixty-three feet of new motion-picture negative film have been made and 3,591 feet printed from this and old negative; 1,581 feet of 35mm. film were reduced to 16mm. film for use in the small projectors that are now employed so generally. Dr. Robert G. Green donated 495 feet of 16mm. print taken on a trip to Hudson Bay, which, combined with film taken by Mr. Breckenridge at the same time, completed an interesting and instructive series of pictures.

There have been added, also, 321 negatives, 381 prints, and thirty-seven lantern-slides.

*Co-operation.*—A total of 200 illustrated lectures was given with an estimated attendance of 20,527, of which ninety-six, with an attendance of 12,553, were to school children. The remaining lectures were to miscellaneous audiences including Boy and Girl Scouts, Izaak Walton League and sportsmen's organizations, church societies, science and other clubs, etc. In April, 1934, Mr. Breckenridge gave

a series of talks to Duluth schools, and Mr. Kilgore has appeared before audiences at Stillwater and Mankato. Numerous St. Paul engagements have also been filled. Most of these lectures (144) have been given by Mr. Kilgore, a number (forty-five) by Mr. Breckenridge, and a few (eleven) by the director.

In addition to the usual series of portable groups loaned to the Minneapolis public schools, others have been loaned as follows: Robbinsdale, St. Louis Park, Northrop Collegiate and Wayzata schools, Augsburg Seminary, Minneapolis School of Arts, University Institute of Child Welfare, Minnesota Game and Fish Department, and St. Louis County for state fair exhibits, sportsmen's out-door show, sportsmen's show at the Minneapolis auditorium, the Dayton Company, and the St. Paul First National Bank.

Motion-picture films, lantern-slides, and specimens have been loaned to a considerable number of teachers to be used in lectures and demonstrations, thus bringing the museum's material before hundreds of children and adults who would not otherwise be reached. There are in the state a number of unofficial lecturers on nature subjects who give their services freely to schools and clubs, and the museum is pleased to furnish them with illustrative material. Mrs. J. A. Thabes of Brainerd may be mentioned as one of the most active and efficient of this group.

Series of study skins have been loaned to the museum of the University of Michigan, the Harvard Museum of Vertebrate Zoology, the National Museum at Washington, and to several individuals to assist in research problems.

A large correspondence, asking for information on many subjects, has been taken care of, and teachers and bird students have been supplied with free printed literature. In return our correspondents have sent us a large amount of information in regard to the natural history of the state, which has been entered and indexed in the museum files.

The two-quarter course in ornithology, offered by the Zoology Department, has been conducted for eighteen consecutive years by the museum director, assisted in recent years by Mr. Kilgore, curator. The collections of the museum are used in this work which could not be carried on successfully without them.

Mr. Kilgore has examined eighty-five Boy Scouts for bird-study merit badges.

*Outside activities of the staff.*—Mr. Breckenridge and the director attended the annual meeting of the Association of American Museums in Chicago, June 12 to 14, 1933. The director attended the meeting of the American Ornithologists' Union in New York City in November, 1933, and presented a short paper.

## FIELD WORK

From July 26 to September 7, 1933, Mr. Breckenridge accompanied Dr. Robert G. Green and party on a trip to the Hudson Bay region. The object of the expedition was to determine the presence or absence of tularemia in birds and mammals of that northern country. Mr. Breckenridge acted as field assistant to Dr. Green and also secured a considerable number of birds and mammals for the museum collections. Other field work during the two-year period has been largely confined to the Twin Cities area.

## FINANCES

*University Museum Maintenance Budget.*—The appropriation for 1932-33 was \$2,700, and for 1933-34, \$2,360. Aside from current office expenses and transfers from this budget to the insufficient Museum-aid Budget, this fund has been largely expended as follows: twenty-four portable school-cases and twelve shipping cases, made in the university shops; chairs for class use; one four-drawer steel letter file; one four-drawer card file; one lantern-slide file; one file for photographic negatives; one large multiplex display case for exhibiting the series of water-color paintings; motion-picture supplies, including developing and printing; street-car advertising; carpenter and other work and electrical installations associated with the display of new groups and rearrangement of the exhibits.

