

THE AMERICAN MUSEUM OF NATURAL HISTORY

EIGHTY-EIGHTH ANNUAL REPORT
JULY, 1956, THROUGH JUNE, 1957

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THE CITY OF NEW YORK
1957

EIGHTY-EIGHTH 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*

IT is fitting that the annual report of the President of the American Museum of Natural History be directed "to the Trustees . . . and . . . the Municipal Authorities of the City of New York," because they are the official guardians of this great public trust. In them is vested the responsibility to maintain and develop the Museum in the public interest.

I like to think, however, that the Museum actually has a limitless number of unofficial trustees, because in reality every member of the public—young and not-so-young—has a share and a stake in the Museum, in its existence, its growth, and its use. It seems especially important, therefore, that each visitor realize fully what the Museum can mean to him or her.

It is my own belief that the most significant experience this Museum can offer to any individual, from wide-eyed school child to distinguished scholar, is the opportunity for discovery. To each of us, according to our individual needs and areas of interest, the Museum offers the excitement of discovering something new.

If we were able to determine what expression is most often heard in our halls, I believe it would be the phrase, "I never knew that before!" Discoveries are made at the Museum by visitors each day as they view a new exhibit, observe some previously unnoticed detail in a familiar hall, or witness a rare celestial occurrence in a Planetarium sky show. In one day, a

Museum visitor can travel from America to Africa to Asia and can be transported from the prehistoric age to the day after tomorrow—an odyssey rich in new facts about other places and other times.

Our younger visitors are constantly discovering objects of fascination and surprise, creatures as remote as the dinosaurs and as astonishing as the varied wildlife of New York City. Older people, some retired and with a recently acquired awareness of the opportunities presented by leisure, are finding that the Museum opens new doors, and that beyond these doors lie new meaning and purpose, often new direction, for their lives.

Today, as the frontiers of scientific research are pushed farther and farther into our universe, we have dramatic evidence of the fact that man's capacity for discovery is infinite. Scientific inquiry knows no bounds, for man and discovery are inseparable. The whole history of man's life on earth is the story of continuing search. And within this Museum and its Planetarium that history is told through the evidences of life of the past and present and with indications of the shape of the future: recorded, translated, interpreted, and exhibited in such a way that each one of us may make our own discoveries about the nature of the world around us and of the universe.

This element of discovery-for-oneself, in our era of automation, stereotypes, and mass communication, is the very special gift the Museum gives to the public. It is particularly important because it is not easily come by. It is the result of research by scientists who are devoting their lives to the pursuit of new knowledge combined with the efforts of many other skilled workers who are translating this knowledge into a form that the public can see, read, hear, and understand. In effect, it is a bequest—the bequest of all the ages of mankind, and of centuries before, to the child who will know the twenty-first century and to those who have built the twentieth.

To insure the use of this legacy to the fullest extent, the American Museum of Natural History needs the support of its public. For our scientists to continue adding to the world's bank of knowledge, making new discoveries and enabling all of us to make our own, the Museum needs the financial help of each person who is able to make a contribution, large or small.

Our predecessors, the founders and early builders of this Museum, made a courageous investment. It proved to be a wise one. It is up to us to continue, in that tradition and with equal foresight, to develop this great place of discovery for the present and for the future.

For the twelve-month period ending June 30, 1957, the Museum's combined sources of income, consisting of appropriations from the City, income from endowment, donations, memberships, the shop, magazines, and other activities, fell \$48,804 short of meeting the Museum's annual budget of \$3,668,000. This deficit was made up by drawing on the unrestricted capital funds. The practice should not continue, but rather the fund must be increased substantially if, in the light of increased expenses, we are to maintain an adequate scientific staff and complete the exhibits that are now in the planning stage.

During the past year our two committees, led by Mrs. James B. Campbell and Mr. George Percy, raised \$175,699 in contributions from 2103 individuals, the largest amount raised in the twenty-year history of our Contributors Program. The endowment fund had a market value on July 1, 1957, of \$27,781,075, as compared with \$27,885,740 at the previous year's end. The Pension Fund now stands at \$5,618,759.

Two distinguished Honorary Trustees, Alexander Hamilton Rice and Harold Benjamin Clark, died during the year.

The Museum will miss their counsel and active support. In the same period, two new Trustees, Endicott P. Davison and Thomas L. Higginson, joined our Board.

It has been said that there is an “aristocracy of those who care.” Readers of this report are in this group, and I herewith thank those who care for this Museum and its future.

Alexander M. White

THE YEAR 1956-1957

THE Museum's areas of interest reach from the depths of the oceans to, and beyond, the stars. Astronomy mirrors the universe and states the theories of the earth's origin. The hardened rocks furnish the material of geology, and the life-forms trapped therein are the objects of the paleontologist's search. From fossils, the quest moves to forms that are familiar today—living creatures without backbones, insects, fishes, reptiles, birds, and mammals—all leading to the study of man himself.

The scientist knows that it is not enough to study for facts alone, and the scientist-educator is concerned with the interpretation of nature rather than with the mere accumulation of knowledge. He knows that man must see nature as a whole, for he must live as a whole being within its framework.

The scientist carries on his work in the laboratory, the field, and the classroom—describing, classifying, observing, identifying, writing, teaching, and guiding the development of public exhibitions. The following pages give some of the highlights of the work which has occupied him during the past year, and which he has carried forward with a keen personal dedication to the public interest he serves.

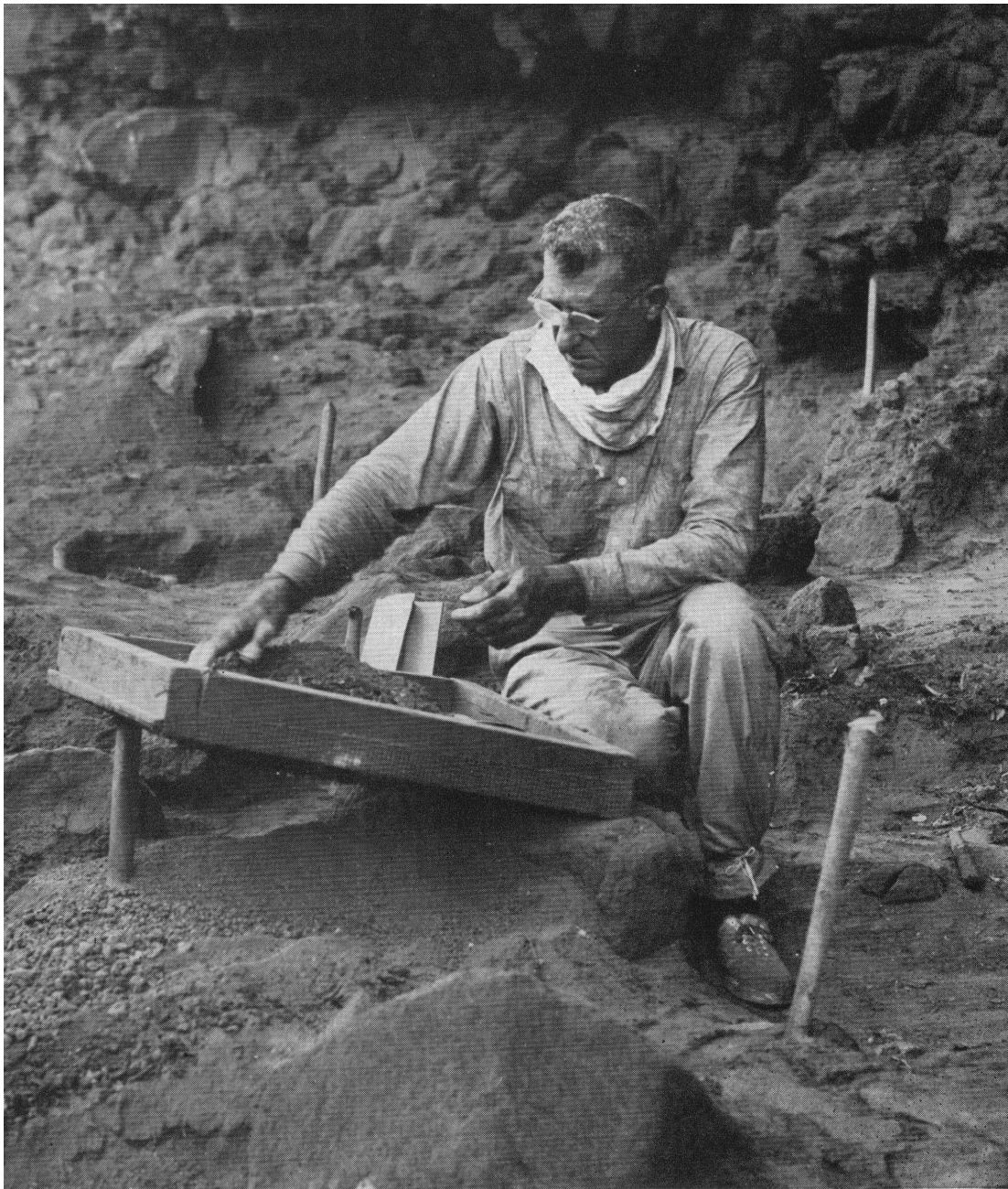
DEPARTMENT OF ANTHROPOLOGY

As part of the continuing emphasis by the Department of Anthropology on cultures in the New World and Oceania, three important archeological studies were made in such widely varying areas as southern Mexico, the rain-forested Montaña in Peru, and the Marquesas Islands in the South Pacific. Harry L. Shapiro, Department Chairman, spent the summer of 1956 in the Marquesas Islands as leader of an expedition that carried out the first systematic archeological work ever to be done

in those islands. With Mr. and Mrs. Cornelius Crane, who financed the expedition, and his assistant, Robert Suggs, Dr. Shapiro worked at several sites in the bays of Nukuhiva, the largest island in the group. There they discovered the remains of a culture predating European contact and perhaps going back to the very early stages of Marquesan life. The main purpose of the expedition was to obtain suitable material with which to secure a carbon-14 date for the settlement of these islands, and it is anticipated that the results will help to clarify the early history of Polynesia.

Excavations by Harvard graduate student Donald W. Lathrap in the little-known area of Peru called the Montaña prove that this region has an even more complex history than was formerly thought and once again point out its importance to the cultural history of the South American continent as a whole. Pottery that Mr. Lathrap has brought back to the Museum for study indicates that early inhabitants had some sort of contact with regions as diverse as the highlands of Peru and Bolivia, the island of Marajó at the mouth of the Amazon, and even the shores of the Caribbean. One type of ware he discovered, with similarities to that of the Maya of Central America, has never before been found in South America.

