

THE AMERICAN MUSEUM
OF NATURAL HISTORY

SEVENTIETH ANNUAL REPORT
FOR THE YEAR 1938

SERIAL SCIENTIFIC PUBLICATIONS

NATURAL HISTORY, The Magazine of The American Museum of Natural History:

Volumes I-XLII, 1900-1938. An illustrated magazine, issued monthly, excepting July and August, devoted to records of scientific research, exploration and discovery, of the development of museum exhibitions and of museum influence on education. Contributors include the scientific staff, explorers and Members of the American Museum, and other eminent naturalists. Issued to all Members as one of the privileges of membership, or on subscription \$3.00; 50c. per copy.

THE JUNIOR NATURAL HISTORY MAGAZINE:

Volumes I-II, 1936-1938. An illustrated monthly magazine for young readers. \$1.00 per year; 10c. per copy; special rates for schools.

THE SKY: Bulletin of the Hayden Planetarium. Published by The American Museum of Natural History.

Volumes I-II, 1936-1938. An illustrated monthly magazine. \$1.50 per year; 15c. per copy.

BULLETIN of the American Museum:

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MEMOIRS of the American Museum:

Volumes I-XV, 1893-1930; New Series, I-III, 1912-1921. (Volumes II, IV, V, VII, VIII, X-XV, form the Jesup North Pacific Expedition series, Volumes I-XI). Prices range from 75c. to \$18.00 per part.

SPECIAL SCIENTIFIC PUBLICATIONS

A REVIEW OF THE PRIMATES:

By Daniel Giraud Elliot. 1913. A monographic treatise in three quarto volumes. Paper, \$35.00; morocco, \$45.00.

BIBLIOGRAPHY OF FISHES:

By Bashford Dean. 1916-1923. Covers the entire literature of fishes to 1914 and embraces 45,000 titles arranged alphabetically by authors. Three volumes, \$15.00.

THE BASHFORD DEAN MEMORIAL VOLUME:

Article I, 1930, \$1.25; Article II, 1931, 60c.; Article III, 1931, \$1.75; Article IV, 1932, \$2.50; Article V, 1933, \$1.00; Article VI, 1937, \$3.50.

OCEANIC BIRDS OF SOUTH AMERICA:

By Robert Cushman Murphy. 1936. The first comprehensive work in its field. Two quarto volumes, cloth-bound. Out of print.

PROBOSCIDEA:

By Henry Fairfield Osborn. 1936. An exhaustive study to be completed in two quarto volumes. Volume I, cloth-bound, \$20.00.

(Publications continued on third page of cover.)

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SEVENTIETH ANNUAL REPORT FOR THE YEAR 1938

"For the purpose of establishing and maintaining in said city a Museum and Library of Natural History; of encouraging and developing the study of Natural Science; of advancing the general knowledge of kindred subjects, and to that end of furnishing popular instruction."

THE CITY OF NEW YORK
Issued May 1, 1939

This abstract of the departmental reports was prepared by Ruth Tyler.

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SEVENTIETH ANNUAL REPORT OF THE PRESIDENT

*To the Trustees of
The American Museum of Natural History
and to the Municipal Authorities of the City of New York*

IN this preface to the Seventieth Annual Report of the American Museum of Natural History, I wish first to pay tribute to the ability, loyalty and painstaking efforts of the men and women who are the blood and brains of this institution. Teamwork is the determinant in the success or failure of any organization. Thanks to the spirit of cooperation which dominates the personnel, we were able to continue and, in many instances, to expand our activities in spite of decreasing financial resources and understaffed departments. This could not have been possible but for the continued support of old friends and the interest and help of many new ones brought to us by the committees of the Ten Year Development Program headed by Mr. A. Perry Osborn, Mrs. Winthrop W. Aldrich and Mr. S. Sloan Colt.

Details of these activities, of the scientific and educational work, and a survey of the financial condition of the Museum will be found elsewhere in this report. For that reason, I propose here to present a résumé of the program for the American Museum in connection with the New York World's Fair. Realizing that millions of visitors from all over the country and many parts of the world will be interested in the Museum, the Roosevelt Memorial and the Hayden Planetarium, the Administrative and Scientific Staffs early in 1938 hastened toward completion new halls and the rearrangement of existing exhibits, as far as time, money and personnel would permit.

Outstanding among the new exhibits are three halls in the magnificent Whitney Wing. In the Whitney Memorial Hall eight habitat groups of the land and sea birds of the islands of the Pacific Ocean have been completed. Hawaii, Samoa, Galapagos, Tuamotu, Marquesas—the names only suggest the enchantment and beauty in these lovely groups.

One of the most instructive and interesting bird halls in the Museum is that of the Biology of Birds, occupying the entire first

floor of the Whitney Wing, which presents a survey of the place of birds in nature and their relationship to man. Although the hall is by no means completed, four sections showing nesting habits and various types of nest building from crude nests to large and elaborate structures will be open to the public by May.

The fine American Museum collection of paintings and drawings by Louis Agassiz Fuertes includes some of his early work and shows, therefore, the development of his art. These are hung in the new Whitney Gallery of Bird Art, where are also about forty paintings by Joseph Wolf, some the original plates for the magnificent illustrations in a few of the Elliot monographs, principally the great work on the pheasants. Two of the largest paintings from our extensive collection of Auduboniana are also in the Whitney Gallery of Bird Art; the remainder are exhibited in the fourth floor ambulatory of the Roosevelt Memorial.

Of the four groups significant of the life of Theodore Roosevelt, that showing the Elkhorn Ranch in North Dakota where Roosevelt spent many years as a ranchman and where his love of nature was fostered is open to the public. The three other groups, relating to the ancestry of the Roosevelt family in the waterfront scene of Old Dutch New York, conservation in the group of deer in the Adirondack woods and the Bird Sanctuary at Oyster Bay, will be finished in the spring.

The invertebrate palaeontology exhibits in the Geology Hall have been completely revised and a new feature of the hall is a geological relief model of the Hudson River region from New York City to the vicinity of Albany.

Closely associated with the Geology Hall is the new Hall of Petrology, which presents a concise and graphic visualization of the basic processes of rock formation as well as the application of the science of geology to modern life and the industrial world.

The completion of the new Jurassic Dinosaur Hall and the rearrangement of the Cretaceous Hall bring to the public the finest collection of fossil reptiles in the world. Here are the water-living and flying reptiles, the towering carnivorous *Tyrannosaurus*, the newly installed dinosaur tracks, and all the great and small reptilian creatures of the land, sea and air which dominated the earth at least sixty million years ago.

At the request of the World's Fair authorities, the Museum plans a temporary exhibition of primitive art, utilizing original pieces from

our extensive collections from the Americas, Africa and Polynesia. As the emphasis of the New York World's Fair is not upon individual glory but cooperative mass achievement, so the purpose of this exhibition is to stress the high point art can attain when purely anonymous and created for a social end.

In the Hayden Planetarium, two spectacles designed to stimulate the layman's appreciation of astronomy are planned. One reveals the circumstances by means of which life on earth or the earth itself might come to an end; the other carries the visitor on a trip to the moon and gives him a realistic picture of the surface of our nearest cosmic neighbor.

In addition to opening these new avenues of interest to Museum visitors during the World's Fair, we shall also have, in cooperation with municipal authorities, an exhibit in the Building of the City of New York. The central attraction is the large translucent model of the three-horned chameleon, which when illuminated will undergo the same changes of color seen in a living specimen. A supplementary exhibit of a dynamic cross-section of the chameleon's skin shows how pigment cells move to produce color effects. Although the chameleon is frequently green, there are no green pigments in its skin, the color being due to reflected blue light through a layer of oil droplets. Surrounding this exhibit will be miniature dioramas depicting various branches of natural history—volcanoes, pearl divers of the South Seas, the life of the Seminole Indians, dinosaurs from the Gobi, mica in polarized light, and bird life.

An astronomical spectacle on the Fair grounds, directed by the Museum and the Hayden Planetarium and sponsored by the Longines-Wittnauer Watch Company, will give World's Fair visitors an opportunity to make a realistic and authentic journey beyond our planetary system to the island universes of remote space. At the time of this writing, negotiations are under way for an arrangement between the Hayden Planetarium and the World's Fair organization whereby the gorgeous lighting display at the Fair grounds will be turned on by impulses from cosmic rays transmitted from a receiver in the Hayden Planetarium.

As observed at the beginning of this preface, the record of Museum activities for the past year will be found in the following sections of this report. My purpose here has been to outline briefly our plans to be of the greatest possible service and interest to the World's Fair visitors in 1939 and to those who will visit the Museum during the many years to follow.

II. REPORT OF THE DIRECTOR

The American Museum of Natural History is striving, with every other institution dependent for its effectiveness and growth upon public support, to maintain itself in sound financial health. The exigencies of the immediate situation demand a rigid restriction of expenditures and a thorough, unceasing effort to raise funds with which to operate.

We have steadily restricted, year by year, our expeditions into the field, sending out only those specifically financed. Within the building we have made only such changes in exhibits as are consonant with our means and repairs that are essential. So restricted, the energies of the Scientific Staff were, some years ago, urged upon research and especially publication. Articles, papers, monographs have been written, are constantly being produced, and completed manuscripts, chiefly descriptive of the extensive Museum collections, submitted continually to the respective editors. We cannot publish them for lack of funds. More pages of manuscript were submitted to the Department of Scientific Publications in 1938, which must be carried into 1939 or later, than we actually printed in the year. Because of this increasing congestion, authors in every department of the Museum have been compelled to resort to non-Museum journals in order to put their reports on record, while the number of our own journals is deplorably small—forty-five *Novitates*, three articles of only one volume of the *Bulletin*, one part of one volume of the *Anthropological Papers*.

A specific example of the cut delivered to publication for the purpose of economy is the shrunken size of all sections of this Annual Report.

As several years ago we omitted from it the entire roll of Members, whose generous loyalty is one of our foundations, so now we take the further step of omitting any specific record of accessions or gifts of money. To list all the gifts the Museum receives annually is obviously impossible. To mention some, and not all, implies a distinction in our appreciation and evaluation of the act of giving which we do not feel. The list of gifts which has always heretofore been printed in the Report of the Secretary we therefore omit entirely and in this place, on behalf of the Trustees and Staff of the American Museum of Natural History, is spread upon the records our

gratitude for every article donated to our collections from every source, for all gifts of money contributed for any purpose. This concrete evidence of the public support renders possible the fulfillment year by year of our function as a source of delight and instruction in the public life.

The other side of our endeavor, to increase our money income, is concentrated in the Ten Year Development Program which, in its second year of operation, placed the major emphasis of its activities on broadening the base of Museum support. The degree of its success can be gauged by the fact that the deficit was raised, salary contributions of Museum employees were refunded and the Museum was able to start the new year with a cash balance.

Even more significant accomplishments for 1938 were the enlistment of two active committees: the Women's Century Fund Committee, Mrs. Winthrop W. Aldrich, Chairman; and the Men's Committee, Mr. S. Sloan Colt, Chairman. Through the combined efforts of these committees and the Executive Working Committee, which controls all activities of the program, 702 subscriptions for a total of \$224,178.24 were received during the year. The personnel of the three working committees now numbers 175 men and women. The officers of the program are: Mr. F. Trubee Davison, Chairman; Mr. A. Perry Osborn, Executive Chairman; Mrs. Winthrop W. Aldrich and Mr. S. Sloan Colt, Vice-Chairmen; Mr. E. Roland Harriman, Treasurer; and Mr. Reuel C. Estill, Secretary.

The Museum acknowledges its continued appreciation of the hearty support of the city officials, particularly the cooperation of the Commissioner of Parks, Mr. Robert Moses, and the Park Department.