*Museum-aid Budget.*—The appropriation for the two years was \$1,500. This fell somewhat short of the amount required for clerical work and general assistance, and several transfers from the University Museum Maintenance Budget were made. This money goes very largely to students who are working their way through the University.

*Museum Donation Fund.*—Mr. James F. Bell has continued his monthly contribution of \$75, amounting for the two years to \$1,800. The \$1,000 gift of Miss Constance Everett was deposited in this fund and expended for the purchase of twenty steel-jacketed cases for the bird-study collection.

The following expenses have been met from this fund: a 16mm. motion-picture projector and accessories (\$245.25); supplies for taxidermic and photographic work; purchase of books for the museum library; binding; specimens for museum collections; care of aquarium; Sunday museum helpers; two balloon-silk tents; repairs on cameras and motion-picture projectors; and other museum supplies needed immediately.

This fund is now carried in the Minneapolis First National Bank and Trust Company. On June 30, 1934, there was a balance of \$479.32 to the credit of Thos. S. Roberts, Trustee.

Respectfully submitted,  
THOMAS S. ROBERTS, *Director*



Fig. 35.—Water Snake. Portable Group.

*To the President of the University:*

SIR: I have the honor to submit the following report of the condition and activities of the Museum of Natural History for the biennial period ending June 30, 1936.

## MUSEUM

As long as the museum is confined to its present restricted quarters there can be no considerable growth in the direction of large exhibits. Efforts, therefore, have been directed toward installing medium-sized groups and increasing the number of the small portable loan groups, the demand for which is rapidly growing. Although not as imposing as the large exhibits these small groups are, perhaps, as attractive and certainly have greater educational value than the larger displays. Each one is a special, close-at-hand study and is carefully constructed so as to forcibly emphasize the subject presented. Also, the carefully studied arrangement, colored background, accessories, and special lighting device serve to bring out the natural beauty of the setting, where beauty is possible. These small groups now number 133.

*Attendance.*—Throughout the year the museum is open to the public on week-days, except holidays, from eight-thirty in the morning to four-thirty in the afternoon, and on Sunday afternoons during Jan-

uary, February, and March. The Sunday attendance has been equal to the accommodation, averaging 421 each Sunday with a total attendance of 10,939, the largest on any one day being 667. A lecture, illustrated with motion pictures, has been given each Sunday by a member of the staff. The week-day attendance has continued to be satisfactory, with many out-of-town visitors.

*Exhibits.*—Five medium-sized groups have been added as follows: Pileated Woodpecker, Screech Owl, Mink, Spotted Skunk, and Muskrat. Seventeen new portable groups are as follows: Lesser Yellow-legs and Stilt Sandpiper, Sharp-shinned Hawk, Orchard Oriole, Yellow-headed Blackbird, Pectoral and Least Sandpipers, Cat-bird, Yellow Warbler with two-tiered nest showing buried Cowbird egg, Redstart, Mole, Minnesota butterflies, foreign butterflies; and the following reptiles and amphibians—garter and red-bellied snakes, fox snake, bull snake, hog-nosed snake, black-banded skink, and salamanders.

In a large case in the upper hall there has been installed an exhibit designed to show, by means of actual specimens, salient features in the molt of birds, migration of birds, adaptive variation in the eggs of birds, and instances of marked adaptation of structure in birds to habit.

An Adélie Penguin, brought back from Little America by the second Byrd expedition, was obtained by purchase and is displayed among the other mounted specimens in the upper hall. It has a special value as a peculiar bird-type, and has attracted considerable attention, both on this account and because of its association with the Byrd expedition.

*Accessions.*—From some fifty-four different sources gifts of natural-history material have been made to the museum and these have for the most part been incorporated in the study collections. Notable among these gifts is a pair of the rare red mutant phase of the Bob-white from the Ames plantation, Grand Junction, Tennessee, received through the courtesy of Mr. H. L. Stoddard and Mr. Hobart Ames. Also a beautiful pair of the black mutant Ring-necked Pheasant was received from the Minnesota Game and Fish Department through the kind offices of Mr. Frank Blair, superintendent of the state game farm. Among the specimens purchased the following were particularly valuable additions: a good skin of the now practically extinct Eskimo Curlew, and two skins of the Fisher, now a rare animal in the state, taken in northern St. Louis County by warden trappers.