Because of the department's traditional interest in Mesoamerican archeology, Gordon Ekholm returned to the late classic Maya site at Comalcalco in the state of Tabasco, Mexico. Comalcalco is unique in the New World in having major buildings built entirely of fired brick. It is of potentially great importance to Middle American archeology because it is here that the great Maya culture came in contact with the Olmec and with other culture centers of pre-Columbian Mexico. To add to the knowledge of the site obtained during this work there last year, Dr. Ekholm completed the clearing of the palace structure, excavated two additional buildings, and made various test and stratigraphic excavations at several places on the site.



Archeological investigations in the Marquesas Islands by Harry L. Shapiro revealed the remains of a culture pre-dating European contact and perhaps going back to the very early stages of Marquesan life

Research problems covered all three phases of the department's interest: physical anthropology, ethnology, and archeology. "Aspects of Culture," published by Dr. Shapiro during the year, shows how a knowledge and understanding of our cultural heritage and that of other peoples are necessary if we are to bridge the gap which our technical advances have created between power and wisdom. This book is based on the Brown and Haley lectures delivered by Dr. Shapiro at the invitation of the College of Puget Sound, Tacoma, Washington. Dr. Shapiro worked on a comprehensive study of the anthropology of the Jews in preparation for its publication by UNESCO, and on a study of human cranial material excavated in Ceylon.

Margaret Mead's current interests center on the evolution of culture, and in this connection she is attempting to define a workable basic unit in evolution which combines genetic, constitutional, societal, and cultural data. She has also begun a study of learning and identification in the United States based upon a study, the "Image of the Scientist," taken from reports of high school students. Dr. Mead is also interested in the relationship between biologically adequate behavior and culturally required behavior.

Theodore Schwartz, who assisted Dr. Mead on her expedition to the Admiralty Islands in 1953, was appointed Research Fellow in the department and during the coming year will work intensively on the field data gathered during the trip.

Junius B. Bird has continued research on the prehistory of South America, with particular emphasis on Peru. Because of his interest in pre-Columbian textiles, Mr. Bird was asked by the Director of the Stanford University Library and by former President Herbert Hoover to supervise the restoration of a large mantle from the Paracas period in Peru belonging to Mr. Hoover and stored in the Stanford Library. This mantle, one of the best preserved of its kind, afforded Mr. Bird the opportunity to do basic research on the dyes and mordants used. It

was possible not only to identify these but to determine the predictable effects on the mantle when it is exposed to light.

James A. Ford is currently at work on Eskimo archeology and is preparing a final report on a series of five sites in the Point Barrow, Alaska, area, dating from 400 A.D. to the present time. The principal significance of this study is the fact that in this area and at this time the Thule culture developed. This culture, which forms the basis for all historic Eskimo cultures east of Alaska, spread from Alaska to Greenland about 1200 A.D.

On November 12, 1956, Harry Tschopik, Jr., Assistant Curator of South American Ethnology, died suddenly. During the decade that Dr. Tschopik had been in the department he had already made a considerable mark and his loss to the department was a severe one. At his death Dr. Tschopik was in the course of preparing two monographs on the socio-economic and material aspects of the Aymara Indians of Peru. Robert Carneiro has been appointed to fill the vacancy left by Dr. Tschopik's death.

The major exhibition project in the department during the year was the continuation of work on the Hall of the Biology of Man. In addition, a special exhibition of an outstanding series of Tibetan banners depicting events in the former lives of the Buddha Gautama was displayed in the Seventy-seventh Street Foyer of the Museum.

DEPARTMENT OF MAMMALS

Harold E. Anthony, Chairman of the Department of Mammals, reports that with the aim of world coverage in view, the department has continued during the year to build up its collections of skins, skulls, and series of preserved specimens. Emphasis in collecting was directed towards areas hitherto unexplored and towards such groups of mammals as are inadequately represented in the Museum.

The Fifth Archbold Expedition to New Guinea, under the leadership of Leonard J. Brass, returned during the year with more than 67,000 zoological and botanical specimens from the D'Entrecasteaux Islands and the Louisiade Archipelago, Papua. To gather the first comprehensive plant and mammal collections ever made on the islands east of the mainland of New Guinea, the expedition explored terrain that ranged from dry coastal plains to dripping rain forests to 6000-foot mountain regions never before penetrated by a biologist. Among the mammals brought back to the Museum by Russell Peterson, expedition mammalogist, is the finest collection of bats ever made in New Guinea, consisting of over 600 specimens and which includes, in addition to the giant fruit bats, tube-nosed, golden-haired, sheath-tailed, and free-tailed bats. Also collected were fine examples of the marsupial bandicoot, cuscus, flying phalanger, and wallaby. An outstanding mammal find was an elusive marsupial rat (*Murexia*) never before reported in the islands under study. The expedition's work, both in the collection of animals and plants, constitutes an important addition to the findings of earlier expeditions also sponsored by Richard Archbold. The mammal collections brought back by the five Archbold expeditions, unequalled in any museum, are being studied by Hobart M. Van Deusen, with a view to extensive publication.

Another field trip in which the department took part was the Puritan-American Museum Expedition to the Gulf of California. Among the specimens collected by Richard G. Van Gelder, expedition mammalogist, was an interesting fish-eating bat that obtained its food directly from the water. Mr. Van Gelder hopes the collection will help determine both the possible rates of evolution of the small mammals living on the islands in the Gulf and something of the way in which these animals reached these islands.

Research has been directed primarily towards the identification of unworked collections and has been influenced consider-



The Fifth Archbold Expedition to New Guinea returned with over 67,000 zoological and botanical specimens, the first comprehensive collections ever made on the islands east of the mainland. Here, a Papuan assistant to the expedition holds a monitor lizard, one of 907 specimens collected for the Department of Amphibians and Reptiles

ably by the acquisition of new materials. As part of the departmental program to further its studies in Latin America, and particularly Mexico, George Goodwin worked on 2000 mammals from Mexico collected by students of Walla Walla College in Washington and prepared a report on the mammals of Oaxaca.

Mr. Van Gelder continued his work on the revision of the spotted skunk (genus *Spilogale*), the first study of this genus to be undertaken in 50 years. He also began a study, assisted by Edward McGuire, of mammals from Utah.

Joseph Curtis Moore reported acceleration in his survey of Asiatic squirrels, a work begun by the late George H. H. Tate. The report, which promises to be an important contribution to the literature, is concerned with aspects of geographical distribution and of evolution with large populations, as well as with a taxonomic and systematic study of these mammals.

During 1956-1957 Dr. Moore was able to study fourteen species and 74 subspecies. In addition, he has reached tentative hypotheses to explain the origin of fourteen species in accordance with their present distribution and degree of specific differentiation.

The interest of the department in African mammals is represented by T. Donald Carter's identification and study of the fine collections made by Arthur S. Vernay and Col. William J. Morden.

An animated, carved lucite relief map was installed in the Hall of North American Mammals, dramatically illustrating the prehistoric migrations of such big game mammals as the bear, moose, bison, caribou, and wapiti. An illuminated representation of the Americas and Asia, the map shows how the land bridge that spanned the Bering Strait ten thousand to twenty thousand years ago accounts for the presence in the Western Hemisphere of large mammals the ancestors of which evolved in Europe and Asia. The map also illustrates the west-

ward migrations, by the same route, of species that originated in America and are found today in the Eastern Hemisphere.

Adjacent to this map is a new temporary exhibit, "An Introduction to the Hall of North American Mammals." Located in the corridor linking the North American Mammal Hall to the Hall of Northwest Coast Indians, this photographic exposition of the preliminary research for the Mammal Hall will remain in place until additional permanent habitat groups are installed.

ARCHBOLD BIOLOGICAL STATION

The Archbold Biological Station at Lake Placid, Florida, reported a successful year in which a variety of projects was initiated or continued by visiting research workers. Lawrence R. Penner and his associates from the University of Connecticut continued their studies on the biological aspects of avian schistosomiasis. Through the collection and study of numerous parasites, some progress was made in elucidating the biology of several poorly known species. Insect investigations were pursued by H. F. Strohecker of the University of Miami and Karl V. Krombein of the United States National Museum, and Austin L. Rand of the Chicago Natural History Museum gathered field data pertaining to the feeding of the cattle heron, *Bubulcus ibis*. Continuing her research on the Seminole Indians, Ethel Cutler Freeman explored the manner in which the Seminoles are adapting themselves to political and economic forces that are changing their way of life.

An interesting project developed at the station by Albert Middleton Laessle, plant ecologist of the University of Florida, involves a possible extension of the Okefenokee Terrace. Dr. Laessle is investigating the significance of a ring of scrub surrounding a section of the station as evidence of a fossil beach of the Okefenokee Sea.

DEPARTMENT OF BIRDS

The Department of Birds records with deep regret the death of John T. Zimmer, Chairman of the Department and world-renowned authority on South American birds. Dr. Zimmer had been a member of the department staff for 26 years as Associate Curator, Curator, and Chairman. His death is a great loss to the ornithological world.

Upon Dr. Zimmer's death, Dean Amadon assumed chairmanship of the department in addition to his duties as Lamont Curator of Birds.

Dr. Amadon reports that because the Museum possesses the finest and best-housed collection of birds in the world today (a total of about one million specimens) much of the department's research, although less than formerly, is devoted to taxonomic studies of this material. All portions of the world are included in these studies.

Dr. Zimmer had, at the time of his death, almost completed a check-list of certain South American birds which will form a volume in Peters' "Check-List of the Birds of the World," now in preparation. James Bond of the Academy of Natural Sciences of Philadelphia has kindly volunteered to prepare this manuscript for the printer.

Dr. Amadon published a paper on evolution in the starlings (family Sturnidae), continued his studies of the classification of birds, and has in press a general paper on the origin and relationships of the songbirds. As part of a long-range major photographic and scientific study of hummingbirds carried on by Crawford H. Greenewalt, a Museum Trustee, Dr. Amadon spent one month in Brazil studying this family of birds. Charles Vaurie completed the manuscript for the first volume of a two-volume check-list of the birds of Eurasia.