We are indebted for another year to the Works Progress Administration for most valuable help in nearly every phase of our work. The brevity of the mention in the departmental records of the assistance these workers have given is only an inadequate measure of this important help.

III. THE SCIENTIFIC DEPARTMENTS

NEW EXHIBITS

Astronomy and the Hayden Planetarium. Improvements and additions were made to the Planetarium technical equipment.

The following were exhibited at various times during the year: an accurate scale relief model, eight feet in diameter, representing three hundred miles of the moon's surface; materials needed for an amateur astronomer's reflecting telescope and mirrors in various stages of being polished; four oil paintings by James Perry Wilson of the lunar and solar eclipses in May; six astronomical paintings by D. Owen Stephens of eclipse and southern skies; ancient and modern calendars and almanacs, including the earliest known wall calendar, a Siberian calendar pole, many rare astronomical books and manuscripts on the calendar, and a group of ceremonial objects used in connection with the Jewish lunar calendar; an historically important eight-foot spectrum of the sun, a series of old spectroscopic line gratings made by L. M. Rutherford, his grating machine and the first telescopic lens, made for Rutherford, especially corrected for photographic work; a collection of large astronomical photographs made by amateur astronomers through their home-made telescopes; an experimental rocket, with accessories, used for tests by the American Rocket Society; a practically completed twenty-one-inch telescope mirror made by the Optical Division of the Amateur Astronomers Association; an illuminated model of the sun with changing sun-spots; exhibit illustrating old and new methods of etching metallic meteorites to reveal their crystalline structure; model showing life history of a typical star, its changes in temperature, color and size; enlargements of four drawings by Rockwell Kent illustrating theories of the possible end of the world; a series of cut precious stones showing the star motif.

The portrait of Charles Hayden by Wilbur Fiske Noyes, presented by Mr. J. Willard Hayden, was unveiled April 21.

Geology and Mineralogy. The Curator assigned Dr. Frederick H. Pough to the assembling of a new geology display on the third floor, about half of which was completed with the aid of W. P. A. artists and letterers. With the same W. P. A. assistance, Dr. Pough finished three new installations showing the minerals of Bedford, New York, Franklin, New Jersey, and Portland, Connecticut.

Forty per cent of the new mineral species announced in 1938 were added to the synoptic collection. A lot of forty-five diamond crystals which fluoresce in various colors was added to the case of fluorescent minerals. Fluorescent diamonds are rare; the average is one in every forty crystals.

Special temporary exhibits in the first floor foyer were "How Old is a Gem" during February, including gems loaned by Mr. Roswell Miller, "Russian Easter Eggs carved from Ornamental Stones" in April, with several Imperial examples loaned by Dr. Armand Hammer of the Hammer Galleries, and "Eve and Her Jewel Casket" during June. In the Morgan Hall were shown "Beryl" in the series of American gems, "Swedish Minerals," prepared for the Swedish Tercentenary in July, and type mineral specimens, illustrating the research work of the Department, prepared for the meetings of the Geological Society of America and the Mineralogical Society of America in December.

Palaeontology. Eight skeletons of a new type of Camptosaurid dinosaur, a free mounted skeletal cast of the marine reptile *Placodus*, a skeleton of the low-plated Nodosauroid dinosaur prepared in 1937 but not previously exhibited, and an unmounted skeleton of the great Sauropod dinosaur *Barosaurus* were prepared for exhibition in the Jurassic Hall. Labeling was revised and augmented and several new restorations were added in the collection of Pterosaurs.

Living Invertebrates. The modeling staff concentrated on the preparation for the Hall of Ocean Life of the new Pearl Divers group, the funds for which, to the total of \$12,000, were most generously given by Mrs. George B. de Long. Mrs. de Long's gift provides also for a mural by Mr. Francis L. Jaques directly above the group.

A model of a primitive protochordate for the Chordate Alcove, two models illustrating sponge structure for the Sponge Alcove, and a model of *Notholca longispina*, magnified about 500 diameters, for the Rotifer Alcove were completed for the Darwin Hall.

Entomology. Four new natural-size habitat groups of insects were opened in the Hall of Insect Life and eight renovated. The first group to be finished, of a proposed series with models large enough to show clearly the often strange structures of insects as related to the features of their environment, is a mole cricket whose front legs are highly specialized for digging.

Ichthyology. The Tropical Ocean group, made possible through the support of Mr. Michael Lerner, was nearing completion at the close of 1938.

Herpetology. Early in the year the foyer of the subway entrance was made available for a new type of museum exhibit. By means of live animals, painted backgrounds and adequate labeling, many principles of animal distribution were shown. The importance of rafting and accidental dispersal was illustrated by a collection of living stowaways, including geckos, dwarf opossum and boas, presented by Mr. Louis Brody. Methods of survival in desert reptiles were demonstrated by lizards and snakes from the American Southwest. The animal and plant association of the New Jersey Pine Barrens and the reptile and amphibian associations of Long Island utilized material from the local field. Significant life history exhibits, such as a bushmaster and its eggs, the economic importance of tropical toads, and the breeding of Cuban tree frogs, supplemented the distribution displays. W. P. A. artists and craftsmen constructed the exhibits and the Department of Experimental Biology fed and maintained the living material.

In the Hall of Reptiles skeletons of the reticulated python and gaboon viper were added and much of the osteological material rearranged. The exhibit of living reptiles was continued, and living specimens illustrated the burrowing adaptations of snakes and the extraordinary variation in the Pacific king snake.

Experimental Biology. In the Hall of Animal Behavior the exhibits completed this year included: a measure of animal intelligence, the world as seen by the fly, color vision of the bull and the dog, the visual field of fish, maze learning in the rat, visual discrimination of the rat, social reactions of fish, and the gull's recognition of its eggs. The largest exhibit attempted will show the mechanics of learning in the dog; others partly completed illustrate intelligence tests of chimpanzees, the mechanisms of prey-capture and swallowing in snakes.

Work in the Hall of Animal Behavior was carried on largely through W. P. A. assistance.

Ornithology. Eight groups of Pacific Island birds in the Whitney Memorial Hall are completed or under construction: Ship Followers, Tuamotu Islands, Samoa, Peruvian Guano Islands, Hawaii, Galapagos Islands, Marquesas, and Laysan. The painting of the dome is

finished and awaits only the placing of the mounted birds. The painting of the murals at the north and south entrances to the hall is nearly complete.

President Davison has fully described in his section of this report the other new exhibits arranged and projected in the Whitney Wing.

Mammalogy. The Okapi group and the Black Rhinoceros group, both donated by Mr. William D. Campbell, were installed in the Akeley African Hall, and a magnificent pair of African elephant tusks obtained by Mr. Campbell was mounted at the west entrance of the hall. Mr. Campbell pledged the Chimpanzee and Mandrill groups for this hall; Mr. Philip M. Plant, the Vulture group, the Leopard and Red River Hog group and the Colobus Monkey group.

The following new groups were promised in 1938 for the North American Mammal Hall, upon which construction is actively progressing: the Grizzly Bear by Mr. Beverley R. Robinson, the Jaguar by Mr. C. V. Whitney, the Musk Ox by Mr. H. S. Mudd, the White Sheep by Mr. Richard K. Mellon, and the Alaska Brown Bear by the Boone and Crockett Club.

The Walrus group, donated by Mrs. Andrew Carnegie, with specimens given by Mr. and Mrs. Charles H. Stoll, and the rebuilding of the Fur Seal group were completed in the Hall of Ocean Life; the Elkhorn Ranch group, in the Roosevelt Memorial.

Comparative Anatomy. "Meshie," Mr. Raven's domesticated and diverting chimpanzee, died in 1937. The Zoological Park of Chicago returned her body to Mr. Raven, and the mounted skeleton now forms part of the exhibit on the upright posture of man in the Hall of the Natural History of Man.

A new unit containing casts and models of the skulls and jaws of the fossil South African man-apes, in part secured by Dr. Gregory and Dr. Hellman and in part presented by Dr. Raymond A. Dart and Dr. Robert Broom, was added to the Age of Man exhibit in the Quaternary Hall.

Anthropology. Three miniature groups, the Seminole Indians, Iroquois False Face Carving, and a Pueblo Indian village, were completed.

Progress was made with the exhibit of a Japanese magic mirror and a wall chart showing the distribution of man over the earth. Revisions of existing exhibits were made in the Chinese section,

the Central American Hall, the Southwest Hall and in the Iroquois section of the Woodland Indians Hall.

Two Tibetan costumed figures, the gift of Mr. and Mrs. C. Suydam Cutting, exhibited in the foyer, will eventually be placed in the Asiatic Hall.

RESEARCH AND PUBLICATION

Astronomy and the Hayden Planetarium. Publications of the members of this Department appear chiefly in the monthly issues of *The Sky*. Dr. Fisher published a Guide Leaflet, "Earth and Neighbor Worlds."

Geology and Mineralogy. The Curator contributed two articles to *Natural History*, and several short book reviews were written by Dr. Pough. The Curator also wrote on the progress in mineralogy in 1937 for the *New International Year Book* for 1937, issued in June, 1938.

Palaeontology. One *Bulletin* article and three *Novitates* by Dr. Simpson, and one *Bulletin* article by Dr. Colbert were published. Dr. Vokes wrote two *Novitates* and one *Novitates* each was issued by Dr. Granger and Dr. H. E. Wood, II.

A large part of the researches of the staff are either uncompleted or have been finished and submitted but not yet published.

Living Invertebrates. Curator Miner published one article in *The National Geographic Magazine* and one in *Natural History*.

Dr. Van Name has ready for early publication a supplement to his work on American land and fresh-water isopods. Four *Novitates* by Dr. Libbie H. Hyman, one by Mr. Donald B. Davison and one by Mr. Frank J. Myers were issued. Dr. Aaron L. Treadwell continued his work on annulates and submitted one paper to the editor for printing. Dr. Melbourne Ward of Australia is studying the Brachyuran collections from Dr. Van Name's Philippine expedition, and also completed a manuscript, now ready for the printer. Dr. Horace W. Stunkard, on sabbatical leave, is pursuing in European universities his studies on parasitic worms. Dr. William J. Clench of the Museum of Comparative Zoölogy is working on the land mollusks, Professor H. A. Pilsbry on the marine collections, of the Whitney Expeditions.

Entomology. Owing to the large number of new species of insects in our growing collection, their diversity, and the scattered

localities whence they come, many of our publications are short reports on small groups. It is, however, also important that some of our work be monographic in character. A notable example is the series of studies on stingless bees of the tropics of both Hemispheres to which Mr. Herbert F. Schwarz has been devoting a great deal of his time. Another is an extensive paper, now in press, by Dr. W. J. Gertsch dealing with a section of the American representatives of the crab spiders. It is a pleasure to note the publication by one of our trustees, Dr. William Procter, of the results of his long continued, detailed study of the insect fauna of Mt. Desert Island, Maine. This survey not only lists the 5,465 species he and his cooperators found there but gives data concerning their biology, especially their habits and dates of appearance.

Ichthyology. Publication of the Department may be summarized thus:

Dr. William K. Gregory and Mr. G. Miles Conrad: an extensive paper on the classification and phylogeny of the Characin fishes, in *Zoologica*.

Mr. John T. Nichols: a classification of the carp-like fishes, also in *Zoologica*; two *Novitates* (one as No. 16 in the Michael Lerner Ichthyological Expeditions series, one on the Morden *Caranx* Fund) on Carangin fishes as partial result of research upon new material from various sources.