## BY GIFT

Dr. William P. Abbott, Duluth.....	1 Greater Scaup, 1 Lesser Scaup, 2 Surf Scoters (all in flesh)
Mr. Harry Adams, Minneapolis.....	1 long-tailed weasel (in flesh)
Mr. Sam Anderson, Hutchinson.....	1 Whistling Swan (in flesh)
Mr. William S. Austin, Minneapolis.....	1 Pileated Woodpecker (in flesh)

Mr. Northrop Beach, Minneapolis.....	1 Sparrow Hawk (in flesh)
Mr. R. M. Berthel, St. Paul.....	1 Semi-palmated Sandpiper, 1 Old-squaw Duck, 1 Yellow-bellied Sapsucker (all in flesh)
Mr. W. B. Boardman, Minneapolis.....	1 Chimney Swift's nest
Mr. W. J. Breckenridge, Minneapolis.....	3 bird skins, 9 mammal skins, 6 snakes, 12 lizards
Dr. J. C. Brown, St. Paul.....	1 Red-headed Woodpecker and 1 Horned Lark (in flesh)
Mr. Bernard Conner, Jr., Minneapolis.....	1 woodchuck (in flesh)
Mrs. Frank W. Commons, Crystal Bay.....	48 bird skins, 15 colored post-cards of Australian birds, and several pamphlets and books
Mr. R. C. Dahlberg, Minneapolis.....	1 Starling (in flesh)
Dr. R. W. Dawson, St. Paul.....	17 bird skins
Miss Dorothy Dittes, Minneapolis.....	1 Yellow Rail (in flesh)
Mr. Charles Drake, Minneapolis.....	1 red-bellied snake (alive)
Mrs. Leonard Du Champ, Thief River Falls.....	1 Golden-eyed Duck (mounted)
Dr. Samuel Eddy, St. Paul.....	1 large tree-section showing annual rings
Mr. James Ellison, Minneapolis.....	1 Oven-bird (in flesh)
Mr. Allor Erlandson, Bear River.....	1 set of white-tailed deer horns (in the velvet)
Mr. Gust Evander, Minneapolis.....	1 tiger salamander (alive)
Mr. Charles Evans, Minneapolis.....	3 bats (Pipistrelles)
Miss Constance Everett, Waseca.....	1 Toucan (skin)
Mr. William Feeney, St. Paul.....	2 Spruce Grouse (in flesh)
Mr. O. Fischer, Shakopee.....	1 adult DeKay's snake and 15 young (alive)
Mr. P. O. Fryklund, Roseau.....	3 Prairie Chickens, 2 Sharp-tailed Grouse, 2 Great Horned Owls (all in flesh)
Dr. Robert G. Green, Minneapolis.....	2 black-banded skinks (alive)
Dr. W. R. Hiller, Minneapolis.....	2 young Wood Ducks (in flesh)
Mr. Robert Haas, Minneapolis.....	1 Sharp-shinned Hawk (in flesh)
Mr. H. J. Jager, Owatonna.....	1 Snow Goose, 1 Bean Goose, 1 Barnacle Goose, 1 Egyptian Goose, 1 Black Duck (all in flesh)
Mr. Edward P. Kehoe, St. Louis Park.....	2 Starlings (alive)
Miss Olga Lakela, Duluth.....	1 Gray-cheeked Thrush (in flesh)
Mr. R. A. Lampher, St. Paul.....	1 Old-squaw Duck (in flesh)
Mr. R. C. Lewis, Stillwater.....	1 Pileated Woodpecker (in flesh)
Mr. V. L. Marsh, Great Falls, Montana.....	1 Long-billed Marsh Wren, 2 nests, and 5 eggs
Mrs. C. K. D. Minar, Minneapolis.....	1 Flicker (in flesh)
Minnesota Game and Fish Department.....	2 black mutant Ring-necked Pheasants, 1 black squirrel, 1 long-tailed chipmunk (all in flesh), and 64 fish (alive)
Mr. M. J. Magee, Sault Ste. Marie, Michigan.....	1 Evening Grosbeak (young)
Mr. John R. Nord, Milbank, So. Dak.....	8 coyote pups (alive)
Mr. Warren Nord, St. Paul.....	1 badger, 1 Hooded Merganser, 2 Lesser Scaup Ducks, 1 American Golden-eyed Duck, 1 Prairie Chicken, 1 Ring-necked Pheasant (all in flesh)