E. Thomas Gilliard has continued to devote most of his efforts both in the field and at the Museum to a study of the biology of the birds of paradise and bowerbirds. As a result, he arranged an exhibition of bowerbirds that was on view to the



Bowerbirds of the South Pacific were the subject of a temporary exhibit depicting the colorful courtship behavior of these extraordinary birds

public during the spring. He also published a paper presenting the interesting suggestion that in the more advanced bowerbirds artificial ornaments such as shells replace and eventually supplant plumage ornamentation. This thesis and other original data on these birds will be discussed at greater length in papers still in press.

Robert Cushman Murphy, Lamont Curator Emeritus, continued to use the Museum's collection of seabirds in his studies. During the year he also acquired valuable data on birds of the waters off western Mexico while on a research ship of the Scripps Institution of Oceanography.

Several new exhibition projects were the concern of the department during the period under discussion. Through the generosity of one of the Museum's Trustees, funds were made available for a new exhibit of the nests and eggs of the birds of the New York City area. This exhibit, together with the birds of the New York area already on view, has proved a valuable aid to both students and laymen in the metropolitan area.

Plans were also made for finishing the three remaining alcoves in Sanford Hall of the Biology of Birds. Called "Courtship and Pair Formation," "Parental Care in Birds," and "Birds in Their Environment," these exhibits should add greatly to knowledge of the behavior and ecology of bird life.

Wesley F. Lanyon has been appointed Assistant Curator, and Eugene Eisenmann a Research Associate, in the department during the year.

DEPARTMENT OF AMPHIBIANS AND REPTILES

Charles M. Bogert, Chairman of the Department of Amphibians and Reptiles, reports that in 1956-1957 the study of thermal relationships of reptiles received continuing emphasis in both the field and laboratory work of the department. Mr. Bogert is now preparing a report that will assemble and

interpret the numerous data he has gathered pertinent to thermoregulation in reptiles. Aspects of this problem to be dealt with include the relationships of habits, habitats, pigmentation, geographic distribution, speciation, and adaptations to thermal conditions.

Experiments carried out with some of the larger tropical iguanas during the past year indicate that these lizards lack any adaptive response to extreme temperatures. These animals live in a tropical, thermally buffered environment where extreme high or low temperatures are not encountered. The northern limit of the distribution of the species corresponds closely to the southernmost locality where freezing temperatures have been reported.

The most notable additions to the department's collections made during the past year were the 907 excellently preserved reptile and amphibian specimens brought back by the Fifth Archbold Expedition. The little-known islands to the southeast of New Guinea, the site of the expedition, were previously very poorly represented in herpetological collections. As a result of this collection the American Museum now undoubtedly possesses the most complete representation in the world of the herpetofauna of this region.

Collecting in the field was also carried on by Richard G. Zweifel, who took part in the Puritan-American Museum Expedition to the islands off the west coast of Mexico. Specimens were taken on several islands on the west side of the peninsula of Baja California, but the main emphasis was placed on the Tres Mariás Islands, where a study of the herpetofauna stressing aspects of biogeography and insular evolution is intended. This is the first collection made in this area in several decades.

Two new Research Associates were added to the department's staff during the year. Samuel B. McDowell, a student of George Gaylord Simpson, has made notable studies of reptile anatomy and will continue such researches in the department.

Herndon G. Dowling, of the University of Arkansas, has specialized in studies of the systematics of snakes.

DEPARTMENT OF FISHES AND AQUATIC BIOLOGY

The Department of Fishes and Aquatic Biology, while utilizing a wide range of varied marine and fresh-water organisms in its research, continued to present an integrated approach to the problems of aquatic ecology. For the first time the department sponsored experimental work in Crustacea comparable to that which has previously been undertaken in fishes. Dorothy E. Bliss, arriving at the Museum in July, 1956, brought with her much research in progress on various features of crustacean ecology. Her studies on the neurosecretory control of water metabolism and growth in land crabs progressed considerably during the year, and it is anticipated that some fundamental matters involving the whole bearing of ecological conditions on the physiology of these organisms will be elucidated by the work.

A new series of studies on the Sargassum fish, initiated by Charles M. Breder, Jr., Chairman, involved the collaborative efforts of several department members including Priscilla Rasquin, Vladimir Walters, and Paul Zahl who was appointed Research Associate in Physiology during the period covered by the present annual report. These studies, made possible by the development in the department laboratories of a satisfactory miniature system of circulating salt water, cover the pigmentary behavior of the Sargassum fish as well as its reproductive habits and embryology, the flotation of the distinctive egg-rafts, the handling of the peculiar "fishing apparatus," and the manner of operation of the prehensile pectoral fins.

Continuing studies on speared fishes by Francesca R. LaMonte progressed into research on the visceral organs as well as the nature of the complex squamation of these fishes. Miss



The distribution and composition of invertebrate marine organisms, both fossil and recent, were studied by William K. Emerson and Donald F. Squires on the three-month expedition in the Gulf of California. On the same trip, known as the Puritan-American Museum Expedition, mammals were collected by Richard G. Van Gelder and amphibians and reptiles were collected by Richard G. Zweifel

LaMonte did field work both at the Lerner Marine Laboratory and at Ocean City, Maryland, and cooperated closely with investigators in a number of other institutions.

A project on the metabolism of marine fishes, begun last year by Dr. Walters with the support of the Office of Naval Research, moved ahead with field work at the Lerner Marine Laboratory. Satisfactory measurements were obtained of oxygen consumption and carbon dioxide production of fishes under various conditions of resting and activity.

Research on the evolution of cave fishes entered a new phase in which cultures of the various types of cave *Mollienesia* obtained last year from Tabasco, Mexico, were being built up in the laboratory in preparation for experimental work parallel to that already done on the cave characins. Studies in the schooling behavior of fishes involved field work by Dr. Breder at several fresh- and salt-water locations in Florida, including the Cape Haze Marine Laboratory. During the period Dr. Breder also made some progress towards completion of his monograph on the reproductive habits of fishes.

In invertebrate ecology, William K. Emerson continued his studies on the comparative composition of Recent and Pleistocene molluscan faunas. In connection with this work he initiated and developed the first full-scale expedition to be sponsored by the department in some time. Obtaining the support of Harry J. Bauer, Chairman of the Board of Trustees of the University of Southern California, Dr. Emerson led the three-month expedition aboard Mr. Bauer's schooner, the "Puritan," in the Gulf of California. It is anticipated that his extensive collection of fossil and Recent mollusks from this area will be of considerable value in throwing new light on the zoogeography of its marine faunas, both past and present. Three other departments also participated in the Puritan-American Museum Expedition; their activities in this connection are discussed under the headings of the departments concerned.

The fifth volume of Libbie H. Hyman's valuable series on the invertebrates was advanced almost to completion, and Dr. Hyman was able to devote a minor portion of her time to taxonomic studies of free-living flatworms. Horace W. Stunkard continued his development of the life histories of six different genera of trematodes.

Accessions to the department included two interesting collections of fishes: one from the Red Sea, the other from Formosa. John T. Nichols devoted his attention to these as well as to other important aspects of curatorial activity.

LERNER MARINE LABORATORY

In its tenth year of operation the Lerner Marine Laboratory, Bimini, British West Indies, served the needs of 44 visiting scientists. Of particular interest were retinal studies carried on by a group from the Retina Foundation of Harvard University, and investigations into various aspects of sound production in fishes by James M. Moulton of Bowdoin College and Marie Poland Fish of the Narragansett Marine Laboratory. A radio-isotope study of bone and shell formations by Walter Chavin of the Argonne National Laboratory concerned the rates of absorption by various forms of radioactive strontium. Charles J. Fish of the Narragansett Marine Laboratory pursued a productivity study of plankton in the Gulf Stream. Field work at the laboratory by American Museum personnel included research on molluscan taxonomy by William King Gregory.

As part of the continued development of the laboratory's facilities, the cruiser, "Wild Goose," was converted to diesel power, with the addition of a power winch and boom for dredging operations. The year also saw the publication of the third volume of collected reprints of reports on investigations undertaken at the laboratory.

DEPARTMENT OF INSECTS AND SPIDERS

The Department of Insects and Spiders was concerned during the year with its work in the museum, with field work, and with the further development of the Southwestern Research Station. Mont A. Cazier reports that during the year the departmental collection has been studied by more visiting entomologists than at any other time in its history.

Frederick H. Rindge has completed the transfer of all the families of Microlepidoptera of the Palearctic region to units, making them readily available for study, and the entire collection of Sphingidae has been repinned and relabeled. He is now working on the Rocky Mountain material collected on the 1956 field trip.

C. H. Curran has incorporated most of the miscellaneous Diptera into their respective families and rearranged the Asilidae. He is continuing the study of the syrphid genus *Microdon* and the family Mydidae.

Willis J. Gertsch spent two and one-half months collecting and studying arachnids in Arizona and Mexico, accompanied by Vincent Roth. An addition of 9770 specimens was made to the collection. Accompanied by Raymond W. Forster, he spent two weeks in Florida this spring, collecting 2000 spiders and a few hundred insects.