Mr. Nichols and Miss Francesca LaMonte: publication of "The Field Book of Fresh-water Fishes," revised, edited and completed from the manuscript of the late Raymond Schrenkeisen; a *Novitates* on two new species of African fishes.

Dr. E. W. Gudger: an illustrated paper on the attacks of swordfish and spearfish on vessels. Dr. Gudger is at work with Dr. B. G. Smith on Article 7 of the Dean Memorial Volume on the development of the frilled shark.

One *Novitates* each was contributed by Mr. G. Miles Conrad, Mr. Sidney Shapiro and Dr. Ross Nigrelli of the New York Aquarium to the Michael Lerner Ichthyological Expeditions series.

Dr. Louis Hussakof is identifying, and preparing to publish results on, fossil fish.

Studies on the swordfish and marlin are being continued; research on the new large Mead-Johnson collection of Scombroid fishes was begun.

Herpetology. A report on the snakes secured by the Vernay-Angola Expeditions, supplemented by an account of the snakes secured by several other African expeditions of the Museum in recent years, was completed by Mr. C. M. Bogert.

The extensive collections of South American reptiles and amphibians accumulated recently are being studied by several workers. Mr. Francis Trembly nearly completed his report on the lizards. Dr. Harvey Bassler continued work on his monograph of the snakes. Dr. Noble published a description of a new species of *Telmatobius*.

Experimental Biology. Research work in this Department deals primarily with the social behavior of vertebrates, and is supported by the Josiah Macy, Jr. Foundation and by the National Research Council, Committee for the Study of Problems of Sex. Dr. Noble published papers in the *Auk* (with Wurm and Schmidt), *Endocrinology* (with Kumpf and Billings), the *Journal of Comparative Psychology* (with Breslau); an abstract of some of his work (with Wurm) appeared in the *Anatomical Record*, and an abstract of an address given before the American Society of Ecologists was published in their *Bulletin*. He participated in two symposia, one at the annual meeting of the American Ornithologists' Union and the other at the annual meeting of the American Society of Naturalists.

Dr. Beach continued his studies on instinctive behavior in mammals, published two papers in the *Journal of Comparative Psychology*, two in the *Journal of Genetic Psychology* and one in *Science*.

Dr. William Etkin is studying with Dr. R. W. Root the respiration of fishes. With L. Rosenberg, Dr. Etkin published a paper in the *Proceedings of the Society of Experimental Biology and Medicine*, and another in the *Journal of Experimental Zoology*.

Dr. Libbie Hyman, in addition to the taxonomic studies published in cooperation with the Department of Living Invertebrates mentioned above, continued her experimental work on invertebrates, publishing during the year four papers and an annotated bibliographic study (with C. D. Van Cleave) in various journals.

Generous assistance was given to many phases of the research work by the W. P. A.

Ornithology. Dr. Frank M. Chapman carried on certain studies of high mountain birds collected by the Phelps Venezuelan Expedition with revisionary work on several species. His account, "Life in an Air Castle," of further studies of tropical wild life

on Barro Colorado Island, Canal Zone, was published in September.

Mr. John T. Zimmer continued his studies of South American birds with particular reference to Peru, publishing one *Novitates* in the "Studies of Peruvian Birds" series and other papers and reviews in various periodicals. The "Pocket Guide to the Exhibits," initiated by Dr. Chapman, was compiled by Mr. Zimmer, published and reprinted once during the year.

Dr. R. C. Murphy continued his revisionary studies of the petrels and albatrosses, published one *Novitates* on Pan-Antarctic terns (financed by Dr. Leonard C. Sanford), and several articles and reviews on geographical, ornithological and general conservation subjects in different journals.

Dr. James P. Chapin spent some months at the Tervueren museum, Belgium, studying Congo birds. The second volume of his "Birds of the Belgian Congo," financed by Mr. Charles W. Boise of London, England, is in press. Acknowledgment is made to the W. P. A. for valuable assistance in bibliographic and indexing work for this publication.

Dr. Ernst Mayr continued research on the Whitney-Rothschild collections of South Sea Island birds, completed a first draft of a check-list of New Guinea birds, and commenced the study, in collaboration with the Academy of Natural Sciences of Philadelphia, of a collection of New Guinea birds in that institution. He published three papers in *Novitates* and various other studies in outside periodicals.

Mrs. E. M. B. Naumburg continued her study of east Brazilian birds in the Kaempfer collection, secured under her auspices.

Mr. Thomas Gilliard assisted Mr. William Phelps in the identification of birds obtained by the Phelps Venezuelan Expedition.

Mammalogy. A *Novitates* in the "Results of the Archbold Expeditions" series was published by Mr. Richard Archbold and Dr. G. H. H. Tate. Dr. Tate also contributed a paper to the Tring Museum *Novitates Zoologicae*, one to the *Geographical Review* and a popular article to *Natural History*, and has two other manuscripts ready for publication. He nearly finished a report on the mammals collected by the Phelps Venezuelan Expedition, the publication of which Mr. William H. Phelps has generously undertaken to finance.

A *Novitates* on new Costa Rican mammals and a popular article in *Natural History* by Mr. G. G. Goodwin, and a paper in the

Journal of Mammalogy by Dr. J. E. Hill were also published. Dr. Hill spent six weeks in London completing studies of African mammals; the manuscript of his report on the mammals of Angola is finished.

Comparative Anatomy. An illustrated report on the dentition and jaws of the fossil South African man-apes by Dr. W. K. Gregory and Dr. Milo Hellman was completed and sent to the Transvaal Museum, Pretoria, South Africa, for publication. Brief articles on the relationships of these man-apes were published in *Nature*, *Science* and the *Journal of the American Dental Association*.

The first section of the series of researches on the evolution of the skull and dentition in the aeluroid Carnivora by Drs. Gregory and Hellman was ready for the department editor.

Special dissections of the gorilla body, with anatomical drawings beautifully executed by Miss Betsy Garrett, for the illustrated monograph on the anatomy of the gorilla were made by Mr. Henry C. Raven.

Dr. George Pinkley, in addition to his studies on the evolution of the brain in fossil and recent vertebrates, issued, with Dr. Gregory, a complete revision of the Guide Leaflet to the Hall of the Age of Man.

The Departments of Comparative Anatomy, Ichthyology and Palaeontology, and the Department of Zoology at Columbia University continued active cooperation in research. Mr. Percy M. Butler, a graduate student of Cambridge University and Columbia University, completed an important survey of the dentition of fossil and recent mammals. A study of the morphology and evolution of the atlas-axis complex by Mr. Gaynor Evans won an A. Cressy Morrison \$200 prize awarded by the New York Academy of Sciences, the third successive year one of the graduate students has won this prize. Rockwell, Evans and Pheasant published a valuable review of the functional evolution of the spinal column of vertebrates in the *Journal of Morphology*, and Dr. Gregory, Miss Rockwell and Mr. Evans published a paper on the structure of the vertebral column in the crossopterygian ancestors of the land-living vertebrates in the *Journal of Palaeontology*.

Anthropology. In outline, the main research projects of this Department are:

Dr. Clark Wissler began a synthetic study of technological processes, a phase of primitive culture.

Mr. N. C. Nelson studied critically the archaeological collections in the Museum from the Great Plains area in the United States.

Dr. G. C. Vaillant is investigating the chronology of the Valley of Mexico as shown in the collections made by him. He published a preliminary report on his findings. On a grant from the Rockefeller Foundation Dr. Vaillant is continuing the direction of the photographic record of the Indian arts of North America, eventually to be published as an illustrated monograph.

Dr. H. L. Shapiro, in cooperation with the Neurological Institute, has investigated the effects of endocrine functions on the growth of the human body. He completed a study of anthropometric data upon the Japanese population of the Hawaiian Islands.

Dr. W. C. Bennett, before leaving for his new post at the University of Wisconsin, completed a study of the material collected during his expeditions to Peru.

Mr. Junius Bird published a preliminary report on his explorations in southern Chile and completed a manuscript covering the entire collection.

Mr. Froelich Rainey, Fairbanks, Alaska, defined a new early Eskimo horizon and completed a paper reviewing the archaeology of the region surrounding Fairbanks.

Dr. W. W. Howells completed a study of neolithic skulls collected in Ireland and published an account of certain skulls found in Wyoming.

Dr. Robert Heine began a comparative study of Polynesian and North American art.

A certain amount of scientific and popular publication in anthropological journals was issued concurrently with these researches by staff members. Funds permitted the publication of only one *Anthropological Paper*, by Dr. Margaret Mead, in 1938.

Asiatic Exploration and Research. "The Mammals of China and Mongolia" by Dr. Glover M. Allen of the Museum of Comparative Zoölogy, Part 1 of Volume XI of the series on the Natural History of Central Asia under the editorship of Dr. Walter Granger, was published September 2. Dr. Allen's work is described as "a comprehensive account of the five hundred or more forms of mammals known or presumed to occur in Mongolia, China and the adjacent sea." Part 2 is completely ready, needs only funds for publication.

Volume IX in this same series, "The Fresh-water Fishes of China," by Mr. John T. Nichols, also awaiting publication for several years, was revised to include another year's literature, the bibliography closed and the entire manuscript submitted to the editor.

GENERAL DEPARTMENTAL ACTIVITIES

Astronomy and the Hayden Planetarium. The attendance at the Planetarium was:

Paid	433,612
Classes free	88,330
Total	521,942

Lecture subjects, as heretofore, are changed monthly, and many performances were given for special groups.

Sixteen W. P. A. workers were of valuable assistance in carrying out the work of the Department of Astronomy. W. P. A. teachers organized school astronomical clubs which attended special lectures at the Planetarium.

The Weems System of Navigation held a series of lectures over a period of twenty-five weeks on Dead Reckoning and Celestial Navigation.

In its third year, the Book Corner has developed from little more than a souvenir stand to a comprehensive bookshop supplying not only beginners in the study of astronomy but students and professionals.

The biweekly meetings of the Junior Astronomy Club were attended by 1,149 persons. Members of the Club (181 on January 20, 1939) edit and publish annually six issues of a monthly magazine, the *Junior Astronomy News*. They conducted expeditions for the study of several recent astronomical phenomena.

The Amateur Astronomers Association meets monthly, instead of fortnightly as in the past. The nine classes in the fall schedule covering the subjects of elementary, intermediate and advanced astronomy, constellation study, practical astronomy and practical optics, elementary, intermediate and advanced mathematics totaled 110 registrations. Members of the Association participated in many field expeditions for practical astronomical observations, notably a three-day trip for constellation, meteor and sun spot study.

Staff members lectured on the Planetarium or on astronomical subjects in general to schools, colleges, women's clubs, churches and astronomical clubs.

Research Associate Pough gave valuable advice in examining specimens sent to the Planetarium as meteorites.

Geology and Mineralogy. The Department of Geology was merged with Mineralogy March 17, 1938.

The informal talks on gems given by the Curator Saturday afternoons in the spring and fall were well attended, particularly those in October and November on "Jade" which drew an average audience of eighty. Mr. Whitlock also addressed a group of Hunter College students.

Dr. Pough lectured twice at the Staten Island Museum, twice in the series of American Museum Members' lectures, twice before the New York Mineralogical Club.

Storage drawers containing excess geological specimens were thoroughly overhauled and useless material discarded.

A valuable W. P. A. worker aided the Department in translating inscriptions in Arabic engraved on Persian chalcedony seals and turquoise tablet in the Morgan Gem Collection.

Palaeontology. The division of Invertebrate Palaeontology of the old Department of Geology and Invertebrate Palaeontology was incorporated on March 17, 1938, with Vertebrate Palaeontology as the Department of Palaeontology.