## ANNALS OF MUSEUM OF NATURAL HISTORY

Dr. J. Anna Norris, Minneapolis .....	1 bird house with nest and 1 egg of House Wren
Mrs. C. E. Peterson, Madison .....	2 Arctic Towhees, 1 Yellow-breasted Chat, 1 Chipping Sparrow, 2 Rough-legged Hawks, 1 Great Horned Owl, 1 Barred Owl, 1 Golden Eagle (all in flesh)
Dr. C. A. Prosser, Minneapolis .....	1 Horned Lark (in flesh)
Mr. Charles Reif, Minneapolis .....	1 common shrew (in flesh)
Dr. Alden Risser, St. Paul .....	1 young Ring-necked Pheasant (salted skin)
Dr. T. S. Roberts, Minneapolis .....	185 bird skins
Mr. E. Duane Sayles, Virginia .....	1 Golden Plover (alive)
Mrs. Schroder, Minneapolis .....	1 albino pocket gopher (in flesh)
L. K. Stein and Company, Minneapolis .....	1 tropical whipsnake
Mr. H. L. Stoddard, Beachton, Ga. ....	2 red Quail (salted skins)
Mr. Gustav Swanson, Minneapolis .....	1 Olive-backed Thrush, 2 Ring-necked Pheasants, and 1 white-tailed jack-rabbit (all skins), and 88 mammal skins
Mr. E. D. Swedenborg and Dr. C. A. Prosser, Minneapolis .....	1 nest and 3 eggs of Canada Warbler, 1 nest and 4 eggs of Olive-backed Thrush
Dr. D. H. Talbott, Minneapolis .....	1 Hooded Merganser (in flesh)
Mrs. J. A. Thabes, Sr., Brainerd .....	1 Goldfinch (in flesh)
Mr. E. R. Tinkham, Minneapolis .....	1 Baldpate Duck (skin)

## BY PURCHASE (MUSEUM DONATION FUND)

13 mammal skins, 53 bird skins, 2 mounted birds, 7 nests, and 40 birds' eggs; 200 feet of 16mm. motion-picture print

## BY FIELD WORK

10 mammals, 3 birds, 60 reptiles and amphibians for study collections; 700 feet of colored and black-and-white 16mm. motion-picture film; several photographic studies and various accessories for medium- and small-sized groups

*Study collections.*—The study collections of birds and mammals are now in excellent and readily accessible condition and are open for study and comparison to all well-accredited students. All the material in these collections is available to the members of the Zoology Department for class work, and a selected series of birds is used regularly in the bird classes conducted by members of the museum staff.

Six additional steel-jacketed cases for the storage of bird skins were purchased.

*Publications.*—The ninety-two colored plates from *The Birds of Minnesota*, with a page of text for each plate, were issued in September, 1934, by the University Press under the title *Bird Portraits in Color*. The loose plates in sets have also been made available for those who wish to use them in that form. The director has revised the two volumes of *The Birds of Minnesota* for a second edition, which is now in the hands of the printer and will be issued by the Uni-

## ANNALS OF MUSEUM OF NATURAL HISTORY

versity Press in the fall of 1936. A new revised edition of the *Manual for the Identification of the Birds of Minnesota and Neighboring States* was issued by the University Press in the spring of 1936. The bi-monthly *Bird-Lore* articles have been continued by the director. Several papers on natural-history subjects have been written by Mr. Breckenridge and the director and published in current journals.

*Photography.*—Fifteen hundred feet of 16mm. colored and black-and-white, and 821 feet of 35mm. motion-picture film have been made, and 3,946 feet of 35mm. old film have been reduced to 16mm. film. Two hundred and seventy-two negatives, 120 lantern-slides, and 113 prints have been made. A complete set of colored slides from the colored plates in *The Birds of Minnesota* has been prepared for lecture and loan purposes. Two hundred feet of slow-motion motion-picture film of an Eagle in flight were purchased.