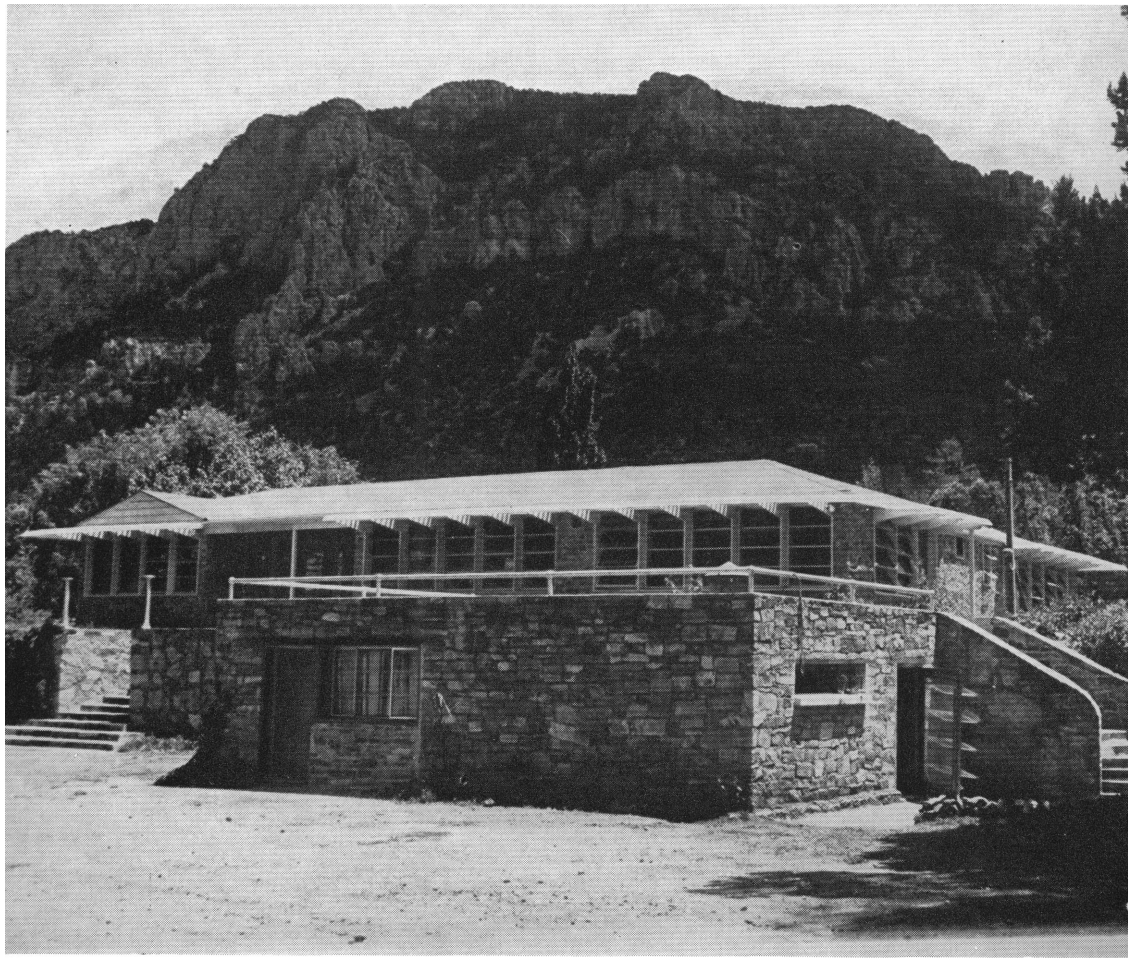
Alice Gray continued to work with the Department of Exhibition, particularly on the insect-tree relationship in the Hall of North American Forests and also on plans for the new Insect Hall. Patricia Vaurie is continuing work on the revision of the genus *Diploptaxis* and was recently in Europe studying types in various museums, a study made possible by a National Science Foundation grant.

Frederico Lane, of São Paulo, Brazil, is engaged in the revision of many genera of the family Cerambycidae from tropical America.

During the past six years, the research program of the department has been concentrated on the insect and spider fauna of the Western Hemisphere, as New World collections are so large and this fauna is readily accessible. Through its activities in field research, exchange, gifts, and purchases the collection has increased by 1,006,024 specimens during the six-year period. A new series of publications is also being established, featuring monographic works illustrated with color plates. The first volume will be "Butterflies of the American Tropics; the Genus *Anaea*" by the late William P. Comstock.

THE SOUTHWESTERN RESEARCH STATION

Dr. Cazier has devoted most of his time to the organization of the Southwestern Research Station and its new Osborn Laboratory. During its first year of operation, the station was host



The Osborn Laboratory at the Museum's Southwestern Research Station near Portal, Arizona, provided research facilities for 80 scientists and 43 students during the year. Surrounded by a rich variety of flora and fauna, the station offers visiting research workers the opportunity to study in five distinct "life zones"

to 82 scientists, four of whom revisited the station many times. Thirteen fields of research in natural history were covered. During the second year, the station welcomed 80 specialists and 43 students, who engaged in 20 different fields of activity.

The station now has eight cabin units and two bachelor quarters, with a total capacity of about 53 individuals or ten families. In addition, there is trailer space and improved camp-

ing areas with unlimited capacity. Through the generosity of David Rockefeller and Herbert F. Schwarz, the station procured much valuable equipment not heretofore available in this area, thus enhancing and enlarging the scope of research activities.

The S. W. Williston Library on Diptera, consisting of several hundred volumes and reprints, forms the nucleus of the library. A number of modern reference texts and several thousand reprints on all subjects of natural history have been added, including hundreds of papers from the library of the late John T. Zimmer.

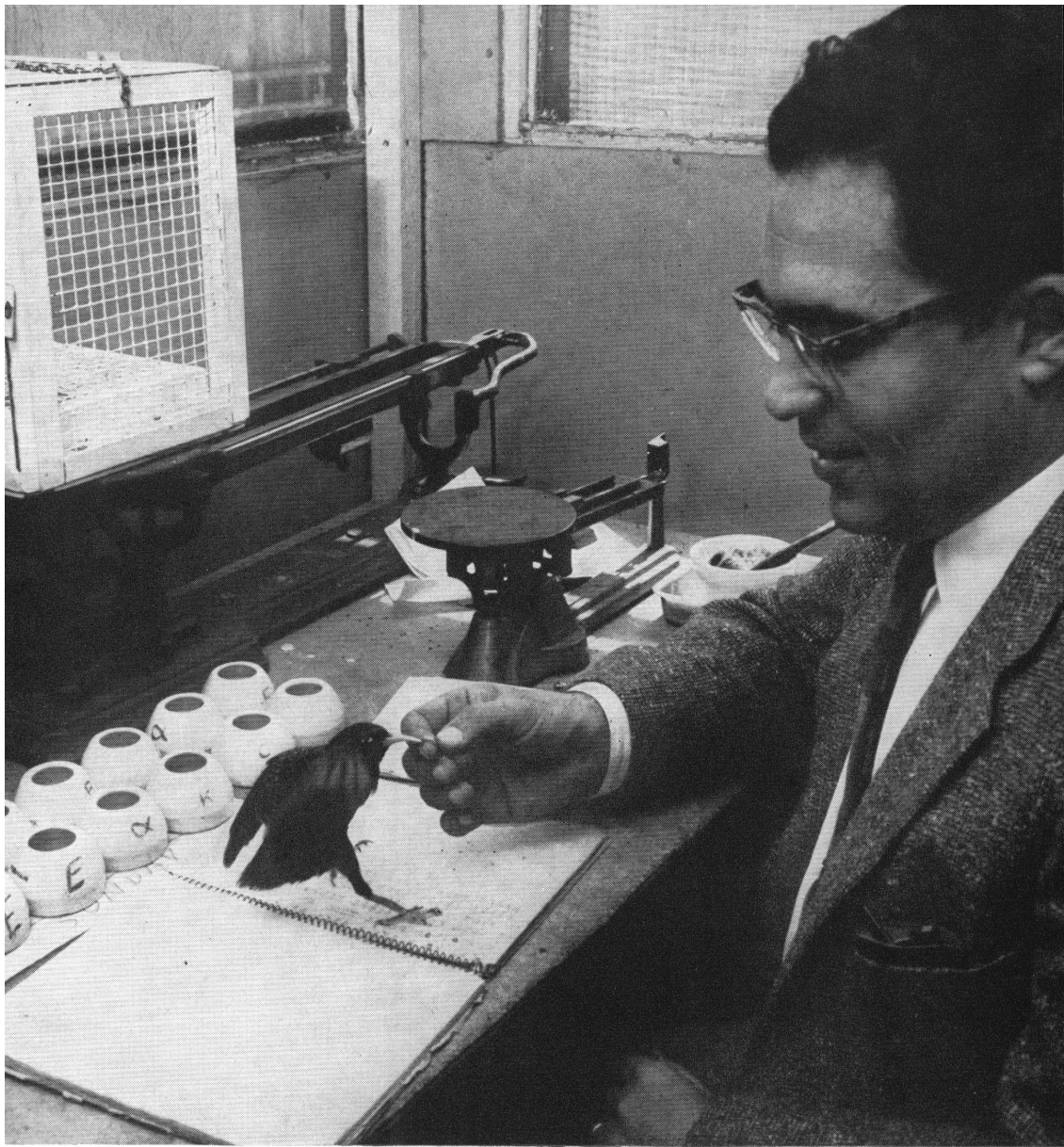
The following were appointed Research Associates: Patricia Vaurie, Coleoptera; Ralph V. Chamberlin, Arachnida; Frederick M. Snyder, Diptera; and F. Martin Brown, Lepidoptera.

DEPARTMENT OF ANIMAL BEHAVIOR

The interaction of environment and heredity, and the role played by each in the development of fishes, birds, cats, and other animals, have been the major problem underlying the research work of the Department of Animal Behavior.

While the efforts of most animal behaviorists in the United States have been directed during the last few decades to the problems of learning, this department's interest has been oriented towards an understanding of those highly stereotyped behavior patterns of animals that are frequently referred to as "instinctive."

For one important study, a continuation of research by Theodore C. Schneirla on the biology and behavior of Nearctic army ants, the department was awarded a grant from the National Science Foundation. During the period under discussion Dr. Schneirla studied ten colonies of the species *Neivamyrmex nigrescens* for evidences of cyclical behavior patterns, well known in related tropical species. He discovered that these patterns did exist and were related to the periodic stimulation of the adult by the developing brood.



Research on the visual capacity of starlings, undertaken by Helmut E. Adler, was part of a long-range project to elucidate the extent to which birds use vision to migrate unerringly

Lester R. Aronson, Chairman of the Department, and Kenneth Cooper carried on a study of the persistence of mating behavior in castrated male cats. The experiment was designed to discover if there is any difference in the persistence of mating behavior after cessation of hormone treatment in sexually experienced castrated males, depending on whether or not they were allowed sexual experience during the period of hormone administration. Results thus far indicate that there is much less persistence in those males permitted no sexual experience during the period of hormone administration.

A study of the effect of stress on animals as induced by intense light, cortisone, and epinephrine was carried on by Drs. Schneirla and Tobach, with the assistance of H. Block. When the animals so subjected were later exposed to diseases, such as tuberculosis, they were more resistant than animals not exposed to earlier stressful situations. This has an important bearing on the differences between wild and domesticated or captive animals, as stress is most often encountered by animals in the wild state.

Visual capacity in birds was the major research problem of Helmut E. Adler, who, with John Dalland, has been measuring the vision of starlings, using an elaborate apparatus designed and constructed especially for this purpose. Part of a long-range project to try to understand to what extent birds use vision to migrate unerringly, the experiments undertaken during the year were to determine starlings' capacity to discern detail and the dimmest lights of varying colors that these birds are able to see. Preliminary indications are that the night vision of starlings is limited, especially at the red end of the spectrum.