The invertebrate division personnel spent most of the year reconditioning the Hall of Invertebrates. Central cases were removed and the hall reopened with temporary exhibits fittingly placed and the collection displayed to better advantage.

Most of the vertebrate division personnel were engaged in the installation of exhibits in the new Jurassic Hall and Roosevelt ambulatory and in the rearrangement of the Cretaceous Hall.

In the fossil reptile collection zoological grouping has been maintained with the smaller forms; with the dinosaurs, stratigraphic sequence.

In the Cretaceous Hall are displayed all the Cretaceous dinosaurs, exclusive of the Mongolian collection, including all the Pterosauria (flying reptiles), Rhynchocephalia and other small aquatic reptiles, Chelonia, Crocodilia, Phytosauria and fossil birds.

In the Roosevelt ambulatory will be the finest examples of fossil tracks; those already installed are a trail of a Triassic carnivorous dinosaur from the Connecticut valley and one of a giant Cretaceous Iguanodont dinosaur from a coal mine in western Colorado. Large marine reptiles are to be mounted on the walls; some of the Mosasaurs, Plesiosaurs and Ichthyosaurs are already placed.

The Lower Cretaceous, Jurassic, Triassic and Permian exhibits in the Jurassic Hall (to be opened April, 1939) are about four-fifths completed.

A remarkable feat was accomplished by three Palaeontology laboratory technicians in the moving from the Cretaceous Hall, cleaning and remounting in the Jurassic Hall of the huge sixty-foot skeleton of *Brontosaurus* in only twenty-four days. In addition to moving skeletons already mounted, many of the incomplete skeletons were restored.

Valuable assistance was rendered to the Department by several W. P. A. workers in translation, sculpture, art and office work.

Living Invertebrates. Curator Miner delivered a course of eight lectures for Members in connection with the Department of Education. He also lectured for the Cranbrook Museum of Science, Bloomfield Hills, Michigan; Biological Department of the State Teachers' College, Boston; Carnegie Museum, Pittsburgh; Horace Mann School for Girls, Brooklyn College, and the New York Academy of Sciences, New York.

During the past year the coral collections were installed as far as the present supply of fireproof cases permits. Four thousand six hundred invertebrate specimens were catalogued, including 600 species, 400 new to the collections. The general invertebrate collection now contains a total of about 64,000 specimens comprising more than 7,000 species, 967 types. The mollusk collection comprises about 72,000 catalogued lots and about 716,640 specimens.

An extensive series of illustrated and indexed labels painted in water color were constructed by our invaluable W. P. A. artist.

Entomology. Owing to the retirement of Mr. A. J. Mutchler and the Museum policy not to fill vacancies until financial conditions improve, we were left with no curator for one of the most important orders of insects, the beetles. Thanks to the generosity of Mr. David Rockefeller, we have, however, been able to appoint Dr. R. E. Blackwelder for 1939. As part of the benefits derived

from a special fund contributed by Dr. William Procter, we temporarily secured the services of Mrs. Elsie Klots to help us with our dragonflies.

Contributions from Mr. Cyril F. dos Passos to our Lepidoptera Fund have, among other things, financed his extensive project for securing photographs of, and data concerning, the type specimens of Lepidoptera.

Mr. L. James Sanford continued his valuable full-time volunteer assistance in Lepidoptera. Mr. John C. Pallister kindly spent much time arranging the beetles of the Bassler South American collection and Mr. David M. Bigelow helped with our collections of butterflies and moths.

We furnished facilities for the following specialists who worked on our collections more or less regularly throughout the year: Dr. William S. Creighton on ants, Dr. A. B. Klots on Microlepidoptera, Mrs. Elsie Klots on dragonflies, and Dr. Herman T. Spieth on mayflies.

Ichthyology. Work on the Bibliography of Fishes, in continuation of the earlier volumes by Bashford Dean, was carried forward by Mr. Conrad and the department secretary, recently with the assistance of a W. P. A. worker. Work on South American, African and local collections has gone forward as usual under Mr. Nichols and Miss LaMonte.

The World Record Rod and Reel Gamefish chart was published in the *World Almanac*.

Herpetology. Although the greater number of the 2,106 reptiles and amphibians added to the collection during the year were secured by expeditions, 105 snakes, 92 lizards, 12 turtles, 36 frogs and one crocodile were received as gifts. Loans were made to many scientific institutions.

The osteological collections were greatly improved by the addition of a large number of specimens, especially vipers, boas and colubrids. Volunteers were of the greatest assistance in the preparation of cleared whole mounts. The entire amphibian collection was rearranged and relabeled. The W. P. A. extended considerable clerical assistance.

Experimental Biology. With W. P. A. assistance it has been possible to develop an extensive bibliography of experimental biology,

consulted this year by numerous local students and visiting biologists from other institutions.

Experimental cages, equipment and testing apparatus were also built by the W. P. A. Since much of this construction required special wiring, two electricians assigned by the W. P. A. were of the greatest help.

The Hall of Animal Behavior, not yet open to the public, was available to special groups of visitors. Living specimens were brought from the laboratories to supplement the exhibits.

Ornithology. The long task of cataloguing the Rothschild Collection, with the preparation of an index to families and genera, was finished September 30. Seven thousand additional skins, 650 skeletons, 4,800 sets of eggs were also catalogued. We consolidated the skin collections of sea, water and shore birds and various families of New World and Old World land birds. In this work acknowledgment is made of W. P. A. assistance and the generous and valuable services of several volunteers. Progress was made in the arrangement of bird skeletons and rearrangement of the collection of nests and eggs, including the new Philipp Collection. The exhibition of local birds was improved by rearrangement and addition of fresh material.

Drs. Chapin and Mayr presented papers at the Ninth International Ornithological Congress at Rouen, France. Mr. Zimmer, Drs. Murphy, Chapin, Mayr, Messrs. Gilliard, Birckhead and Amadon attended the American Ornithologists' Union meeting in October. Mr. Zimmer and Mr. Gilliard presented papers. Dr. Chapin was reelected First Vice-President; Mr. Zimmer was elected to the Council and Dr. Rand to membership. Members of the Department gave other papers or addresses to various groups. In April Dr. Murphy received the John Burroughs Medal for his "Oceanic Birds of South America," published in 1936.

The Department lent 2,700 specimens for study, an increase of nearly one hundred per cent over 1937. Visiting scientists from various parts of the world were given study facilities, and many artists, sculptors, photographers and technicians received attention. We appreciate the help of the W. P. A. in card indexing and the preparation of important records.

Accessions: 3,660 specimens by gift, 3,396 by expeditions, 215 by exchange, 104 by purchase.

Mammalogy. Increased field activity resulted in a constant influx of new material; approximately 4,000 specimens were catalogued.

During the last third of the year the Curator's time was fully occupied with preparations for the Vernay-Cutting Expedition to Burma.

Mounting and labeling a valuable collection of photographs of the skulls of type specimens of Indo-Australian Muridae, marsupials and bats, obtained in Europe in 1937 by Assistant Curator Tate, were completed by W. P. A. helpers under Dr. Tate's supervision.

Dr. J. E. Hill printed 500 photographs of type skulls of African mammals in his own time.

W. P. A. workers catalogued and labeled a large number of specimens, completed a limited amount of translation from the Russian and prepared for departmental use an alphabetical catalogue of the mammals on exhibition.

Comparative Anatomy. Dr. Gregory delivered sixty lectures in the Columbia University graduate courses in vertebrate palaeontology, eight in the "Know Your Museum" series for Members during the 1937-38 season, several dealing with phases of evolution in the vertebrates before various scientific organizations, six to universities and scientific societies in South Africa, and three on the South African man-apes before societies at Yale and Columbia Universities and Hunter College.

Drs. Gregory and Hellman received honorary degrees of Doctor of Science from the University of the Witwatersrand, Johannesburg, South Africa, and Honorary Fellowships in the Odontological Society of the Union of South Africa.

Models of skulls and skeletons illustrating various stages in evolution from fish to man continue to be purchased by universities, schools and museums.

Mr. Conrad largely rearranged and reinstalled the study collections of fossil and recent skeletons, and Mr. Chubb began the mounting of the skeleton of the Przewalsky horse.

Anthropology. Five members of the Department are giving regular academic teaching courses: Dr. Wissler at Yale, Dr. Vaillant at Yale (in spring term, 1938) and New York University, Dr. Shapiro at Columbia, Dr. Howells at Hunter, and Dr. Heine at New York University.

Under the direction of the Department of Anthropology at Columbia University, several Columbia students carried on investigations using our collections. A few volunteer students from the same institution desirous of acquiring museum experience are rechecking the storage collections. Our archaeological collections contain great quantities of broken pottery which must be repaired and stored before it can be systematically studied. Our technicians and two student volunteers made progress with this material. The demand for loans to schools and libraries increases and a number of loans were made to institutions outside the metropolitan district.

We are indebted to the W. P. A. workers assigned to us for mounting and indexing about 1,000 photographs, copying and filing 3,000 pages of notes, field catalogues and manuscripts, the painting of a large pictorial map of the world representing the spread of the primary races of man over the earth, and clerical assistance in the project for the study of anthropometric data on the mixture of races. Measurements of Japanese in the Hawaiian Islands were tabulated and prepared for publication.

EXPEDITIONS

NORTH AMERICA

Palaeontology. An expedition by Mr. Albert Thomson and Dr. Walter Granger to the White River beds of South Dakota secured a small but important collection of fossils from the Oredon beds, and additional Cretaceous mammal specimens from a new Montana locality.

Mr. R. T. Bird collected two Cretaceous Camptosaurid dinosaur skeletons, on an expedition to Wyoming and Montana, and in Arizona, Triassic fossil plants and a Phytosaur skull; in Texas he discovered the first known Sauropod tracks, obtaining casts of fore and hind footprints.

Dr. Harold E. Vokes, sponsored and accompanied by Mr. W. O. Sweet, visited twelve states and collected 150,000 invertebrate specimens from the Palaeozoic, Mesozoic and Tertiary strata.

Dr. Erich M. Schlaikjer of Brooklyn College made a reconnaissance of Jurassic localities in northeastern Wyoming and located an extensive deposit of dinosaur remains in the vicinity of Sundance.

Entomology. The trips by Drs. F. E. Lutz and W. J. Gertsch to Florida particularly for spiders, by Dr. C. H. Curran to Canada

particularly for flies, and by Messrs. Frank E. Watson and L. J. Sanford to Florida particularly for butterflies were financed by Dr. William Procter, Dr. L. C. Sanford, and the Entomological Fund.

Ichthyology. The Second Lerner Cape Breton Expedition to the swordfishing grounds off Louisburg yielded much valuable additional data on the biology of swordfish. The members of the expedition were Mr. Michael Lerner, Miss Francesca LaMonte and Mr. G. Miles Conrad.

Herpetology. During nearly two months in the Southwest Mr. C. M. Bogert collected living snakes and lizards for the foyer exhibits, and in addition brought back sixty-six preserved lizards and the same number of snakes.

Experimental Biology. Much of the material utilized in the research work of this Department is secured in the local field, necessitating numerous trips to Long Island and New Jersey for fish, frogs, turtles and birds. Through the cooperation of Mr. D. S. Lehrman, a volunteer worker, a most extensive field study was made of the factors regulating the social behavior of laughing gulls in a colony at Stone Harbor, New Jersey.

Ornithology. The Rockefeller Hudson Bay Expedition to Fort Churchill, Manitoba, sponsored and led by Mr. William A. Rockefeller, secured specimens and accessories for the Arctic tundra bird group. Two members of the Department of Preparation accompanied the expedition, and Mr. Frank A. Farley of Camrose, Alberta, joined it at Fort Churchill. Work on construction of the group, funds for which have also been given by Mr. Rockefeller, is already under way. Acknowledgments are made to various government officials of Ontario and Manitoba, of the Hudson Bay Company and of the Canadian Pacific Railway who contributed to the great success of the expedition.