*Co-operation.*—Side by side with the growth of the material and the purely scientific and research work of a museum, its value as a general and special educational unit should develop. Under favorable circumstances and judicious fostering this educational function of a museum may be made to rival or even dominate its other activities. Too frequently, however, even with the modern well-developed museum, the teaching value of such an institution is lost sight of or minimized by the general body of educators. The word "museum" seems still to signify to most educators a collection of objects more or less unusual or startling for the entertainment of visitors. But the advanced museum of to-day is making every effort to find a legitimate place in the teaching field, where it properly belongs. The larger independent museums of this and other countries have succeeded fairly well, but where the museum is an integral part of a college or university it seems more difficult to secure recognition. The display features alone of a museum are too apt to subordinate all else, and an estimate of the value of a museum is too often based upon its material possessions. The value for show purposes and in dollars and cents of these material possessions is but a small fraction of their real intrinsic worth if properly handled. Used as a basis of intelligent first-hand teaching and as a means of co-operative dealings with other educational activities, the possessions of even a small museum have a potential value not easily estimated. To place a cost of construction value on museum exhibits would be like valuing a fine collection of paintings by the cost of canvas, paint, and frames.

The University Museum labors under a handicap in not having a building of its own, but I think it fair to say that the staff has not been negligent in developing the educational side as best it could under the circumstances. The following recital will point to some of its efforts along this line:

A total of 231 lectures has been given by members of the staff during the biennium, with an estimated attendance of 21,418. A majority of these have been to groups of school children from the Twin Cities, but other groups have come from outside places including St. Cloud, Northfield, Appleton, Howard Lake, and Rock Falls, Iowa. Illustrated lectures were also given by members of the staff to the Southern Minnesota Medical Association at Mankato, to Sigma Xi at Rochester, to the Rochester Garden Club, to numerous parents and teachers associations, to adults and children at the Minneapolis Woman's Club, in the nature study and conservation courses at the Minneapolis public library, to sportsmen's clubs, church clubs, and many other groups.

Portable school-groups were loaned as follows: Minneapolis public schools, St. Louis Park schools, Robbinsdale schools, White Bear High School, Faribault State School for the Deaf, New Ulm Izaak Walton League, Northwest Sportsmen's Show, and others—360 in all. Twenty-three motion-picture reels, 1,795 lantern-slides, 118 bird skins, and 182 mammal skins have been loaned.

The bird-study course offered by the Zoology Department was conducted each year by the museum staff, and a new evening extension course in bird study was given under the auspices of the museum the past two years.

Mr. Kilgore continued to examine Boy Scouts for the bird-study merit badge.

*Outside activities of the staff.*—Mr. Breckenridge attended the McGregor, Iowa, Wild Life School, August 7 to 9, 1934, and gave four illustrated lectures.

Mr. Kilgore, Mr. Breckenridge, and the director attended the meeting of the American Ornithologists' Union, October 22 to 25, 1934, at Chicago, and the director went to the Toronto meeting, October 21 to 24, 1935.

#### FIELD WORK

With the exception of one short trip by Mr. Breckenridge into northern Minnesota in the winter of 1934-35 to study the remaining small herd of caribou, the field work has been confined to the vicinity of the Twin Cities.

#### FINANCES

*Museum Maintenance Budget.*—The amount allowed for 1934-36 was \$2,360 for each year. This was expended largely for permanent equipment, office supplies, and to supplement the Museum-aid Budget.

*Museum-aid Budget.*—The amount allowed for 1934-36 was \$700 for each year.

*University Museum Donation Fund.*—Mr. James F. Bell has continued his monthly contribution of \$75 throughout the two years. This fund has been used to purchase for the museum an Eastman Cino special 16mm. motion-picture camera, photographic supplies, six cases for the egg collection, specimens, books for the museum library, and incidentals. On June 30, 1936, there was a balance of \$508.14 in the First National Bank of Minneapolis to the credit of Thos. S. Roberts, Trustee.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*



Fig. 36.—Lynx Group. Constructed by W. J. Breckenridge.