Evelyn Shaw, on a research fellowship from the National Institutes of Health, conducted experiments on the influence of early experience on the sexual behavior of male platyfish. This work makes it evident that effective mating behavior at maturity may depend on an early life which is rich in general

experience. These early experiences contribute extensively to the socializing process which forms the framework for sexual behavior.

Dr. Schneirla and Jay S. Rosenblatt continued their study on the adjustment of kittens to the mother and other members of the litter. Kittens were taken from their mother on varying days after birth, raised in solitary confinement in an incubator, and after a number of weeks were returned to the parent and litter mates. The result showed clearly that the earlier the kittens were removed from the mother and the longer they were kept away the more difficult was the readjustment.

Other phases of the department's research activities were supported by grants from the National Research Council, and from the Rockefeller Foundation.

DEPARTMENT OF GEOLOGY AND PALEONTOLOGY

The attention of scientists in the Department of Geology and Paleontology is divided between laboratory research, exhibition, and field work. Although the department's collections of fossil material is already the most comprehensive in existence, expeditions are of prime importance in furnishing new material and information for research problems.

As part of his long-range study of the fossil mammals of South America, George Gaylord Simpson, Chairman of the Department, and a group from the Museum participated in an expedition to the Alto Jurúa River in the territory of Acre, Brazil, during the summer of 1956. The expedition, which was co-sponsored by the Museum and the Departamento Nacional de Produção Mineral of Brazil, was the first of its kind to visit this little-known region of South America. As a result of the trip the previously unknown upper river area has been mapped to the Peruvian border, and the largest collection of vertebrate fossils ever made in the Amazon Basin will be studied jointly by Dr. Simpson and Brazilian scientists.

Several field trips were carried out during the year for the

purpose of enlarging the Museum's fossil invertebrate collections. Norman D. Newell brought back Permian invertebrates from Mexico and Guatemala, and Donald F. Squires collected specimens of fossil corals both along the coast of the Gulf of Mexico and in the Gulf of California, in the latter area while Dr. Squires was a member of the Puritan-American Museum Expedition.

Dr. Newell also resumed work on his biogeological survey of Bimini and the Great Bahama Bank, completing a detailed map of the terrain and vegetation of the island. Work was also begun on a map of the bottom of Bimini lagoon. Dr. Squires reported progress in his study of Triassic coral fauna and, in addition, began a survey of the living corals of the Japanese continental shelf.

Edwin H. Colbert continued work on several long-range projects, most of them involving Triassic fossils and sediments. Specific research problems are those on the Triassic dinosaurs of North America, and work on the tritylodonts, mammal-like reptiles about the size of our modern domestic cat that lived about 175 million years ago. In collaboration with Joseph T. Gregory of Yale University, Dr. Colbert also completed a study of the continental Triassic sediments of North America scheduled to be published by the Geological Society of America.

Two extended projects occupied the time of Bobb Schaeffer: a faunistic and paleo-ecologic analysis of the Mesozoic fishes of the world, and a critical review of the paleoniscoid fishes. Dr. Schaeffer also traveled to Europe to examine fossil fish collections in Denmark, Sweden, Norway, Great Britain, France, Germany, and Switzerland.

Brian H. Mason continued his studies of the mineralogy and petrology of the metamorphic rocks of the Southern Alps of New Zealand. He also visited and collected from mines and mineral deposits in the southwestern United States and Mexico. A particularly fine suite of specimens was obtained from the uranium mines on the Colorado Plateau.



Two baby Protoceratops, primitive horned dinosaurs that lived about 120,000,000 years ago, hatch from their eggs. The model is part of a new exhibit in Tyrannosaur Hall which was redesigned and refurbished during the year

Tyrannosaur Hall, a striking exhibition of life on earth 120,000,000 years ago and the world's most comprehensive display of Cretaceous dinosaurs, was reopened to the public after having been closed for more than a year for redesign and refurbishing. Around the walls of the hall, in newly lighted and brightly painted cases, are dinosaurs of almost every shape and description representing the apex of evolution of these animals. Giant meat-eating, duck-billed, horned, and armored dinosaurs, as well as flying reptiles, are on view. One of the highlights of the exhibition is a new display called "The Birth, Life, and Death of a Dinosaur." With the use of the Museum's unique collection of *Protoceratops* fossils, discovered in Outer Mongolia during the Central Asiatic Expedition of the 1920's, the exhibit illustrates the growth of a dinosaur from the egg until death.

The past year also saw progress in the planning of exhibits in the Giant Sloth Hall. The largest display in the hall, and one of the largest single displays in the entire Museum, an exhibit devoted to fossils and their interpretation, is now being installed and should be completed soon.

DEPARTMENT OF MICROPALAEONTOLOGY

A major activity of the Department of Micropaleontology during 1956-1957 was a continuation of the Long Island Sound Project, an ecological study of the sediments and micro-organisms in the Sound under the direction of Brooks F. Ellis, Chairman of the Department. The project, which receives partial support from Abercrombie and Fitch, began last year. The field phase of the program includes an examination of the sediments and associated micro-organisms by skin-divers and by remote-control apparatus, while the laboratory work involves detailed examination of field samples, and experimental ecology.

The sediment that is characteristic of the bottom of the Sound is made up of myriad substances, from tiny invertebrates, which can be seen only through a microscope, to larger marine



As part of his sedimentation survey of Long Island Sound, Brooks Ellis took core samples of the Sound bottom. Graduate students in Geology at New York University assisted in the work

life, plants, and the waste products of civilization. The purpose of this project is to discover something about how these substances get where they are, their relationships with one another, the ways in which they are deposited and become mud, and even what that mud may become in several million years.

Two new research projects were initiated for the Carter Oil Company of Tulsa, Oklahoma. The first is for the purpose of determining the nature of microforaminifera, to study their ecology, and to learn whether they are of practical importance in the search for oil. Both fossil and living microforaminifera are under study, as living representatives of the group have been found in faunas from Bimini, Staten Island, and Long Island Sound. They may represent a true dwarf race or may be a hitherto unknown part of the life cycle of normal-sized forms. This research has been carried on under the direction of Dr. Ellis and Angelina R. Messina.

A similar study was begun at approximately the same time of the tiny thorny spheres known as hystrichospherids. These microscopic forms have been known to science for some time, but their taxonomic positions and affinities are still unknown. The research task is to determine what they are and how they can be used. This project was under the direction of L. R. Wilson, Research Associate, and will be continued at the University of Oklahoma, where Dr. Wilson is now teaching.

Work on the definitive catalogue of Ostracoda being compiled by Dr. Ellis and Miss Messina continued, and volumes 8 and 9 were published during 1956-1957. *Micropaleontology*, the professional journal published by the department and edited by Miss Messina, now has about 1000 subscribers and is firmly established as the leading quarterly in this field.

ASTRONOMY AND THE AMERICAN MUSEUM-HAYDEN PLANETARIUM

Growth and development for every program in the American Museum-Hayden Planetarium are reported by Joseph Miles

Chamberlain, Chairman. Never in 22 years of operation has the Planetarium been more active or more effective in fulfilling the many roles assigned to it.

New projects begun include a radio astronomy research program, a new curriculum in advanced astronomy, and improved service to teachers and students in local colleges and schools.

K. L. Franklin, who joined the Planetarium staff last year, is principal investigator for the radio astronomy project, a program to investigate the radio frequency noises emanating from the planet Jupiter. With a grant from the National Science Foundation, as well as support from Planetarium funds, Dr. Franklin began actual work in February. Site of the investigations is the Lamont Geological Observatory of Columbia University. Through observation of the radio frequency spectrum of Jupiter, Dr. Franklin hopes to contribute data that will aid in determining the cause of the static-emissions from this planet.

Under the supervision of Franklyn M. Branley, a specialist in science education who joined the staff last year, the educational services of the Planetarium were expanded, and aspects already well established were further strengthened. Studies made to determine the needs of teachers, students, and laymen in the metropolitan area resulted in the initiation of two new courses: an astronomy seminar and a course in intermediate astronomy. In addition, plans were made for two new courses to be given in the coming year: a college credit course in descriptive astronomy given in cooperation with New York University and a course in astronomy for teachers.

Highlights of the exhibition program included installation of the Great Clock, built by William Herschel, acquired on loan from Fordham University; of a weather telephone, a gift of the New York Telephone Company; and the refurbishing of the Willetts Memorial Weather exhibit. In addition, topical displays were introduced in connection with the close approach to the earth of the planet Mars and with the appearance of comet Arend-Roland.

Under the supervision of Thomas D. Nicholson, Associate Astronomer, the popular sky demonstrations presented daily in the dome have placed new emphasis on latest research developments in the field of astronomy. A greater use of art and visual material has also been introduced. Enthusiasm for these innovations in the sky show has been widespread. Planetarium attendance exceeded 608,000 for the twelve-month period reported on. This is an all-time record for any fiscal year since the Planetarium opened.