Mr. Amadon spent several weeks in Arizona during the summer and brought back birds' skins, nests and eggs, including one or two of forms new to the collection.

Mammalogy. Carrying out plans projected for the North American Mammal Hall as described in the Annual Report for 1937, the W. L. Honnold Colorado Expedition obtained accessories and background for the Elk group, the specimens having been collected earlier. Through the courtesy and cooperation of the National Park

Service, the entire Grizzly Bear group was collected by the Expedition to the Yellowstone sponsored by Mr. Beverley R. Robinson. The White Sheep group was collected by the Richard K. Mellon Yukon Expedition. The Wilton Lloyd-Smith Alaska Expedition secured the complete Alaska Moose group together with a record head and antlers which will be used in the composition; they also obtained the specimens, accessories and background for the Grant Caribou group and the accessories and sketches for the Osborn Caribou group. The H. P. Davison Big Horn Expedition procured accessories and background for the Big Horn group, but finding the sheep in poor condition concluded to collect them at a later date. Six specimens for the White-tailed Deer group were collected by Mr. E. Roland Harriman.

We continue our efforts to build up the study collections of native mammals. The trailer, after a short trial trip to Bear Mountain, was sent to Florida for its maiden collecting trip, financed by Mr. Childs Frick, and obtained 504 mammals. Later, in charge of Dr. J. E. Hill, it was dispatched on a more extensive collecting trip to New Mexico, where Mr. Robert E. McConnell, who with Mr. Harold B. Clark financed the trip, joined the expedition. Further facilities were generously provided by Mr. Waite Phillips. On the New Mexico trip were secured about 758 mammals, and an interesting collection of pale lizards from the White Sands National Monument for the Department of Herpetology.

Anthropology. A search for traces of early American inhabitants was made by Mr. Junius Bird, supported by the Western Canada Archaeological Fund, in the marginal prairie country east of the Rocky Mountains from the Peace River district in Alberta south into Montana. The only significant find was the discovery, in the old river terraces at Edmonton and the town of Peace River, of stones of considerable age showing human workmanship.

CENTRAL AMERICA

Anthropology. Mr. Gordon Ekholm, supported by funds contributed by Mr. Edward S. Harkness, completed a reconnaissance of northwestern Mexico. Preliminary excavations in six strategic sites of the 125 he located revealed the existence of at least one culture that shows definite connections with the Southwestern area. Traces of two other cultures were found, the affiliations of which are as yet uncertain.

SOUTH AMERICA

Palaeontology. Dr. G. G. Simpson left in September for an expedition to Venezuela sponsored by the Venezuelan Government and Mr. Horace S. Scarritt. Important Pleistocene fossils have already been secured.

Herpetology. The Terry-Holden Expedition to British Guiana and Brazil, financed by Mrs. Franklin S. Terry, secured more than 1,600 reptiles and amphibians, including a series of rare turtles and various rare aquatic frogs.

Ornithology. The Phelps Venezuelan Expedition, sponsored and led by Mr. William H. Phelps of Caracas, Venezuela, with Dr. G. H. H. Tate of the Department of Mammalogy in charge, reached southern Venezuela late in 1937, worked the summit and slopes of Mt. Auyan-tepui, a zoologically unknown mountain, and returned in the spring of 1938. Messrs. Thomas Gilliard and William Coultas represented the Department of Ornithology. Mr. Phelps, also a keen ornithologist, took an active part in the work of the party. Over 2,300 birds, about 500 mammals, and 33 frogs, 18 lizards and 21 snakes for the Department of Herpetology were obtained.

Through the further kindness of Mr. Phelps, who defrayed all expenses, a subsidiary collecting trip to the Tucuayo basin between Caracas and Mérida secured 225 mammals.

Anthropology. Dr. Wendell C. Bennett, supported by the Voss Fund, spent six months working at a site near Huaraz in the upper part of the Santa River valley between the White and Black Cordilleras in Peru. He located villages with subterranean structures, some extending two stories below the surface, and two temples, of three stories, standing about thirty feet above the ground.

ASIA

Mammalogy. On October 16, Dr. H. E. Anthony left New York to accompany the A. S. Vernay-Suydam Cutting Burma Expedition to the mountains adjoining the upper Irawadi River, a region important from the viewpoint of animal distribution and geographical relationships. The expedition hopes to secure specimens of the rare black barking deer and the somewhat commoner takin. The Vernay-Cutting Expedition ornithologist is Capt. J. K.

Stanford, and important collections of birds are expected. Mr. Vernay has kindly consented to collect insects and spiders for the Department of Entomology.

The Sidney Legendre Iran Expedition, accompanied by Mr. G. G. Goodwin, reported great success in collecting large and small mammals.

AFRICA

Mammalogy. The Vernay-Kaffrarian Museum Expedition to the upper Zambesi, under the joint auspices of the American Museum and the Kaffrarian Museum, spent the entire year in the field. Mr. T. Donald Carter reports exceptionally large and valuable collections. The share of mammals for this Museum will probably reach several thousand specimens.

The Harry Snyder East African Expedition, though it traveled rather too rapidly to permit comprehensive work in given localities, procured a valuable series of mammals, including, as reported by Mr. G. G. Goodwin, an albinistic giraffe.

The W. D. Campbell Expedition early in the year secured all materials for the Libyan Desert group, took the field again in the fall for material for the Chimpanzee and Mandrill groups.

Comparative Anatomy. A three months' journey to South Africa was made by Dr. Gregory and Dr. Hellman in response to invitations received from Dr. Robert Broom of the Pretoria Museum and Dr. Raymond Dart of the Medical School of the University of the Witwatersrand who placed at the disposal of the Museum representatives all their original material of the South African fossil man-apes from which casts, photographs and measurements were made.

SOUTH SEAS AND PACIFIC ISLANDS

Living Invertebrates. In March Dr. Van Name returned from the extended expedition to the Philippines, chiefly the Island of Davao, and Java, which resulted in important observations on the biological and zoological possibilities of these regions and in a collection of marine invertebrates. The majority of the 554 lots (a total of 1,181 specimens) are new to our collections.

Ichthyology. At the end of December Dr. Gregory, Mr. Lerner, Mr. Raven and Mr. Conrad left New York on the Michael Lerner New Zealand-Australia Expedition to secure big game fishes and

full photographic records for study and exhibition and to secure exhibition and illustrative material relating to various branches of the natural history of New Zealand and Australia for a future synoptic exhibit.

Ornithology. The Whitney South-Sea Expeditions maintained Mr. L. Macmillan in the field in southern Melanesia where he completed the survey of Maré, Uvea, and Lifu, Loyalty Islands, and began work on New Caledonia. In addition to large collections of birds, the expedition secured thirty-seven lizards from the Loyalty Islands for the Department of Herpetology and thirty mammals for the Department of Mammalogy.

Mammalogy. Mr. Richard Archbold, leader of the present expedition to Dutch New Guinea under the direction of the incorporated Biological Explorations, crossed the Pacific in the expedition airplane in the spring. He conveyed the large party of scientists, their Dutch escort and many native helpers from their base at Hollandia on the north coast of Dutch New Guinea to Lake Habbema in the mountains about 10,000 feet above sea level. Dr. A. L. Rand, assistant leader and ornithologist, reports the work about Lake Habbema as virtually completed, and that plans for working in the Idenburg region are projected.

The expedition obtained thousands of birds and plants and hundreds of mammals, and discovered, incidentally, mountain tribes which have reached a rather high level of agricultural technique.

Anthropology. Supported by the South Pacific Exploration Fund, Dr. Margaret Mead spent the season at Tambunum, Sepik River, New Guinea, to continue the investigations of former years. She was in Bali in the first months of 1938 studying the development and culture conditioning of young children — probably the most exhaustive study so far made of children of non-European culture.

IV. MUSEUM SERVICES

EDUCATION

Dr. Charles Russell, appointed January 10, assumed his duties as Curator of the Department of Education February 1.

During the year the Department was studied and reorganized to meet the following purposes:

1. To clarify the types and extent of the service divisions which are: manufacturing, slides and slide service, motion pictures, cuts, photography, library, and projection and delivery. The significant changes were the coordination of W. P. A. workers with the Museum employees to develop production otherwise impossible, establishment in each division of a responsible chief, and concentration on the development of materials relating only to the Museum area of exhibition and science.

2. To abandon services unrelated to Museum content. All slides, picture collections and motion pictures were carefully graded and the distribution of 30,000 slides, 700 reels of motion pictures and 350 collections of pictures unrelated to Museum areas was discontinued June 1. This resulted in a sharp drop in the totals of distribution, but accounts for increases in the distribution possibilities of related materials, still only at a rate of fifty per cent of the demand.

3. To locate and extend types of services inadequately met. The coordination of the W. P. A. and Planetarium teaching services of the Field Activities Project with those of the Department of Education brought about greatly increased service to the schools and permitted the preparation of pupils for more effective guidance in both the Museum and the Planetarium. Closer cooperation in scheduling resulted in smoother relations and less duplication of effort. The release of energy and possible delivery space increased greatly the distribution of circulating collections, dioramas, other materials properly within the area of departmental services. A study was made of private school curricula with a view to extending and improving the services to these progressive schools. Courses, lectures and other services were developed for increasing the effectiveness of the Department service to adults.

4. To modify certain services as formerly rendered. The content of courses for students and teachers was carefully adjusted so as

not to parallel or duplicate content offered by colleges to their own students. Courses now given in the Museum are confined to materials not as easily developed elsewhere. A service charge for the use of motion pictures by organizations other than the New York City public schools was established in order partially to indemnify the Museum for costs. Additions were made to the motion picture collection to increase its effectiveness.

5. To increase the ability of the Department to cooperate with other Museum departments. The services of the Department to Members were studied and a new series of discussion forums developed to relate the areas of the Museum to modern living. The division of temporary exhibits was incorporated in the Department and the exhibits were coordinated with the receipt of new accessions and with the needs of the Planetarium, *Natural History*, Membership and Publicity Departments.

6. The significant statistics of departmental service follow:

I. Reached by staff by direct contact

1. Attendance, lectures and instruction in Museum..	304,730
2. Attendance, lectures and instruction outside Museum	211,906
3. Attendance and instruction (pupils), Planetarium	173,213
4. Attendance and instruction, Bear Mountain Trails	382,000
5. Attendance, School Science Fair.....	20,440
Total reached by direct contact.....	1,092,289

II. Reached by departmental circulation of materials

1. Motion picture distribution.....	8,884,988
2. Lantern slide distribution.....	13,598,789
3. Distribution of circulating collections.....	11,744,816
Total reached by circulation.....	34,228,593
TOTAL REACHED BY ALL EDUCATION SERVICES...	35,320,882

PUBLIC AND PRESS INFORMATION

The Publicity Department extended its distribution of printed and pictorial publicity relating to research, expeditions, education, new acquisitions, temporary and permanent exhibits, as well as Planetarium presentations and events, and the activities of the Ten Year Development Program.

Due to enhanced interest of radio audiences in the natural sciences and exhibits of the Museum and Planetarium, our efforts in the preparation, presentation and dramatization of broadcasts culminated in several sustaining programs for 1938, namely:

"New Horizons," a series of weekly broadcasts on the natural sciences presented from the halls of the Museum, from January through September, by various members of the Scientific Staff. From April 25 to September 26 inclusive this program was given with the cooperation of the Department of Radio Production of the W. P. A. for New York City. In October, in cooperation with the Columbia Broadcasting System American School of the Air, "New Horizons" was continued with Director Andrews as guide and commentator and prominent scientists taking part. This program reached not only the general radio audience of 103 C.B.S. stations but the students in 40,000 elementary and high schools from coast to coast.