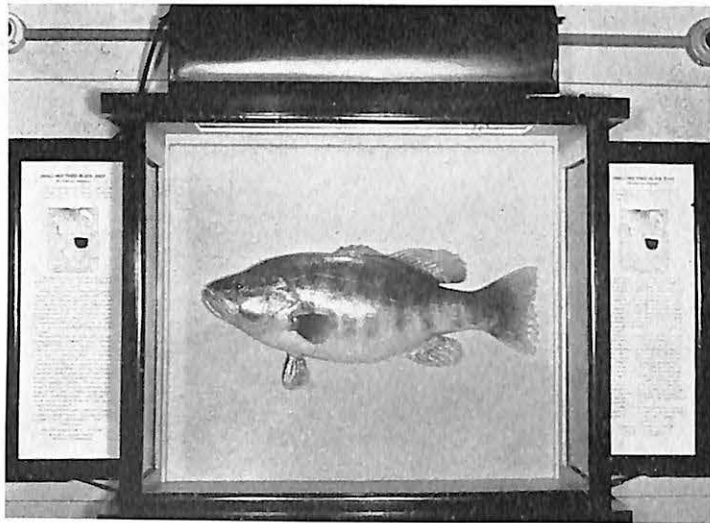


Fig. 37.—Small-mouthed Black Bass. Portable Group.

To the President of the University:

SIR: I have the honor of submitting the following report of the condition and activities of the Museum of Natural History for the biennial period ending June 30, 1938.

#### MUSEUM

The museum has continued and increased its activities during the period just closed. The daily attendance has shown a steady growth, including many out-of-town visitors, especially during the summer months when tourists are directed to the museum by various city agencies. "Mother's" and "Dad's" days always bring a marked influx of visitors, as it is the chief show place on the campus.

*Attendance.*—The museum, as usual, has been open during weekdays and on Sunday afternoons during January, February, and March. Attention is called to the Sunday openings by cards placed in the street-cars during the week preceding January 1. The Sunday attendance was 3,982 for 1937, and 4,979 for 1938, a total for the two years of 8,961, with an average of 344. The largest single day was 590.

*Exhibits.*—No large exhibits have been added because of lack of space. Ten portable school-groups have been constructed making a total of 143. Also four regular medium-sized groups and one triple medium-sized group have been added. These are as follows: port-

able school-groups: Bob-white, Prairie Marsh Wren, albino Ruddy and Mallard Ducks, Wilson's Phalarope, Minnesota Bats, banded rattlesnake, milk-snake, blue racer, water-snake, and chambered nautilus. Medium-sized groups: Wood Duck, Goshawk, Franklin's Ground-squirrel, and Snow-shoe Rabbit with young. Also a larger Red Fox Group has been added, with adult female, young, flower accessories, and painted background.

*Accessions.*—An especially valuable gift was fourteen bound volumes of Seitz's *Macrolepidoptera of the World* given by Miss Constance Everett, with a promise to present, also, future volumes as they are issued.

#### BY GIFT

Dr. William P. Abbott, Duluth.....	1 Greater Scaup (in flesh)
Miss Aler, Minneapolis.....	1 Bohemian Waxwing (in flesh)
Mr. James Bailey, Dickinson, No. Dak.....	1 Golden Eagle (alive)
Mr. R. M. Berthel, St. Paul.....	2 Yellow-bellied Sapsuckers and 1 Purple Martin (in flesh), and 1 fox-snake (alive), 1 wandering garter-snake (alive)
Mr. William Boardman, Minneapolis.....	1 Dovekie (skin)
Botany Class, University of Minnesota.....	1 smooth green snake (alive)
Mr. Sterling Brackett, Minneapolis.....	2 water-snakes (alive)
Mr. B. S. Bull, Jr., Wayzata.....	1 DeKay's snake (alive)
Mr. Kenneth Carlander, Minneapolis.....	2 water-snakes and 2 frogs (alive)
Mr. K. P. Caswell, Hokah.....	1 albino garter-snake (alive)
Mr. Thomas Chan, Minneapolis.....	2 Lyre-bird tails
Mrs. George C. Christian, Minneapolis.....	3 photographs of Biological Museum at Stockholm, Sweden
Mr. R. R. Church, Minneapolis.....	1 milk-snake
Mr. A. S. Cools, Cook.....	1 star-nosed mole (in flesh)
Mrs. W. H. Crone, Minneapolis.....	1 Olive-backed Thrush and 1 Grinnell's Water-Thrush (in flesh), and 2 ram's-head orchids
Mr. Franklin Crosby, Sr., Minneapolis.....	1 albino Ruddy Duck (in flesh)
Dr. R. W. Dawson, St. Paul.....	4 sets of eggs
Mr. A. B. Erickson, Minneapolis.....	1 Say's bat (alive), 2 rusty fox squirrels and 1 short-tailed weasel (in flesh)
Miss Constance Everett, Waseca.....	14 volumes, <i>Macrolepidoptera of the World</i> by Seitz (bound)
Mr. P. O. Fryklund, Roseau.....	1 Lesser Canada Goose (alive)
Dr. R. G. Green, Minneapolis.....	1 adult red fox and 4 snow-shoe rabbits (in flesh)
Mr. Edward Gustafson, Worthington.....	1 common toad and 1 western toad (alive)
Miss Amy Hankinson.....	1 Wood Duck (in flesh)
Mr. H. Hanson, Chisago City.....	6 skinks and 2 swamp tree-frogs (alive)
Mr. Bert Hawkins, St. Paul.....	1 tree-frog and 1 swamp tree-frog (alive)
Mr. Sam Held, St. Paul.....	1 Screech Owl and 1 Snowy Owl (in flesh)
Dr. W. R. Hiller, Minneapolis.....	2 young Shovelers (in flesh)
Mr. A. C. Hodson, Minneapolis.....	1 red-bellied snake (alive)