VEGETATION STUDIES

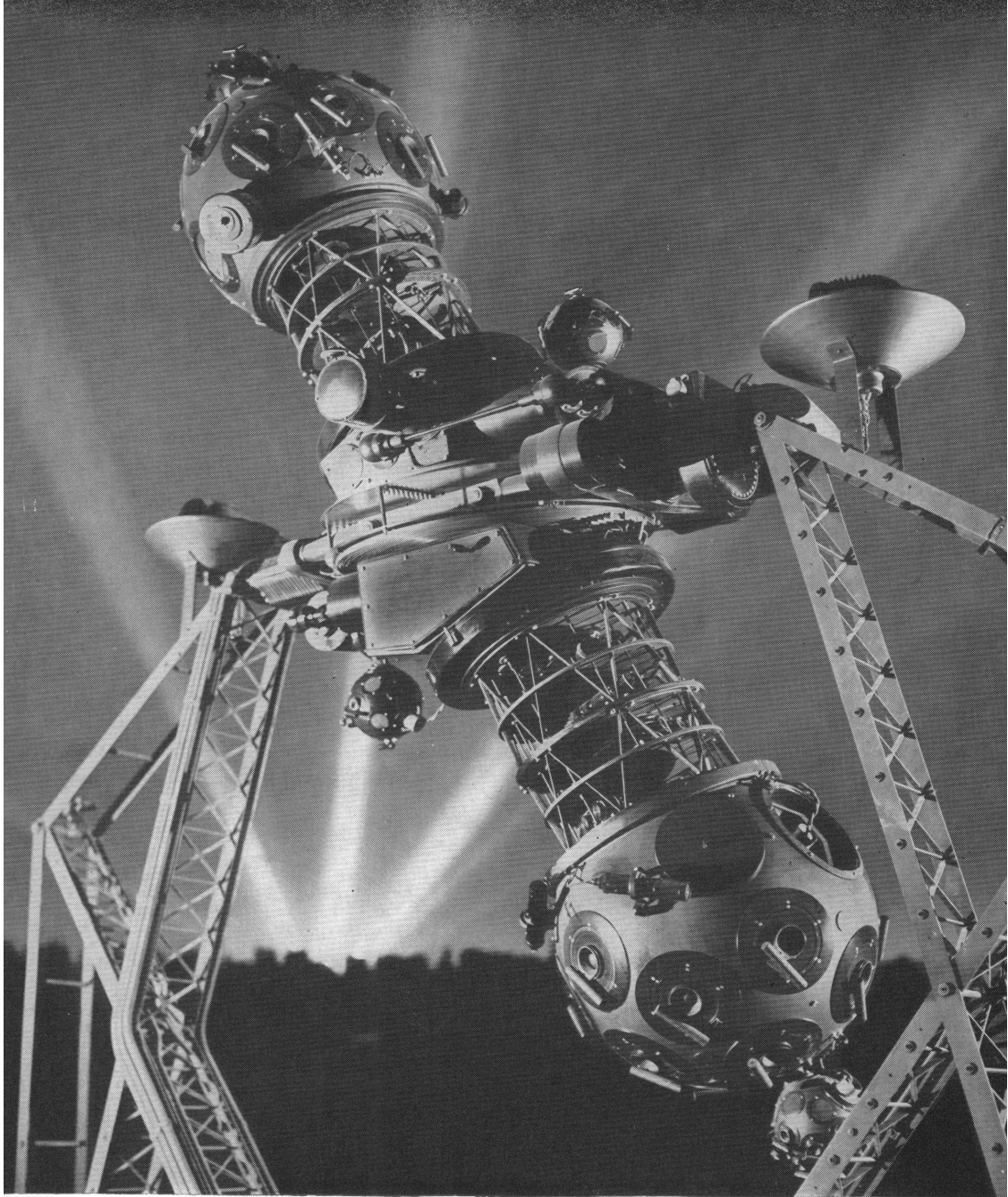
Jack McCormick, in charge of Vegetation Studies, has been engaged in a variety of research projects and exhibition work during the past year.

A study of the original vegetation of the state of Indiana was completed, based on the data obtained by the original United States Land Survey from 1795 to 1835. Work also continued on a detailed investigation of vegetation of southwestern Indiana based on contemporary field studies and the data from the original United States Land Surveys.

Other studies included a comparison of instruments designed to measure tree cover, an investigation of saw-fly damage to trees in southern New Jersey, and the effect of prescribed burning on saw-fly populations.

Vegetation Studies collaborated with the New Jersey Department of Conservation on the establishment of natural areas on the Wharton tract in southern New Jersey. In cooperation with the Nature Conservancy and the Indiana Department of Conservation, pledges were obtained for the purchase of a 600-acre tract of land in west central Indiana, known as Pine Hills. This tract will be added to the Shades State Park when the purchase is completed.

The Oak-Hickory, Jeffrey Pine, and Spruce-Fir Groups for the Hall of North American Forests were completed during the year. A Piñon-Juniper Group was collected from the Colorado



The Zeiss projector in the American Museum-Hayden Planetarium revealed the fascinating, ever-changing story of the sky to more than 600,000 visitors during the year. This complex instrument enables audiences to view the stars from any part of the world at any point in time

National Monument during October of 1956, and preparation work is well along towards completion. The exhibits "How Man Harvests" and "How Forests Serve Man," first of 21 teaching units, were finished in May.

DEPARTMENT OF PUBLIC INSTRUCTION

John R. Saunders, Chairman of the Department of Public Instruction, lists a grand total of 15,437,058 contacts by all the educational services of the Museum during the past year, of which 9,979,961 were made by the department. The remaining 5,457,097 were accomplished by other departments, divisions, and services, including Membership, Guest Services, the Film Library, and the Slides Library.

The "World We Live In" program for city school classes grades 3 to 9 continued to be the major program of the Department of Public Instruction. The teaching staff, working in close coordination with the schools, revised and improved the program.

The entire staff of senior instructors and instructors participates in this daily program which is under the supervision of Marguerite R. Ross, Supervising Instructor.

During the year, museum educators and school officials from the following countries have visited the Museum to observe this program in action: England, West Germany, Austria, Pakistan, India, Japan, Afghanistan, Canada, and New Zealand.

Considerable materials were added during the year to the department's growing collections. Included were contemporary ethnic material from rural communities in Mexico, India, and Alaska (Eskimo). The material from Mexico and Alaska was collected by members of the department staff while on vacation. These articles are in daily use in program demonstrations as well as in teachers' courses. Several new teaching films were purchased and used on the weekly program.

The High School Science Program is unique in the special



The Hall of North American Forests moved towards completion with the preparation of the last of twelve habitat groups. Here, Matthew Kalmenoff paints a background for the Oak-Hickory Group

educational service it renders to selected students of biology from the senior high schools. During the past year the program was modified to include, in addition to the two-hour study tour of the Animal Behavior laboratories, a tour of the Genetics Laboratory of the New York Zoological Society, and a study discussion of the paleontological exhibits. The department is deeply grateful to Lester Aronson and Myron Gordon for their cooperation in making this program expansion possible.

Museum courses for teachers this year follow a pattern similar to those of last year. Special emphasis has been placed on natural science in terms of numbers of courses given. For the year, eleven different courses were available, one being repeated in the spring session. C. Bruce Hunter, Supervisor of Adult Programs, announced that a new course in museum resources has been filled to capacity and that there has been a decided increase in the size of classes in natural science as well.

The Museum-sponsored study tour to Central America proved most successful. Fifteen students enrolled, left New York by plane, visited and studied at all the important archeological zones in Mexico, in remote regions of Guatemala, and at the famous zones of Chichen Itza and Uxmal in Yucatan, and returned to New York after five weeks in the field. This field trip was accredited by the Board of Education for six credits.

In addition to the extensive field trip to Central America, two other field trips were undertaken. The first was to Bimini Island and the second to the Archbold Station in Florida. The purpose of both trips was to survey these areas as possible work areas for educational projects in natural science that might be directed to natural science teachers in the New York City schools.

Because of increasing interest by schools of nursing concerning the nursing education program, it was felt that the whole nurse-education program should be reëvaluated. This was done by conducting a survey of all nurse-education schools in the Greater New York area. The total number of nurses-in-training



The Natural Science Center for Young People continued, in its third year, to help city children become familiar with the wildlife of the metropolitan area. Here Michael Hackshaw-Stoute, one of the Center's "regulars," works on a new exhibit

for the existing program for the year was 465 persons.

Farida A. Wiley, Honorary Associate in Natural Science Education, assisted by six instructors, held a series of programs for the layman in natural science, including "Camp Counselors and Youth Leaders," "Local Birds, Plants, and Animals," and "Birds, Their Habitats and Their Relationships to Man."

THE NATURAL SCIENCE CENTER FOR YOUNG PEOPLE

The Peter Van Gerbig Natural Science Center for Young People, now well into its third year of operation, continues to attract a large number of boys and girls interested in local natural history.

Many physical improvements have been made to the center during the past year, and a special gift from the Peter Brookdale Fund has enabled the department to buy equipment for the main room and to furnish the office and the children's work and study rooms. Lois Hussey, Assistant Chairman of the Department of Public Instruction, in addition to her regular assignments, supervises the Natural Science Center.

Through its exhibits, the center provides the inspiration and challenge for many activities and, through the staff, the needed guidance and assistance for carrying them to a conclusion.

The Circulating Exhibits Division of the Department, under the supervision of Carleton Beil, served approximately 500 different schools and educational and community organizations in New York City during the past year. Almost 9000 loans of exhibit material were organized and delivered by Museum trucks, and these were seen by a total audience of 9,500,000 people. The individual loans varied from a single exhibit to an assortment of specimens and exhibits.

EXHIBITION AND CONSTRUCTION

The activities of the Museum's artists, designers, and construction staff included much work mentioned above in con-



The colorful, modern exhibit "To Make To Know How" illustrated some of the Museum's educational activities during its first 87 years. The temporary display took its title from Webster's first definition of the word "teach." This was one of twelve temporary exhibitions held during the year

nection with the scientific departments. Under the supervision of Gordon Reekie, Manager of Exhibition and Construction, these groups were actively concerned with all phases of the Museum's exhibition program and with improving building maintenance.

Continuing its exploration of new techniques of display and construction, the Exhibition Department has made great prog-

ress in plastic embedding and infiltration of specimens. In the Hall of Biology of Man, in particular, internal organs and human tissue have been infiltrated with great success, with no distortion of physical characteristics and structure. The utter realism of exhibit specimens thus treated and their ability to retain this quality indefinitely are the great virtues of this technique. Some problems of color retention still remain to be solved, but the department is well on the way to reaching a solution to this most difficult aspect of preservation.

Making a visit to the Museum pleasanter and simpler was a major activity during the year. Under the supervision of the Planning Department, murals by the well-known illustrator Robert Osborn, "spoofing" Museum activities ranging from digging for dinosaurs to preparing elephants for display, were installed in the Museum's cafeteria. Numerous signs, floor plans, and posters designed by the graphic artists added to the exhibition floors were of great aid in guiding the Museum visitor through a tour of our 58 exhibition halls. Installation by the City of new library storage stacks, to be used when the new library is constructed, should expedite work for the thousands of scholars and interested laymen who use the library's facilities each year. Visitors to the Museum Shop not only had more room in which to browse but more attractive surroundings as a result of an extensive remodeling and refurbishing of the shop.

A temporary exhibition program, set up early in the year, was responsible for twelve exhibitions ranging from an illustrated history of the work of the Museum's Education Department, "To Make to Know How," to photographic displays of various cultures in widely separated parts of the world. Bright and contemporary in feeling, these displays provided the opportunity to experiment with new structural units and unusual layout ideas.