"Exploring Space," a series of weekly programs on popular astronomy, in cooperation with the Planetarium and the W. P. A. radio organization, from April through October. In November and December this program, as "Men Behind the Stars," was continued with the Columbia Broadcasting System Department of Education cooperating with the Planetarium, and with the help of various actors of the W. P. A. radio organization.

"This Wonderful World," a weekly Saturday morning program of questions and answers on the natural sciences broadcast from the dome of the Planetarium.

The "Music of the Spheres" program initiated in 1937 was continued to May 25; the "Romance of the Stars," to October 3. Additional monthly "spot broadcasts" by members of the Museum and Planetarium staffs were arranged over WQXR.

On November 7, over a national hookup of the Columbia Broadcasting System, President Davison and Professor Barton broadcast their impressions of the lunar eclipse from a TWA airplane 18,000 feet above Manhattan.

The Guest Relations Bureau enlarged its scope of promoting interest in the Planetarium through various channels; during 1938, 1,123 group reservations were made, including approximately 45,000 visitors to the Planetarium.

The Planetarium received free advertising space in various transportation lines in the metropolitan area and Long Island through

the kind cooperation of Mr. Barron Collier, Sr. Transit Advertisers, Inc., also cooperated in placing Planetarium advertising cards in the New Haven Railroad.

The Department acknowledges its appreciation of the prompt and efficient cooperation of members of all departments in the Museum and Planetarium in obtaining and distributing news to the public and press, and of those who gave unstintingly of their time in connection with the broadcasting presentations.

Valuable assistance was rendered by several W. P. A. clerks regularly assigned to office work in the Department.

LIBRARY

The year has been a difficult one; the volume of work increased, and the physical condition of the Library has been deplorable. The book stacks are overcrowded. To the disorder caused by lack of space, repairs to the walls and roof of the building added an intermittent confusion of plaster dust and hammering, and necessitated the laborious shifting from their accustomed places of many folio volumes. We were further handicapped by the resignation of one member from our staff, a reduction somewhat compensated for by opening for service an hour later and closing an hour earlier, giving two uninterrupted hours for routine work.

We had efficient volunteer help during the year and were also ably assisted by the W. P. A. in carrying on the organization of the entomological correspondence of Henry Edwards and in our efforts to bind accumulated back files.

Eight hundred and forty-one books and 587 pamphlets were bound, and 73 hours of work contributed to various departments by the Bindery.

BOOK SHOP

Although sales dropped somewhat in the summer, there was a marked increase in the last months of the year which continues into 1939.

The Book Shop handled approximately 1,500 mail orders, answered many requests for information, forwarded over a hundred applications to the Membership Department, and operates not only as a practical service for the sale of books and materials on the natural sciences, but in more intangible ways is a valuable point of contact between the public and the Museum.

PRINTING AND PUBLISHING

The Print Shop produced all job press work for the twenty-eight departments, with a force of five compositors and pressmen and the foreman. Two additional W. P. A. workers were assigned to the Shop, making a total of six, who gave valuable assistance. The increase in output from 3,132,273 to 4,179,519 printed pieces was not due to a greater number of jobs but to longer runs. Many jobs called for 100,000 printed pieces each, and a recent order ran to 1,000,000 pieces. Other jobs included twelve issues of *Junior Natural History* (118,000), *School Nature League Monthly Bulletin*, and Reprints (42,000), Manual of Instructions for Employees in the Custodian's Department (400), and the Museum telephone directory (500). Eighty galleys of Volume 2 of the Proboscidea Memoir were set; three chapters were corrected and put in page proof.

For the Committee on Popular Publications, which is under the chairmanship and direction of Dr. Roy W. Miner, the Shop printed 1,000 copies of a reissue of the General Guide and three Guide Leaflets. Four other Guide Leaflets issued by this Committee were sent to outside printers, as were all *Anthropological Papers*, *Bulletins*, *Novitates*, *Natural History*, *The Sky*, and the *Annual Reports* of the President and of the Pension Board.

SCIENTIFIC PUBLICATIONS

(*Bulletin*, *Novitates*, *Anthropological Papers*)

During 1938 the Scientific Publication Department published the following papers: *Novitates* Nos. 969 to 1014, inclusive; two indexes; Article 5 of *Bulletin* Volume 74, by Dr. G. G. Simpson; Article 6, by Dr. E. H. Colbert; Article 7, by Mr. Herbert F. Schwarz; and Part 3, Volume 36, *Anthropological Papers*, by Dr. Margaret Mead. This is a total of 1,075 pages and 408 illustrations. There were in press three *Novitates*, one *Bulletin*, and one *Anthropological Paper*: approximately 140 pages and 20 illustrations.

Thirty-four additional manuscripts were submitted, equal to 1,750 pages and 200 illustrations. These must be carried over for publication to 1939 due to curtailment of funds.

NATURAL HISTORY Magazine

The circulation growth of *Natural History Magazine* to 26,489 during 1938 raises the influence of the Museum official popular

publication to the highest level in its history. The greatest compliment was the ever-increasing demand for the paid reprinting of articles from *Natural History* in innumerable other magazines. This far exceeds the demand of a few years ago, and guarantees popular interest in the work of the American Museum and allied institutions, even beyond points the magazine itself reaches, countries as remote as Formosa and Greenland. Further emphatic evidence of the enthusiastic reception of the magazine is the unusually high renewal rate of eighty-one per cent maintained by the Circulation Department in 1938.

Natural History takes this opportunity to express gratitude for assistance rendered by the W. P. A.

THE JUNIOR NATURAL HISTORY MAGAZINE

During 1938 *The Junior Natural History Magazine* continued to increase its annual subscriptions and to be sold on consignment in many private and public schools. It was financially self-sustaining throughout the year.

THE SKY Magazine

The editorship of *The Sky* was transferred to the Department of Astronomy from the Publicity Department on January 10, to take effect with the production of the March issue. Dr. Clyde Fisher succeeded Mr. Hans Christian Adamson as editor, appointing Miss Dorothy A. Bennett Associate Editor and Miss Helene Booth Assistant Editor. Mr. Charles C. Powers continued with the makeup work.

In November, 1938, *The Sky* completed its second volume with a subscription list of 4,400, a monthly sales averaging 1,041, a consignment list of 700 to schools and colleges, and a complimentary distribution list of 1,200 which includes observatories, astronomers, libraries, and members of the Museum staff. By December 31 the subscribers' list was nearly 5,000 with a net gain of 600 subscriptions.

The Sky pays for no contributions. All articles are original, not reprinted, and the list of contributors includes many of the most distinguished names in astronomy.

V. CONSTRUCTION, INSTALLATION AND OPERATION

ARTS, PREPARATION AND INSTALLATION

With the exception of occasional work for Palaeontology and Living Invertebrates which have their own preparation laboratories, all departments in the Museum are served by the Department of Preparation in the creation of exhibits. It cooperates with the strictly scientific departments in the planning of expeditions and the collecting and preparation of specimens and accessories in the field. Fourteen of the twenty-seven department members were drafted for expedition service during the year.

In the Museum the Department designs the groups, executes the details of preparation and mounting of specimens, the painting of backgrounds, the creation of foregrounds and accessories, and finally coordinates the assembly of all these factors into the finished whole. In addition, a vast amount of routine work is done in skeletal and skin preparation for the study collections. The completion of new exhibits, such as the Okapi and White Rhinoceros groups in the African Hall, the Walrus and Fur Seal groups in the Hall of Ocean Life, the bird groups and the painting of the dome and murals on the second floor of the Whitney Wing during 1938 (to mention only major activities), represents the creative skill and achievement of the Preparation Department.

GENERAL SUPERINTENDENT

The Superintendent reports, in addition to the routine inspection, maintenance, construction, draughting and repair work performed regularly by the manifold departmental forces under his jurisdiction, the following major activities:

Steam and electrical energy generated increased by 12.5 per cent over 1937.

Correction of improper operating condition in No. 2 engine by dismantling and realignment.

Installation of a complete new heating system in the North Wing (Section 1).

New roofs, installed by outside contractors, over Sections 3 and 4.

Construction of a large three compartment concrete storage tank lined with glazed tile.

A large case construction program for the new North American Mammal Hall, the Whitney Wing, together with numerous miscellaneous cases.

Publication of a "Manual of Instructions" for employees of the Custodian's Department.

The attendance records for the Museum in 1938 were:

General attendance	1,151,490
Lectures, meetings, special exhibits, concerts, etc.	328,898
Total	<u>1,480,388</u>

This is a decrease of 301,309 from 1937.

Change of hour for opening the Museum to the public to 10 a. m. was voted at the Executive Committee meeting of October 20, approved by the Park Commissioner by letter November 10.

A report of the work done in the Emergency Aid Room shows the extent and importance of this medical service, particularly in preventing the spread of contagious illnesses like colds, and in prompt and efficient attention to injuries.

The Superintendent's Department was given assistance by skilled labor in various trades (particularly painters) assigned by the W. P. A.

VI. REPORT OF THE TREASURER—FINANCIAL ADMINISTRATION

BUDGETARY FUNDS OF 1938

The Budget of 1938 (City Maintenance, General and Morris K. Jesup Fund Accounts), as approved by the Trustees on January 10, 1938, was as follows:

Disbursements	\$1,244,146.76	
Receipts	<u>1,163,192.24</u>	
Estimated Deficit		\$80,954.52

The actual receipts and disbursements are as follows:

Receipts	\$1,238,726.97	
Disbursements	<u>1,213,342.38</u>	
Balance, December 31, 1938....		\$25,384.59

The Budget approved by the Board of Trustees on January 10, 1938, showed disbursements of \$1,244,146.76 and receipts of \$1,163,192.24 with a deficiency of \$80,954.52, later increased to \$92,454.52. The Ten Year Development Committee pledged itself to raise \$70,000.00, and the employees were taxed 2½% of their salaries, or \$22,454.52.

In the fall of 1938 the Ten Year Development Committee decided to raise the sum contributed by the employees. They were successful in their efforts and the employees' contributions were returned in December, 1938.

As the Committee raised \$95,910.24 and only pledged a total of \$92,454.52, the surplus of \$3,455.72 together with obligations from 1938 of \$3,400.00, 1939 and 1940 subscriptions paid in 1938 of \$1,200.00, and unencumbered cash of \$17,328.87, making the balance December 31, 1938, of \$25,384.59, was brought forward to the 1939 Budget.