## ANNALS OF MUSEUM OF NATURAL HISTORY

Mr. William Jellison, Bozeman, Montana	1 rubber boa, 1 capybara skull
Mr. E. Johnson, St. Paul	1 Western Meadowlark (in flesh)
Mr. J. C. Jones, Washington, D.C.	1 Black Skimmer (skin)
Mr. Key, St. Paul	1 Buffle-head Duck (in flesh)
Mr. James Kimball, St. Paul	1 tree-frog and 1 swamp tree-frog (alive)
Minnesota Game and Fish Department by Mr. Joseph Krall, warden, Lake County	3 wolf skins
Mr. Emil Liers, Homer	2 otters (in flesh)
Dr. Donald Mahle, Plainview	1 spring-peeper (alive)
Mr. J. Manweiler, Baudette	1 caribou calf and 1 wolf (in flesh), 1 cow elk (skin)
Mr. Dean Mather, Cushing	7 tiger salamanders, 1 Jefferson's sala- mander, and 4 black-banded skinks (all alive)
Mr. Louis Mellenthin, Lynd	1 partial-albino Pheasant
Minnesota Game and Fish Department by Mr. Carl Meyer, warden, Grand Marais	1 timber wolf (skin and skull), 2 timber wolves (skins)
Dr. C. E. Mickel, Minneapolis	1 Western Grebe (in flesh)
Dr. J. C. Miller, Minneapolis	1 White-winged Scoter (in flesh)
Dr. D. E. Minnich, Minneapolis	1 Blue-headed Vireo, 1 Ruby-crowned Kinglet, and 1 Gray-cheeked Thrush (all in flesh)
Mr. Martin Nelson, Fertile	1 Greater Scaup (in flesh)
Mr. Warren Nord, St. Paul	1 Sharp-shinned Hawk and 1 Red- shouldered Hawk (in flesh), 1 frog (alive)
Mr. Charles Ott, Grand Marais	2 Spruce Grouse (in flesh), 1 wood- land caribou antler
Mr. Max Partch, Minneapolis	1 Lincoln's Sparrow (in flesh)
Mr. Alfred Peterson, Pipestone	1 Parasitic Jaeger, 1 Buffle-head Duck, 1 Goshawk, and 2 western toads (all in flesh)
Mrs. C. E. Peterson, Madison	1 Gray-cheeked Thrush, 1 Oven-bird, 1 Arctic Towhee, 1 Red-tailed Hawk, 1 Mourning Warbler, and 1 Lincoln's Sparrow (all in flesh)
Dr. C. A. Prosser, Minneapolis	1 Tree Swallow (in flesh)
Mr. Leslie Rolsen, Minneapolis	1 photograph of Wood Duck's nest
Mr. George N. Rysgaard, St. Paul	1 false map-turtle shell, 1 garter- snake (alive), 2 red-backed and 4 Jefferson's salamanders (preserved)
Messrs. G. N. Rysgaard and Robert Turner	1 blue racer snake (alive)
Mr. Kenneth Sather, Round Lake	1 Golden Plover (in flesh)
Mr. M. R. Snyder	1 tiger salamander
Minnesota Game and Fish Department	1 Canada Goose (in flesh), 1 lot of live fish
Mr. Ray Steele, Winona	1 young Guinea Fowl and 2 Wood Ducks (in flesh)
Mrs. Rene B. Stiles, Minneapolis	1 black swamp snake, 1 Say's king- snake, 1 milk-snake, 1 western diamond-back rattlesnake, 2 timber rattlesnakes (all preserved)
Mr. C. B. Straub, Tyler	1 western toad