MEMBERSHIP

Membership in the American Museum rose 7.8 per cent during the year, according to William A. Burns, Membership Sec-

retary. A grand total of 76,186 members was recorded in all classes. Junior Membership was established, with two classes (Explorers and Adventurers) enjoying privileges similar to those enjoyed by adult members.

MUSEUM STAFF

After 22 years as Editor of *Natural History* magazine, Edward Moffatt Weyer, Jr., resigned on April 1, 1957, to return to the field of research and writing. Under Dr. Weyer's devoted guidance, the magazine gained recognition nationally and internationally as a leading publication in the field of the natural sciences. He has been succeeded by John F. Purcell.

Junius B. Bird was promoted from Associate Curator of Archeology to Curator of South American Archeology, and Gordon F. Ekholm was similarly advanced from Associate Curator of Archeology to Curator of Mexican Archeology. Robert L. Carneiro was appointed Assistant Curator of Ethnology. Philip C. Gifford was appointed Scientific Assistant, Department of Anthropology.

Dean Amadon was promoted to Chairman of the Department of Birds, and Wesley E. Lanyon was appointed Assistant Curator in that department.

Agni Vlavianos was appointed Scientific Assistant in the Department of Geology and Paleontology.

Isabel Mount was appointed Assistant Manager, Department of Public Relations, and Barbara Swift was appointed Senior Public Relations Representative.

ATTENDANCE

During the fiscal year here reported on, 1,859,305 people visited the Museum and 608,411 visited the Planetarium, making a combined total of 2,467,716. This represents an increase of 75,872 for the Museum and 34,911 for the Planetarium. Attendance for the Planetarium was the highest recorded for any fiscal year since its opening.

THE AMERICAN MUSEUM OF NATURAL HISTORY

Financial Statements

For the Fiscal Years ended June 30, 1957 and 1956

THE AMERICAN MUSEUM

BALANCE

June 30,

ASSETS:	1957	1956
Current funds:		
General funds:		
Cash	\$ 33,416	\$ 30,004
Accounts receivable	294,329	216,834
Inventories, principally publications	93,598	81,983
Prepaid expenses and deferred charges	60,802	79,054
	<u>\$ 482,145</u>	<u>\$ 407,875</u>
Special funds:		
Cash	\$ 479,924	\$ 439,597
U. S. Government bonds, at cost	211,000	186,000
Accounts receivable	6,082	3,940
	<u>\$ 697,006</u>	<u>\$ 629,537</u>
Exhibition halls funds:		
Cash	\$ 25,637	\$ 263,962
U. S. Government bonds, at cost	539,000	514,000
Due from general funds	127,173	
	<u>\$ 691,810</u>	<u>\$ 777,962</u>
	<u>\$ 1,870,961</u>	<u>\$ 1,815,374</u>
Endowment funds:		
Cash	\$ 5,983	\$ 56,904
Investments (market June 30, 1957, \$27,740,300) (Notes 1 and 2):		
Bonds	12,592,767	9,422,162
Preferred stocks	2,096,618	2,561,863
Common stocks	7,090,019	8,276,519
Other	34,748	34,936
	<u>\$21,820,135</u>	<u>\$20,352,384</u>
Investment in bonds of The American Museum of Natural History Planetarium Authority, \$570,000 principal amount, at cost (Note 3)	<u>\$ 425,000</u>	<u>\$ 425,000</u>
Pension funds:		
Cash	\$ 81,342	\$ 167,429
Investments, at cost (market June 30, 1957, \$5,536,900):		
Bonds	4,074,611	3,104,013
Preferred stocks	809,621	762,536
Common stocks	612,762	967,450
Loan receivable	510	550
	<u>\$ 5,578,846</u>	<u>\$ 5,001,978</u>
	<u>\$29,694,942</u>	<u>\$27,594,736</u>

The accompanying notes are an integral part of this statement.

OF NATURAL HISTORY

SHEETS

1957 and 1956

FUNDS and LIABILITIES:		1957	1956
Current funds:			
General funds:			
Accounts payable, payroll taxes withheld, etc.	\$	57,249	\$ 41,220
Deferred income, principally unearned dues and subscriptions		300,436	334,593
Due to exhibition halls funds		127,173	
Appropriations for outstanding commitments		46,091	64,475
		530,949	440,288
Deficit (Note 6)		48,804	32,413
	\$	482,145	\$ 407,875
Special funds:			
Balances of funds available for specific purposes, net of overdrafts (Note 6)	\$	697,006	\$ 629,537
Exhibition halls funds:			
Funds for exhibition halls rehabilitation	\$	691,810	\$ 777,962
	\$	1,870,961	\$ 1,815,374
Endowment funds:			
Endowment funds, income available for:			
Restricted purposes	\$	9,889,996	\$ 9,280,036
Unrestricted purposes		5,880,721	5,479,580
Funds functioning as endowment, principal and income available for:			
Restricted purposes		574,337	526,751
Unrestricted purposes (Notes 2 and 5)		5,475,081	5,066,017
	\$	21,820,135	\$ 20,352,384
Funds invested in the bonds of The American Museum of Natural History Planetarium Authority (no change during year)		\$	\$ 425,000
Pension funds:			
Pension fund balance	\$	5,577,719	\$ 5,000,851
Welfare fund balance		1,127	1,127
	\$	5,578,846	\$ 5,001,978
	\$	29,694,942	\$ 27,594,736

GENERAL FUNDS
SUMMARY STATEMENT OF CHANGES
for the fiscal years ended June 30, 1957 and 1956

	1957	1956 (Note 7)
Deficit, beginning of year	\$ 32,413	\$ 44,692
Less, Transfers from unrestricted funds functioning as endowment	<u>32,413</u>	<u>44,692</u>
	<u>—</u>	<u>—</u>
Income:		
Appropriation from the City of New York	\$1,354,672	\$1,261,301
Endowment funds	967,551	926,949
Outside trusts and foundations	49,281	53,857
Gifts and grants	175,700	175,081
Other (Notes 2, 3 and 4)	<u>311,611</u>	<u>290,335</u>
	<u>\$2,858,815</u>	<u>\$2,707,523</u>
Expenses and appropriations:		
General administration	\$ 487,519	\$ 457,654
Educational activities	1,162,639	1,126,623
Pension and other social benefits	225,163	210,327
Operation and maintenance of physical plant	1,038,700	930,028
Appropriations transferred to special funds	11,982	—
Appropriation for outstanding commitments at end of year	<u>46,091</u>	<u>64,475</u>
	<u>\$2,972,094</u>	<u>\$2,789,107</u>
Less, Appropriation for outstanding commitments at beginning of year	<u>64,475</u>	<u>49,171</u>
	<u>\$2,907,619</u>	<u>\$2,739,936</u>
Deficit, end of year	<u>\$ 48,804</u>	<u>\$ 32,413</u>

The accompanying notes are an integral part of this statement.

SPECIAL FUNDS
SUMMARY STATEMENT OF CHANGES IN FUND BALANCES
for the fiscal years ended June 30, 1957 and 1956

	1957	1956
Balance, beginning of year	\$659,883	\$572,776
Less, Overdrafts (Note 6)	<u>30,346</u>	<u>4,975</u>
	<u>\$629,537</u>	<u>\$567,801</u>
Income:		
Endowment funds	\$ 98,801	\$ 92,326
Gifts and grants	391,999	395,791
Other	102,408	83,146
Transfers from general funds	<u>11,982</u>	<u>—</u>
	<u>\$605,190</u>	<u>\$571,263</u>
Expenditures for the special purposes and objects for which the funds were established	\$520,221	\$509,527
Transfers to exhibition halls funds	<u>17,500</u>	<u>—</u>
	<u>\$537,721</u>	<u>\$509,527</u>
Balance, end of year	\$723,494	\$659,883
Less, Overdrafts (Note 6)	<u>26,488</u>	<u>30,346</u>
	<u>\$697,006</u>	<u>\$629,537</u>

The accompanying notes are an integral part of this statement.

EXHIBITION HALLS FUNDS
SUMMARY STATEMENT OF CHANGES IN FUND BALANCES
for the fiscal years ended June 30, 1957 and 1956

	<i>1957</i>	<i>1956</i>
Balance, beginning of year	<u><u>\$777,962</u></u>	<u><u>\$843,599</u></u>
Income:		
Endowment funds	\$ 395	\$ 382
Gifts and grants	68,847	51,916
Other	564	381
Transfers from special funds	<u><u>17,500</u></u>	<u><u>—</u></u>
	<u><u>\$ 87,306</u></u>	<u><u>\$ 52,679</u></u>
Expenditures for exhibition hall program	<u><u>\$173,458</u></u>	<u><u>\$118,316</u></u>
Balance, end of year	<u><u>\$691,810</u></u>	<u><u>\$777,962</u></u>

ENDOWMENT FUNDS
SUMMARY STATEMENT OF CHANGES IN PRINCIPAL
for the fiscal years ended June 30, 1957 and 1956

	1957	1956
Balance, beginning of year:		
Endowment funds, income available for:		
Restricted purposes	\$ 9,280,036	\$ 8,865,497
Unrestricted purposes	5,479,580	4,892,152
	<u>\$14,759,616</u>	<u>\$13,757,649</u>
Funds functioning as endowment, principal and income available for:		
Restricted purposes	\$ 526,751	\$ 485,497
Unrestricted purposes	5,066,017	4,865,967
	<u>\$ 5,592,768</u>	<u>\$ 5,351,464</u>
Totals	<u><u>\$20,352,384</u></u>	<u><u>\$19,109,113</u></u>
Additions:		
Gifts and bequests, etc. (Note 2)	\$ 272,197	\$ 661,855
Net profit on sales of investments	1,353,194	649,692
	<u>\$ 1,625,391</u>	<u>\$ 1,311,547</u>
Deductions:		
Expenditures, for custodian fee	\$ 5,000	\$ 5,000
Transfers to general funds:		
For payment of certain expenses	14,227	9,475
To dispose of operating deficit of preceding year	32,413	44,692
Transfers to pension fund for past service costs, including cost of amendment to plan in 1957	106,000	9,109
	<u>\$ 157,640</u>	<u>\$ 68,276</u>
Net additions	<u><u>\$ 1,467,751</u></u>	<u><u>\$ 1,243,271</u></u>
Balance, end of year:		
Endowment funds, income available for:		
Restricted purposes	\$ 9,889,996	\$ 9,280,036
Unrestricted purposes	5,880,721	5,479,580
	<u>\$15,770,717</u>	<u>\$14,759,616</u>
Funds functioning as endowment, principal and income available for:		
Restricted purposes	\$ 574,337	\$ 526,751
Unrestricted purposes	5,475,081	5,066,017
	<u>\$ 6,049,418</u>	<u>\$ 5,592,768</u>
Totals	<u><u>\$21,820,135</u></u>	<u><u>\$20,352,384</u></u>

The accompanying notes are an integral part of this statement.