SUMMARY OF RECEIPTS AND DISBURSEMENTS

FOR ALL PURPOSES, 1938

Receipts

City of New York for Maintenance.....		\$497,809.37
Trustees Funds:		
Balance, January 1, 1938.....	\$157,369.74	
Income from Endowment Funds.....	\$599,874.62	
Contributions of Trustees.....	40,280.51	
Contributions of Members and Friends	339,904.22	
Contributions of Foundations.....	86,769.69	
Membership Dues	45,885.00	
Sale of Publications and Exchanges...	16,474.22	1,129,188.26
		<hr/>
Total Income, Trustees Funds.....		1,286,558.00
		<hr/>
Total Income, all Sources.....		\$1,784,367.37

Disbursements

Scientific and Research.....	\$502,842.00	
Printing, Books and Publications.....	30,811.88	
Arts, Preparation and Installation.....	155,649.04	
Education	81,050.56	
Administration and Operation.....	738,191.16	
New York State Roosevelt Memorial.....	48,602.68	
		<hr/>
Total, all Costs.....		1,557,147.32
		<hr/>
Balance, December 31, 1938.....		\$227,220.05

Explanation of balances

Special Funds Account		
For specially designated purposes.....	\$201,835.46	
Morris K. Jesup Fund Account		
Brought forward for 1938 obligations.....	3,400.00	
General Account		
1939-1940 Subscriptions received in		
1938	\$4,655.72	
Unencumbered cash balance.....	17,328.87	21,984.59
		<hr/>
Balance, December 31, 1938....		\$227,220.05

PERMANENT ENDOWMENT FUNDS, 1938

The Treasurer, who is also Chairman of the Finance Committee, reports the following additions to the Endowment Fund:

Gifts:	
Mrs. Olga H. Guggenheim.....	\$5,000.00
Mrs. Carl Tucker.....	2,500.00
Bequests:	
Morris Drey	1,000.00
Wood Fosdick	158.42
Maria DeWitt Jesup.....	77,101.37
Henry Fairfield Osborn.....	186.92
Margaret Olivia Sage.....	251.81
James Reuel Smith.....	1,800.00
Morris Yussim	100.00
Membership Fees	3,000.00
	<hr/>
	\$91,098.52
	<hr/>

The Finance Committee also reports the following summary of the transactions during the year:

Receipts	
Balance, January 1, 1938.....	\$343,679.40
Cash received a/c Gifts, Bequests and Membership Fees	30,121.24
Cash transferred from income accounts for reinvestment	3,835.19
Proceeds from Sales and Redemptions of Securities and Amortization Payments a/c Real Estate Mortgages	2,268,694.11
Refunds a/c Real Estate Expenses previously advanced	531.14
	<hr/>
Total Receipts	\$2,646,861.08
Disbursements	
Cost of Securities Purchased....	\$2,164,453.62
Temporarily Invested in Reduction of Indebtedness to Bank..	260,153.61
	<hr/>
Total Disbursements	2,424,607.23
	<hr/>
Balance, December 31, 1938.....	\$222,253.85
	<hr/>

The Endowment Funds on December 31, 1938, had a book value of \$14,316,510.43, of which amount real estate holdings and other investments carried on our books at cost total \$1,794,481.85. The balance, amounting to \$12,522,028.58, had a market value as of December 31, 1938, of \$12,097,410.32. The estimated income from our invested funds is \$606,638.77, a yield of 4.07% on book value.

In addition to the above, the Museum has interests in four trust funds having a value of \$578,560.00.

FINANCIAL STATEMENT, 1938

BUDGETARY ACCOUNTS

	CITY MAINTENANCE	GENERAL	MORRIS K. JESUP FUND	TOTALS
Receipts				
Balance, January 1, 1938	\$15,000.00	\$2,500.00		\$17,500.00
City of New York.....	497,809.37			497,809.37
Income from Endowment Funds		337,083.05	\$239,693.87	576,776.92
Membership Fees		45,885.00		45,885.00
Sales, Subscriptions to Natural History and Credit Interest on Loans		11,325.03	2,320.41	13,645.44
Contributions of Trustees, Members and Friends.		102,110.24		102,110.24
Total Receipts	\$512,809.37	\$498,903.32	\$242,014.28	\$1,253,726.97
Disbursements				
Administration and Operation	\$419,589.60	\$307,870.42		\$727,460.02
Scientific and Research.	15,690.00	104,612.84	\$150,622.89	270,925.73
Printing and Publishing.		18,640.57	12,091.81	30,732.38
Arts, Preparation and Installation		2,255.03	75,899.58	78,154.61
Education	15,392.05	42,074.91		57,466.96
New York State Roosevelt Memorial Building	47,137.72	1,464.96		48,602.68
Total Disbursements	\$497,809.37	\$476,918.73	\$238,614.28	\$1,213,342.38
Balance, December 31, 1938				
Capital Fund	15,000.00			
1939-1940 Subscriptions received in 1938.....		4,655.72		
Unencumbered Balance.		17,328.87		
Brought Forward for 1938 Obligations			3,400.00	
Total Balance				40,384.59
	\$512,809.37	\$498,903.32	\$242,014.28	\$1,253,726.97

SPECIAL FUNDS ACCOUNTS

(NOT AVAILABLE FOR BUDGETARY PURPOSES)

Receipts	
Balance, January 1, 1938.....	\$154,869.74
Income from Endowment and Investment Funds.....	23,097.70
Contributions of Trustees, Members, Friends, Foundations, Grants, Organizations, etc.....	352,427.82
Sales of Publications, and Fees.....	2,828.78
Departmental Transfers Contra.....	12,416.36
	<hr/>
	\$545,640.40
<hr/>	
Disbursements	
Administration and Operation.....	\$10,731.14
Scientific and Research.....	225,664.72
Printing and Publishing.....	79.50
Arts, Preparation and Installation.....	67,494.43
Education	23,583.60
Departmental Transfers Contra.....	12,416.36
Transferred to Endowment Funds for reinvestment....	3,835.19
	<hr/>
	\$343,804.94
Balance, December 31, 1938, for specially designated purposes	201,835.46
	<hr/>
	\$545,640.40
	<hr/>

All the foregoing accounts have been

Examined and	{	JUNIUS S. MORGAN	} <i>Auditing Committee.</i>
Approved		CORNELIUS V. WHITNEY	
E. and O.E.		H. RIVINGTON PYNE	

NEW YORK, December 31, 1938.

E. ROLAND HARRIMAN, *Treasurer.*

CERTIFICATE OF AUDITORS

We have audited the cash transactions of The American Museum of Natural History for the year ended December 31, 1938.

According to the usual custom, certain collections to and including January 24, 1939, have been treated as of December 31, 1938, in order to obtain the benefit for the period then ended, of revenue earned during said period, but which became due and payable on January 3, 1939.

WE HEREBY CERTIFY, that in our opinion, subject to the foregoing comment, the receipts and disbursements for the year under review were properly accounted for and correctly stated upon the records.

(Signed) ADAMS & BECKER

Certified Public Accountants

New York, February 14, 1939

VII. REPORT OF THE SECRETARY—MEMBERSHIP AND PERSONNEL

The increase of 6,083 new Members during 1938 brought the total enrolment to 24,831 active Members and supporters. This is the largest number ever attained, despite the loss of 3,338 by death or resignation.

The classification of the Membership Roll is as follows:

Associate Members.....	18,870	Fellows	112
Annual Members.....	4,088	Honorary Fellows.....	15
Sustaining Members.....	211	Patrons	231
Corresponding Members....	26	Associate Benefactors.....	64
Life Members.....	1,073	Associate Founders.....	28
Honorary Life Members....	82	Benefactors	22
Endowment Members.....		9	

On May 26 the Tenth Annual Members' Visiting Day was held. The new exhibits and those in the process of development were shown to the visiting Members, and a general tour of the Museum was made.

The Members' Lectures and the lectures for the children of Members proved very popular, with the result that the Museum Auditorium was taxed to capacity on practically every occasion.

The Membership Department wishes to express its gratitude to the W. P. A. for the splendid assistance rendered by twenty workers, who labored efficiently and effectively during the year for the interest of this Department.

THE BOARD OF TRUSTEES

At the Annual Meeting January 10, 1938, the following officers were reelected: President, F. Trubee Davison; First Vice-President, J. P. Morgan; Second Vice-President, Cleveland E. Dodge; Treasurer, E. Roland Harriman; Secretary, Clarence L. Hay. The Trustees of the Class of 1937 were reelected to the Class of 1942: F. Trubee Davison, Lincoln Ellsworth, Clarence L. Hay, and Lewis W. Douglas. Mr. Robert Woods Bliss was elected to the Class of 1938 to fill the vacancy due to the death of Mr. George F. Baker. Dr. William Procter was elected to the Class of 1939 in compliance with the amendment of the Constitution increasing the number of Trustees in each Class from six to seven. Mr. Frederick H. Osborn resigned as a member of the Pension Board; Mr. Clarence L. Hay was appointed to succeed him. A Committee on Educational Policy

was established, with the following personnel: Livingston Farrand, Chairman; James Rowland Angell; A. Perry Osborn; Roy Chapman Andrews, Director; Clark Wissler, Dean, Scientific Staff; Charles Russell, Curator.

On March 17, 1938, the Executive Committee appointed Mrs. Carl Akeley a member of the Committee on African Hall and African Collections.

At the May 2 meeting of the Board of Trustees, Mr. Malcolm P. Aldrich was elected to the Class of 1942 to fill the vacancy caused by the death of Mr. Madison Grant, and Mr. Dean Sage, Jr., was elected to the same Class to fill the vacancy due to the death of Mr. Ogden L. Mills. Mr. Clarence L. Hay resigned as a member of the Pension Board and Mr. Dean Sage, Jr., was appointed in his place.

The Executive Committee, at a meeting on June 9, 1938, appointed Mr. Arthur H. Bunker Adviser to the Finance Committee.

At the Board of Trustees meeting, November 14, 1938, Mr. Arthur H. Bunker was elected a Trustee in the Class of 1942 in place of Mr. W. K. Vanderbilt, resigned.

At the Executive Committee meeting of April 21, 1938, it was proposed to amend Article III of the Constitution to give the *ex-officio* members of the Board or their accredited representatives voting power, and to amend Article VI by adding the Park Commissioner as an *ex-officio* member of the Executive Committee, giving his accredited representative voting power. The first reading of these proposed amendments was given at the Board of Trustees meeting of May 2, 1938. The amendments were adopted at the meeting of the Board of November 14, 1938, effective on the date of adoption.

On October 20 the Executive Committee unanimously adopted a resolution expressing their sorrow at the death of their colleague on the Board, Mr. Henry W. Sage, on August 12, 1938.

THE ADMINISTRATIVE AND SCIENTIFIC STAFFS

Action voted at the Board of Trustees meeting, January 10, 1938:

Charles Russell, Ph.D., appointed Curator of the Department of Education. H. E. Vokes, Ph.D., appointed Assistant Curator, Department of Geology and Invertebrate Palaeontology. Donald R. Barton, B.A., promoted to Assistant Editorship of *Natural History*

magazine. The editorial staffs of *The Junior Natural History Magazine* and *The Sky* magazine given Scientific Staff status. Louis W. Kinzer appointed Custodian.

The Executive Committee on March 17, 1938, reestablished the Department of Woods and Forestry to provide a suitable organization for the proper development of the Jesup Hall of North American Woods, with Mr. Clarence L. Hay as Honorary Curator and Dr. Charles Russell, Staff Associate. The Committee also approved the discontinuance of the Department of Geology and Invertebrate Palaeontology, the amalgamation of the section of Invertebrate Palaeontology with the Department of Vertebrate Palaeontology, the combined departments to be known as the Department of Palaeontology; the amalgamation of the section of Geology with that of Mineralogy, the combined departments to be known as the Department of Geology and Mineralogy.

At the Executive Committee on March 17 the following appointments were made: S. H. Chubb, Research Associate in the Department of Comparative and Human Anatomy; Charles C. Mook, Ph.D., Research Associate, Department of Palaeontology; E. W. Gudger, Ph.D., Honorary Associate, Department of Living and Extinct Fishes; H. E. Vokes, Ph.D., Assistant Curator of Invertebrate Palaeontology, Department of Palaeontology; George Pinkley, Ph.D., Associate Curator, Department of Comparative and Human Anatomy; Frederick H. Pough, Ph.D., Research Associate in Meteorites, Department of Astronomy and the Hayden Planetarium; Hazel L. Muller, B.A., Staff Assistant, Department of Education.