## ANNALS OF MUSEUM OF NATURAL HISTORY

Mr. Thaddeus Surber, St. Paul	1 Raven (in flesh)
Dr. Gustav Swanson, St. Paul	1 Robin, 2 Purple Sandpipers, and 2 red fox cubs (all in flesh), 1 hog-nosed snake and 1 fox-snake (alive)
Dr. R. B. Tweedy, Winona	1 Red-shouldered Hawk (in flesh)
Mr. Robert Upson, Minneapolis	1 wood turtle (in flesh)
Mrs. C. C. Webber, Lake Minnetonka	1 pocket gopher (in flesh)
Mr. Archie Whelman	1 Great Horned Owl (in flesh)
Zoology Department, University of Min- nesota	1 copperhead snake (in flesh)

## BY EXCHANGE

Red Wing Izaak Walton League	1 Passenger Pigeon (mounted)
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## BY PURCHASE (MUSEUM DONATION FUND)

4 birds, 5 sets of birds' eggs, 5 mammals, and 32 reptiles

## BY FIELD WORK

6 bird skins, 4 mammals

*Photography.*—Four thousand feet of motion-picture film have been taken, more than half in color, and 3,150 feet printed. Also many still photographs have been made and printed for the files. The museum now has fifty-eight reels of motion pictures in color and black-and-white for lecture purposes and to loan.

*Publications.*—The revised second edition of *The Birds of Minnesota* was released by the University Press in October, 1936, and a *Logbook of Minnesota Bird Life 1917-1937*, also by the director, was issued in the spring of 1938. The bimonthly "Season" reports to *Bird-Love* have been continued. Several articles by Mr. Breckenridge and one or two by the director, on natural-history subjects, have been printed in various journals.

*Lectures.*—Three hundred and twenty-three lectures have been given by members of the staff during the biennium with a total attendance of 29,025, distributed as follows: school children at the museum 7,889, school children elsewhere 10,920, adults 6,550, Sunday afternoon lectures 3,666. Most of the lectures to school groups at the museum were given by Mr. George Rysgaard, Mr. Arnold Erickson, and Mr. Russell M. Berthel, university students employed by the museum as aids. Most of the outside lectures have been given by Mr. Breckenridge.

*Co-operation.*—In addition to lectures, the museum has co-operated with other institutions and other departments of the University by the loan of material as follows: portable school-groups 317, lantern-slides 920, motion-picture reels sixty-one, mammal skins 168, bird skins forty-four, and also by the distribution of a large amount of printed matter to teachers, Boy and Girl Scout leaders, and others.

## ANNALS OF MUSEUM OF NATURAL HISTORY

### FIELD WORK

Mr. Breckenridge has made several trips into various parts of the state collecting specimens and making motion pictures, notably a trip to the western part of the state in April, 1938, to secure film records of the vast migration of Geese that annually passes northward. A large amount of field work has also been done in the vicinity of the Twin Cities.

### FINANCES

*Museum Maintenance Budget.*—The amount allowed for 1936-38 was \$2,100 for each year. This was expended as usual.

*Museum-aid Budget.*—The amount allowed for 1936-38 was \$700 for each year.

*Museum Donation Fund.*—Mr. James F. Bell's monthly contribution has continued throughout the two years, amounting to \$1,800. This fund is expended in the purchase of photographic equipment and supplies, developing and printing, for specimens for the study collections, books for the museum library, and incidentals.

Respectfully submitted,

THOMAS S. ROBERTS, *Director*



Fig. 38.—Detail from  
Lynx Group

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