PENSION FUNDS
SUMMARY STATEMENT OF CHANGES IN PRINCIPAL
for the fiscal years ended June 30, 1957 and 1956

	1957	1956
Balance, beginning of year:		
Pension fund	\$5,000,851	\$4,620,147
Welfare fund	1,127	1,127
	<u>\$5,001,978</u>	<u>\$4,621,274</u>
Additions:		
Payments by subscribing members	\$ 129,413	\$ 128,742
Payments by general and other funds	153,832	155,345
Payment by unrestricted funds functioning as endow- ment in connection with amendment to plan	106,000	—
Income from investments	197,450	182,875
Net profit on sales of investments	194,169	114,500
	<u>\$ 780,864</u>	<u>\$ 581,462</u>
Deductions:		
Payments to members and beneficiaries	\$ 199,094	\$ 196,305
Expenses	4,902	4,453
	<u>\$ 203,996</u>	<u>\$ 200,758</u>
Net additions	<u>\$ 576,868</u>	<u>\$ 380,704</u>
Balance, end of year:		
Pension fund	\$5,577,719	\$5,000,851
Welfare fund	1,127	1,127
	<u>\$5,578,846</u>	<u>\$5,001,978</u>

NOTES TO FINANCIAL STATEMENTS

1. The land, buildings and equipment utilized by the Museum are either owned by the City of New York or were charged off at the time of purchase and, therefore, are not reflected in the balance sheet. No valuation of exhibits, collections, library, etc., has been established for balance sheet purposes.

Investments are recorded at cost in respect of those purchased, and in respect of those acquired by gift, bequest or otherwise at market valuations at the dates of acquisition, probate court valuations or valuations established by the trustees.

2. The Museum owns an interest in certain mining properties acquired through a bequest. No valuation has been recorded on the books for the interest in these properties and, therefore, it is not reflected in the balance sheet. However, the Museum receives royalties from this source and such royalties are recorded, when received, as additions to unrestricted funds functioning as endowment (as bequests) or to current general funds. During the fiscal years ended in 1957 and 1956 royalties received, net of expenses, amounted to \$118,617 and \$137,651, respectively, of which \$50,000 was credited to general funds (other income) in each year.
3. The Planetarium Authority is operated under the supervision of the Museum's management. Its financial statements and the auditors' opinion with respect thereto are annexed. Interest income received from the Planetarium amounted to \$25,650 in each of the fiscal years ended in 1957 and 1956. These amounts are included in other income of the general funds.
4. Other income of the general funds for the fiscal years ended in 1957 and 1956 include (a) net income from magazine and book shop operations of \$51,790 and \$21,005, respectively, and (b) transfers from unrestricted funds functioning as endowment of \$14,227 and \$9,475, respectively. Gross income from magazine and book shop operations amounted to \$746,951 and \$735,031 for the respective years.
5. Unrestricted funds in the amount of \$250,000 have been committed in connection with alterations to the existing electrical system and an additional amount of \$800,000 has been conditionally appropriated for the construction of a new auditorium subject to appropriation of an equivalent sum by the City of New York.
6. The overdrafts on special funds represent advances in anticipation of gifts, grants and other income. To the extent such income is not received the amounts will be charged against general funds.
7. Expenditures of general funds for the fiscal year ended in 1956 differ in certain instances from those previously reported because they have been reclassified for comparative purposes.

LYBRAND, ROSS BROS. & MONTGOMERY
Certified Public Accountants

The Board of Trustees,
The American Museum of Natural History,
New York, N. Y.

We have examined the balance sheet of THE AMERICAN MUSEUM of NATURAL HISTORY as of June 30, 1957 and the related statements of funds for the fiscal year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We made a similar examination for the fiscal year ended June 30, 1956.

In our opinion, the accompanying balance sheets and related statements of funds present fairly the financial position of the Museum at June 30, 1957 and 1956 and the results of its operations for the fiscal years then ended, on a consistent basis.

Lybrand, Ross Bros. & Montgomery
New York, September 12, 1957.

THE AMERICAN MUSEUM OF NATURAL HISTORY
PLANETARIUM AUTHORITY

Financial Statements

For the Fiscal Years ended June 30, 1957 and 1956

THE AMERICAN MUSEUM
PLANETARIUM
BALANCE SHEETS,

ASSETS:	1957	1956
Cash	\$ 27,824	\$ 9,141
Accounts receivable	1,724	993
Inventory of publications	19,695	16,214
	<u>\$ 49,243</u>	<u>\$ 26,348</u>
Equipment, fixtures, etc.:		
Furniture and fixtures	\$ 38,870	\$ 38,870
Plant equipment, machinery and tools	70,222	70,222
Zeiss planetarium instrument	126,434	126,434
Copernican planetarium instrument	30,435	30,435
	<u>\$265,961</u>	<u>\$265,961</u>
Less, Allowances for depreciation	253,345	250,192
	<u>\$ 12,616</u>	<u>15,769</u>
Building, at cost (see note)	569,209	569,209
Land (donated by the City of New York)	—	—
	<u>\$581,825</u>	<u>\$584,978</u>
Prepaid expenses	<u>\$ 4,829</u>	<u>\$ 1,471</u>
	<u>\$635,897</u>	<u>\$612,797</u>

Note: The Authority's corporate charter terminates when all its liabilities, including its bonds, have been paid in full or have otherwise been discharged. At that time title to its personal property passes to The American Museum of Natural History and title to its real property passes to the City of New York to be maintained and operated in the same manner as other city property occupied by the Museum. Because of the nature of the ownership of the property, provision for depreciation of the building is considered unnecessary.

OF NATURAL HISTORY

AUTHORITY

June 30, 1957 and 1956

LIABILITIES:	1957	1956
Accounts payable	\$ 522	\$ 446
4 1/2% Refunding Serial Revenue bonds, and interest thereon (held by The American Museum of Natural History):		
Interest:		
Unpaid coupons, past due	\$255,915	\$252,000
Accrued on bonds not yet due	435	652
Accrued on past-due unpaid bonds	196,800	174,848
	\$453,150	\$427,500
Less, Payments on account, including \$25,650 in each of the respective years	137,700	112,050
	\$315,450	\$315,450
Principal:		
Past due	\$512,000	\$483,000
Due in annual instalments of \$29,000 each through May 1, 1959	58,000	87,000
	\$570,000	\$570,000
	\$885,972	\$885,896
Deferred income, unearned subscriptions	\$ 7,225	\$ 5,653

CONTRIBUTED CAPITAL AND DEFICIT:

Contributed capital:		
Charles Hayden	\$156,869	\$156,869
Charles Hayden Foundation	130,925	130,925
	\$287,794	\$287,794
Deficit, as annexed	545,094	566,546
	\$257,300*	\$278,752*
	\$635,897	\$612,797

* Denotes deduction.

STATEMENT OF INCOME, EXPENSES AND DEFICIT

for the fiscal years ended June 30, 1957 and 1956

	1957	1956
Income:		
Admission fees less allowances and commissions	\$291,310	\$274,632
Special lectures and courses	10,751	5,805
Miscellaneous	149	321
	<u>\$302,210</u>	<u>\$280,758</u>
Auxiliary activities:		
Sales booth	\$ 76,581	\$ 65,854
Sky Reporter pamphlet	6,237	5,672
	<u>\$ 82,818</u>	<u>\$ 71,526</u>
Total	<u>\$385,028</u>	<u>\$352,284</u>
Expenses:		
Preparation, presentation and promotional:		
Salaries	\$105,802	\$ 93,660
Supplies and expenses	22,887	23,436
	<u>\$128,689</u>	<u>\$117,096</u>
Operation and maintenance:		
Salaries	\$ 65,214	\$ 62,673
Supplies and expenses	32,624	26,138
Special improvements, renovations, etc.	19,304	48,534
	<u>\$117,142</u>	<u>\$137,345</u>
Administrative and general:		
Salaries	\$ 5,000	\$ 5,000
Pension fund, social security and other employee benefits	13,155	13,496
Miscellaneous	9,978	8,034
	<u>\$ 28,133</u>	<u>\$ 26,530</u>
Auxiliary activities:		
Sales booth	\$ 54,772	\$ 47,798
Sky Reporter pamphlet	6,037	4,331
	<u>\$ 60,809</u>	<u>\$ 52,129</u>
Total	<u>\$334,773</u>	<u>\$333,100</u>
Income before interest and depreciation	<u>\$ 50,255</u>	<u>\$ 19,184</u>
Interest expense:		
Interest on 4½% Refunding Serial Revenue bonds, including \$21,952 and \$20,647 on past-due bonds for the respective years	\$ 25,650	\$ 25,650
Provision for depreciation (see note to accompanying balance sheet)	3,153	4,121
Total interest and depreciation	<u>\$ 28,803</u>	<u>\$ 29,771</u>
Net income (loss*) for year	<u>\$ 21,452</u>	<u>\$ 10,587*</u>
Deficit, beginning of year	566,546	555,959
Deficit, end of year	<u>\$545,094</u>	<u>\$566,546</u>

LYBRAND, ROSS BROS. & MONTGOMERY
Certified Public Accountants

The Members of The American Museum of
Natural History Planetarium Authority,
New York, N. Y.

We have examined the balance sheet of THE AMERICAN MUSEUM of NATURAL HISTORY PLANETARIUM AUTHORITY as of June 30, 1957 and the related statement of income, expenses and deficit for the fiscal year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We made a similar examination for the fiscal year ended June 30, 1956.

In our opinion, the accompanying balance sheets and related statements of income, expenses and deficit present fairly the financial position of the Authority at June 30, 1957 and 1956 and the results of its operations for the fiscal years then ended, on a consistent basis.

Lybrand, Ross Bros. & Montgomery

New York, September 12, 1957.

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