The Executive Committee on April 21, 1938, adopted the revised General Regulations of the Museum.

The Board of Trustees on May 2, 1938, passed a resolution of congratulation and deep appreciation for the fifty years of service of Dr. Frank M. Chapman.

Dr. Robert Cushman Murphy's title was changed to Curator of Oceanic Birds at the Executive Committee meeting June 9, 1938.

At the Executive Committee meeting of October 20, 1938, the following resignations were accepted: Dr. Wendell C. Bennett, effective September 30, 1938; Mr. Charles A. Federer, Jr., effective October 15, 1938; Mrs. Agnes K. Saunders, effective October 15, 1938. At this meeting Robert von Heine-Geldern, Ph.D., was appointed Research Associate in Anthropology in the Department of Anthropology; Richard E. Blackwelder, Ph.D., Assistant Curator of

Coleoptera in the Department of Entomology. A resolution expressing the sorrow of the Board at the death of Dr. Frederick Tilney, Research Associate in the Department of Comparative and Human Anatomy, on August 7 was unanimously adopted.

The Board of Trustees, at its meeting of November 14, 1938, unanimously adopted a resolution expressing their loss in the death on November 13, 1938, of Mr. Walter W. Holmes, Field Associate in the Department of Palaeontology.

VIII. ADMINISTRATION OF THE YEAR 1938

BOARD OF TRUSTEES

President*

F. TRUBEE DAVISON

First Vice-President

J. P. MORGAN

Second Vice-President

CLEVELAND E. DODGE

Treasurer

E. ROLAND HARRIMAN

Secretary

CLARENCE L. HAY

ELECTIVE TRUSTEES

Class of 1938

ROBERT WOODS BLISS

A. PERRY OSBORN

ARCHER M. HUNTINGTON

KERMIT ROOSEVELT

JUNIUS S. MORGAN

FREDERICK M. WARBURG

JAMES ROWLAND ANGELL

Class of 1939

CHAUNCEY J. HAMLIN

ARTHUR S. VERNAY

SUYDAM CUTTING

A. HAMILTON RICE

WILLIAM PROCTER

FREDERICK H. OSBORN

ROBERT EARLL McCONNELL

Class of 1940

GEORGE T. BOWDOIN

DANIEL E. POMEROY

CORNELIUS V. WHITNEY

H. RIVINGTON PYNE

J. P. MORGAN

WILTON LLOYD-SMITH

Class of 1941

DOUGLAS BURDEN

E. ROLAND HARRIMAN

CLEVELAND E. DODGE

JOHN D. ROCKEFELLER, 3RD

CHILDS FRICK

LEONARD C. SANFORD

LIVINGSTON FARRAND

Class of 1942

F. TRUBEE DAVISON

LEWIS W. DOUGLAS

LINCOLN ELLSWORTH

MALCOLM P. ALDRICH

CLARENCE L. HAY

DEAN SAGE, JR.

ARTHUR H. BUNKER

EX-OFFICIO TRUSTEES

FIORIELLO H. LA GUARDIA

(MAYOR OF THE CITY OF NEW YORK)

JOSEPH D. MCGOLDRICK

(COMPTROLLER OF THE CITY OF NEW YORK)

ROBERT MOSES

(COMMISSIONER OF PARKS OF THE CITY OF NEW YORK)

* The President is *ex-officio* a member of all Committees.

STANDING COMMITTEES OF THE TRUSTEES**Executive Committee**

CLEVELAND E. DODGE,
Chairman
 F. TRUBEE DAVISON
 E. ROLAND HARRIMAN
 CLARENCE L. HAY
 COMMISSIONER OF PARKS
 GEORGE T. BOWDOIN
 CHILDS FRICK
 JUNIUS S. MORGAN
 DANIEL E. POMEROY
 KERMIT ROOSEVELT
 A. PERRY OSBORN
 JOHN D. ROCKEFELLER, 3RD

Finance Committee

E. ROLAND HARRIMAN,
Chairman
 ROBERT EARLL McCONNELL
 FREDERICK M. WARBURG
 A. PERRY OSBORN
 JUNIUS S. MORGAN
 ARTHUR H. BUNKER, *Adviser*
 FREDERICK H. SMYTH, *Bursar*

Auditing Committee

JUNIUS S. MORGAN, *Chairman*
 CORNELIUS V. WHITNEY
 H. RIVINGTON PYNE

Nominating Committee

DOUGLAS BURDEN, *Chairman* LEWIS W. DOUGLAS
 FREDERICK H. OSBORN

Pension Board**Trustee and Employee Members**

FREDERICK M. WARBURG,
Chairman A. PERRY OSBORN
 DEAN SAGE, JR. FREDERICK H. SMYTH
 GEORGE T. BOWDOIN JACOB W. SHROPE
 H. E. ANTHONY, *Secretary*

Counsel to the Board of Trustees

LEWIS L. DELAFIELD

GENERAL DEPARTMENTAL COMMITTEE OF THE TRUSTEES

F. TRUBEE DAVISON, *Chairman* CLARENCE L. HAY
 ROBERT WOODS BLISS JUNIUS S. MORGAN
 GEORGE T. BOWDOIN FREDERICK H. OSBORN
 DOUGLAS BURDEN WILLIAM PROCTER
 SUYDAM CUTTING A. HAMILTON RICE
 CLEVELAND E. DODGE JOHN D. ROCKEFELLER, 3RD
 LIVINGSTON FARRAND LEONARD C. SANFORD
 CHILDS FRICK ARTHUR S. VERNAY

FREDERICK M. WARBURG

Co-ordinating Committee of General Departmental Committee

FREDERICK H. OSBORN, *Chairman* CLARENCE L. HAY
DOUGLAS BURDEN LIVINGSTON FARRAND
LEONARD C. SANFORD

Special Sub-Committee on Entomology

LEONARD C. SANFORD WILLIAM PROCTER

SPECIAL COMMITTEES OF THE TRUSTEES

Astronomy and Planetarium

A. CRESSY MORRISON, <i>Chairman</i>	SAMUEL ALFRED MITCHELL
H. RIVINGTON PYNE	WALDEMAR A. CHADBOURNE
CHARLES J. LIEBMAN	JOHN M. MOREHEAD
O. H. CALDWELL	JOHN I. DOWNEY
JOHN A. KINGSBURY	DUNCAN H. READ
HENRY NORRIS RUSSELL	WALLACE W. ATWOOD
HARLOW SHAPLEY	LENOX RILEY LOHR
J. WILLARD HAYDEN	CLYDE FISHER, <i>Curator-in-Chief</i>

African Hall and African Collections

DANIEL E. POMEROY, <i>Chairman</i>	MRS. CARL AKELEY
A. PERRY OSBORN	H. E. ANTHONY, <i>Curator</i>
KERMIT ROOSEVELT	JAMES L. CLARK, <i>Preparation</i>

North American Mammals

ROBERT EARLL MCCONNELL,	KERMIT ROOSEVELT
<i>Chairman</i>	JOHN D. ROCKEFELLER, 3RD
CHILDS FRICK	MALCOLM P. ALDRICH
DOUGLAS BURDEN	H. B. CLARK
WILTON LLOYD-SMITH	H. E. ANTHONY, <i>Curator</i>
JAMES L. CLARK, <i>Preparation</i>	

Participation in 1939 New York World's Fair

FREDERICK M. WARBURG,	DOUGLAS BURDEN
<i>Chairman</i>	CLARENCE L. HAY
F. TRUBEE DAVISON	JUNIUS S. MORGAN
ARTHUR S. VERNAY	ROY CHAPMAN ANDREWS

Rothschild Collection

LEONARD C. SANFORD, <i>Chairman</i>	ROBERT CUSHMAN MURPHY
MRS. GERTRUDE VANDERBILT	ERNST MAYR
WHITNEY	ROY CHAPMAN ANDREWS,
FRANK M. CHAPMAN, <i>Curator</i>	<i>Director</i>

Whitney Wing

LEONARD C. SANFORD, <i>Chairman</i>	FRANK M. CHAPMAN, <i>Curator</i>
MRS. GERTRUDE VANDERBILT	ROBERT CUSHMAN MURPHY
WHITNEY	ROY CHAPMAN ANDREWS,
	<i>Director</i>

Natural History and Membership

FREDERICK M. WARBURG,	CASS CANFIELD
<i>Chairman</i>	F. D. DUKE
CLARENCE L. HAY	NELSON DOUBLEDAY
	ROBERT L. JOHNSON

New York State Theodore Roosevelt Memorial

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LEGISLATURE OF THE STATE OF NEW YORK IN 1869

The Corporation consists of a self-perpetuating Board of thirty-five Trustees, elected for terms of five years. Also, *ex-officio*, the Mayor, the Comptroller, and the Commissioner of Parks of the City of New York.

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HISTORY

PRESIDENCY OF JOHN DAVID WOLFE, 1869-1872.

1869 Museum incorporated. Constitution adopted as drafted by Joseph H. Choate.

1870 First home secured, the Arsenal, Central Park.

1871 The City of New York appropriated \$700,000 for building. (Section I.)

PRESIDENCY OF ROBERT L. STUART, 1872-1881.

1874 Cornerstone of first section of building laid by President Ulysses S. Grant.

1878 Contract adopted between Trustees and Department of Parks, as drawn up by Andrew H. Green and Joseph H. Choate.

1880 Educational work with the schools inaugurated by Professor Albert S. Bickmore.

PRESIDENCY OF MORRIS K. JESUP, 1881-1908.

1892 Museum opened to the public on Sundays.

1887—1905 The City of New York appropriated \$4,218,820.94 for eight new building sections, II-VIII, and XV.

1907 Museum opened free to the public every day in the year.

1908—1917 Mr. and Mrs. Jesup bequeathed \$6,000,000 to the Museum.

PRESIDENCY OF HENRY FAIRFIELD OSBORN, 1908-1933.

1908 Constitution amended making the Mayor, the Comptroller and the President of the Department of Parks, *ex-officio* members of the Board of Trustees.

1921 Greater New York Charter amended, placing the Museum on the same basis as Public Schools with respect to Corporate Stock Appropriations, by Chapter 618 of the Laws of 1921, State of New York.

1921—1925 The City of New York appropriated \$2,233,800 for new sections, IX-XI, and equipment and alterations of old sections.

1924 The State of New York provided for the Theodore Roosevelt Memorial (Educational). Cost \$3,500,000. (Original Chapter 615 Laws of 1924.) (Building Section XII.)

- 1929 Appropriation of \$3,550,000 by the City of New York for construction of African Wing, Power Plant and Service Building, and Whitney Wing. (Sections XIII, XVII and XIX.)
 Contribution of \$750,000 by Harry Payne Whitney for one-half cost of Whitney Wing. (Section XIX.)
 1932 Completion of the African Wing. (Section XIII.)
 1933 Completion of the Whitney Wing. (Section XIX.)

PRESIDENCY OF F. TRUBEE DAVISON, 1933—

- 1934 Contribution of \$150,000 by Charles Hayden for purchase of Zeiss Projection Planetarium and Copernican Planetarium.
 The American Museum of Natural History Planetarium Authority erecting Planetarium Building with funds (\$650,000) secured through loan from the Reconstruction Finance Corporation. (Section XVIII.)
 1935 Opening of the Hayden Planetarium. (Section XVIII.)
 1936 Dedication of the Theodore Roosevelt Memorial. (Section XII.)

PERMANENT ENDOWMENT

The Endowment Fund was established in 1884. It now amounts to \$14,316,510.43 (book value). The Trustees especially desire to insure the permanent growth and welfare of the Museum through an increase of the General Endowment Fund. The additional sum of \$10,000,000 is needed at present.

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